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SPECIFICATIONS

DEPARTMENT OF VETERANS AFFAIRS MILWAUKEE EHRM INFRASTRUCTURE UPGRADES

5000 W National Ave, Milwaukee, WI 53295
Project Number 695-21-700
VISN 12

FINAL BID DOCUMENTS
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3308 Preston Road . Suite 350-164
Plano, Texas 75093 . 972.625.3838

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SEALS PAGE

Romanyk Consulting Corp
Registration No. BR 360
State of Texas

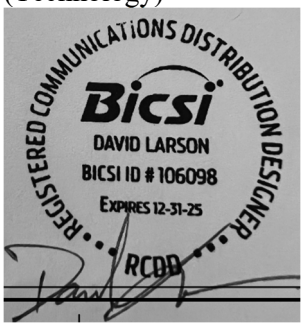
Rebecca C. Olson
Registered Architect

9.5.2025

Linnea Shaw
Professional Engineer
(Civil)

Yumei Wang
Professional Engineer
(Electrical)

David Larson
Registered Communications Distribution Designer
(Technology)



Arlo Wieczorek
Professional Engineer
(Mechanical, Plumbing, and Fire Protection)

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111-FP107	BUILDING 111 LEVEL 06 - FIRE PROTECTION FLOOR PLAN
111-FP108	BUILDING 111 LEVEL 07 - FIRE PROTECTION FLOOR PLAN
111-FP109	BUILDING 111 LEVEL 08 - FIRE PROTECTION FLOOR PLAN
111-FP110	BUILDING 111 LEVEL 09 - FIRE PROTECTION FLOOR PLAN
111-FP111	BUILDING 111 LEVEL 10 - FIRE PROTECTION FLOOR PLAN
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06-PD102	BUILDING 06 LEVEL 02 - PLUMBING DEMOLITION PLAN
06-PD103	BUILDING 06 LEVEL 03 - PLUMBING DEMOLITION PLAN
06-PP101	BUILDING 06 LEVEL 01 - PLUMBING FLOOR PLAN
06-PP102	BUILDING 06 LEVEL 02 - PLUMBING FLOOR PLAN
06-PP103	BUILDING 06 LEVEL 03 - PLUMBING FLOOR PLAN
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43-PP101	BUILDING 43 LEVEL 01 - PLUMBING FLOOR PLAN
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70-PP101	BUILDING 70 LEVEL 01 - PLUMBING FLOOR PLAN
102-PP101	BUILDING 102 BASEMENT - PLUMBING FLOOR PLAN
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102-PP103	BUILDING 102 LEVEL 01 - PLUMBING FLOOR PLAN
109-PP101	BUILDING 109 BASEMENT - PLUMBING FLOOR PLAN
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111-PD102	BUILDING 111 LEVEL 01 - PLUMBING DEMOLITION PLAN
111-PD103	BUILDING 111 LEVEL 01 - PLUMBING DEMOLITION PLAN
111-PD104	BUILDING 111 LEVEL 02 - PLUMBING DEMOLITION PLAN
111-PD105	BUILDING 111 LEVEL 03 - PLUMBING DEMOLITION PLAN
111-PD106	BUILDING 111 LEVEL 04 - PLUMBING DEMOLITION PLAN
111-PD107	BUILDING 111 LEVEL 05 - PLUMBING DEMOLITION PLAN
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111-PP116	BUILDING 111 LEVEL 10 - PLUMBING FLOOR PLAN
123-PD101	BUILDING 123 LEVEL 01 - PLUMBING DEMOLITION PLAN
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06-MD103	BUILDING 06 LEVEL 03 - MECHANICAL DEMOLITION PLAN
06-MH101	BUILDING 06 LEVEL 01 - MECHANICAL FLOOR PLAN
06-MH102	BUILDING 06 LEVEL 02 - MECHANICAL FLOOR PLAN
06-MH103	BUILDING 06 LEVEL 03 - MECHANICAL FLOOR PLAN
07-MD101	BUILDING 07 BASEMENT - MECHANICAL DEMOLITION PLAN
07-MH101	BUILDING 07 BASEMENT - MECHANICAL FLOOR PLAN
43-MD101	BUILDING 43 LEVEL 01 - MECHANICAL DEMOLITION PLAN
43-MD102	BUILDING 43 LEVEL 02 - MECHANICAL DEMOLITION PLAN
43-MH101	BUILDING 43 LEVEL 01 - MECHANICAL FLOOR PLAN
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70-MD101	BUILDING 70 LEVEL 01 - MECHANICAL DEMOLITION PLAN
70-MH101	BUILDING 70 LEVEL 01 - MECHANICAL FLOOR PLAN
102-MD101	BUILDING 102 BASEMENT - MECHANICAL DEMOLITION PLAN
102-MD102	BUILDING 102 LEVEL 01 - MECHANICAL DEMOLITION PLAN
102-MH101	BUILDING 102 BASEMENT - MECHANICAL FLOOR PLAN
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111-MD101	BUILDING 111 BASEMENT - OVERALL & ENLARGED MECHANICAL DEMOLITION PLANS
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111-MD103	BUILDING 111 LEVEL 02 - MECHANICAL OVERALL & ENLARGED DEMOLITION PLANS
111-MD104	BUILDING 111 LEVEL 03 - MECHANICAL OVERALL & ENLARGED DEMOLITION PLANS
111-MD105	BUILDING 111 LEVEL 04 - MECHANICAL OVERALL & ENLARGED DEMOLITION PLANS
111-MD106	BUILDING 111 LEVEL 05 - MECHANICAL OVERALL & ENLARGED DEMOLITION PLANS
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111-MD108	BUILDING 111 LEVEL 07 - MECHANICAL OVERALL & ENLARGED DEMOLITION PLANS
111-MD109	BUILDING 111 LEVEL 08 - MECHANICAL OVERALL & ENLARGED DEMOLITION PLANS
111-MD110	BUILDING 111 LEVEL 09 - MECHANICAL OVERALL & ENLARGED DEMOLITION PLANS
111-MD111	BUILDING 111 LEVEL 10 - MECHANICAL OVERALL & ENLARGED DEMOLITION PLANS
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111-MH102	BUILDING 111 LEVEL 01 - MECHANICAL FLOOR PLAN
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111-MH104	BUILDING 111 LEVEL 02 - MECHANICAL FLOOR PLAN
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111-MH108	BUILDING 111 LEVEL 05 - MECHANICAL FLOOR PLAN
111-MH109	BUILDING 111 LEVEL 06 - MECHANICAL FLOOR PLAN
111-MH110	BUILDING 111 LEVEL 07 - MECHANICAL FLOOR PLAN
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111-MH113	BUILDING 111 LEVEL 10 - MECHANICAL FLOOR PLAN
123-MD101	BUILDING 123 LEVEL 01 - MECHANICAL DEMOLITION PLAN
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04-ED101	BLDG 4 - SECOND FLOOR OVERALL & ENLARGED - ELECTRICAL DEMOLITION
04-EP101	BLDG 4 - BASEMENT/SECOND FLOOR OVERALL & ENLARGED - ELECTRICAL NEW WORK
05-ED101	BLDG 5 - FIRST FLOOR OVERALL & ENLARGED - ELECTRICAL DEMO
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05-EP102	BLDG 5 - SECOND FLOOR OVERALL & ENLARGED - ELECTRICAL NEW WORK
06-ED101	BLDG 6 - FIRST FLOOR OVERALL & ENLARGED - ELECTRICAL DEMOLITION
06-ED102	BLDG 6 - SECOND FLOOR OVERALL & ENLARGED - ELECTRICAL DEMOLITION
06-ED103	BLDG 6 - THIRD FLOOR OVERALL & ENLARGED - ELECTRICAL DEMOLITION
06-EP100	BLDG 6 - BASEMENT OVERALL & ENLARGED - ELECTRICAL NEW WORK
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07-ED101	BLDG 7 - BASEMENT OVERALL & ENLARGED - ELECTRICAL DEMO
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20-ED101	BLDG 20 - SECOND FLOOR OVERALL & ENLARGED - ELECTRICAL DEMO
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20-EP101	BLDG 20 - SECOND FLOOR OVERALL & ENLARGED - ELECTRICAL NEW WORK
43-ED100	BLDG 43 - BASEMENT - OVERALL & ENLARGED - ELECTRICAL DEMO
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70-ED101	BLDG 70 - FIRST FLOOR OVERALL & ENLARGED - ELECTRICAL DEMOLITION

70-EP100	BLDG 70 - BASEMENT OVERALL & ENLARGED - ELECTRICAL NEW WORK
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70-EP102	BLDG 70 - FIRST FLOOR ENLARGED - ELECTRICAL NEW WORK
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102-ED101	BLDG 102 - BASEMENT OVERALL & ENLARGED - ELECTRICAL DEMOLITION
102-ED102	BLDG 102 - FIRST FLOOR OVERALL & ENLARGED - ELECTRICAL DEMOLITION
102-EP101	BLDG 102 - BASEMENT OVERALL & ENLARGED - ELECTRICAL NEW WORK
102-EP102	BLDG 102 - FIRST FLOOR OVERALL & ENLARGED - ELECTRICAL NEW WORK
107-ED101	BLDG 107 - FIRST FLOOR OVERALL & ENLARGED - ELECTRICAL DEMOLITION
107-ED102	BLDG 107 - MEZZANINE OVERALL & ENLARGED - ELECTRICAL DEMOLITION
107-EP101	BLDG 107 - FIRST FLOOR OVERALL & ENLARGED - ELECTRICAL NEW WORK
107-EP102	BLDG 107 - MEZZANINE OVERALL & ENLARGED - ELECTRICAL NEW WORK
108-ED101	BLDG 108 - SECOND FLOOR OVERALL & ENLARGED - ELECTRICAL DEMOLITION
108-EP101	BLDG 108 - SECOND FLOOR OVERALL & ENLARGED - ELECTRICAL NEW WORK
109-ED101	BLDG 109 - BASEMENT OVERALL & ENLARGED - ELECTRICAL DEMOLITION
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111-ED102	BLDG 111 - FIRST FLOOR OVERALL & ENLARGED - ELECTRICAL DEMOLITION
111-ED103	BLDG 111 - SECOND FLOOR OVERALL & ENLARGED - ELECTRICAL DEMO
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111-ED107	BLDG 111 - SIXTH FLOOR OVERALL & ENLARGED - ELECTRICAL DEMOLITION
111-ED108	BLDG 111 - SEVENTH FLOOR OVERALL & ENLARGED - ELECTRICAL DEMOLITION
111-ED109	BLDG 111 - EIGHTH FLOOR OVERALL & ENLARGED - ELECTRICAL DEMOLITION
111-ED110	BLDG 111 - NINTH FLOOR OVERALL & ENLARGED - ELECTRICAL DEMOLITION
111-ED111	BLDG 111 - TENTH FLOOR OVERALL & ENLARGED - ELECTRICAL DEMOLITION
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111-EP101	BLDG 111 - BASEMENT OVERALL & ENLARGED - ELECTRICAL NEW WORK
111-EP102	BLDG 111 - BASEMENT AND FIRST FLOOR - ELECTRICAL CONDUIT NEW WORK
111-EP103	BLDG 111 - FIRST FLOOR OVERALL & ENLARGED - ELECTRICAL NEW WORK
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112-EP101	BLDG 112 - FIRST FLOOR OVERALL & ENLARGED - ELECTRICAL NEW WORK
113-ED101	BLDG 113 - BASEMENT OVERALL & ENLARGED - ELECTRICAL DEMOLITION
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123-ED101	BLDG 123 - FIRST FLOOR OVERALL & ENLARGED - ELECTRICAL DEMOLITION
123-EP101	BLDG 123 - FIRST FLOOR OVERALL & ENLARGED - ELECTRICAL NEW WORK
123-EP102	BLDG 123 - FIRST FLOOR ENLARGED - ELECTRICAL NEW WORK
144-ED101	BLDG 144 - BASEMENT OVERALL & ENLARGED - ELECTRICAL DEMOLITION
144-ED102	BLDG 144 - FIRST FLOOR OVERALL & ENLARGED - ELECTRICAL DEMOLITION
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144-EP102	BLDG 144 - FIRST FLOOR OVERALL & ENLARGED - ELECTRICAL NEW WORK
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146-ED101	BLDG 146 - BASEMENT OVERALL & ENLARGED - ELECTRICAL DEMOLITION
146-EP101	BLDG 146 - BASEMENT OVERALL & ENLARGED - ELECTRICAL NEW WORK
147-ED101	BUILDING 147 BASEMENT - ELECTRICAL DEMOLITION PLAN

147-EP101	BLDG 147 - BASEMENT OVERALL & ENLARGED - ELECTRICAL NEW WORK
148-ED101	BLDG 148 - BASEMENT OVERALL & ENLARGED - ELECTRICAL DEMOLITION
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E-401	ELECTRICAL PANEL SCHEDULES
E-402	ELECTRICAL PANEL SCHEDULES
E-403	ELECTRICAL PANEL SCHEDULES
E-404	ELECTRICAL PANEL SCHEDULES
E-405	ELECTRICAL PANEL SCHEDULES
E-406	ELECTRICAL PANEL SCHEDULES
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04-TD101	BUILDING 04 FIRST FLOOR DEMO PLAN - TECHNOLOGY
04-TD102	BUILDING 04 SECOND FLOOR DEMO PLAN - TECHNOLOGY
04-TN100	BUILDING 04 BASEMENT PLAN - TECHNOLOGY
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05-TD102	BUILDING 05 SECOND FLOOR DEMO PLAN - TECHNOLOGY
05-TD103	BUILDING 05 THIRD FLOOR DEMO PLAN - TECHNOLOGY
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06-TD101A	BUILDING 06 FIRST FLOOR DEMO PLAN - TECHNOLOGY - AREA A
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06-TD101C	BUILDING 06 FIRST FLOOR DEMO PLAN - TECHNOLOGY - AREA C
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06-TD102A	BUILDING 06 SECOND FLOOR DEMO PLAN - TECHNOLOGY - AREA A
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06-TD102C	BUILDING 06 SECOND FLOOR DEMO PLAN - TECHNOLOGY - AREA C
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06-TN100	BUILDING 06 BASEMENT FLOOR OVERALL PLAN - TECHNOLOGY
06-TN100A	BUILDING 06 BASEMENT PLAN - TECHNOLOGY - AREA A
06-TN100B	BUILDING 06 BASEMENT PLAN - TECHNOLOGY - AREA B
06-TN100C	BUILDING 06 BASEMENT PLAN - TECHNOLOGY - AREA C
06-TN100D	BUILDING 06 BASEMENT PLAN - TECHNOLOGY - AREA D
06-TN101	BUILDING 06 FIRST FLOOR OVERALL PLAN - TECHNOLOGY
06-TN101A	BUILDING 06 FIRST FLOOR PLAN - TECHNOLOGY - AREA A
06-TN101B	BUILDING 06 FIRST FLOOR PLAN - TECHNOLOGY - AREA B
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06-TN102	BUILDING 06 SECOND FLOOR OVERALL PLAN - TECHNOLOGY
06-TN102A	BUILDING 06 SECOND FLOOR PLAN - TECHNOLOGY - AREA A
06-TN102B	BUILDING 06 SECOND FLOOR PLAN - TECHNOLOGY - AREA B
06-TN102C	BUILDING 06 SECOND FLOOR PLAN - TECHNOLOGY - AREA C
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06-TN103	BUILDING 06 THIRD FLOOR OVERALL PLAN - TECHNOLOGY
06-TN103C	BUILDING 06 THIRD FLOOR PLAN - TECHNOLOGY - AREA C
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43-TN103 43-TN104	BUILDING 43 THIRD FLOOR PLAN – TECHNOLOGY BUILDING 43 FOURTH FLOOR PLAN - TECHNOLOGY
70-TD100A	BUILDING 70 BASEMENT DEMO PLAN - TECHNOLOGY - AREA A
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70-TD100C-S	BUILDING 70 BASEMENT DEMO PLAN - TECHNOLOGY - AREA C SOUTH
70-TD100D-N	BUILDING 70 BASEMENT DEMO PLAN - TECHNOLOGY - AREA D NORTH
70-TD100D-S	BUILDING 70 BASEMENT DEMO PLAN - TECHNOLOGY - AREA D SOUTH
70-TD100E-N	BUILDING 70 BASEMENT DEMO PLAN - TECHNOLOGY - AREA E NORTH
70-TD100E-S	BUILDING 70 BASEMENT DEMO PLAN - TECHNOLOGY - AREA E SOUTH
70-TD100K	BUILDING 70 BASEMENT DEMO PLAN - TECHNOLOGY - AREA K
70-TD101A	BUILDING 70 FIRST FLOOR DEMO PLAN - TECHNOLOGY - AREA A
70-TD101B	BUILDING 70 FIRST FLOOR DEMO PLAN - TECHNOLOGY - AREA B
70-TD101C-N	BUILDING 70 FIRST FLOOR DEMO PLAN - TECHNOLOGY - AREA C NORTH
70-TD101C-S	BUILDING 70 FIRST FLOOR DEMO PLAN - TECHNOLOGY - AREA C SOUTH
70-TD101D-N	BUILDING 70 FIRST FLOOR DEMO PLAN - TECHNOLOGY - AREA D NORTH
70-TD101D-S	BUILDING 70 FIRST FLOOR DEMO PLAN - TECHNOLOGY - AREA D SOUTH
70-TD101E-N	BUILDING 70 FIRST FLOOR DEMO PLAN - TECHNOLOGY - AREA E NORTH
70-TD101E-S	BUILDING 70 FIRST FLOOR DEMO PLAN - TECHNOLOGY - AREA E SOUTH
70-TD101K	BUILDING 70 FIRST FLOOR DEMO PLAN - TECHNOLOGY - AREA K
70-TD102A	BUILDING 70 SECOND FLOOR DEMO PLAN - TECHNOLOGY - AREA A
70-TD102B	BUILDING 70 SECOND FLOOR DEMO PLAN - TECHNOLOGY - AREA B
70-TD102C-N	BUILDING 70 SECOND FLOOR DEMO PLAN - TECHNOLOGY - AREA C NORTH
70-TD102C-S	BUILDING 70 SECOND FLOOR DEMO PLAN - TECHNOLOGY - AREA C SOUTH
70-TD102D-N	BUILDING 70 SECOND FLOOR DEMO PLAN - TECHNOLOGY - AREA D NORTH
70-TD102D-S	BUILDING 70 SECOND FLOOR DEMO PLAN - TECHNOLOGY - AREA D SOUTH
70-TD102E-N	BUILDING 70 SECOND FLOOR DEMO PLAN - TECHNOLOGY - AREA E NORTH

70-TD102E-S	BUILDING 70 SECOND FLOOR DEMO PLAN - TECHNOLOGY - AREA E SOUTH
70-TD103	BUILDING 70 THIRD FLOOR DEMO PLAN - TECHNOLOGY
70-TN100	BUILDING 70 BASEMENT OVERALL PLAN - TECHNOLOGY
70-TN100A	BUILDING 70 BASEMENT PLAN - TECHNOLOGY - AREA A
70-TN100B	BUILDING 70 BASEMENT PLAN - TECHNOLOGY - AREA B
70-TN100C-N	BUILDING 70 BASEMENT PLAN - TECHNOLOGY - AREA C NORTH
70-TN100C-S	BUILDING 70 BASEMENT PLAN - TECHNOLOGY - AREA C SOUTH
70-TN100D-N	BUILDING 70 BASEMENT PLAN - TECHNOLOGY - AREA D NORTH
70-TN100D-S	BUILDING 70 BASEMENT PLAN - TECHNOLOGY - AREA D SOUTH
70-TN100E-N	BUILDING 70 BASEMENT PLAN - TECHNOLOGY - AREA E NORTH
70-TN100E-S	BUILDING 70 BASEMENT PLAN - TECHNOLOGY - AREA E SOUTH
70-TN100K	BUILDING 70 BASEMENT PLAN - TECHNOLOGY - AREA K
70-TN101	BUILDING 70 FIRST FLOOR OVERALL PLAN - TECHNOLOGY
70-TN101A	BUILDING 70 FIRST FLOOR PLAN - TECHNOLOGY - AREA A
70-TN101B	BUILDING 70 FIRST FLOOR PLAN - TECHNOLOGY - AREA B
70-TN101C-N	BUILDING 70 FIRST FLOOR PLAN - TECHNOLOGY - AREA C NORTH
70-TN101C-S	BUILDING 70 FIRST FLOOR PLAN - TECHNOLOGY - AREA C SOUTH
70-TN101D-N	BUILDING 70 FIRST FLOOR PLAN - TECHNOLOGY - AREA D NORTH
70-TN101D-S	BUILDING 70 FIRST FLOOR PLAN - TECHNOLOGY - AREA D SOUTH
70-TN101E-N	BUILDING 70 FIRST FLOOR PLAN - TECHNOLOGY - AREA E NORTH
70-TN101E-S	BUILDING 70 FIRST FLOOR PLAN - TECHNOLOGY - AREA E SOUTH
70-TN101K	BUILDING 70 FIRST FLOOR PLAN - TECHNOLOGY - AREA K
70-TN102	BUILDING 70 SECOND FLOOR OVERALL PLAN - TECHNOLOGY
70-TN102A	BUILDING 70 SECOND FLOOR PLAN - TECHNOLOGY - AREA A
70-TN102B	BUILDING 70 SECOND FLOOR PLAN - TECHNOLOGY - AREA B
70-TN102C-N	BUILDING 70 SECOND FLOOR PLAN - TECHNOLOGY - AREA C NORTH
70-TN102C-S	BUILDING 70 SECOND FLOOR PLAN - TECHNOLOGY - AREA C SOUTH
70-TN102D-N	BUILDING 70 SECOND FLOOR PLAN - TECHNOLOGY - AREA D NORTH
70-TN102D-S	BUILDING 70 SECOND FLOOR PLAN - TECHNOLOGY - AREA D SOUTH
70-TN102E-N	BUILDING 70 SECOND FLOOR PLAN - TECHNOLOGY - AREA E NORTH
70-TN102E-S	BUILDING 70 SECOND FLOOR PLAN - TECHNOLOGY - AREA E SOUTH
70-TN103	BUILDING 70 THIRD FLOOR PLAN - TECHNOLOGY
97-TD101	BUILDING 97 FIRST FLOOR DEMO PLAN - TECHNOLOGY
97-TN101	BUILDING 97 FIRST FLOOR PLAN - TECHNOLOGY
102-TD100	BUILDING 102 BASEMENT DEMO PLAN - TECHNOLOGY
102-TD101	BUILDING 102 FIRST FLOOR DEMO PLAN - TECHNOLOGY
102-TN100	BUILDING 102 BASEMENT PLAN - TECHNOLOGY
102-TN101	BUILDING 102 FIRST FLOOR PLAN - TECHNOLOGY
107-TD101	BUILDING 107 FIRST FLOOR DEMO PLAN - TECHNOLOGY
107-TD102	BUILDING 107 MEZZANINE FLOOR DEMO PLAN - TECHNOLOGY

107-TN101	BUILDING 107 FIRST FLOOR PLAN - TECHNOLOGY
107-TN102	BUILDING 107 MEZZANINE FLOOR PLAN - TECHNOLOGY
108-TD101	BUILDING 108 FIRST FLOOR DEMO PLAN - TECHNOLOGY
108-TD102	BUILDING 108 SECOND FLOOR DEMO PLAN - TECHNOLOGY
108-TN101	BUILDING 108 FIRST FLOOR PLAN - TECHNOLOGY
108-TN102	BUILDING 108 SECOND FLOOR PLAN - TECHNOLOGY
109-TD100	BUILDING 109 BASEMENT DEMO PLAN - TECHNOLOGY
109-TN100	BUILDING 109 BASEMENT PLAN - TECHNOLOGY
111-TD1009	BUILDING 111 SUB-BASEMENT OVERALL DEMO PLAN - TECHNOLOGY
111-TD1009A	BUILDING 111 SUB-BASEMENT DEMO PLAN - TECHNOLOGY - AREA A
111-TD1009B	BUILDING 111 SUB-BASEMENT DEMO PLAN - TECHNOLOGY - AREA B
111-TD1009C	BUILDING 111 SUB-BASEMENT DEMO PLAN - TECHNOLOGY - AREA C
111-TD1009D	BUILDING 111 SUB-BASEMENT DEMO PLAN - TECHNOLOGY - AREA D
111-TD1009E	BUILDING 111 SUB-BASEMENT DEMO PLAN - TECHNOLOGY - AREA E
111-TD1009F	BUILDING 111 SUB-BASEMENT DEMO PLAN - TECHNOLOGY - AREA F
111-TD1009G	BUILDING 111 SUB-BASEMENT DEMO PLAN - TECHNOLOGY - AREA G
111-TD1009H	BUILDING 111 SUB-BASEMENT DEMO PLAN - TECHNOLOGY - AREA H
111-TD1009I	BUILDING 111 SUB-BASEMENT DEMO PLAN - TECHNOLOGY - AREA I
111-TD1009J	BUILDING 111 SUB-BASEMENT DEMO PLAN - TECHNOLOGY - AREA J
111-TD1009K	BUILDING 111 SUB-BASEMENT DEMO PLAN - TECHNOLOGY - AREA K
111-TD1009L	BUILDING 111 SUB-BASEMENT DEMO PLAN - TECHNOLOGY - AREA L
111-TD1100	BUILDING 111 BASEMENT OVERALL DEMO PLAN - TECHNOLOGY
111-TD1100A	BUILDING 111 BASEMENT DEMO PLAN - TECHNOLOGY - AREA A
111-TD1100B	BUILDING 111 BASEMENT DEMO PLAN - TECHNOLOGY - AREA B
111-TD1100C	BUILDING 111 BASEMENT DEMO PLAN - TECHNOLOGY - AREA C
111-TD1100D	BUILDING 111 BASEMENT DEMO PLAN - TECHNOLOGY - AREA D
111-TD1100E	BUILDING 111 BASEMENT DEMO PLAN - TECHNOLOGY - AREA E
111-TD1100F	BUILDING 111 BASEMENT DEMO PLAN - TECHNOLOGY - AREA F
111-TD1100G	BUILDING 111 BASEMENT DEMO PLAN - TECHNOLOGY - AREA G
111-TD1100H	BUILDING 111 BASEMENT DEMO PLAN - TECHNOLOGY - AREA H
111-TD1100I	BUILDING 111 BASEMENT DEMO PLAN - TECHNOLOGY - AREA I
111-TD1100J	BUILDING 111 BASEMENT DEMO PLAN - TECHNOLOGY - AREA J
111-TD1100K	BUILDING 111 BASEMENT DEMO PLAN - TECHNOLOGY - AREA K
111-TD1100L	BUILDING 111 BASEMENT DEMO PLAN - TECHNOLOGY - AREA L
111-TD1101	BUILDING 111 FIRST FLOOR OVERALL DEMO PLAN - TECHNOLOGY
111-TD1101A	BUILDING 111 FIRST FLOOR DEMO PLAN - TECHNOLOGY - AREA A
111-TD1101B	BUILDING 111 FIRST FLOOR DEMO PLAN - TECHNOLOGY - AREA B
111-TD1101C	BUILDING 111 FIRST FLOOR DEMO PLAN - TECHNOLOGY - AREA C
111-TD1101D	BUILDING 111 FIRST FLOOR DEMO PLAN - TECHNOLOGY - AREA D
111-TD1101E	BUILDING 111 FIRST FLOOR DEMO PLAN - TECHNOLOGY - AREA E

111-TD1101F	BUILDING 111 FIRST FLOOR DEMO PLAN - TECHNOLOGY - AREA F
111-TD1101G	BUILDING 111 FIRST FLOOR DEMO PLAN - TECHNOLOGY - AREA G
111-TD1101H	BUILDING 111 FIRST FLOOR DEMO PLAN - TECHNOLOGY - AREA H
111-TD1101I	BUILDING 111 FIRST FLOOR DEMO PLAN - TECHNOLOGY - AREA I
111-TD1101J	BUILDING 111 FIRST FLOOR DEMO PLAN - TECHNOLOGY - AREA J
111-TD1101K	BUILDING 111 FIRST FLOOR DEMO PLAN - TECHNOLOGY - AREA K
111-TD1101L	BUILDING 111 FIRST FLOOR DEMO PLAN - TECHNOLOGY - AREA L
111-TD1102	BUILDING 111 SECOND FLOOR OVERALL DEMO PLAN - TECHNOLOGY
111-TD1102A	BUILDING 111 SECOND FLOOR DEMO PLAN - TECHNOLOGY - AREA A
111-TD1102B	BUILDING 111 SECOND FLOOR DEMO PLAN - TECHNOLOGY - AREA B
111-TD1102C	BUILDING 111 SECOND FLOOR DEMO PLAN - TECHNOLOGY - AREA C
111-TD1102D	BUILDING 111 SECOND FLOOR DEMO PLAN - TECHNOLOGY - AREA D
111-TD1102E	BUILDING 111 SECOND FLOOR DEMO PLAN - TECHNOLOGY - AREA E
111-TD1102F	BUILDING 111 SECOND FLOOR DEMO PLAN - TECHNOLOGY - AREA F
111-TD1102G	BUILDING 111 SECOND FLOOR DEMO PLAN - TECHNOLOGY - AREA G
111-TD1102H	BUILDING 111 SECOND FLOOR DEMO PLAN - TECHNOLOGY - AREA H
111-TD1102I	BUILDING 111 SECOND FLOOR DEMO PLAN - TECHNOLOGY - AREA I
111-TD1102J	BUILDING 111 SECOND FLOOR DEMO PLAN - TECHNOLOGY - AREA J
111-TD1102K	BUILDING 111 SECOND FLOOR DEMO PLAN - TECHNOLOGY - AREA K
111-TD1102L	BUILDING 111 SECOND FLOOR DEMO PLAN - TECHNOLOGY - AREA L
111-TD1103	BUILDING 111 THIRD FLOOR OVERALL DEMO PLAN - TECHNOLOGY
111-TD1103A	BUILDING 111 THIRD FLOOR DEMO PLAN - TECHNOLOGY - AREA A
111-TD1103B	BUILDING 111 THIRD FLOOR DEMO PLAN - TECHNOLOGY - AREA B
111-TD1103C	BUILDING 111 THIRD FLOOR DEMO PLAN - TECHNOLOGY - AREA C
111-TD1103D	BUILDING 111 THIRD FLOOR DEMO PLAN - TECHNOLOGY - AREA D
111-TD1103E	BUILDING 111 THIRD FLOOR DEMO PLAN - TECHNOLOGY - AREA E
111-TD1103F	BUILDING 111 THIRD FLOOR DEMO PLAN - TECHNOLOGY - AREA F
111-TD1103G	BUILDING 111 THIRD FLOOR DEMO PLAN - TECHNOLOGY - AREA G
111-TD1103H	BUILDING 111 THIRD FLOOR DEMO PLAN - TECHNOLOGY - AREA H
111-TD1103I	BUILDING 111 THIRD FLOOR DEMO PLAN - TECHNOLOGY - AREA I
111-TD1103J	BUILDING 111 THIRD FLOOR DEMO PLAN - TECHNOLOGY - AREA J
111-TD1103K	BUILDING 111 THIRD FLOOR DEMO PLAN - TECHNOLOGY - AREA K
111-TD1103L	BUILDING 111 THIRD FLOOR DEMO PLAN - TECHNOLOGY - AREA L
111-TD1104	BUILDING 111 FOURTH FLOOR OVERALL DEMO PLAN - TECHNOLOGY
111-TD1104A	BUILDING 111 FOURTH FLOOR DEMO PLAN - TECHNOLOGY - AREA A
111-TD1104B	BUILDING 111 FOURTH FLOOR DEMO PLAN - TECHNOLOGY - AREA B
111-TD1104D	BUILDING 111 FOURTH FLOOR DEMO PLAN - TECHNOLOGY - AREA D
111-TD1104E	BUILDING 111 FOURTH FLOOR DEMO PLAN - TECHNOLOGY - AREA E
111-TD1104F	BUILDING 111 FOURTH FLOOR DEMO PLAN - TECHNOLOGY - AREA F
111-TD1104H	BUILDING 111 FOURTH FLOOR DEMO PLAN - TECHNOLOGY - AREA H

111-TD1104I	BUILDING 111 FOURTH FLOOR DEMO PLAN - TECHNOLOGY - AREA I
111-TD1104J	BUILDING 111 FOURTH FLOOR DEMO PLAN - TECHNOLOGY - AREA J
111-TD1104K	BUILDING 111 FOURTH FLOOR DEMO PLAN - TECHNOLOGY - AREA K
111-TD1104L	BUILDING 111 FOURTH FLOOR DEMO PLAN - TECHNOLOGY - AREA L
111-TD1105	BUILDING 111 FIFTH FLOOR OVERALL DEMO PLAN - TECHNOLOGY
111-TD1105A	BUILDING 111 FIFTH FLOOR DEMO PLAN - TECHNOLOGY - AREA A
111-TD1105B	BUILDING 111 FIFTH FLOOR DEMO PLAN - TECHNOLOGY - AREA B
111-TD1105D	BUILDING 111 FIFTH FLOOR DEMO PLAN - TECHNOLOGY - AREA D
111-TD1105E	BUILDING 111 FIFTH FLOOR DEMO PLAN - TECHNOLOGY - AREA E
111-TD1105F	BUILDING 111 FIFTH FLOOR DEMO PLAN - TECHNOLOGY - AREA F
111-TD1105H	BUILDING 111 FIFTH FLOOR DEMO PLAN - TECHNOLOGY - AREA H
111-TD1105I	BUILDING 111 FIFTH FLOOR DEMO PLAN - TECHNOLOGY - AREA I
111-TD1105J	BUILDING 111 FIFTH FLOOR DEMO PLAN - TECHNOLOGY - AREA J
111-TD1105K	BUILDING 111 FIFTH FLOOR DEMO PLAN - TECHNOLOGY - AREA K
111-TD1105L	BUILDING 111 FIFTH FLOOR DEMO PLAN - TECHNOLOGY - AREA L
111-TD1106	BUILDING 111 SIXTH FLOOR OVERALL DEMO PLAN - TECHNOLOGY
111-TD1106A	BUILDING 111 SIXTH FLOOR DEMO PLAN - TECHNOLOGY - AREA A
111-TD1106B	BUILDING 111 SIXTH FLOOR DEMO PLAN - TECHNOLOGY - AREA B
111-TD1106D	BUILDING 111 SIXTH FLOOR DEMO PLAN - TECHNOLOGY - AREA D
111-TD1106E	BUILDING 111 SIXTH FLOOR DEMO PLAN - TECHNOLOGY - AREA E
111-TD1106F	BUILDING 111 SIXTH FLOOR DEMO PLAN - TECHNOLOGY - AREA F
111-TD1106H	BUILDING 111 SIXTH FLOOR DEMO PLAN - TECHNOLOGY - AREA H
111-TD1106I	BUILDING 111 SIXTH FLOOR DEMO PLAN - TECHNOLOGY - AREA I
111-TD1106J	BUILDING 111 SIXTH FLOOR DEMO PLAN - TECHNOLOGY - AREA J
111-TD1106K	BUILDING 111 SIXTH FLOOR DEMO PLAN - TECHNOLOGY - AREA K
111-TD1106L	BUILDING 111 SIXTH FLOOR DEMO PLAN - TECHNOLOGY - AREA L
111-TD1107	BUILDING 111 SEVENTH FLOOR OVERALL DEMO PLAN - TECHNOLOGY
111-TD1107A	BUILDING 111 SEVENTH FLOOR DEMO PLAN - TECHNOLOGY - AREA A
111-TD1107B	BUILDING 111 SEVENTH FLOOR DEMO PLAN - TECHNOLOGY - AREA B
111-TD1107D	BUILDING 111 SEVENTH FLOOR DEMO PLAN - TECHNOLOGY - AREA D
111-TD1107E	BUILDING 111 SEVENTH FLOOR DEMO PLAN - TECHNOLOGY - AREA E
111-TD1107F	BUILDING 111 SEVENTH FLOOR DEMO PLAN - TECHNOLOGY - AREA F
111-TD1107H	BUILDING 111 SEVENTH FLOOR DEMO PLAN - TECHNOLOGY - AREA H
111-TD1107J	BUILDING 111 SEVENTH FLOOR DEMO PLAN - TECHNOLOGY - AREA J
111-TD1107K	BUILDING 111 SEVENTH FLOOR DEMO PLAN - TECHNOLOGY - AREA K
111-TD1107L	BUILDING 111 SEVENTH FLOOR DEMO PLAN - TECHNOLOGY - AREA L
111-TD1108	BUILDING 111 EIGHTH FLOOR OVERALL DEMO PLAN - TECHNOLOGY
111-TD1108A	BUILDING 111 EIGHTH FLOOR DEMO PLAN - TECHNOLOGY - AREA A
111-TD1108B	BUILDING 111 EIGHTH FLOOR DEMO PLAN - TECHNOLOGY - AREA B
111-TD1108D	BUILDING 111 EIGHTH FLOOR DEMO PLAN - TECHNOLOGY - AREA D

111-TD1108E	BUILDING 111 EIGHTH FLOOR DEMO PLAN - TECHNOLOGY - AREA E
111-TD1108F	BUILDING 111 EIGHTH FLOOR DEMO PLAN - TECHNOLOGY - AREA F
111-TD1108H	BUILDING 111 EIGHTH FLOOR DEMO PLAN - TECHNOLOGY - AREA H
111-TD1108J	BUILDING 111 EIGHTH FLOOR DEMO PLAN - TECHNOLOGY - AREA J
111-TD1108K	BUILDING 111 EIGHTH FLOOR DEMO PLAN - TECHNOLOGY - AREA K
111-TD1108L	BUILDING 111 EIGHTH FLOOR DEMO PLAN - TECHNOLOGY - AREA L
111-TD1109	BUILDING 111 NINTH FLOOR OVERALL DEMO PLAN - TECHNOLOGY
111-TD1109A	BUILDING 111 NINTH FLOOR DEMO PLAN - TECHNOLOGY - AREA A
111-TD1109B	BUILDING 111 NINTH FLOOR DEMO PLAN - TECHNOLOGY - AREA B
111-TD1109D	BUILDING 111 NINTH FLOOR DEMO PLAN - TECHNOLOGY - AREA D
111-TD1109E	BUILDING 111 NINTH FLOOR DEMO PLAN - TECHNOLOGY - AREA E
111-TD1109F	BUILDING 111 NINTH FLOOR DEMO PLAN - TECHNOLOGY - AREA F
111-TD1109H	BUILDING 111 NINTH FLOOR DEMO PLAN - TECHNOLOGY - AREA H
111-TD1109J	BUILDING 111 NINTH FLOOR DEMO PLAN - TECHNOLOGY - AREA J
111-TD1109K	BUILDING 111 NINTH FLOOR DEMO PLAN - TECHNOLOGY - AREA K
111-TD1109L	BUILDING 111 NINTH FLOOR DEMO PLAN - TECHNOLOGY - AREA L
111-TD1110	BUILDING 111 TENTH FLOOR OVERALL DEMO PLAN - TECHNOLOGY
111-TD1110A	BUILDING 111 TENTH FLOOR DEMO PLAN - TECHNOLOGY - AREA A
111-TD1110B	BUILDING 111 TENTH FLOOR DEMO PLAN - TECHNOLOGY - AREA B
111-TD1110D	BUILDING 111 TENTH FLOOR DEMO PLAN - TECHNOLOGY - AREA D
111-TD1110E	BUILDING 111 TENTH FLOOR DEMO PLAN - TECHNOLOGY - AREA E
111-TD1110F	BUILDING 111 TENTH FLOOR DEMO PLAN - TECHNOLOGY - AREA F
111-TD1110H	BUILDING 111 TENTH FLOOR DEMO PLAN - TECHNOLOGY - AREA H
111-TD1110J	BUILDING 111 TENTH FLOOR DEMO PLAN - TECHNOLOGY - AREA J
111-TD1110K	BUILDING 111 TENTH FLOOR DEMO PLAN - TECHNOLOGY - AREA K
111-TD1110L	BUILDING 111 TENTH FLOOR DEMO PLAN - TECHNOLOGY - AREA L
111-TN1009	BUILDING 111 SUB-BASEMENT OVERALL PLAN - TECHNOLOGY
111-TN1009A	BUILDING 111 SUB-BASEMENT PLAN - TECHNOLOGY - AREA A
111-TN1009B	BUILDING 111 SUB-BASEMENT PLAN - TECHNOLOGY - AREA B
111-TN1009C	BUILDING 111 SUB-BASEMENT PLAN - TECHNOLOGY - AREA C
111-TN1009D	BUILDING 111 SUB-BASEMENT PLAN - TECHNOLOGY - AREA D
111-TN1009E	BUILDING 111 SUB-BASEMENT PLAN - TECHNOLOGY - AREA E
111-TN1009F	BUILDING 111 SUB-BASEMENT PLAN - TECHNOLOGY - AREA F
111-TN1009G	BUILDING 111 SUB-BASEMENT PLAN - TECHNOLOGY - AREA G
111-TN1009H	BUILDING 111 SUB-BASEMENT PLAN - TECHNOLOGY - AREA H
111-TN1009I	BUILDING 111 SUB-BASEMENT PLAN - TECHNOLOGY - AREA I
111-TN1009J	BUILDING 111 SUB-BASEMENT PLAN - TECHNOLOGY - AREA J
111-TN1009K	BUILDING 111 SUB-BASEMENT PLAN - TECHNOLOGY - AREA K
111-TN1009L	BUILDING 111 SUB-BASEMENT PLAN - TECHNOLOGY - AREA L
111-TN1100	BUILDING 111 BASEMENT OVERALL PLAN - TECHNOLOGY

111-TN1100A	BUILDING 111 BASEMENT PLAN - TECHNOLOGY - AREA A
111-TN1100B	BUILDING 111 BASEMENT PLAN - TECHNOLOGY - AREA B
111-TN1100C	BUILDING 111 BASEMENT PLAN - TECHNOLOGY - AREA C
111-TN1100D	BUILDING 111 BASEMENT PLAN - TECHNOLOGY - AREA D
111-TN1100E	BUILDING 111 BASEMENT PLAN - TECHNOLOGY - AREA E
111-TN1100F	BUILDING 111 BASEMENT PLAN - TECHNOLOGY - AREA F
111-TN1100G	BUILDING 111 BASEMENT PLAN - TECHNOLOGY - AREA G
111-TN1100H	BUILDING 111 BASEMENT PLAN - TECHNOLOGY - AREA H
111-TN1100I	BUILDING 111 BASEMENT PLAN - TECHNOLOGY - AREA I
111-TN1100J	BUILDING 111 BASEMENT PLAN - TECHNOLOGY - AREA J
111-TN1100K	BUILDING 111 BASEMENT PLAN - TECHNOLOGY - AREA K
111-TN1100L	BUILDING 111 BASEMENT PLAN - TECHNOLOGY - AREA L
111-TN1101	BUILDING 111 FIRST FLOOR OVERALL PLAN - TECHNOLOGY
111-TN1101A	BUILDING 111 FIRST FLOOR PLAN - TECHNOLOGY - AREA A
111-TN1101B	BUILDING 111 FIRST FLOOR PLAN - TECHNOLOGY - AREA B
111-TN1101C	BUILDING 111 FIRST FLOOR PLAN - TECHNOLOGY - AREA C
111-TN1101D	BUILDING 111 FIRST FLOOR PLAN - TECHNOLOGY - AREA D
111-TN1101E	BUILDING 111 FIRST FLOOR PLAN - TECHNOLOGY - AREA E
111-TN1101F	BUILDING 111 FIRST FLOOR PLAN - TECHNOLOGY - AREA F
111-TN1101G	BUILDING 111 FIRST FLOOR PLAN - TECHNOLOGY - AREA G
111-TN1101H	BUILDING 111 FIRST FLOOR PLAN - TECHNOLOGY - AREA H
111-TN1101I	BUILDING 111 FIRST FLOOR PLAN - TECHNOLOGY - AREA I
111-TN1101J	BUILDING 111 FIRST FLOOR PLAN - TECHNOLOGY - AREA J
111-TN1101K	BUILDING 111 FIRST FLOOR PLAN - TECHNOLOGY - AREA K
111-TN1101L	BUILDING 111 FIRST FLOOR PLAN - TECHNOLOGY - AREA L
111-TN1102	BUILDING 111 SECOND FLOOR OVERALL PLAN - TECHNOLOGY
111-TN1102A	BUILDING 111 SECOND FLOOR PLAN - TECHNOLOGY - AREA A
111-TN1102B	BUILDING 111 SECOND FLOOR PLAN - TECHNOLOGY - AREA B
111-TN1102C	BUILDING 111 SECOND FLOOR PLAN - TECHNOLOGY - AREA C
111-TN1102D	BUILDING 111 SECOND FLOOR PLAN - TECHNOLOGY - AREA D
111-TN1102E	BUILDING 111 SECOND FLOOR PLAN - TECHNOLOGY - AREA E
111-TN1102F	BUILDING 111 SECOND FLOOR PLAN - TECHNOLOGY - AREA F
111-TN1102G	BUILDING 111 SECOND FLOOR PLAN - TECHNOLOGY - AREA G
111-TN1102H	BUILDING 111 SECOND FLOOR PLAN - TECHNOLOGY - AREA H
111-TN1102I	BUILDING 111 SECOND FLOOR PLAN - TECHNOLOGY - AREA I
111-TN1102J	BUILDING 111 SECOND FLOOR PLAN - TECHNOLOGY - AREA J
111-TN1102K	BUILDING 111 SECOND FLOOR PLAN - TECHNOLOGY - AREA K
111-TN1102L	BUILDING 111 SECOND FLOOR PLAN - TECHNOLOGY - AREA L
111-TN1103	BUILDING 111 THIRD FLOOR PLAN - TECHNOLOGY
111-TN1103A	BUILDING 111 THIRD FLOOR PLAN - TECHNOLOGY - AREA A

111-TN1103B	BUILDING 111 THIRD FLOOR PLAN - TECHNOLOGY - AREA B
111-TN1103C	BUILDING 111 THIRD FLOOR PLAN - TECHNOLOGY - AREA C
111-TN1103D	BUILDING 111 THIRD FLOOR PLAN - TECHNOLOGY - AREA D
111-TN1103E	BUILDING 111 THIRD FLOOR PLAN - TECHNOLOGY - AREA E
111-TN1103F	BUILDING 111 THIRD FLOOR PLAN - TECHNOLOGY - AREA F
111-TN1103H	BUILDING 111 THIRD FLOOR PLAN - TECHNOLOGY - AREA H
111-TN1103I	BUILDING 111 THIRD FLOOR PLAN - TECHNOLOGY - AREA I
111-TN1103J	BUILDING 111 THIRD FLOOR PLAN - TECHNOLOGY - AREA J
111-TN1103K	BUILDING 111 THIRD FLOOR PLAN - TECHNOLOGY - AREA K
111-TN1103L	BUILDING 111 THIRD FLOOR PLAN - TECHNOLOGY - AREA L
111-TN1104	BUILDING 111 FOURTH FLOOR PLAN - TECHNOLOGY
111-TN1104A	BUILDING 111 FOURTH FLOOR PLAN - TECHNOLOGY - AREA A
111-TN1104B	BUILDING 111 FOURTH FLOOR PLAN - TECHNOLOGY - AREA B
111-TN1104D	BUILDING 111 FOURTH FLOOR PLAN - TECHNOLOGY - AREA D
111-TN1104E	BUILDING 111 FOURTH FLOOR PLAN - TECHNOLOGY - AREA E
111-TN1104F	BUILDING 111 FOURTH FLOOR PLAN - TECHNOLOGY - AREA F
111-TN1104H	BUILDING 111 FOURTH FLOOR PLAN - TECHNOLOGY - AREA H
111-TN1104I	BUILDING 111 FOURTH FLOOR PLAN - TECHNOLOGY - AREA I
111-TN1104J	BUILDING 111 FOURTH FLOOR PLAN - TECHNOLOGY - AREA J
111-TN1104K	BUILDING 111 FOURTH FLOOR PLAN - TECHNOLOGY - AREA K
111-TN1104L	BUILDING 111 FOURTH FLOOR PLAN - TECHNOLOGY - AREA L
111-TN1105	BUILDING 111 FIFTH FLOOR OVERALL PLAN - TECHNOLOGY
111-TN1105A	BUILDING 111 FIFTH FLOOR PLAN - TECHNOLOGY - AREA A
111-TN1105B	BUILDING 111 FIFTH FLOOR PLAN - TECHNOLOGY - AREA B
111-TN1105D	BUILDING 111 FIFTH FLOOR PLAN - TECHNOLOGY - AREA D
111-TN1105E	BUILDING 111 FIFTH FLOOR PLAN - TECHNOLOGY - AREA E
111-TN1105F	BUILDING 111 FIFTH FLOOR PLAN - TECHNOLOGY - AREA F
111-TN1105H	BUILDING 111 FIFTH FLOOR PLAN - TECHNOLOGY - AREA H
111-TN1105I	BUILDING 111 FIFTH FLOOR PLAN - TECHNOLOGY - AREA I
111-TN1105J	BUILDING 111 FIFTH FLOOR PLAN - TECHNOLOGY - AREA J
111-TN1105K	BUILDING 111 FIFTH FLOOR PLAN - TECHNOLOGY - AREA K
111-TN1105L	BUILDING 111 FIFTH FLOOR PLAN - TECHNOLOGY - AREA L
111-TN1106	BUILDING 111 SIXTH FLOOR OVERALL PLAN - TECHNOLOGY
111-TN1106A	BUILDING 111 SIXTH FLOOR PLAN - TECHNOLOGY - AREA A
111-TN1106B	BUILDING 111 SIXTH FLOOR PLAN - TECHNOLOGY - AREA B
111-TN1106D	BUILDING 111 SIXTH FLOOR PLAN - TECHNOLOGY - AREA D
111-TN1106E	BUILDING 111 SIXTH FLOOR PLAN - TECHNOLOGY - AREA E
111-TN1106F	BUILDING 111 SIXTH FLOOR PLAN - TECHNOLOGY - AREA F
111-TN1106H	BUILDING 111 SIXTH FLOOR PLAN - TECHNOLOGY - AREA H
111-TN1106I	BUILDING 111 SIXTH FLOOR PLAN - TECHNOLOGY - AREA I

111-TN1106J	BUILDING 111 SIXTH FLOOR PLAN - TECHNOLOGY - AREA J
111-TN1106K	BUILDING 111 SIXTH FLOOR PLAN - TECHNOLOGY - AREA K
111-TN1106L	BUILDING 111 SIXTH FLOOR PLAN - TECHNOLOGY - AREA L
111-TN1107	BUILDING 111 SEVENTH FLOOR OVERALL PLAN - TECHNOLOGY
111-TN1107A	BUILDING 111 SEVENTH FLOOR PLAN - TECHNOLOGY - AREA A
111-TN1107B	BUILDING 111 SEVENTH FLOOR PLAN - TECHNOLOGY - AREA B
111-TN1107D	BUILDING 111 SEVENTH FLOOR PLAN - TECHNOLOGY - AREA D
111-TN1107E	BUILDING 111 SEVENTH FLOOR PLAN - TECHNOLOGY - AREA E
111-TN1107F	BUILDING 111 SEVENTH FLOOR PLAN - TECHNOLOGY - AREA F
111-TN1107H	BUILDING 111 SEVENTH FLOOR PLAN - TECHNOLOGY - AREA H
111-TN1107I	BUILDING 111 SEVENTH FLOOR PLAN - TECHNOLOGY - AREA I
111-TN1107J	BUILDING 111 SEVENTH FLOOR PLAN - TECHNOLOGY - AREA J
111-TN1107K	BUILDING 111 SEVENTH FLOOR PLAN - TECHNOLOGY - AREA K
111-TN1107L	BUILDING 111 SEVENTH FLOOR PLAN - TECHNOLOGY - AREA L
111-TN1108	BUILDING 111 EIGHTH FLOOR OVERALL PLAN - TECHNOLOGY
111-TN1108A	BUILDING 111 EIGHTH FLOOR PLAN - TECHNOLOGY - AREA A
111-TN1108B	BUILDING 111 EIGHTH FLOOR PLAN - TECHNOLOGY - AREA B
111-TN1108D	BUILDING 111 EIGHTH FLOOR PLAN - TECHNOLOGY - AREA D
111-TN1108E	BUILDING 111 EIGHTH FLOOR PLAN - TECHNOLOGY - AREA E
111-TN1108F	BUILDING 111 EIGHTH FLOOR PLAN - TECHNOLOGY - AREA F
111-TN1108H	BUILDING 111 EIGHTH FLOOR PLAN - TECHNOLOGY - AREA H
111-TN1108J	BUILDING 111 EIGHTH FLOOR PLAN - TECHNOLOGY - AREA J
111-TN1108K	BUILDING 111 EIGHTH FLOOR PLAN - TECHNOLOGY - AREA K
111-TN1108L	BUILDING 111 EIGHTH FLOOR PLAN - TECHNOLOGY - AREA L
111-TN1109	BUILDING 111 NINTH FLOOR OVERALL PLAN - TECHNOLOGY
111-TN1109A	BUILDING 111 NINTH FLOOR PLAN - TECHNOLOGY - AREA A
111-TN1109B	BUILDING 111 NINTH FLOOR PLAN - TECHNOLOGY - AREA B
111-TN1109D	BUILDING 111 NINTH FLOOR PLAN - TECHNOLOGY - AREA D
111-TN1109E	BUILDING 111 NINTH FLOOR PLAN - TECHNOLOGY - AREA E
111-TN1109F	BUILDING 111 NINTH FLOOR PLAN - TECHNOLOGY - AREA F
111-TN1109H	BUILDING 111 NINTH FLOOR PLAN - TECHNOLOGY - AREA H
111-TN1109J	BUILDING 111 NINTH FLOOR PLAN - TECHNOLOGY - AREA J
111-TN1109K	BUILDING 111 NINTH FLOOR PLAN - TECHNOLOGY - AREA K
111-TN1109L	BUILDING 111 NINTH FLOOR PLAN - TECHNOLOGY - AREA L
111-TN1110	BUILDING 111 TENTH FLOOR OVERALL PLAN - TECHNOLOGY
111-TN1110A	BUILDING 111 TENTH FLOOR PLAN - TECHNOLOGY - AREA A
111-TN1110B	BUILDING 111 TENTH FLOOR PLAN - TECHNOLOGY - AREA B
111-TN1110D	BUILDING 111 TENTH FLOOR PLAN - TECHNOLOGY - AREA D
111-TN1110E	BUILDING 111 TENTH FLOOR PLAN - TECHNOLOGY - AREA E
111-TN1110F	BUILDING 111 TENTH FLOOR PLAN - TECHNOLOGY - AREA F

111-TN1110H	BUILDING 111 TENTH FLOOR PLAN - TECHNOLOGY - AREA H
111-TN1110J	BUILDING 111 TENTH FLOOR PLAN - TECHNOLOGY - AREA J
111-TN1110K	BUILDING 111 TENTH FLOOR PLAN - TECHNOLOGY - AREA K
111-TN1110L	BUILDING 111 TENTH FLOOR PLAN - TECHNOLOGY - AREA L
112-TD111	BUILDING 112 FIRST FLOOR DEMO PLAN - TECHNOLOGY
112-TN111	BUILDING 112 FIRST FLOOR PLAN - TECHNOLOGY
113-TD100	BUILDING 113 BASEMENT DEMO PLAN - TECHNOLOGY
113-TD101	BUILDING 113 FIRST FLOOR DEMO PLAN - TECHNOLOGY
113-TN100	BUILDING 113 BASEMENT PLAN - TECHNOLOGY
113-TN101	BUILDING 113 FIRST FLOOR PLAN - TECHNOLOGY
123-TD101A	BUILDING 123 FIRST FLOOR DEMO PLAN - TECHNOLOGY - AREA A
123-TD101B	BUILDING 123 FIRST FLOOR DEMO PLAN - TECHNOLOGY - AREA B
123-TD101C	BUILDING 123 FIRST FLOOR DEMO PLAN - TECHNOLOGY - AREA C
123-TD101D	BUILDING 123 FIRST FLOOR DEMO PLAN - TECHNOLOGY - AREA D
123-TD101E	BUILDING 123 FIRST FLOOR DEMO PLAN - TECHNOLOGY - AREA E
123-TN101	BUILDING 123 FIRST FLOOR OVERALL PLAN - TECHNOLOGY
123-TN101A	BUILDING 123 FIRST FLOOR PLAN - TECHNOLOGY - AREA A
123-TN101B	BUILDING 123 FIRST FLOOR PLAN - TECHNOLOGY - AREA B
123-TN101C	BUILDING 123 FIRST FLOOR PLAN - TECHNOLOGY - AREA C
123-TN101D	BUILDING 123 FIRST FLOOR PLAN - TECHNOLOGY - AREA D
123-TN101E	BUILDING 123 FIRST FLOOR PLAN - TECHNOLOGY - AREA E
144-TD100	BUILDING 144 BASEMENT OVERALL DEMO PLAN - TECHNOLOGY
144-TD100A	BUILDING 144 BASEMENT DEMO PLAN - TECHNOLOGY - AREA A
144-TD100B	BUILDING 144 BASEMENT DEMO PLAN - TECHNOLOGY - AREA B
144-TD100C	BUILDING 144 BASEMENT DEMO PLAN - TECHNOLOGY - AREA C
144-TD100D	BUILDING 144 BASEMENT DEMO PLAN - TECHNOLOGY - AREA D
144-TD100E	BUILDING 144 BASEMENT DEMO PLAN - TECHNOLOGY - AREA E
144-TD100F	BUILDING 144 BASEMENT DEMO PLAN - TECHNOLOGY - AREA F
144-TD101A	BUILDING 144 FIRST FLOOR DEMO PLAN - TECHNOLOGY - AREA A
144-TD101B	BUILDING 144 FIRST FLOOR DEMO PLAN - TECHNOLOGY - AREA B
144-TD101C	BUILDING 144 FIRST FLOOR DEMO PLAN - TECHNOLOGY - AREA C
144-TD101D	BUILDING 144 FIRST FLOOR DEMO PLAN - TECHNOLOGY - AREA D
144-TD101E	BUILDING 144 FIRST FLOOR DEMO PLAN - TECHNOLOGY - AREA E
144-TD101F	BUILDING 144 FIRST FLOOR DEMO PLAN - TECHNOLOGY - AREA F
144-TN100	BUILDING 144 BASEMENT OVERALL PLAN - TECHNOLOGY
144-TN100A	BUILDING 144 BASEMENT PLAN - TECHNOLOGY - AREA A
144-TN100B	BUILDING 144 BASEMENT PLAN - TECHNOLOGY - AREA B
144-TN100C	BUILDING 144 BASEMENT PLAN - TECHNOLOGY - AREA C
144-TN100D	BUILDING 144 BASEMENT PLAN - TECHNOLOGY - AREA D
144-TN100E	BUILDING 144 BASEMENT PLAN - TECHNOLOGY - AREA E

144-TN100F	BUILDING 144 BASEMENT PLAN - TECHNOLOGY - AREA F
144-TN101	BUILDING 144 FIRST FLOOR OVERALL PLAN - TECHNOLOGY
144-TN101A	BUILDING 144 FIRST FLOOR PLAN - TECHNOLOGY - AREA A
144-TN101B	BUILDING 144 FIRST FLOOR PLAN - TECHNOLOGY - AREA B
144-TN101C	BUILDING 144 FIRST FLOOR PLAN - TECHNOLOGY - AREA C
144-TN101D	BUILDING 144 FIRST FLOOR PLAN - TECHNOLOGY - AREA D
144-TN101E	BUILDING 144 FIRST FLOOR PLAN - TECHNOLOGY - AREA E
144-TN101F	BUILDING 144 FIRST FLOOR PLAN - TECHNOLOGY - AREA F
146-TD100	BUILDING 146 BASEMENT DEMO PLAN - TECHNOLOGY
146-TD101	BUILDING 146 FIRST FLOOR DEMO PLAN - TECHNOLOGY
146-TN100	BUILDING 146 BASEMENT PLAN - TECHNOLOGY
146-TN101	BUILDING 146 FIRST FLOOR PLAN - TECHNOLOGY
147-TD100	BUILDING 147 BASEMENT DEMO PLAN - TECHNOLOGY
147-TD101	BUILDING 147 FIRST FLOOR DEMO PLAN - TECHNOLOGY
147-TN100	BUILDING 147 BASEMENT PLAN - TECHNOLOGY
147-TN101	BUILDING 147 FIRST FLOOR PLAN - TECHNOLOGY
148-TD100	BUILDING 148 BASEMENT DEMO PLAN - TECHNOLOGY
148-TD101	BUILDING 148 FIRST FLOOR DEMO PLAN - TECHNOLOGY
148-TN100	BUILDING 148 BASEMENT PLAN - TECHNOLOGY
148-TN101	BUILDING 148 FIRST FLOOR PLAN - TECHNOLOGY
TN300	TECHNOLOGY ROOM ENLARGEMENTS
TN301	TECHNOLOGY ROOM ENLARGEMENTS
TN302	TECHNOLOGY ROOM ENLARGEMENTS
TN303	TECHNOLOGY ROOM ENLARGEMENTS
TN304	TECHNOLOGY ROOM ENLARGEMENTS
TN305	TECHNOLOGY ROOM ENLARGEMENTS
TN306	TECHNOLOGY ROOM ENLARGEMENTS
TN307	TECHNOLOGY ROOM ENLARGEMENTS
TN308	TECHNOLOGY ROOM ENLARGEMENTS
TN309	TECHNOLOGY ROOM ENLARGEMENTS
TN310	TECHNOLOGY ROOM ENLARGEMENTS
TN311	TECHNOLOGY ROOM ENLARGEMENTS
TN312	TECHNOLOGY ROOM ENLARGEMENTS
TN313	TECHNOLOGY ROOM ENLARGEMENTS
TN314	TECHNOLOGY ROOM ENLARGEMENTS
TN315	TECHNOLOGY ROOM ENLARGEMENTS
TN316	TECHNOLOGY ROOM ENLARGEMENTS
TN317	TECHNOLOGY ROOM ENLARGEMENTS
TN318	TECHNOLOGY ROOM ENLARGEMENTS
TN319	TECHNOLOGY ROOM ENLARGEMENTS

TN320	TECHNOLOGY ROOM ENLARGEMENTS
TN321	TECHNOLOGY ROOM ENLARGEMENTS
TN322	TECHNOLOGY ROOM ENLARGEMENTS
TN323	TECHNOLOGY ROOM ENLARGEMENTS
TN324	TECHNOLOGY ROOM ENLARGEMENTS
TN325	TECHNOLOGY ROOM ENLARGEMENTS
TN326	TECHNOLOGY ROOM ENLARGEMENTS
TN327	TECHNOLOGY ROOM ENLARGEMENTS
TN328	TECHNOLOGY ROOM ENLARGEMENTS
TN329	TECHNOLOGY ROOM ENLARGEMENTS
TN330	TECHNOLOGY ROOM ENLARGEMENTS
TN331	TECHNOLOGY ROOM ENLARGEMENTS
TN401	TECHNOLOGY DETAILS
TN402	TECHNOLOGY DETAILS
TN500	TECHNOLOGY DIAGRAMS
TN501	TECHNOLOGY DIAGRAMS
TN502	TECHNOLOGY DIAGRAMS
TN503	TECHNOLOGY DIAGRAMS
TN504	TECHNOLOGY DIAGRAMS
TN505	TECHNOLOGY DIAGRAMS
TN506	TECHNOLOGY DIAGRAMS
TN507	TECHNOLOGY DIAGRAMS
TN508	TECHNOLOGY SITE RISER
TN509	TECHNOLOGY SITE RISER
TN510	RISER FOR EXISTING BIOMED AND AUXILLIARY SYSTEMS TO REMAIN
TN511	BIOMED FIBER OPTIC RISER DIAGRAM
TN600	TECHNOLOGY SCHEDULES
TN601	TECHNOLOGY SCHEDULES
TN400	TECHNOLOGY DETAILS

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SECTION 01 00 00
GENERAL REQUIREMENTS

1.1 SAFETY REQUIREMENTS

Refer to Specification 01 35 26 for Safety and Infection Control requirements.

1.2 GENERAL INTENTION

A. See included Drawings and Specifications.
B. Visits to the site by Bidders may be made only as described in the solicitation in accordance with FAR 52.236-27 Site Visit (Construction).
C. Contractor shall completely prepare site for building operations, including demolition and removal of existing structures, and furnish labor and materials and perform additions and interior renovation work for Clement J. Zablocki VA Medical Center – EHRM Infrastructure Upgrades as required by the contract drawings and specifications.
D. Offices of _____, as Architect-Engineers, will render certain technical services during construction. Such services shall be considered as advisory to the Government and shall not be construed as expressing or implying a contractual act of the Government without affirmations by Contracting Officer or his duly authorized representative.
E. All employees of Contractor and subcontractors shall comply with VA security management program and obtain permission of the VA police, be identified by project and employer, and restricted from unauthorized access. Refer to Specification 01 01 10-SN for fingerprint, badging, construction door access and parking requirements.

1.3 STATEMENT OF BID ITEM(S) & SPECIFICATIONS AND DRAWINGS FOR THE CONTRACTOR

A. Item 1, General Construction: Base Bid. Contractor shall provide all labor, equipment, materials, and supervision necessary to complete project 695-21-700, EHRM Infrastructure Upgrades at the Clement J. Zablcoki VA Medical Center in Milwaukee, Wisconsin in accordance with the attached drawings and specifications.
B. Drawings and specifications (contract documents) may be obtained from the SAM.gov website where the solicitation is posted. Hard copies will be the responsibility and expense of the Contractor(s).
C. Project building locations for work include but are not limited to the following: Buildings 3, 4, 5, 6, 7, 20, 43, 70, 97, 102, 107, 108, 109, 111 (main hospital), 112, 113, 115, 123, 144, 146, 147, and 148.

1. A portion of the contract work will be off hours (after 5pm) in patient care buildings. This includes Telecommunication Room/ Enclosure (TR/TE) construction as well as horizontal cable pulling.

New network connectivity work (transition from existing data closet to new TR/TE; or switch-to-patch panel punch downs) shall also be off hours (after 5pm). See the phasing/sequencing plan later in this specification for details.

2. VA in-patient care locations shall be scheduled for work (TE/TR construction and cable pulling) during the day so as to not impact nighttime sleeping of Veterans.
3. VA will provide switches, telecommunications technicians, and patch cabling during the punch down work for the new TRs and TEs. The contractor shall not be responsible for the connectivity of the patch panel to the VA switch.

D. The scope of this project includes but is not limited to the following work:

1. Civil site work to include improvements on and additions to the existing fiber network "ring" throughout the VA Milwaukee campus, resolving at the new DEMARC room (Room 1470) to support the ICC.
2. Civil site work installation of a redundant fiber optic network cable from "ISP #2". The connection to ISP #2 will be at the far west side of campus per the plans and will be trenched to the new DEMARC room in Building 111 (Room 1470). From the new DEMARC room, the dual path fiber ISP #2 shall be trenched/installed to the following buildings: 7, 43, 70, 102, 109, 123, 144, 146, 147, and 148.
3. Re-roofing of Building 97.
4. Construction of a new substation and electrical room in Building 111, first floor, "old kitchen". Medium voltage feeders from Building 115 will be pulled under the loading dock in available pre-installed conduit and routed to the "old kitchen" to support the new switch gear, transformers, and panels.
5. Construction of the Intermediate Cross-Connect (ICC) that will become the new Main Computer Room (MCR, Room 1474) in Building 111, first floor, "old kitchen". The new MCR will be constructed on a later construction contract, executed/awarded at a date in the future. The new MCR will take the place of the existing 3rd floor Data Center.
6. Construction of a new DEMARC room (Room 1470) in Building 111, first floor, "old kitchen". This DEMARC room will receive both the improved fiber and the redundant fiber from ISP #2. The DEMARC will then be used to connect to the existing 3rd floor data center and the Intermediate Cross-Connect (ICC).
7. Construction and/or renovation of new TRs/TEs in the following buildings (Building No./Quantity of TRs/TEs): 3/1, 4/1, 5/2, 6/5, 7/1, 20/1, 43/2, 70/4, 97/1, 102/2, 107/1, 108/1, 109/1, 111/17, 112/1, 113/1, 123/5, 144/4, 146/1, 147/1, and 148/1. This is a total of 54 new or refurbished TRs/TEs in 21 campus buildings. This work includes creation, expansion, and renovation for new TRs in

occupied patient care buildings on campus and as listed in the drawings. Ancillary work includes hazardous materials abatement, demolition, doors/hardware, security upgrades, plumbing/electrical/ mechanical upgrades and relocations, fire suppression, general construction, and finishes.

8. Complete vertical fiber optic cable (FOC) installation between "old kitchen" ICC and new TRs in Building 111.
9. Complete horizontal FOC and communication infrastructure (including, but not limited to new 3D data outlets, patch panels, category 6A cable, electrical panels) between TRs/TEs and renovated data drops in offices, storage spaces, waiting rooms, and exam rooms as identified in the plans.
10. Existing data closet abandonments, relocations, and connections to support the floor-by-floor TR/TE work in Building 111 (main hospital). This includes old category network cable that connected the old receptacle to the data closets. Note: VA Milwaukee will supply twelve (12) spare switches to support the migration of network infrastructure from an existing data closet to the new TR/TE. See Appendix A this specification.
11. Copper telephony changes to support the analog telephone system changes in the existing data closets.

E. Expected period of performance for the construction contract is 48 months.

1.4 PROJECT MANAGEMENT TEAM

A. **Submit Project Management Team delegation memorandum of the below individuals meeting requirements as listed below and in accordance with Section 01 33 23 SUBMITTALS, RFIS, AND CBS within 60 calendar days of the Notice to Proceed.** Please refer to 01 35 26 Section 1.7 for additional requirements.

B. Construction Project Manager (PM)

1. The PM shall have a minimum of ten years of construction project management experience with at least five years' experience managing projects similar in size, complexity, and scope.
2. The PM shall be dedicated to this project alone.
3. The PM shall be an employee of the General Contractor and shall be a separate and qualified individual from the General Contractor's Superintendent, Quality Control Manager, and Safety Professional/ SSHO.

C. Superintendent & Alternate Superintendents

1. Superintendent(s) shall have a minimum of ten years of construction superintendence experience with at least five years' experience as superintendent on projects similar in size, complexity, and scope.

2. Superintendent shall have experience in the areas of hazard identification and safety compliance in addition to safety training requirements as indicated elsewhere in these specifications. The individual shall be capable of interpreting a critical path schedule and construction drawings. Superintendents and Alternate Superintendents shall be OSHA 30 certified.
3. The General Contractor shall provide adequate supervision wherever work is being performed on the contract. This project will potentially have work in multiple locations concurrently. Adequate, competent supervision is mandatory; therefore, an Alternate Superintendent or Alternate Superintendents may be necessary. The qualification requirements for the Alternate Superintendent(s) are the same as for the Superintendent.
4. Superintendent(s) shall be dedicated to this project alone.
5. Superintendent(s) shall be an employee of the General Contractor and shall be a separate and qualified individual from the General Contractor’s Project Manager, Quality Control Manager, and Safety Professional/SSHO.

D. Quality Control Manager (QCM) & Communications Project Manager (CPM)

1. The QCM/CPM shall be responsible for the overall management of the Contractor’s quality control system and has the authority to act in all QC matters for the Contractor.
2. The QCM/CPM shall have an RCDD certification (or justifiable RCDD-like experience in construction) and shall have a minimum of ten years of construction QCM experience with at least five years’ experience on projects similar in size, complexity, and scope.
3. The QCM/CPM may be an employee of the General Contractor or may be from the lead telecommunications subcontractor and shall be a separate and qualified individual from the General Contractor’s Project Manager, Superintendent, and Safety Professional/SSHO.
4. The QCM/CPM shall be onsite when telecommunications work is being performed.

E. Safety Professional (SSHO)

1. The SSHO shall administer the General Contractor's Safety Program and government-accepted Accident Prevention Plan (APP).
2. The SSHO shall be dedicated to this project alone.
3. The SSHO is separate from and not the same individual as the contracted third-party CSP or CHST. See the Safety Specification for the third-party CSP/CHST requirements.
4. The SSHO shall be an employee of the General Contractor and shall be a separate and qualified individual from the General Contractor’s Project Manager, Superintendent, and Quality Control Manager.

F. Commissioning Manager (CxM)

1. The GC shall assign a Commissioning Manager to manage commissioning activities of the GC and subcontractors. Refer to Specification 01 91 00 for CxM requirements, duties, and responsibilities. The CxM may be the Contractor Project Manager or Superintendent but shall be assigned in writing by the company.

1.5 CONSTRUCTION SECURITY REQUIREMENTS

A. **Submit Site Security Plan meeting requirements as listed below and in accordance with Section 01 33 23 SUBMITTALS, RFIS, AND CBS within 60 calendar days of the Notice to Proceed.**

B. Security Plan:

1. The Security Plan defines both physical and administrative security procedures that will remain effective for the entire duration of the contract.
2. The General Contractor is responsible for assuring that all sub-contractors working on the contract and their employees also comply with these regulations.

C. Security Procedures:

1. Contractor’s employees shall not enter the project site without appropriate badge. They may also be subject to inspection of their personal effects when entering or leaving the project site.
2. A Special Agreement SAC form is required for every contract employee. See the 01 01 10-SN SPECIAL NOTES specification for an example of this SAC form and the badging process. This needs to be supplied to the COR for every contract employee on the jobsite. Even if the Contractor has an active badge, a SAC form is needed for the COR’s records.
3. Before starting work the Contractor shall give one week’s notice to the Contracting Officer so that security escort arrangements can be provided for the employees. This notice is separate from any notices required for utility shutdown described later in this section.
4. No photography of VA premises is allowed without written permission of the Contracting Officer.
5. VA reserves the right to shut down the project site and order Contractor’s employees off the premises in the event of a national emergency. The Contractor may return to the site only with the written approval of the Contracting Officer.

D. Document Control:

1. Before starting any work, and as required by the Contracting Officer, the General Contractor and sub-contractors shall provide an electronic security memorandum describing their approach to maintaining confidentiality of VA “sensitive information”.
2. The Contractor is responsible for safekeeping of all drawings, project manual and other project information. This information

shall be shared only with those with a specific need to accomplish the project.
3. These security documents shall not be removed or transmitted from the project site without the written approval of Contracting Officer.
4. All paper waste or electronic media shall be shredded and destroyed in a manner acceptable to the VA.
5. Notify Contracting Officer and Site Security Officer immediately when there is a loss or compromise of "sensitive information".

E. Motor Vehicle Restrictions:

1. Permits shall be issued for Contractor and its employees for parking in designated areas only. See the 01 01 10-SN SPECIAL NOTES Specification.

1.6 OPERATIONS AND STORAGE AREAS

A. **Submit Logistics Plan meeting requirements as listed below and in accordance with Section 01 33 23 SUBMITTALS, RFIS, AND CBS within 60 calendar days of the Notice to Proceed.** At a minimum, the Logistics Plan shall include proposed laydown/storage areas, delivery routes, container & equipment staging, temporary toilets, dumpsters, ingress & egress routes, construction fencing, and job trailers.
B. Containers/deliveries/pallets shall be marked with the construction contract number and 695-21-700 project number. Dumpsters remaining on VA property longer than five days shall also be so marked.
C. The Contractor shall confine all operations (including storage of materials) on Government premises to areas authorized or approved by the Contracting Officer. The Contractor shall hold and save the Government, its officers, and agents, free and harmless from liability of any nature occasioned by the Contractor's performance.
D. Temporary storage facilities and utilities may be requested, built, or implemented by the Contractor, but only with the approval of the COR. They shall be provided with labor and materials furnished by the Contractor without expense to the Government. Any temporary storage or utilities shall be removed by the Contractor at its expense upon completion of the work. Ultimately, working space and space available for storing materials shall be as determined by the COR.

1. Do not store materials and equipment in other than assigned areas.
2. Schedule delivery of materials and equipment to immediate construction working areas only. Provide unobstructed access to roadways and sidewalks - complying with the traffic control plan - or other areas as required.
3. Storage of Contractor's materials and equipment will be permitted subject to fire and safety requirements.

E. The Contractor shall, under regulations prescribed by the Contracting Officer, use only established roads and assigned laydown areas as

authorized by the COR. When materials are transported or delivered in prosecuting the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any Federal, State, or local law or regulation. Deliveries at the Loading Dock shall be coordinated with the COR. The Contractor shall not cross curbs, lawns, or sidewalks, and shall protect existing conditions from damage. The Contractor shall repair or pay for the repair of any damaged curbs, sidewalks, or roads.

F. The Contractor and all subcontractor employees are subject to rules of Medical Center applicable to their conduct.

G. Execute work to interfere as little as possible with normal functioning of Medical Center as a whole, including operations of utility services, fire protection systems and any existing equipment, and with work being done by others. **Use of equipment and tools that transmit vibrations and noises through the building structure are not permitted in buildings that are occupied, during construction, jointly by patients or medical personnel, and Contractor's personnel, except as permitted by COR where required by limited working space.** Refer to the 01 01 10-SN SPECIAL NOTES Specification for more details.

H. Utilities Services: Maintain existing utility services in the Medical Center and on the VA campus. Provide temporary facilities, labor, materials, equipment, connections, and utilities to assure uninterrupted services when needed. Where necessary to cut existing pipes (sanitary drain, roof drain, condensate drain), electrical wires, conduits, cables, etc., of utility services, or of fire protection systems or communications systems (except telephone), they shall be cut and capped at suitable places where shown; or, in absence of such indication, where directed by COR. All such actions shall be coordinated with the COR and Utility.

1. No utility service such as water, natural gas, steam, medical gases, sewers, electricity, or fire protection systems and communications systems may be interrupted without prior approval of COR. Electrical work shall be accomplished with all affected circuits or equipment de-energized. Refer to Specifications 21 13 13, 22 05 11, 26 05 11, 27 05 11 and 28 05 00 for additional requirements. **Utility interruptions shall be off shift (after 5pm, with re-establishment of utility prior to 6am next day).**
2. Contractor shall submit a request to interrupt any such services to COR, in writing, **21** days in advance of proposed interruption. Request shall state reason, date, exact time of, and approximate duration of such interruption.
3. Contractor will be advised (in writing) of approval of request, or of which other date and/or time such interruption will cause least inconvenience to operations of Medical Center Campus. Interruption time approved by Medical Center Campus may occur at other than Contractor's normal working hours.

4. In case of a contract construction emergency, service will be interrupted on approval of COR. Such approval will be confirmed in writing as soon as practical.
5. Whenever it is required that a connection fee be paid to a public utility provider for new permanent service to the construction project, for such items as water, sewer, electricity, gas or steam, payment of such fee shall be the responsibility of the Government and not the Contractor.

I. Phasing:

1. **Submit overall Phasing Plan (there will be multiple specific and individual phasing plans for each location of work) meeting requirements as listed below and in accordance with Section 01 33 23 SUBMITTALS, RFIS, AND CBS within 60 calendar days of the Notice to Proceed meeting.**
2. The Medical Center Campus must maintain its operation 24 hours a day 7 days a week. Therefore, any interruption in service must be scheduled and coordinated with the COR to ensure that no lapses in operation occur. It is the Contractor's responsibility to develop a work plan and schedule detailing, at a minimum, the procedures to be employed, the equipment and materials to be used, and the infection control/interim life safety methods employed during the work defining the duration of the work with milestone subtasks. Refer to Specification 01 32 16.15 for schedule requirements.
3. To ensure such executions, Contractor shall furnish the COR with a schedule of approximate phasing dates on which the Contractor intends to accomplish work in each specific area of site. In addition, Contractor shall notify the COR three (3) weeks in advance of the proposed date of starting work in each specific area of site. Arrange such phasing dates to ensure accomplishment of this work in successive phases mutually agreeable to COR.
4. The first phase(s) shall be administrative. The General Contractor shall prepare his pre-construction submittals for VA review and approval (refer to Section 01 33 23 SUBMITTALS, RFIS, AND CBS) as well as "long lead time equipment" submittals. It is feasible and logical that after determining long lead time equipment deliveries that the Contracting Officer may consider an early suspension to avoid excess General Conditions expenses. This will be a bilateral discussion with the Contractor.
5. The project site is generally the entire VA campus; see the project drawings. Contractor shall plan for **day shift (8am-4pm)** or **off shift (after 5pm, before 6am next day)** work with regards to demolition and new work associated with Data Closets/ Telecommunications Rooms based on the table below.

Bldg	Contractor Work	General Scope of Work
3	During day (8am-4pm)	Existing demo; new Telecommunications Enclosure construction; category network cable runs to "coils or loops" in ceilings above new wall plates, WAPs, and/or cameras.
	Off shift (**After 5pm**)	Data connections/terminations and patch panel connections.
4	During day (8am-4pm)	Existing demo; new Telecommunications Enclosure construction; category network cable runs to "coils or loops" in ceilings above new wall plates, WAPs, and/or cameras.
	Off shift (**After 5pm**)	Data connections/terminations and patch panel connections.
5	During day (8am-4pm)	Existing demo; new Telecommunications Enclosure construction; category network cable runs to "coils or loops" in ceilings above new wall plates, WAPs, and/or cameras.
	Off shift (**After 5pm**)	Data connections/terminations and patch panel connections.
6	During day (8am-4pm)	Existing demo; new Telecommunications Room construction; category network cable runs to "coils or loops" in ceilings above new wall plates, WAPs, and/or cameras.
	Off shift (**After 5pm**)	Data connections/terminations and patch panel connections.
7*	During day (8am-4pm)	Existing demo; new Telecommunications Room construction; category network cable runs to "coils or loops" in ceilings above new wall plates, WAPs, and/or cameras. New dual path FOC installed.
	Off shift (**After 5pm**)	Data connections/terminations and patch panel connections.
20	During day (8am-4pm)	Existing demo; new Telecommunications Enclosure construction; category network cable runs to "coils or loops" in ceilings above new wall plates, WAPs, and/or cameras.
	Off shift (**After 5pm**)	Data connections/terminations and patch panel connections.
43*	Off shift (**After 5pm**)	Existing demo; new Telecommunications Room construction; category network cable runs to "coils or loops" in

		ceilings above new wall plates, WAPs, and/or cameras. New dual path FOC installed. Data connections/terminations and patch panel connections.
70*	Off shift (**After 5pm**)	Existing demo; new Telecommunications Room construction; category network cable runs to "coils or loops" in ceilings above new wall plates, WAPs, and/or cameras. New dual path FOC installed. Data connections/terminations and patch panel connections. 3rd party coordination with MCW.
97	During day (8am-4pm)	Existing demo; new Telecommunications Enclosure construction; category network cable runs to "coils or loops" in ceilings above new wall plates, WAPs, and/or cameras.
	Off shift (**After 5pm**)	Data connections/terminations and patch panel connections.
102*	Off shift (**After 5pm**)	Existing demo; new Telecommunications Room construction; category network cable runs to "coils or loops" in ceilings above new wall plates, WAPs, and/or cameras. New dual path FOC installed. Data connections/terminations and patch panel connections.
107	During day (8am-4pm)	Existing demo; new Telecommunications Enclosure construction; category network cable runs to "coils or loops" in ceilings above new wall plates, WAPs, and/or cameras.
	Off shift (**After 5pm**)	Data connections/terminations and patch panel connections.
108	During day (8am-4pm)	Existing demo; new Telecommunications Enclosure construction; category network cable runs to "coils or loops" in ceilings above new wall plates, WAPs, and/or cameras.
	Off shift (**After 5pm**)	Data connections/terminations and patch panel connections.

109*	Off shift (**After 5pm**)	Existing demo; new Telecommunications Room construction; category network cable runs to "coils or loops" in ceilings above new wall plates, WAPs, and/or cameras. New dual path FOC installed. Data connections/terminations and patch panel connections.
111*	Patient Care: Off shift (**After 5pm**) Non-Patient Care: During day (8am-4pm) **See Below #6, #7**	Electrical Switchgear/Medium Voltage feeders pulled from Bldg 115. Construction of new Electrical and Substation Rooms on 1st Floor. Construction of new DEMARC Room and terminations from ISP #2 on 1st Floor. Construction of ICC on 1st Floor. Fiber runs between ICC and 3rd Floor Data Center and renovated TRs. Existing demo; new Telecommunications Rooms; Category network cable runs to "coils or loops" in ceilings above new wall plates, WAPs, and/or cameras. New dual path FOC installed. Miscellaneous category cable, fiber, and telephony work. Data connections/terminations and patch panel connections.
112	During day (8am-4pm)	Existing demo; new Telecommunications Enclosure construction; category network cable runs to "coils or loops" in ceilings above new wall plates, WAPs, and/or cameras.
	Off shift (**After 5pm**)	Data connections/terminations and patch panel connections.
113	During day (8am-4pm)	Existing demo; new Telecommunications Enclosure construction; category network cable runs to "coils or loops" in ceilings above new wall plates, WAPs, and/or cameras.
	Off shift (**After 5pm**)	Data connections/terminations and patch panel connections.
123*	**During day** **(8am-4pm)**	Existing demo; new Telecommunications Room construction; category network cable runs to "coils or loops" in

	***See below #7**	ceilings above new wall plates, WAPs, and/or cameras. New dual path FOC installed. Data connections/terminations and patch panel connections.
144*	**During day (8am-4pm)** ***See below #7**	Existing demo; new Telecommunications Room construction; category network cable runs to "coils or loops" in ceilings above new wall plates, WAPs, and/or cameras. New dual path FOC installed. Data connections/terminations and patch panel connections.
146* **147*** **148***	**During day (8am-4pm)** ***See below #7**	Existing demo; new Telecommunications Room construction; category network cable runs to "coils or loops" in ceilings above new wall plates, WAPs, and/or cameras. New dual path FOC installed. Data connections/terminations and patch panel connections.

***** These buildings will have dual path fiber optic cables (ISP #2) run into them; refer to site/civil drawings.

6. Work in Building 111 (main hospital), general phasing/sequencing:

   a. Construction of Substation Room 1471 and Electrical Room 1472 shall be the first work completed. The medium voltage feeders from Building 115 shall be pulled into Building 111 and new switch gear, transformers, and panels shall be installed, tested, commissioned, and accepted before the Contractor shall be allowed to proceed to other phases of the construction.
   b. ICC (to become new MCR) shall be next completed, tested, commissioned, and accepted before the Contractor shall be allowed to proceed to other phases of the construction. Significant coordination with VA Station and National OIT technicians is paramount this phase.
   c. All data closet and telecommunications room work in Building 111 shall be per the architectural drawing notes and the appendix to this specification. Construction in the new TRs may proceed during days. Data Closet work in Building 111 may proceed during days. Pulling of new category cables from TR to data drops shall be off shift and will commence around 5pm each evening for all clinical and patient care areas (with the exception of those areas that are in-patient – see the contract drawings – those areas shall be scheduled during the day). Those administrative

(non-patient care) areas may be scheduled for cable pulls during days. Data connections/terminations and patch panel connections shall be off shift (after 5pm).

d. Start 10th floor, work down. VA will provide up to 12 temporary switches to Contractor to use as "leapfrog" devices so that internet connectivity is not impacted. **Each new TR** (one on each floor except basement/1st/2nd: three TRs these floors) **will require its own Phasing Plan, Infection Control Plan, temporary construction barrier(s), and ILSM review.**
e. Coordinate network cable and fiber optic work with VA COR and OIT/Healthcare Technology Management (HTM) staff. OIT/HTM have equipment that will relocate from old DC to new TR. Appendix A this specification has details regarding Existing to Remain (ETR) DC infrastructure and Contractor's responsibilities to support that infrastructure with new fiber or category cable.
f. Construct new Telecommunication Rooms – includes infection control, demo, new work; install power, infrastructure, lighting, racks, and ensure TR is fully functional. Confirm services from old Data Closets are transitioned as required into new TRs. VA inspections and approvals are required before cable pulls can be scheduled.
g. Perform new category cable pulls. Patient care areas in the hospital will require cable pulls off shift (with the exception of those areas designated as "in-patient" – those areas shall have cable pulls scheduled during the day). Once all cables are pulled to new locations ("coils or loops" above ceiling), Contractor shall schedule data connections and TR terminations with VA COR and OIT/Biomed. These final terminations and patch panel installations shall be off shift.
h. Plan for 30 connections/terminations each SHIFT of work, per crew; dependent on the availability and capacity of the 12 "leapfrog" VA-provided switches.
i. Completely remove old network cable from refurbished drop(s) to old DC including any J-hooks, cable trays or support infrastructure after all newly installed Cat6A infrastructure is tested and functional on the network.
j. Complete ancillary work (additional network cable or fiber optic cable for remaining services to old DCs).

7. Regarding Buildings 123, 144, 146, 147, 148, and certain floors of Building 111: These are 24/7 patient care buildings with in-patient services. Contractor work will be restricted to the daytime to avoid sleeping hours. There will be significant noise restrictions in these buildings. VA will support the Contractor by coordinating moves. Expect work in the in-patient areas to be slower and more time consuming because of this additional complexity. Contractor infection control and work plans in these buildings will be highly scrutinized to prevent impact to staff and patients.

a. Bldg 111 in-patient areas include ICU (2nd floor), 4C, 5CN, 6C, 7C, 9A, and 9C.

8. The project site will be available to the Contractor immediately after issuance of the Notice to Proceed (to coordinate the pre-construction survey and for the preparation of other pre-construction submittals). **Only upon approval of long lead time equipment submittals and required pre-construction submittals will the project site and any approved laydown areas be turned over to Contractor for mobilization and work (Phase II).**
9. Contractor shall take all measures and provide all material necessary for protecting existing equipment and property in affected areas of construction against unnecessary destruction or damage, so that Medical Center Campus operations will not be hindered. Coordinate protection means in areas so that Medical Center Campus operations will continue without impact to staff, visitors and patients during the construction period.

J. Construction Fence (exterior civil work): Construction fence location, including privacy screen details, shall be included in the submitted Logistics Plan. Before construction operations begin, Contractor shall provide a chain link construction fence, seven (7) feet minimum height, around the construction area indicated on the drawings. The civil work construction fence shall be phased, and the fence will have to occasionally move as the Contractor completes his work. Provide gates as required for access with necessary hardware, including hasps and padlocks. VA padlock shall be daisy-chained with Contractor padlock for our access at any time. Ensure the Fire Department has access to the Fire Department Connection at each building at all times. Fasten fence fabric to terminal posts with tension bands and to line posts and top and bottom rails with tie wires spaced at maximum 15 inches. Bottom of fences shall extend to 1-inch above grade. Remove the fence when directed by COR. Provide the entire construction fence with an approved fabric privacy screening full height with wind cut-outs. Opacity/shade percentage 85% lock-stitch strength 50 LPF consisting of a kitted high density polyethylene filament. Color/design to be COR approved.

K. When the construction site is turned over to Contractor, Contractor shall accept entire responsibility including upkeep and maintenance, specifically:

1. Grass and weeds shall be mowed/cut regularly inside the construction fence.
2. Storage of materials and equipment shall be orderly.
3. Contractor portable toilets shall be serviced and cleaned by an outside service contractor.

L. Abandoned Lines: As necessary, all service lines such as wires, cables, conduits, ducts, pipes and the like, and their hangers or supports, which are to be abandoned but are not required to be entirely

removed, shall be sealed, capped, or plugged at the main, branch or panel they originate from.

1. Those which are indicated to be abandoned but cannot be entirely removed shall be sealed, capped, or plugged at the main, branch, or panel they originate from in an approved method.
2. Abandoned raceways that cannot be fully removed shall have the cables removed in all of those abandoned raceways and duck banks. Where removal of conduit and duct banks is not feasible and if approved by COR, cut abandoned raceway at horizontal level (before turn-up) and cap (do not use tape - use an approved existing style conduit type cap) and paint cap red. Indicate location on record documents.
3. The intent is that those systems listed above that are so embedded in existing concrete walls or floors that they cannot be fully removed without compromising the structure can be capped. These shall be fully investigated by the Contractor and reviewed and accepted by the COR.
4. The lines shall not be capped in any finished or unfinished areas, but shall be removed and sealed, capped, or plugged only in masonry, CMU, concrete where they penetrate those materials or if accepted by the COR within walls or partitions; so that they are completed behind finished surfaces.

M. Existing Conditions: Upon completion of demolition activities, there may be other existing MEP infrastructure to remain (conduit or piping). The Contractor shall be responsible for supporting and anchoring this infrastructure (that will remain) to meet current code requirements.

N. To minimize interference of construction activities with flow of Medical Center Campus traffic, comply with the following:

1. Keep roads, walks and entrances to grounds, to parking and to occupied areas of buildings clear of construction materials, debris and standing construction equipment and vehicles. Wherever excavation for new utility lines cross existing roads, at least one lane must always be open to traffic. Follow traffic control plan as noted in the drawings.
2. Method and scheduling of required cutting, altering and removal of existing roads, walks and entrances must be approved by the COR.
3. Coordinate the work for this contract with other construction operations as directed by COR. This includes the scheduling of traffic and the use of roadways, as specified in Article, USE OF ROADWAYS.

O. Certain Pre-Construction Submittal Requirements apply. These shall be submitted and approved prior to Contractor mobilization. Refer to Specification 01 33 23 paragraph 1.2.A.

1.7 ALTERATIONS

A. **Submit the Existing Conditions Survey as listed below and in accordance with Section 01 33 23 SUBMITTALS, RFIS, AND CBS within 60 calendar days of the Notice to Proceed meeting.**

B. Survey: Before any work is started, the Contractor shall conduct a thorough survey of the project sites with the COR and furnish a written report. Expect that this project will contain multiple Existing Condition Surveys. These reports shall list:

1. For interior work, existing condition and types of room/space finishes including doors, walls, windows, and ceilings. For exterior work, existing conditions of roads, curbs, grassy areas, existing above-ground infrastructure (signage, lighting, structures, hydrants) and other items not required to be altered during the contract work. The report should demarcate the items that are affected by the work from those that are not impacted by the work.
2. Existence and conditions of items such as plumbing fixtures and accessories, electrical fixtures, equipment, shades, etc., required by the drawings to be either reused or relocated, or both.
3. Note any discrepancies between drawings and existing conditions at site.
4. Shall designate areas for working space, materials storage, and routes of access to areas within buildings where alterations occur, and which have been agreed upon by Contractor and COR. Coordinate with the Contractor’s Logistics Plan.
5. Existence and condition of all data locations and fixtures/equipment that currently are services by data and telephony.

C. Any items required by drawings to be either reused or relocated or both, found during this survey to be nonexistent, or in opinion of COR, to be in such condition that their use is impossible or impractical, shall be furnished and/or replaced by Contractor with new items in accordance with specifications which will be furnished by Government. Provided the contract work is changed by reason of this subparagraph B, the contract will be modified accordingly, under provisions of clause entitled "DIFFERING SITE CONDITIONS" (FAR 52.236-2) and "CHANGES" (FAR 52.243-4 and VAAR 852.243-70/71).

D. Re-Survey: Prior to final inspection date and as requested by the Contractor, the Contractor and COR together shall make a thorough re-survey of the areas involved in the Existing Conditions Survey. **Submit this Re-Survey in accordance with Section 01 33 23 SUBMITTALS, RFIS, AND CBS in conjunction with the Punchlist Inspection.**

1. Re-survey report shall also list any damage caused by Contractor to floors, walls, ceilings, or above-grade infrastructure (roads, curbs, signage, hydrants, landscaping) and other surfaces, despite protection measures; and will form basis for determining extent of repair work required of Contractor to restore damage caused by Contractor's workers in executing work of this contract.

E. Protection. Provide the following protective measures:

1. Wherever existing building envelope surfaces are disturbed they shall be protected against water infiltration. In case of leaks, they shall be repaired immediately upon discovery.
2. Temporary protection against damage for portions of existing structures and grounds where work is to be done, materials handled, and equipment moved and/or relocated.
3. Protection of interior of existing structures always, from damage, dust, and weather inclemency. Wherever work is performed, floor surfaces that are to remain in place shall be adequately protected prior to starting work, and this protection shall be maintained intact until all work in the area is completed.

1.8 DISPOSAL AND RETENTION

A. Refer to Specification 01 74 19 for more information. Materials and equipment accruing from work removed and from demolition activities, shall be disposed of as follows:

1. Reserved items (existing to remain or existing to relocate) which are to remain property of the Government are identified in the drawings. Items that remain property of the Government shall be removed or dislodged from present locations in such a manner as to prevent damage which would be detrimental to re-installation and reuse. Store such items as directed by COR.
2. Items not reserved shall become property of the Contractor and be removed by Contractor from Medical Center.
3. Items of portable equipment and furnishings located in rooms and spaces in which work is to be done under this contract shall remain the property of the Government. When rooms and spaces are vacated by the VA during the alteration period, such items which are not required by drawings and specifications to be either relocated or reused will be removed by the Government in advance of work to avoid interfering with the Contractor’s operation.

1.9 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS (FAR 52.236-9)

A. The Contractor shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work site, which are not to be removed, and which do not unreasonably interfere with the work required under this contract. The Contractor shall only remove trees when specifically authorized to do so and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during contract performance, or by the careless operation of equipment, or by workers, the Contractor shall trim those limbs or branches with a clean cut and paint the cut with a tree-pruning compound as directed by the Contracting Officer.

B. The Contractor shall protect from damage all existing improvements and utilities at or near the work site and on adjacent property of a third party, the locations of which are made known to or should be known by the Contractor. The Contractor shall repair any damage to those facilities, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the Contractor fails or refuses to repair the damage promptly, the Contracting Officer may have the necessary work performed and charge the cost to the Contractor.

C. Refer to Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS, for additional requirements on protecting vegetation, soils, and the environment. Refer to Articles, "Alterations", "Restoration", and "Operations and Storage Areas" for additional instructions concerning repair of damage to structures and site improvements.

D. Refer to FAR clause 52.236-7, "Permits and Responsibilities," which is included in General Conditions. **A Wisconsin Pollutant Discharge Elimination System (WPDES) permit is required for this project. Submit proof of this permit in accordance with Section 01 33 23 SUBMITTALS, RFIS, AND CBS.** The Contractor is considered an "operator" under the permit and has extensive responsibility for compliance with permit requirements. VA will make the permit application available at the Facilities Management Office. The Contractor and affected subcontractors shall furnish all information and certifications that are required to comply with the permit process and permit requirements. Many of the permit requirements will be satisfied by completing construction as shown and specified. Some requirements involve the Contractor's method of operations and operations planning and the Contractor is responsible for employing best management practices. The affected activities often include, but are not limited to the following:

1. Designating areas for equipment maintenance and repair.
2. Providing waste receptacles at convenient locations and provide regular collection of wastes.
3. Locating equipment wash down areas on site and provide appropriate control of wash-waters.
4. Providing protected storage areas for chemicals, paints, solvents, fertilizers, and other potentially toxic materials.
5. Providing adequately maintained sanitary facilities.

1.10 RESTORATION

A. Remove, cut, alter, replace, patch and repair existing work as necessary to install new work. Except as otherwise shown or specified, do not cut, alter, or remove any structural work, and do not disturb any ducts, plumbing, steam, gas, or electric work without approval of the COR. Existing work to be altered or extended and that is found to be defective in any way, shall be reported to the COR before it is

disturbed. Materials and workmanship used in restoring work, shall conform in type and quality to that of original existing construction, except as otherwise shown or specified.

B. Upon completion of contract, deliver work complete and undamaged. Existing work (walls, ceilings, partitions, floors, mechanical and electrical work, etc.) disturbed or removed as a result of performing required new work, shall be patched, repaired, reinstalled, or replaced with new work, and refinished and left in as good condition as existed before commencing work.

C. At Contractor's own expense, Contractor shall immediately restore to service and repair any damage caused by Contractor's workers to existing piping and conduits, wires, cables, etc., of utility services or of fire protection systems and communications systems (including telephone) which are not scheduled for discontinuance or abandonment.

D. Expense of repairs to such utilities and systems not shown on drawings or locations of which are unknown will be covered by adjustment to contract time and price in accordance with clause entitled "CHANGES" (FAR 52.243-4 and VAAR 852.243-70/71) and "DIFFERING SITE CONDITIONS" (FAR 52.236-2).

1.11 PHYSICAL DATA / SOIL CONDITIONS - NOT USED

1.12 PROFESSIONAL SURVEYING SERVICES

A. A registered professional land surveyor or registered civil engineer whose services are retained and paid for by the Contractor shall perform services specified herein and in other specification sections (specifically related to the layout, installation, and as-built location (depth) for all buried infrastructure). Buried infrastructure shall be marked/tagged so that it can be utility located. The Contractor shall certify that the land surveyor or civil engineer is not one who is a regular employee of the Contractor, and that the land surveyor or civil engineer has no financial interest in this contract.

1.13 LAYOUT OF WORK

A. The Contractor shall layout the work from Government established base lines and benchmarks, indicated on the drawings, and shall be responsible for all measurements in connection with the layout. The Contractor shall furnish, at Contractor's own expense, all stakes, templates, platforms, equipment, tools, materials, and labor required to lay out any part of the work. The Contractor shall be responsible for executing the work to the lines and grades that may be established or indicated by the Contracting Officer. The Contractor shall also be responsible for maintaining and preserving all stakes and other marks established by the Contracting Officer until authorized to remove them. If such marks are destroyed by the Contractor or through Contractor's negligence before their removal is authorized, the Contracting Officer may replace them and deduct the expense of the replacement from any amounts due or to become due to the Contractor.

B. Establish and plainly mark such lines and grades that are reasonably necessary to properly assure that location, orientation, and elevations established for new work are in accordance with lines and elevations shown on contract drawings.
C. Following completion of general mass excavation and before any other permanent work is performed, establish, and plainly mark (through use of appropriate batter boards or other means) sufficient additional survey control points or system of points as may be necessary to assure proper alignment, orientation, and grade of all major features of work. Survey shall include, but not be limited to, location of lines and grades of major utilities and elevations of valves and hydrants.

1. Such additional survey control points or system of points thus established shall be checked and certified by a registered land surveyor or registered civil engineer. Furnish such certification to the COR before any work is placed.

D. Whenever changes from contract drawings are made in line or grading requiring certificates, record such changes on a reproducible drawing bearing the registered land surveyor or registered civil engineer seal, and forward these drawings upon completion of work to COR.
E. Upon completion of the work, the Contractor shall furnish the COR an electronic copy at the scale of the contract drawings, showing the finished grades of the new work. These drawings shall bear the seal of the registered land surveyor or registered civil engineer.
F. The Contractor shall perform the surveying and layout work of this and other articles and specifications in accordance with the provisions of Article "Professional Surveying Services".

1.14 AS-BUILT DRAWINGS

A. The Contractor shall maintain a full-size set of as-built drawings ("red-lines") which will be kept current during construction of the project, to include all contract changes, modifications, clarifications, and minor adjustments in location by the Contractor. The onsite contract drawings shall be periodically updated after the issuance of Construction Bulletins by the Contracting Officer.
B. All variations shall be shown in the same general detail as used in the contract drawings. To ensure compliance, as-built "red-line" drawings shall be made available for the COR review, as often as requested.
C. **Contractor shall submit MONTHLY as-built "red-line" drawings or progress report narratives in conjunction with monthly pay requests (see 01 32 16.15 paragraph 1.8), manhours worked roll-ups (see 01 35 26 paragraph 1.10.C), photographic documentation, waste manifests and schedule updates.**
D. As necessary, Contractors shall update (as work is completed) the VA exterior/site utility master schematic books. These books are in the FM office.
E. **Submit FINAL and CONSOLIDATED As-Built PDF package upon completion of work in accordance with Section 01 33 23 SUBMITTALS, RFIS, AND CBS.**

The COR shall forward this submittal to the Architect/Engineer for review/approval and so that formal CAD as-built drawings can be developed for the VA by the AE.

1.15 COORDINATION

A. Coordinate work and products meeting the requirements associated with applicable specification sections and plans to produce a system complete, functional, and ready for the purpose intended.
B. Before starting work in a particular area, visit the jobsite and carefully examine to verify complexity, existing conditions, and difficulties that will affect work including all work done under various specification sections. Commencement of work shall be construed as acceptance of the existing conditions and difficulties. No change to the contract price or schedule shall be allowed for worked caused by unfamiliarity with jobsite conditions that are visible or readily apparent by an experienced observer.
C. Coordinate the location of work, equipment and components with trades, vendors, and installers to prevent interferences and maintain proper use and access to all items and spaces.
D. Work shall be installed and connected to existing work neatly and carefully. Work shall be coordinated with other trades to avoid conflicts and to obtain a neat, competent installation that will afford maximum accessibility for easy and proper operation, maintenance, service, and headroom.
E. Work shall be installed in a manner that permits easy accessibility and proper removal of components for periodic maintenance. Disturbed or damaged work shall be replaced or repaired to new conditions. Items determined to be in non-compliance shall be corrected by the Contractor at no additional expense to the Government.
F. The drawings show or describe the general arrangement of equipment, articles, assemblies, appurtenances but do not show all required fittings, drains, air vents, supports and may not identify all required accessories, components, fittings, and offsets that are necessary to properly complete the installation for the purpose intended. The contract drawings are diagrammatic only intended to show general layout of conduit, ductwork, piping, equipment, terminals, specialties and not intended to show all required offsets, details, accessories, and equipment to be connected. Provide necessary fittings, offsets and pipe runs based on field measurements and reviewed coordination drawings. Coordinate with other trades for space available and relative location of equipment and accessories to be connected. The Contractor shall alter locations of items where necessary to avoid interference and clearance difficulties after notifying the COR. Locations of components and equipment shall be adjusted to accommodate the work with interferences anticipated and encountered. The Contractor shall determine the exact routing and location of systems prior to fabrication and installation. Accurate field measurements and coordination drawings shall be prepared to establish the locations and

characteristics of the various systems (new and existing to remain). It is the intent of the drawings/specifications that the Contractor provides materials, labor, and coordination necessary to complete the work described or implied by the contract documents. The Contractor shall submit coordination drawings noting other dimensions with similar characteristics where necessary to avoid interferences and clearance difficulties. Should the contract documents not agree with themselves the greater quantity of superior work and materials shall be performed.

G. Coordinate new work with necessary mechanical, electrical, and plumbing (MEP) utility outages meeting the requirements of this specification and that of 01 35 26 SAFETY REQUIREMENTS.

H. Before placement and installation of work subject to tests, the Contractor shall coordinate and notify the COR in sufficient time to enable testing personnel to be present at the site in time for proper testing and field inspection. Such prior notice shall be not less than two (2) weeks unless otherwise designated by the COR.

1.16 WARRANTY MANAGEMENT PLAN – NOT USED

1.17 USE OF ROADWAYS

A. For hauling, use only established public roads and roads on Medical Center Campus property and, when authorized by the COR, such temporary roads which are necessary in the performance of contract work. Temporary roads shall be constructed, and restoration performed by the Contractor at Contractor's expense. When necessary to cross curbing, sidewalks, or similar construction, they must be protected by well-constructed bridges.

1.18 CONTRACTOR'S FIELD OFFICE – NOT USED

1.19 TEMPORARY USE OF MECHANICAL AND ELECTRICAL EQUIPMENT

A. Use of new installed mechanical and electrical equipment to provide heat, ventilation, plumbing, light and power will be permitted subject to written approval and compliance with the following provisions:

1. Permission to use each unit or system must be given by COR in writing. If the equipment is not installed and maintained in accordance with the written agreement and following provisions, the COR will withdraw permission for use of the equipment.
2. Electrical installations used by the equipment shall be completed in accordance with the drawings and specifications to prevent damage to the equipment and the electrical systems, i.e., transformers, relays, circuit breakers, fuses, conductors, motor controllers and their overload elements shall be properly sized, coordinated and adjusted. Installation of temporary electrical equipment or devices shall be in accordance with NFPA 70, National Electrical Code, (2014 Edition), Article 590, Temporary Installations. Voltage supplied to each item of equipment shall be verified to be correct and it shall be determined that motors are not overloaded. The electrical

equipment shall be thoroughly cleaned before using it and again immediately before final inspection including vacuum cleaning and wiping clean interior and exterior surfaces.

3. Units shall be properly lubricated, balanced, and aligned. Vibrations must be eliminated.
4. Automatic temperature control systems for preheat coils shall function properly and all safety controls shall function to prevent coil freeze-up damage.
5. The air filtering system utilized shall be that which is designed for the system when complete, and all filter elements shall be replaced at completion of construction and prior to testing and balancing of system.
6. All components of heat production and distribution system, metering equipment, condensate returns, and other auxiliary facilities used in temporary service shall be cleaned prior to use; maintained to prevent corrosion internally and externally during use; and cleaned, maintained, and inspected prior to acceptance by the Government.

B. Temporary use of any equipment or system will NOT start the warranty phase of the equipment or system and does not constitute VA acceptance or Beneficial Occupancy.
C. Prior to final inspection, the equipment or parts used which show wear and tear beyond normal, shall be replaced with identical replacements, at no additional cost to the Government.
D. This paragraph shall not reduce the requirements of the mechanical and electrical specifications sections.
E. Any damage to the equipment or excessive wear due to prolonged use will be repaired replaced by the contractor at the contractor’s expense.

1.20 TEMPORARY USE OF EXISTING ELEVATORS

A. Refer to Specification 01 01 10-SN SPECIAL NOTES for more information. Use of existing B-bank freight and service elevators for handling building materials and Contractor's personnel will be permitted subject to following provisions:

1. Contractor shall note that use of the B-bank elevators (B-9, B-10, B-11, and B-12) is NOT exclusive. These elevators are shared with VA staff (food service), other Contractors, and also for patient transport.
2. Do NOT use an elevator if VA staff are utilizing for patient transport. Wait for a future, empty elevator.
3. B-bank elevators are 6ft wide, 7ft deep and just under 8ft tall. They are rated at 5,500 lbs. Elevator B-12 has an additional ceiling “bump out” for longer materials (it is 6ft wide, 2ft deep and 2ft tall).
4. Contractor shall install temporary elevator protection as necessary and may leave it in place for the duration of the project if it does not impede usage by others (VA staff, food service carts, patient beds).

5. Personnel for operating elevators will not be provided by the Department of Veterans Affairs.
6. If existing cab protections, jambs, floor, or elevator systems are excessively worn or damaged during temporary use, they shall be removed and replaced at the Contractor’s expense.
7. All parts of main controller, starter, relay panel, selector, etc., worn, or damaged during temporary use shall be removed and replaced with new parts at the Contractor’s expense.

1.21 TEMPORARY USE OF NEW ELEVATORS – NOT USED

1.22 TEMPORARY TOILETS

A. Provide ample temporary sanitary toilet accommodations (port-a-johns) inside the construction fence. Keep such places clean and free from flies and vermin. All appliances are to be removed prior to completion of contract, and premises left perfectly clean.

1.23 AVAILABILITY AND USE OF UTILITY SERVICES

A. The Government shall make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies. The Contractor shall carefully conserve utilities as they will be furnished without charge.
B. The Contractor, at Contractor's expense and in a workmanlike manner, in compliance with code and as satisfactory to the COR, shall install and maintain all necessary temporary connections and distribution lines (temporary lighting). Before final acceptance of the work by the Government, the Contractor shall remove all the temporary connections, distribution lines, and associated equipment and repair restore the infrastructure as required.
C. Heat: Refer to Article 1.6 (I) for more information. Furnish temporary heat necessary to prevent injury to work and materials through dampness and cold. Use of open salamanders or any temporary heating devices which may be fire hazards or may damage finished work will not be permitted. Maintain minimum temperatures as specified for various materials. Obtain heat by connecting to Medical Center heating hot water distribution system which is available at no-cost to the Contractor.
D. Electricity (for Construction and Testing): Furnish all temporary electric services. Obtain electricity by connecting to the Medical Center electrical distribution system. Electricity is available at no cost to the Contractor.
E. Water (for Construction and Testing): Furnish temporary water service. Obtain water by connecting to the Medical Center water distribution system at the local housekeeping (HAC) Closet. Provide reduced pressure backflow preventer at each connection as per code. Water is available at no cost to the Contractor.

1. Maintain connections, pipe, fittings and fixtures and conserve water. Failure to stop leakage or other wastes will be cause for

revocation (at COR discretion) of use of water from Medical Center's system.

1.24 NEW TELEPHONE EQUIPMENT – NOT USED

1.25 TESTING AND COMMISSIONING

A. Refer to Specification 01 91 00 and the individual testing and commissioning sections within Specifications 21 08 00, 22 08 00, 23 05 93, 23 08 00, 26 08 00, 27 08 00 and 28 08 00. The Contractor shall coordinate with the VA's 3rd party Commissioning Agent to provide a written testing and commissioning plan complete with component level, equipment level, sub-system level and system level breakdowns. The plan will provide a schedule and a written sequence of what will be tested, how and what the expected outcome will be. This document will be submitted for approval by the Commissioning Agent. The Contractor shall document the results of the approved plan and submit for approval with the as-built documentation.
B. Pre-test mechanical and electrical equipment and systems and make corrections required for proper operation of such systems before requesting final tests. Final test will not be conducted unless pre-tested. Pre-functional checklist completion is the responsibility of the Contractor.
C. Conduct final tests required in various sections of specifications in presence of the COR and/or the Commissioning Agent. Contractor shall furnish all labor, materials, equipment, instruments, and forms, to conduct and record such tests.
D. Mechanical, Electrical/Technical, Plumbing and Fire Protection systems shall be balanced, controlled, coordinated, and commissioned. A system is defined as the entire system which must be coordinated to work together during normal operation to produce results for which the system is designed.
E. All related components as defined above shall be functioning when any system component is tested. Tests shall be completed within a reasonably period during which operating and environmental conditions remain reasonably constant and are typical of the design conditions.
F. Individual test result of any component, where required, will only be accepted when submitted with the test results of related components and of the entire system.

1.26 TRAINING, INSTRUCTIONS AND O&M MANUALS

A. Contractor shall provide qualified, factory-trained manufacturers' representatives to give detailed training to VA personnel in the operation and complete maintenance for each piece of equipment. All such training will be at the job site. These requirements are more specifically detailed in the various technical specification sections. Instructions for different items of equipment that are component parts of a complete system, shall be given in an integrated, progressive manner. All instructors for every piece of component equipment in a

system shall be available until instructions for all items included in the system have been completed. This is to assure proper instruction in the operation of inter-related systems. All instruction periods shall be at such times as scheduled by the COR and shall be considered concluded only when the COR is satisfied regarding complete and thorough coverage. The Contractor shall submit a course outline with associated material to the COR for review and approval prior to scheduling training to ensure the subject matter covers the expectations of the VA and the contractual requirements. The Department of Veterans Affairs reserves the right to request the removal of, and substitution for, any instructor who, in the opinion of the COR, does not demonstrate sufficient qualifications in accordance with requirements for instructors above.

1. Preparation Conference. **Before O&M training, the Contractor shall organize and convene a training preparation conference including the COR, O&M personnel, installation subcontractors, and the vendor/ manufacturer.** The purpose of this conference will be to discuss and plan the training and demonstration of VA O&M staff.
2. The Contractor shall provide training and demonstration as required by Divisions 21, 22, 23, 26, 27 and 28. There may be other Divisional training required outside of these as well. The Preparation Conference shall include the following items:

   a. Review of Contract Documents.
   b. Review installed systems, subsystems, and equipment.
   c. Review of instructor qualifications.
   d. Review instructional methods and procedures.
   e. Review training module outlines and contents.
   f. Review course materials (especially O&Ms).
   g. Review and discuss locations and other facilities required for instruction.
   h. Review and finalize training schedule and verify availability of educational materials, instructors, A/V equipment, or facilities needed to avoid delays.
   i. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

3. Training Module Submittals: Scheduling of training will only be made when submittal for course outline and associated material is approved. The Contractor shall submit the following:

   a. Instruction Program: Submit outline of instructional program for demonstration and training, including a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. The course outline shall include an agenda, the learning objective of the training, instructions for operation, maintenance, repairs, troubleshooting and the different sizes and models of equipment installed. A system

schematic shall be included in the course outline. At completion of training, submit two complete training manuals for VA's use.

b. Qualification Data: Submit qualifications for facilitator and/or instructor.

c. Attendance Record: For each training module, submit list of participants and length of instruction time.

d. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.

e. Demonstration and Training Recording:

(i) General: Engage a qualified commercial photographer to record demonstration and training. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice. At beginning of each training module, record each chart containing learning objective and lesson outline.

(ii) Video Format: Provide high quality color DVD color on standard size DVD disks.

(iii) Recording: Mount camera on tripod before starting recording, unless otherwise necessary to show area of demonstration and training. Display continuous running time.

(iv) Narration: Describe scenes on video recording by audio narration by microphone while demonstration and training are recorded. Include description of items being viewed. Describe vantage point, indicating location, direction (by compass point), and elevation or story of construction.

(v) Contractor shall professionally record training session and provide to COR within 7 days of training occurrence.

(vi) Provide in submittal any materials required to complete the training. This will include at a minimum the following: an agenda, name and contact info for manufacturer representative who is conduction the training and their qualifications, training outline and slides, and other training materials to be used at the training event. This may also include O&M Manuals, Redline Drawings, Wiring Diagrams, Troubleshooting Procedures, Lock-Out/Tag-Out Procedures, and any other information. If this has already been submitted and approved note what submittal number the approved material was provided under.

(vii) Transcript: Prepared on 8-1/2-by-11-inch paper, punched and bound in heavy-duty, 3-ring, vinyl-covered binders. Mark appropriate identification on front and spine of each binder. Include a cover sheet with same label information as the corresponding videotape. Include name of Project and date of video recording on each page.

4. Quality Assurance.

a. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
b. Instructor Qualifications: A factory authorized service representative, complying with requirements in Division 01 Section "Quality Requirements," experienced in operation and maintenance procedures and training.
c. Photographer Qualifications: A professional photographer who is experienced photographing construction projects.

5. Training Coordination (submittal for Paragraph A must be approved prior to scheduling any training):

a. Coordinate instruction schedule with VA's operations. Adjust schedule as required to minimize disrupting VA's operations.
b. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
c. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by the VA.

6. Instruction Program:

a. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections, and as follows:

(i) Fire protection systems, including fire alarm, fire pumps, and fire suppression systems.
(ii) Intrusion detection, security/camera, and physical access control systems.
(iii) Refrigeration systems, including chillers, condensing units, CRACs, pumps, and distribution valving/piping.
(iv) HVAC systems, including air handling equipment, air distribution systems, terminal equipment/devices, and HVAC instrumentation and controls.
(v) Electrical service and distribution, including switchgear, generators, transfer switches, synchronizing gear, transformers, switchboards, panelboards, uninterruptible power supplies, motor controllers, and LED lighting equipment and controls.
(vi) Communication systems, including intercommunication, surveillance, nurse call systems, public address, mass evacuation, voice and data, and entertainment television equipment.

(vii) Site utilities include lift stations, condensate pumping and return systems, and storm water pumping systems.

7. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participants are expected to master. Provide services of manufacturer's technical representative for a minimum of four (4) hours or what is specified in the individual sections to instruct each VA personnel responsible in operation and maintenance of the system. For each module, include instruction for the following:

a. Basis of System Design, Operational Requirements, and Criteria: Include the following:

(i) System, subsystem, and equipment descriptions.
(ii) Performance and design criteria.
(iii) Operating standards.
(iv) Regulatory requirements.
(v) Equipment function.
(vi) Operating Characteristics.
(vii) Limiting Conditions.
(viii) Performance Curves.

b. Documentation. Review the following items in detail:

(i) Emergency manuals.
(ii) Operations manuals.
(iii) Maintenance manuals.
(iv) Project record documents.
(v) Identification Systems.
(vi) Warranties and bonds.
(vii) Maintenance service agreements and similar continuing commitments.

c. Emergencies. Include the following, as applicable:

(i) Instructions on meaning of warnings, trouble indications, and error messages.
(ii) Instructions on stopping.
(iii) Shutdown instructions for each type of emergency.
(iv) Operating instructions for conditions outside of normal operating limits.
(v) Sequences for electric or electronic systems.
(vi) Special operating instructions and procedures.

d. Operations. Include the following, as applicable:

(i) Startup procedures.
(ii) Equipment or system break-in procedures.
(iii) Routine and normal operating instructions.

(iv) Regulation and control procedures.
(v) Control sequences.
(vi) Safety procedures.
(vii) Normal shutdown instructions.
(viii) Operating procedures for emergencies, subsystem, system, or equipment failure.
(ix) Seasonal and weekend operating instructions.
(x) Required sequences fore electric or electronic systems.
(xi) Special operating instructions and procedures.

e. Adjustments. Include the following:

(i) Alignments.
(ii) Checking adjustments.
(iii) Noise and vibration adjustments.
(iv) Economy and efficiency adjustments.

f. Troubleshooting. Include the following:

(i) Diagnostic instructions.
(ii) Test and inspection procedures.

g. Maintenance. Include the following:

(i) Inspection procedures.
(ii) Cleaning methods and types of cleaning agents to employ.
(iii) Cleaning methods detrimental to product/equipment.
(iv) Procedures for routine cleaning.
(v) Procedures for preventative maintenance.
(vi) Procedures for routine maintenance.
(vii) Instructions on use of special tools.

h. Repairs. Include the following:

(i) Diagnosis instructions.
(ii) Repair instructions.
(iii) Disassembly; component removal, repair, replacement, and reassembly instructions.
(iv) Instructions for identifying parts and components.
(v) Review of spare parts needed for O&M.

8. Training Execution:

a. Preparation: Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a combined training manual. Set up instructional equipment at instruction location.
b. Instruction:

(i) Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and

Department of Veterans Affairs for number of participants, instruction times, and location.

(ii) Instructor: Engage qualified instructors to instruct VA's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system. The Contractor shall furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements. The VA will describe VA's operational philosophy. The VA will furnish the Contractor with names and positions of participants.

c. Scheduling: Provide instruction at mutually agreed times. For equipment that requires seasonal operation, provide similar instruction at start of each season. Schedule training with the VA and the Commissioning Agent with at least seven days' advance notice.
d. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of an oral, or a written, performance-based test.
e. Cleanup: Collect used and leftover educational materials and remove from Project site. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

9. Demonstration and Training Recording:

a. General: Engage a qualified commercial photographer to record demonstration and training. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice. At beginning of each training module, record each chart containing learning objective and lesson outline.
b. Video Format: Provide high quality color DVD color on standard size DVD disks or digital video files capable of playback on VA computer systems.
c. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to show area of demonstration and training. Display continuous running time.
d. Narration: Describe scenes on videotape by audio narration by microphone while demonstration and training are recorded. Include description of items being viewed. Describe vantage point, indicating location, direction (by compass point), and elevation or story of construction. Contractor shall provide any unanswered questions from the training within 7 days of training in writing.

B. Contractor shall furnish Operating and Maintenance manuals (firstly, electronic PDF copies for review and approval, then one set hard copy when VA approves) and verbal instructions when required by the various sections of the specifications and as hereinafter specified.

C. O&M Manuals: Operating and Maintenance manuals shall be required for each separate piece of equipment. An equipment-specific O&M shall be included at project completion, via electronic submittal, even if the original submittal included a generic O&M or if the equipment was delivered with a hard copy O&M. Manuals shall be complete, detailed guides for the operation and maintenance of equipment. Model and serial numbers shall be noted in the O&M manual. They shall include complete information necessary for starting, adjusting, maintaining in continuous operation for long periods of time and dismantling and reassembling of the complete units and sub-assembly components. Manuals shall include an index covering all component parts clearly cross-referenced to diagrams and illustrations. Illustrations shall include "exploded" views showing and identifying each separate item. Emphasis shall be placed on the use of special tools and instruments. The function of each piece of equipment, component, accessory, and control shall be clearly and thoroughly explained. All necessary precautions for the operation of the equipment and the reason for each precaution shall be clearly set forth. Manuals must reference the exact model, style, and size of the piece of equipment and system being furnished. Manuals referencing equipment similar to but of a different model, style, and size than that furnished will not be accepted.

D. Equipment List: Provide an Excel table equipment list to show all installed electrical and mechanical equipment to include model and serial numbers.

1.27 GOVERNMENT-FURNISHED PROPERTY – NOT USED

1.28 RELOCATED EQUIPMENT – NOT USED

1.29 STORAGE SPACE FOR DEPARTMENT OF VETERANS AFFAIRS EQUIPMENT – NOT USED

1.30 CONSTRUCTION SIGN

A. Provide a Construction Sign as shown in the drawings. All wood members shall be of framing lumber. Cover sign frame with 24-gauge galvanized sheet steel nailed securely around edges and on all bearings. Provide three 4x4-in posts (or equivalent round posts) set four feet into ground. Set bottom of sign level at three feet above ground and secure to posts with through bolts. Make posts full height of sign. Brace posts with 2x4-in material as directed.
B. Paint all surfaces of sign and posts two coats of white gloss paint. Border and letters shall be of black gloss paint, except project title which shall be blue gloss paint.
C. Maintain sign and remove it when directed by the COR.
D. Detail Drawing of construction sign showing required legend and other characteristics of sign is shown on the drawings.

1.31 SAFETY SIGN

A. Provide a Safety Sign as shown in the drawings. Face of sign shall be ¾-in-thick exterior grade plywood. Provide two 4x4-in posts extending full height of sign and three feet into ground. Set bottom of sign level at four feet above ground.
B. Paint all surfaces of Safety Sign and posts with one prime coat and two coats of white gloss paint. Letters and design shall be painted with gloss paint of colors noted.
C. Maintain sign and remove it when directed by COR.
D. Drawing details in VA Signage Design Manual, Section 11 Specialty Signs (found on VA TIL) show required legend and other characteristics of sign and are shown on the drawings.
E. Post the number of accident-free days on a daily basis.

1.32 PHOTOGRAPHIC DOCUMENTATION

A. During the construction period through completion, provide photographic documentation of construction progress and at selected milestones including electronic indexing, navigation, storage, and remote access to the documentation, as per these specifications. The commercial photographer or the subcontractor used for this work shall meet the following qualifications:

1. Demonstrable minimum experience of three (3) years in operation providing documentation and advanced indexing/navigation systems including a representative portfolio of construction projects of similar type, size, duration, and complexity as the project.

2. Demonstrable ability to service projects throughout North America, which shall be demonstrated by a representative portfolio of active projects of similar type, size, duration, and complexity as the project.

B. Photographic documentation elements:

1. Each digital image shall be taken with a professional grade camera with minimum size of 6 megapixels (MP) capable of producing 8 x 10-inch prints with a minimum of 2272 x 1704 pixels and 16 x 20-inch prints with a minimum 2592 x 1944 pixels.
2. Indexing and navigation system shall utilize actual CADD (AUTOCAD/ REVIT) construction drawings, making such drawings interactive on an on-line interface. For all documentation referenced herein, indexing and navigation must be organized by both time (date-stamped) and location throughout the project.
3. Documentation shall combine indexing and navigation system with inspection-grade digital photography designed to capture actual conditions throughout construction and at critical milestones. Documentation shall be accessible on-line through use of an internet connection. Documentation shall allow for secure multiple-user access, simultaneously, on-line.

4. Before construction, the building pad, adjacent streets, roadways, parkways, driveways, curbs, sidewalks, landscaping, adjacent utilities, and adjacent structures surrounding the building pad and site shall be documented. Overlapping photographic techniques shall be used to ensure maximum coverage. Indexing and navigation accomplished through interactive architectural drawings. If site work or pad preparation is extensive, this documentation may be required immediately before construction and at several pre-determined intervals before building work commences.
5. Construction progress for all trades shall be tracked at pre-determined intervals, but not less than once every thirty (30) calendar days (called, *progressions*). Progression documentation shall track both the exterior and interior construction of the construction. Exterior Progressions shall track 360 degrees around the site. Interior Progressions shall track interior improvements beginning when stud work commences and continuing until completion.
6. As-built condition of pre-foundation utilities and site utilities shall be documented prior to pouring footers, placing concrete and/or backfilling. This process shall include all underground and concrete-encased utilities onsite. Overlapping photographic techniques shall be used to ensure maximum coverage. Indexing and navigation accomplished through interactive site utility plans.
7. As-built (rough-in) conditions of mechanical, electrical, plumbing, fire suppression, and other systems shall be documented post-inspection and before insulation, sheet rock or dry wall installation. This process shall include finished systems located in the walls and ceilings. Overlapping photographic techniques shall be used to ensure maximum coverage. Indexing and navigation accomplished through interactive architectural drawings.
8. As-built conditions of exterior elevations impacted by the Contractor’s work shall be documented with an increased concentration of digital photographs as directed by the COR in order to capture pre-determined focal points, such as waterproofing, caulking, or window flashing. Overlapping photographic techniques shall be used to ensure maximum coverage. Indexing and navigation accomplished through interactive elevations or elevation details.
9. As-built finished conditions of the interior of each modified space including floors, ceilings and walls shall be documented prior to occupancy. Overlapping photographic techniques shall be used to ensure maximum coverage. Indexing and navigation accomplished through interactive architectural drawings.
10. Miscellaneous events that occur during any Contractor site visit, or events captured by the Department of Veterans Affairs independently, shall be dated, labeled, and inserted into a Section in the navigation structure entitled “Slideshows,” allowing this information to be stored in the same “place” as the formal scope.

11. Customizable project-specific digital photographic documentation of other details or milestones. Indexing and navigation accomplished through interactive architectural plans.
12. Monthly (29 max) *exterior site progressions* of the civil/site work and terminations at each building including slideshows. This exterior photographic documentation shall capture the project at different stages of construction. These progressions shall capture underground utilities, excavation, grading, backfill, landscaping and road construction throughout the duration of the project. The slideshows allow for the inclusion of Department of Veterans Affairs pictures, aerial photographs, and timely images which do not fit into any regular monthly photopath.
13. Regular (8 max) *interior progressions* of all walls of the entire project to begin at time of substantial framed or as directed by the COR through to completion.
14. Detailed *exact-built* of concrete pours just prior to placing concrete or as directed by the COR.
15. Detailed Interior *exact-built* overlapping photos to include documentation of mechanical, electrical, plumbing, and fire suppression systems in walls and ceilings; to be conducted after rough-ins are complete and before insulation and drywall installation.
16. Finished detailed interior *exact-built* overlapping photos of walls, ceilings, and floors prior to occupancy.
17. In event a greater or lesser number of images than specified above are required by the COR, adjustment in contract price will be made in accordance with clause entitled "CHANGES" (FAR 52.243-4).

C. Images shall be taken by a commercial photographer and must show distinctly, at as large a scale as possible, all parts of work embraced in the picture.
D. Coordination of photo shoots is accomplished through COR. Contractor shall also attend construction team meetings. Contractor shall provide regular updates regarding the status of the documentation, including photo shoots concluded, the availability of new *progressions* or *exact-builts* viewable on-line and anticipated future shoot dates.
E. Contractor shall provide all on-line domain/web hosting, security measures, and redundant server back-up of the documentation.
F. Contractor shall provide technical support related to using the system or service.
G. Upon completion of the project, final copies of the documentation (the “Permanent Record”) with the indexing and navigation system embedded (and active) shall be provided in an electronic media format, typically a DVD or external hard-drive. Permanent Record shall have Building Information Modeling (BIM) interface capabilities. On-line access terminates upon delivery of the Permanent Record.

1.33 FINAL ELEVATION DIGITAL IMAGES – NOT USED

1.34 HISTORIC PRESERVATION

A. Where the Contractor or any of the Contractor's employees, prior to, or during the construction work, are advised of or discover any possible archeological, historical and/or cultural resources, the Contractor shall immediately notify the COR verbally, and then with a written follow up.

1.35 VA TRIRIGA CPMS – NOT USED

- - - E N D - - -

Campus Buildings – TE and TR Construction Narrative

The General Contractor will be working in multiple campus buildings in addition to the Main Hospital (Building 111), constructing and renovating spaces for new Telecommunication Rooms (TRs) or spaces for new Telecommunications Equipment (TE) installation. SSC = Special Service Closet (i.e., existing data or fiber closet.)

- Building 3
  - A 1st floor storage space is being renovated for a new TR. This is a non-patient care building. An infection control and construction plan will be required prior to mobilization for this work.
  - Dual path FOC is not required to be pulled to this building.

- Building 4
  - A 2nd floor office is being renovated for a new TR. This is a non-patient care building. An infection control and construction plan will be required prior to mobilization for this work.
  - Dual path FOC is not required to be pulled to this building.

- Building 5
  - Two (2) spaces are getting TRs. This is a non-patient care building. Infection control and construction plans (both locations) will be required prior to mobilization for this work. There are two existing SSCs (2nd and 3rd floor) that will be decommissioned as part of the TR relocation and construction.
    - A 1st floor existing data closet (SSC) is being renovated for a new TR.
    - A 2nd floor office is being renovated for a new TR.
  - Dual path FOC is not required to be pulled to this building.

- Building 6
  - There will be five (5) new TRs built in Building 6. This is a non-patient care building. Infection control and construction plans (all locations) will be required prior to mobilization for this work.
    - A-wing (north) 1st floor existing SSC is being renovated to a new TR.
    - B-wing (south) 1st floor existing SSC is being renovated to a new TR.
    - C-wing (north) 1st floor space is being renovated for a new TR. The existing SSC adjacent to this space will be decommissioned.
    - D-wing (south) 2nd floor space is being renovated for a new TR. The existing SSC adjacent to this space will be decommissioned.
    - C-wing (south) 3rd floor space is being renovated for a new TR. The existing SSC adjacent to this space will be decommissioned.
  - Dual path FOC is not required to be pulled to this building.

- Building 7
  - A basement existing SSC is being renovated to a new TR. This is an administrative patient care building. An infection control and construction plan will be required prior to mobilization for this work.
  - Dual path FOC is required to be pulled to this building.

- Building 20
  - A 1st floor office is being renovated for a new TR. This is a non-patient care building. An infection control and construction plan will be required prior to mobilization for this work.
  - Dual path FOC is not required to be pulled to this building.

- Building 43
  - There will be two (2) new TRs built in Building 43. This is an administrative patient care building. Infection control and construction plans (both locations) will be required prior to mobilization for this work. There is an existing SSC (3rd floor) that will be decommissioned as part of the TR relocation and construction.
    - A 1st floor existing SSC and adjacent space are being renovated to a new TR.
    - A 2nd floor existing SSC and adjacent spaces are being renovated to a new TR.
  - Dual path FOC is required to be pulled to this building.

- Building 70
  - There will be four (4) new TRs built in Building 70. This is a patient care building. Infection control and construction plans (all locations) will be required prior to mobilization for this work.
    - E-wing (north) 1st floor space is being renovated to a new TR.
    - A/B-wing (south) 1st floor space is being renovated to a new TR.
    - C-wing (north) 1st floor space is being renovated to a new TR.
    - D-wing 1st floor existing SSC is being renovated to a new TR.
  - Coordinate SSC decommissions and relocations of MCW equipment with VA and MCW. ***See detailed MCW Equipment List page 29 this appendix.***
  - Dual path FOC is required to be pulled to this building.

- Building 97
  - A 1st floor space is being renovated for a new TR. This is a non-patient care building. An infection control and construction plan will be required prior to mobilization for this work.
  - Dual path FOC is not required to be pulled to this building.

- Building 102
  - There will be two (2) new TRs built in Building 102. This is a non-patient care building. Infection control and construction plans (both locations) will be required prior to mobilization for this work. There is an existing SSC (1st floor) that will be decommissioned as part of the TR relocation and construction.
    - A basement existing SSC is being renovated to a new TR.
    - A 1st floor space is being renovated to a new TR.
  - Dual path FOC <u>is</u> required to be pulled to this building.

- Building 107
  - A mezzanine space is being renovated for a new TR. This is a non-patient care building. An infection control and construction plan will be required prior to mobilization for this work.
  - Dual path FOC is <u>not</u> required to be pulled to this building.

- Building 108
  - A 2nd floor existing conference room is being renovated for a new TR and storage space. This is a non-patient care building. An infection control and construction plan will be required prior to mobilization for this work.
  - Dual path FOC is <u>not</u> required to be pulled to this building.

- Building 109
  - A basement existing space is being renovated to a new TR. This is an administrative patient care building. An infection control and construction plan will be required prior to mobilization for this work.
  - Dual path FOC <u>is</u> required to be pulled to this building.

- Building 111
  - ***See pages 5 through 28 this appendix.***

- Building 112
  - An existing 1st floor SSC is being renovated for a new TR. This is a non-patient care building. An infection control and construction plan will be required prior to mobilization for this work.
  - Dual path FOC is <u>not</u> required to be pulled to this building.

- Building 113
  - An existing basement space in a Switchgear Room is being renovated for a new TE. This is a non-patient care building. An infection control and construction plan will be required prior to mobilization for this work.
  - Dual path FOC is <u>not</u> required to be pulled to this building.

- Building 123
  - There will be five (5) new TRs built in Building 123. This is a patient care building. Infection control and construction plans (all locations) will be required prior to mobilization for this work.
    - A-wing 1st floor storage room is being renovated to a new TR.
    - B-wing 1st floor existing SSC and storage space are being renovated to a new TR.
    - C-wing 1st floor existing SSC and storage space are being renovated to a new TR.
    - D-wing 1st floor existing SSC and storage space are being renovated to a new TR.
    - E-wing 1st floor existing SSC and storage space are being renovated to a new TR.
  - Dual path FOC <u>is</u> required to be pulled to this building.

- Building 144
  - There will be four (4) new TRs in Building 144. Two (2) existing SSCs on the basement level are being converted to TRs. Two (2) existing SSCs on the 1st floor are being converted to TRs. This is a patient care building. Infection control and construction plans (all locations) will be required prior to mobilization for this work.
  - Dual path FOC <u>is</u> required to be pulled to this building.

- Building 146/147/148
  - Each CLC basement existing SSC space will be renovated to new TRs – three total: one each building. These are patient care buildings. Infection control and construction plans (all locations) will be required prior to mobilization for this work.
  - Dual path FOC <u>is</u> required to be pulled to this building.

BUILDING 111 – General Notes about construction of new Telecommunication Rooms (TRs) and relocation or repurpose of existing non-EHRM data closet switches and equipment. Building 111's old data closets – if they have new fiber or category cable requirements for non-EHRM infrastructure – will become Special Systems Closets (SSCs).

- Noted SSCs contain some ETR infrastructure to support Biomed, HVAC, or other systems. These items will require Cat 6A to new Telecommunications Room (TR) and/or fiber from the nearest TR. See following pages.
- Noted SSCs at the completion of work will need new signage. Please be sure signage DEMO and NEW WORK are included.
- Regarding new Cat 6A pulls between new TRs and SSCs, General Contractor (GC) shall coordinate with VA Biomed, VA OIT, Johnson Controls, Inc. (JCI), and/or Systec as required.
- Regarding fiber pulls between new TRs and SSCs, GC shall coordinate with VA Biomed, VA OIT, Johnson Controls, Inc. (JCI), and/or Systec as required.
- GC shall ignore any remaining VA Guest Wi-Fi equip in existing data closets during construction, there will be no contract work regarding Guest Wi-Fi.
- Remaining infrastructure on the old data rack be relocated to SSC walls. KTR shall coordinate relocation/removal and wall installation of FDUs, switches, or other rack-mounted items with VA. This way old rack can be removed.
- New TRs shall support equipment/devices/wall plates on same floor or in that vicinity if there are to be multiple TRs per floor (Basement/1st/2nd). In Building 111, there shall be no Cat 6A runs from floors above or below to a TR in between*.
    - *This does not apply to those buildings that have TRs that support multiple floors; **see pages 30-33 this Appendix**.
- New TRs shall have additional normal (IVORY) and emergency (RED) wall power at standard height AFF based upon quantity of racks in the new TR per below. NOTE: wall additional power as noted below on the walls of the TR is separate from the PDU power. See Electrical Drawings.
    - 1-2 racks = 2 quad outlets (one RED; one IVORY)
    - 3-4 racks = 4 quad outlets (two RED; two IVORY)
    - 5-6 racks = 6 quad outlets (three RED; three IVORY)
- The GC shall pull new Cat 6A as needed (on- or off-shift as noted in the Phasing Plan in 01 00 00 GENERAL REQUIREMENTS) and terminate at the punchdown (PD) block in the rack, both provided by the contract. VA will connect PD block to the VA switch with patch cord provided by the contract. The terminations between PD block and VA switch shall be off-shift.
- Each new IT Rack shall have its own UPS with integrated ATS. Racks shall have PDU strips vertically the entire length of the rack on each side to aid in VA power/cable management. The PD block shall be the "angled" type to improve cable management. The contract documents dictate Basis of Design for Rack/UPS/ATS/PDU/PD Block equipment.
- VA will provide "leapfrog" switches (anticipate need for 12 switches) for the new work in direct coordination with the GC's schedule.
- The "leapfrog" switches will include necessary switch infrastructure to accommodate the fact that all security camera devices will migrate from 3rd party (JCI) "Netgear" switches to the VA OIT network switch. JCI/Netgear/

Security switches will be removed from the SSCs at the completion of work in Bldg 111. These removed switches remain property of the government.

- New TRs shall have new Div 28 PACS systems to include require Card Readers (CR) with PIN pads for access control. TRs shall have new doors/frames/hardware.
- GC has a responsibility to coordinate/install necessary analog telephone infrastructure for locations that require it (patient rooms, emergency phones, elevator phones). The GC may opt to route new analog phone directly to the old telephone closets or to the new TRs then connecting the TRs to the old telephone closets. See drawings.

BUILDING 111 – 10th Floor – Data Closet/SSC ETR Narrative

New TR: Room **10409**; see contract drawings.

10128 (10AS) – contains two (2) VA and one (1) camera switches

- Note: No fiber will be needed to remain in this DC at completion of work; therefore, the old rack and the FDU shall be demolished and removed.

Room 10120 (becomes SSC 10120)

- GC shall provide and pull one (1) fiber pair between this existing SSC and the new TR 10406 for an ETR Jeron Nurse Call panel.
- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 10409 with cat 6A cable as necessary.
- Note: The GC shall coordinate with VA to relocate any rack-mounted equipment to the walls of the SSC so that the old rack can be demolished and removed. Existing network cable from this SSC to the infrastructure it supports MUST STAY and shall not be abandoned/demolished. Coordinate with the COR in the demolition and removal of the old rack and the FDU.

Room 10141A (Simulation Lab Center Network Closet)

- The GC shall provide and pull forty-eight (48) Cat 6A cables from this Sim Lab network closet (10141A) and new TR 10409 for ETR panel/infrastructure.

Room 10206

- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 10409 with cat 6A cable as necessary.

10228 (10AN) – contains two (2) VA and one (1) camera switches (becomes SSC 10228)

- GC shall provide and pull one (1) fiber pair between this existing SSC and the new TR 10406 for an ETR Cisco "watchfire" switch.
- GC shall provide and pull three (3) Cat 6A cables between this SSC and new TR 10409 for ETR panel/infrastructure.
- Note: The GC shall coordinate with VA to relocate any rack-mounted equipment to the walls of the SSC so that the old rack can be demolished and removed. Existing network cable from this SSC to the infrastructure it supports MUST STAY and shall not be abandoned/demolished. Coordinate with the COR in the demolition and removal of the old rack and the FDU.

Room 10406

- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 10409 with cat 6A cable as necessary.

10519 (10CS) – contains two (2) VA switches (becomes SSC 10519)

- GC shall provide and pull two (2) Cat 6A cables between this DC and new TR 10409 for ETR panel/infrastructure.
- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 10409 with cat 6A cable as necessary.
- Note: No fiber will be needed to remain in this DC at completion of work; therefore, the old rack and the FDU shall be demolished and removed.

Room 10627EC

- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 10409 with cat 6A cable as necessary.

10629 (10CN) – contains two (2) VA switches (becomes SSC 10629)

- GC shall provide and pull one (1) Cat 6A cable between this DC and new TR 10409 for ETR panel/infrastructure.
- Note: No fiber will be needed to remain in this DC at completion of work; therefore, the old rack and the FDU shall be demolished and removed.

BUILDING 111 – 9th Floor – Data Closet/SSC ETR Narrative

New TR: Room **9409**; see contract drawings.

9128 (9AS) – contains two (2) VA switches (becomes SSC 9128)

- GC shall provide and pull one (1) Cat 6A cable between this DC and new TR 9409 for ETR Biomed LEAF equipment. GC shall secure LEAF device to DC wall in coordination with VA Biomed.
- Note: No fiber will be needed to remain in this DC at completion of work; therefore, the old rack and the FDU shall be demolished and removed.

Room 9153

- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 9409 with cat 6A cable as necessary.

9228 (9AN) – contains two (2) VA and one (1) camera switches (becomes SSC 9228)

- GC shall provide and pull one (1) Cat 6A cable between this SSC and new TR 9409 for ETR Biomed LEAF equipment. GC shall secure LEAF device to SSC wall in coordination with VA Biomed.
- GC shall provide and pull one (1) fiber pair between this existing SSC and the new TR 9409 for an ETR Jeron Nurse Call panel.
- Note: The GC shall coordinate with VA to relocate any rack-mounted equipment to the walls of the SSC so that the old rack can be demolished and removed. Existing network cable from this SSC to the infrastructure it supports MUST STAY and shall not be abandoned/demolished. Coordinate with the COR in the demolition and removal of the old rack and the FDU.

9523 (9CS) – contains two (2) VA switches (becomes SSC 9523)

- GC shall provide and pull one (1) Cat 6A cable between this DC and new TR 9409 for ETR Biomed LEAF equipment. GC shall secure LEAF device to DC wall in coordination with VA Biomed.
- Note: No fiber will be needed to remain in this DC at completion of work; therefore, the old rack and the FDU shall be demolished and removed.

9618 (9CN) – contains two (2) VA switches (becomes SSC 9618)

- GC shall provide and pull one (1) Cat 6A cable between this SSC and new TR 9409 for ETR Biomed LEAF equipment. GC shall secure LEAF device to SSC wall in coordination with VA Biomed.
- GC shall provide and pull two (2) Cat 6A cables between this SSC and new TR 9409 for ETR panel/infrastructure.
- GC shall provide and pull one (1) fiber pair between this existing SSC and the new TR 9409 for an ETR Jeron Nurse Call panel.
- Note: The GC shall coordinate with VA to relocate any rack-mounted equipment to the walls of the SSC so that the old rack can be demolished and removed. Existing network cable from this SSC to the infrastructure it supports MUST STAY and shall not be abandoned/demolished. Coordinate with the COR in the demolition and removal of the old rack and the FDU.

BUILDING 111 – 8th Floor – Data Closet/SSC ETR Narrative

New TR: Room **8409**; see contract drawings.

Room 8126EC

- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 8409 with cat 6A cable as necessary.

8128 (8AS) – contains four (4) VA switches (becomes SSC 8128)

- GC shall provide and pull eleven (11) Cat 6A cable between this SSC and new TR 8409 for ETR panel/infrastructure.
- GC shall provide and pull one (1) fiber pair between this existing SSC and the new TR 8409 for an ETR Jeron Nurse Call panel.
- Note: The GC shall coordinate with VA to relocate any rack-mounted equipment to the walls of the SSC so that the old rack can be demolished and removed. Existing network cable from this SSC to the infrastructure it supports MUST STAY and shall not be abandoned/demolished. Coordinate with the COR in the demolition and removal of the old rack and the FDU.

8228 (8AN) – contains three (3) VA switches (becomes SSC 8228)

- GC shall provide and pull five (5) Cat 6A cable between this DC and new TR 8409 for ETR panel/infrastructure.
- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 8409 with cat 6A cable as necessary.
- Note: No fiber will be needed to remain in this DC at completion of work; therefore, the old rack and the FDU shall be demolished and removed.

8523 (8CS) – contains two (2) VA switches

- Note: No fiber will be needed to remain in this DC at completion of work; therefore, the old rack and the FDU shall be demolished and removed.

8622 (8CN) – contains three (3) VA switches (becomes SSC 8622)

- GC shall provide and pull five (5) Cat 6A cable between this DC and new TR 8409 for ETR panel/infrastructure.
- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 8409 with cat 6A cable as necessary.
- Note: No fiber will be needed to remain in this DC at completion of work; therefore, the old rack and the FDU shall be demolished and removed.

BUILDING 111 – 7th Floor – Data Closet/SSC ETR Narrative

New TR: Room **7412**; see contract drawings.

7128 (7AS) – contains two (2) VA switches (becomes SSC 7128)

- GC shall provide and pull one (1) fiber pair between this existing SSC and the new TR 7412 for an ETR Jeron Nurse Call panel.
- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 7412 with cat 6A cable as necessary.
- Note: The GC shall coordinate with VA to relocate any rack-mounted equipment to the walls of the SSC so that the old rack can be demolished and removed. Existing network cable from this SSC to the infrastructure it supports MUST STAY and shall not be abandoned/demolished. Coordinate with the COR in the demolition and removal of the old rack and the FDU.

7226 (7AN) – contains three (3) VA and one (1) camera switches (becomes SSC 7226)

- GC shall provide and pull one (1) fiber pair between this existing SSC and the new TR 7412 for ETR Biomed GE switch.
- GC shall provide and pull two (2) fiber pairs between this existing SSC and the new TR 7412 for ETR Skytron switch.
- GC shall provide and pull one (1) Cat 6A cable between this DC and new TR 7412 for ETR panel/infrastructure.
- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 7412 with cat 6A cable as necessary.
- Note: The GC shall coordinate with VA to relocate any rack-mounted equipment to the walls of the SSC so that the old rack can be demolished and removed. Existing network cable from this SSC to the infrastructure it supports MUST STAY and shall not be abandoned/demolished. Coordinate with the COR in the demolition and removal of the old rack and the FDU.

Room 7228EC

- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 7412 with cat 6A cable as necessary.

7525 (7CS) – contains two (2) VA switches (becomes SSC 7525)

- GC shall provide and pull one (1) Cat 6A cable between this SSC and new TR 7412 for ETR Biomed LEAF equipment. GC shall secure LEAF device to SSC wall in coordination with VA Biomed.
- GC shall provide and pull one (1) fiber pair between this existing SSC and the new TR 7412 for an ETR Jeron Nurse Call panel.
- GC shall provide and pull four (4) fiber pairs between this existing SSC and the new TR 7412 for ETR Biomed GE switches.
- Note: The GC shall coordinate with VA to relocate any rack-mounted equipment to the walls of the SSC so that the old rack can be demolished and removed. Existing network cable from this SSC to the infrastructure it supports MUST STAY and shall not be abandoned/demolished. Coordinate with the COR in the demolition and removal of the old rack and the FDU.

7619 (7CN) – contains two (2) VA switches (becomes SSC 7619)

- GC shall provide and pull one (1) Cat 6A cable between this SSC and new TR 7412 for ETR Biomed LEAF equipment. GC shall secure LEAF device to SSC wall in coordination with VA Biomed.
- GC shall provide and pull four (4) fiber pairs between this existing SSC and the new TR 7412 for ETR Biomed GE switches.
- Note: The GC shall coordinate with VA to relocate any rack-mounted equipment to the walls of the SSC so that the old rack can be demolished and removed. Existing network cable from this SSC to the infrastructure it supports MUST STAY and shall not be abandoned/demolished. Coordinate with the COR in the demolition and removal of the old rack and the FDU.

Room 7635

- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 7412 with cat 6A cable as necessary.

BUILDING 111 – 6th Floor – Data Closet/SSC ETR Narrative

New TR: Room **6410A**; see contract drawings.

6114 (6AS) – contains three (3) VA switches

- Note: No fiber will be needed to remain in this DC at completion of work; therefore, the old rack and the FDU shall be demolished and removed.

6142A (6A SSC) – contains zero (0) VA switches

- Note: No fiber currently exists in this SSC and no fiber will be needed in this SSC at completion of work.
- There will be demo associated with this SSC because of approximately 20-30 category network cables in the Medical Media (MM) department that terminate at an abandoned MM switch this location.

6219 (6AN) – contains three (3) VA switches

- Note: No fiber will be needed to remain in this DC at completion of work; therefore, the old rack and the FDU shall be demolished and removed.

6410A (6B SSC) – contains two (2) VA switches

- Note: No fiber will be needed to remain in this DC at completion of work; therefore, the old rack and the FDU shall be demolished and removed.

6529 (6CS) – contains two (2) VA switches (becomes SSC 6529)

- GC shall provide and pull one (1) Cat 6A cable between this SSC and new TR 6410A for ETR Biomed LEAF equipment. GC shall secure LEAF device to SSC wall in coordination with VA Biomed.
- GC shall provide and pull four (4) fiber pairs between this existing SSC and the new TR 6410A for ETR Biomed GE switches.
- GC shall provide and pull one (1) Cat 6A cable between this SSC and new TR 6410A for ETR panel/infrastructure.
- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 6410A with cat 6A cable as necessary.
- Note: The GC shall coordinate with VA to relocate any rack-mounted equipment to the walls of the SSC so that the old rack can be demolished and removed. Existing network cable from this SSC to the infrastructure it supports MUST STAY and shall not be abandoned/demolished. Coordinate with the COR in the demolition and removal of the old rack and the FDU.

6627 (6CN) – contains two (2) VA switches (becomes SSC 6627)

- GC shall provide and pull one (1) Cat 6A cable between this SSC and new TR 6410A for ETR Biomed LEAF equipment. GC shall secure LEAF device to SSC wall in coordination with VA Biomed.
- GC shall provide and pull four (4) fiber pairs between this existing SSC and the new TR 6410A for ETR Biomed GE switches.
- GC shall provide and pull one (1) Cat 6A cable between this SSC and new TR 6410A for ETR panel/infrastructure.
- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 6410A with cat 6A cable as necessary.
- GC shall provide and pull six (6) Cat 6A cables between this SSC and new TR 6410A for four (4) ETR Biomed APEX PRO devices.
- GC shall provide and pull one (1) fiber pair between this existing SSC and the new TR 6410A for an ETR Jeron Nurse Call panel.
- Note: The GC shall coordinate with VA to relocate any rack-mounted equipment to the walls of the SSC so that the old rack can be demolished and removed. Existing network cable from this SSC to the infrastructure it supports MUST STAY and shall not be abandoned/demolished. Coordinate with the COR in the demolition and removal of the old rack and the FDU.

BUILDING 111 – 5th Floor – Data Closet/SSC ETR Narrative

New TR: Room **5311**; see contract drawings.

5128 (5AS) – contains three (3) VA switches

- Note: No fiber will be needed to remain in this DC at completion of work; therefore, the old rack and the FDU shall be demolished and removed.

5228 (5AN) – contains three (3) VA switches

- Note: No fiber will be needed to remain in this DC at completion of work; therefore, the old rack and the FDU shall be demolished and removed.

5455 (5B SSC) – contains three (3) VA switches (becomes SSC 5455)

- GC shall provide and pull one (1) Cat 6A cable between this SSC and new TR 5311 for ETR panel/infrastructure.
- JCI PACS panel location (two panels). GC shall coordinate with JCI and COR and connect to TR 5311 with cat 6A cable as necessary.
- GC shall provide and pull four (4) fiber pairs between this existing SSC and the new TR 5311 for ETR Biomed GE switches.
- The GC shall coordinate with VA to relocate any rack-mounted equipment to the walls of the SSC so that the old rack can be demolished and removed. Existing network cable from this SSC to the infrastructure it supports MUST STAY and shall not be abandoned/demolished. Coordinate with the COR in the demolition and removal of the old rack and the FDU.

5515B (5CS) – contains three (3) VA and one (1) camera switches (becomes SSC 5515B)

- GC shall provide and pull four (4) fiber pairs between this existing SSC and the new TR 5311 for ETR Biomed GE switches.
- GC shall provide and pull one (1) fiber pair between this existing SSC and the new TR 5311 for an ETR Jeron Nurse Call panel.
- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 5311 with cat 6A cable as necessary.
- Note: The GC shall coordinate with VA to relocate any rack-mounted equipment to the walls of the SSC so that the old rack can be demolished and removed. Existing network cable from this SSC to the infrastructure it supports MUST STAY and shall not be abandoned/demolished. Coordinate with the COR in the demolition and removal of the old rack and the FDU.

5625 (5CN) – contains two (2) VA switches (becomes SSC 5625)

- GC shall provide and pull one (1) Cat 6A cable between this SSC and new TR 5311 for ETR Biomed LEAF equipment. GC shall secure LEAF device to SSC wall in coordination with VA Biomed.
- GC shall provide and pull three (3) Cat 6A cables between this SSC and new TR 5311 for two (2) ETR Biomed APEX PRO devices.
- GC shall provide and pull one (1) Cat 6A cable between this SSC and new TR 5311 for ETR panel/infrastructure.
- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 5311 with cat 6A cable as necessary.
- GC shall provide and pull eight (8) fiber pairs between this existing SSC and the new TR 5311 for ETR Biomed GE switches.
- Note: The GC shall coordinate with VA to relocate any rack-mounted equipment to the walls of the SSC so that the old rack can be demolished and removed. Existing network cable from this SSC to the infrastructure it supports MUST STAY and shall not be abandoned/demolished. Coordinate with the COR in the demolition and removal of the old rack and the FDU.

BUILDING 111 – 4th Floor – Data Closet/SSC ETR Narrative

New TR: Room **4315**; see contract drawings.

4128 (4AS) – contains three (3) VA switches

- Note: No fiber will be needed to remain in this DC at completion of work; therefore, the old rack and the FDU shall be demolished and removed.

4230 (4AN) – contains two (2) VA switches (becomes SSC 4230)

- GC shall provide and pull four (4) fiber pairs between this existing SSC and the new TR 4315 for ETR Biomed GE switches.
- GC shall provide and pull one (1) fiber pair between this existing SSC and the new TR 4315 for an ETR "Research" switch.
- Note: The GC shall coordinate with VA to relocate any rack-mounted equipment to the walls of the SSC so that the old rack can be demolished and removed. Existing network cable from this SSC to the infrastructure it supports MUST STAY and shall not be abandoned/demolished. Coordinate with the COR in the demolition and removal of the old rack and the FDU.

4446A (4B SSC) – contains three (3) VA switches

- Note: No fiber will be needed to remain in this DC at completion of work; therefore, the old rack and the FDU shall be demolished and removed.

4521 (4CS) – contains three (3) VA switches (becomes SSC 4521)

- GC shall provide and pull one (1) Cat 6A cable between this SSC and new TR 4315 for ETR Biomed LEAF equipment. GC shall secure LEAF device to SSC wall in coordination with VA Biomed.
- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 4315 with cat 6A cable as necessary.
- GC shall provide and pull four (4) fiber pairs between this existing SSC and the new TR 4315 for ETR Biomed GE switches.
- Note: The GC shall coordinate with VA to relocate any rack-mounted equipment to the walls of the SSC so that the old rack can be demolished and removed. Existing network cable from this SSC to the infrastructure it supports MUST STAY and shall not be abandoned/demolished. Coordinate with the COR in the demolition and removal of the old rack and the FDU.

4620 (4CN) – contains two (2) VA switches (becomes SSC 4620)

- GC shall provide and pull one (1) Cat 6A cable between this SSC and new TR 4315 for ETR Biomed LEAF equipment. GC shall secure LEAF device to SSC wall in coordination with VA Biomed.
- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 4315 with cat 6A cable as necessary.
- GC shall provide and pull three (3) Cat 6A cables between this SSC and new TR 4315 for two (2) ETR Biomed APEX PRO devices.
- GC shall provide and pull four (4) fiber pairs between this existing SSC and the new TR 4315 for ETR Biomed GE switches.
- GC shall provide and pull one (1) fiber pair between this existing SSC and the new TR 4315 for an ETR Jeron Nurse Call panel.
- GC shall provide and pull one (1) Cat 6A cable between this SSC and new TR 4315 for ETR panel/infrastructure.
- Note: The GC shall coordinate with VA to relocate any rack-mounted equipment to the walls of the SSC so that the old rack can be demolished and removed. Existing network cable from this SSC to the infrastructure it supports MUST STAY and shall not be abandoned/demolished. Coordinate with the COR in the demolition and removal of the old rack and the FDU.

BUILDING 111 – 3rd Floor – Data Closet/SSC ETR Narrative

New TR: Room **3308**; see contract drawings.

Room 3126A

- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 3308 with cat 6A cable as necessary.

3126BEC (3AS) – contains two (2) VA switches

- Note: No fiber will be needed to remain in this DC at completion of work; therefore, the old rack and the FDU shall be demolished and removed.

Room 3228A

- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 3308 with cat 6A cable as necessary.

3228B (3AN) – contains two (2) VA switches

- Note: No fiber will be needed to remain in this DC at completion of work; therefore, the old rack and the FDU shall be demolished and removed.

Room 3315

- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 3308 with cat 6A cable as necessary.

3443 (3B SSC) – contains three (3) VA and one (1) camera switches

- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 3308 with cat 6A cable as necessary.
- Note: No fiber will be needed to remain in this DC at completion of work; therefore, the old rack and the FDU shall be demolished and removed.

Room 3448 (FA Panel Room)

- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 3308 with cat 6A cable as necessary.

Room 3519

- JCI PACS panel location (two panels). GC shall coordinate with JCI and COR and connect to TR 3308 with cat 6A cable as necessary.

3521 (3CS) – contains one (1) VA and one (1) camera switch (becomes SSC 3521)

- Note: No fiber will be needed to remain in this DC at completion of work; therefore, the old rack and the FDU shall be demolished and removed.

3607 (Reception Security Station) – contains one (1) camera switch

- Note: Coordinate with COR and Johnson Controls. The Netgear camera switch this location will be removed and all the cameras terminated this switch will migrate to the OIT switch in the TR 3308. No fiber will be needed to remain at this location at completion of work; therefore, fiber infrastructure supporting the switch at this location shall be demolished and removed.

3624 (3CN) – contains one (1) VA switch

- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 3308 with cat 6A cable as necessary.
- Note: No fiber will be needed to remain in this DC at completion of work; therefore, the old rack and the FDU shall be demolished and removed.

Room 3650

- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 3308 with cat 6A cable as necessary.

BUILDING 111 – 2nd Floor – Data Closet/SSC ETR Narrative

Three (3) new TRs: Room **2235, 2428A,** and **2557;** see contract drawings.

2156 (2AS) – contains four (4) VA switches (becomes SSC 2156)

- GC shall provide and pull four (4) fiber pairs between this existing SSC and new TR 2235 for ETR Biomed GE switches.
- GC shall provide and pull two (2) fiber pairs between this existing SSC and new TR 2235 for an ETR "Research" switch.
- Note: The GC shall coordinate with VA to relocate any rack-mounted equipment to the walls of the SSC so that the old rack can be demolished and removed. Existing network cable from this SSC to the infrastructure it supports MUST STAY and shall not be abandoned/demolished. Coordinate with the COR in the demolition and removal of the old rack and the FDU.

2105 Signal Closet (2AS) (becomes SSC 2105)

- GC shall provide and pull one (1) fiber pair between this existing SSC and new TR 2235 for ETR Biomed equip.
- GC shall provide and pull four (4) fiber pairs between this existing SSC and new TR 2235 for ETR Biomed GE switches.
- The GC shall provide and pull thirty (30) Cat 6A cables from this signal closet (2105) and new TR 2235 for ETR "Extron Elec" infrastructure.
- Note: The GC shall coordinate with VA to relocate any rack-mounted equipment to the walls of the SSC so that the old rack can be demolished and removed. Existing network cable from this SSC to the infrastructure it supports MUST STAY and shall not be abandoned/demolished. Coordinate with the COR in the demolition and removal of the old rack and the FDU.

2205EC (2AN) (becomes SSC 2205)

- GC shall provide and pull one (1) fiber pair between this existing SSC and new TR 2235 for an ETR Jeron Nurse Call panel.
- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 2235 with cat 6A cable as necessary.
- Note: The GC shall coordinate with VA to relocate any rack-mounted equipment to the walls of the SSC so that the old rack can be demolished and removed. Existing network cable from this SSC to the infrastructure it supports MUST STAY and shall not be abandoned/demolished. Coordinate with the COR in the demolition and removal of the old rack and the FDU.

2236 (2AN) – contains four (4) VA switches (becomes SSC 2236)

- GC shall provide and pull one (1) fiber pair between this existing SSC and new TR 2235 for ETR Mobile Access Antenna device.
- GC shall provide and pull four (4) fiber pairs between this existing SSC and new TR 2235 for ETR Biomed GE switches.
- Note: The GC shall coordinate with VA to relocate any rack-mounted equipment to the walls of the SSC so that the old rack can be demolished and removed. Existing network cable from this SSC to the infrastructure it supports MUST STAY and shall not be abandoned/demolished. Coordinate with the COR in the demolition and removal of the old rack and the FDU.

2259 OR video integration closet (becomes SSC 2259)

- GC shall provide and pull eighteen (18) Cat 6A cables between this SSC and new TR 2235 for ETR Skytron video devices.

Room 2429EC

- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 2428A with cat 6A cable as necessary.

Room 2474A

- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 2428A with cat 6A cable as necessary.

2487A (2BN) – contains four (4) VA switches (becomes SSC 2487A)

- GC shall provide and pull four (4) fiber pairs between this existing SSC and new TR 2428A for ETR Biomed GE switches.
- Note: The GC shall coordinate with VA to relocate any rack-mounted equipment to the walls of the SSC so that the old rack can be demolished and removed. Existing network cable from this SSC to the infrastructure it supports MUST STAY and shall not be abandoned/demolished. Coordinate with the COR in the demolition and removal of the old rack and the FDU.

Room 2496A

- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 2428A with cat 6A cable as necessary.

2557 (2CS) – Note: this is an existing DC being reconfigured to new TR – contains one (1) VA switch (becomes TR 2557)

- GC shall extend three (3) Cat 6A cables between existing Biomed APEX PRO devices and the new rack in TR 2557.
- GC shall extend one (1) fiber pair between existing Jeron Nurse Call panel this SSC and the new rack in TR 2557.
- GC shall extend four (4) fiber pairs between existing Biomed GE switches this SSC and the new rack in TR 2557.
- GC shall extend three (3) Cat 6A cables between existing panel/ infrastructure this SSC and the new rack in TR 2557.
- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 2557 with cat 6A cable as necessary.
- GC shall extend one (1) fiber pair between existing Mobile access Antenna device this SSC and the new rick in TR 2557.
- Note: Because of the fiber pull(s) noted above, the GC shall ensure that the FDU stays in this SSC to support the ETR equipment. The GC shall coordinate with VA to relocate any rack-mounted equipment to the walls of the SSC so that the old rack can be demolished and removed. Existing network cable from this SSC to the infrastructure it supports MUST STAY and shall not be abandoned/demolished.

2532A (2CS) inside Clean Util Rm – contains three (3) VA switches (becomes SSC 2532A)

- GC shall provide and pull one (1) Cat 6A cable between this SSC and new TR 2557 for ETR Biomed LEAF equipment. GC shall secure LEAF device to SSC wall in coordination with VA Biomed.
- GC shall provide and pull one (1) fiber pair between this existing SSC and new TR 2557 for ETR Biomed Fiber Panel (2507B).
- Note: The GC shall coordinate with VA to relocate any rack-mounted equipment to the walls of the SSC so that the old rack can be demolished and removed. Existing network cable from this SSC to the infrastructure it supports MUST STAY and shall not be abandoned/demolished. Coordinate with the COR in the demolition and removal of the old rack and the FDU.

2600AB (2CN) inside Lab – contains five (5) VA switches

- Note: No fiber will be needed to remain in this DC at completion of work; therefore, the old rack and the FDU shall be demolished and removed.

Room 2600GEC inside Lab

- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 2557 with cat 6A cable as necessary..

GENERAL NOTES ABOUT OPERATING ROOMS 2nd FLOOR – VA recent project to make 2259A an "OR video integration" SSC. General Contractor on EHRM Tier 1 has some new work to support this recent work.

OR 1

- Three new booms (A/B/C) recently installed. Only boom A has cat 6A cable its two arms (8 per arm, total of 16 cables). GC shall demo the cat 5E cable in the ceiling between OR and SSC 2236. GC shall install cat 6A cable in ceiling from the RJ45 couplers to new TR 2235.

OR 2

- Two new Booms (H and I) recently installed. Both booms have cat 6A cable (8 each, total of 16 cables). GC shall demo the cat 5E cable in the ceiling between OR and SSC 2236. GC shall install cat 6A cable in ceiling from the RJ45 couplers to new TR 2235.

OR 3

- Three new booms (A/B/C) recently installed. Only boom A has cat 6A cable its two arms (8 per arm, total of 16 cables). GC shall demo the cat 5E cable in the ceiling between OR and SSC 2236. GC shall install cat 6A cable in ceiling from the RJ45 couplers to new TR 2235.

OR 4

- Four new booms (D/E/F/G) recently installed. Three booms D/E/F have cat 6A cable (8 each, total of 24 cables). GC shall demo the cat 5E cable in the ceiling between OR and SSC 2236. GC shall install cat 6A cable in ceiling from the RJ45 couplers to new TR 2235.

OR 5

- Four new booms (D/E/F/G) recently installed. Three booms D/E/F have cat 6A cable (8 each, total of 24 cables). GC shall demo the cat 5E cable in the ceiling between OR and SSC 2236. GC shall install cat 6A cable in ceiling from the RJ45 couplers to new TR 2235.

OR 6

- Three existing boom locations. Only EAST wall boom has cat 5E cable. GC shall demo the cat 5E cable in the ceiling above the EAST boom between OR and SSC 2156 (8 cables). GC shall install cat 6A cable in ceiling from new RJ45 couplers to new TR 2235 (8 cables). Cat 5E cable in the boom to remain.

OR 7

- Three existing boom locations. Only WEST wall boom has cat 5E cable. GC shall demo the cat 5E cable in the ceiling above the WEST boom between OR and SSC 2156 (8 cables). GC shall install cat 6A cable in ceiling from new RJ45 couplers to new TR 2235 (8 cables). Cat 5E cable in the boom to remain.

BUILDING 111 – 1st Floor – Data Closet/SSC ETR Narrative

Three (3) new TRs: Room **1180, 1473,** and **1537B;** see contract drawings.

Room 1107EC

- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 1180 with cat 6A cable as necessary.

1122 (Inside VA Police) – contains two (2) camera switches

- Note: Coordinate with COR and Johnson Controls. The Netgear camera switches this location will be removed and all the cameras terminated this switch will migrate to the OIT switch in the TR 1180. No fiber will be needed to remain at this location at completion of work; therefore, fiber infrastructure supporting the switch at this location shall be demolished and removed.

1138FA (old fire extinguisher cabinet in ED) (becomes SSC 1138)

- GC shall provide and pull one (1) fiber pair between this existing cabinet and new TR 1180 for an ETR Jeron Nurse Call panel.

1139B (1AS) inside Clean Util Rm – contains five (5) VA switches (becomes SSC 1139B)

- GC shall provide and pull four (4) fiber pairs between this existing SSC and new TR 1180 for ETR Biomed GE switches.
- Note: The GC shall coordinate with VA to relocate any rack-mounted equipment to the walls of the SSC so that the old rack can be demolished and removed. Existing network cable from this SSC to the infrastructure it supports MUST STAY and shall not be abandoned/demolished. Coordinate with the COR in the demolition and removal of the old rack and the FDU.

Room 1182EC

- JCI PACS panel location (three panels). GC shall coordinate with JCI and COR and connect to TR 1180 with cat 6A cable as necessary.

Room 1225 (Pharmacy)

- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 1180 with cat 6A cable as necessary.

1256 (1AN) – contains eight (8) VA and one (1) camera switches (becomes SSC 1256)

- GC shall provide and pull one (1) Cat 6A cables between this DC and new TR 1180 for ETR Qmatic device. GC shall secure Qmatic device to wall in Room 1256.
- GC shall coordinate with VA Biomed to relocate the VGIA switch to TR 1180.
- GC shall coordinate with VA Biomed to relocate the POE switch to TR 1180.
- Note: No fiber will be needed to remain in this SSC at completion of work; therefore, the old rack and the FDU shall be demolished and removed.

Room 1431 (Kitchen Food Prep)

- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 1473 with cat 6A cable as necessary.

1543B (1CS) – contains three (3) VA switches

- GC shall coordinate with VA Biomed to relocate the VGIA switch to TR 1537B.
- Note: No fiber will be needed to remain in this DC at completion of work; therefore, the old rack and the FDU shall be demolished and removed.

1657C (1CN) in old kitchen area – contains three (3) VA and one (1) camera switches (becomes SSC 1657C)

- GC shall coordinate with VA Biomed to relocate the VGIA switch to TR 1473.
- Note: No fiber will be needed to remain in this DC at completion of work; therefore, the old rack and the FDU shall be demolished and removed.

Room 1803EC

- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR 1473 with cat 6A cable as necessary.

Room C1C01AA (Closet opposite Chapel)

- JCI PACS panel location (two panels). GC shall coordinate with JCI and COR and connect to TR 1473 with cat 6A cable as necessary.

BUILDING 111 – Basement – Data Closet/SSC ETR Narrative

Three (3) new TRs: Room **B0622**, **B0610E**, and **B0423**; see contract drawings.

B0130A (BAS) – contains three (3) VA and one (1) camera switches

- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR B0423 with cat 6A cable as necessary.
- Note: No fiber will be needed to remain in this DC at completion of work; therefore, the old rack and the FDU shall be demolished and removed.

Room B0215

- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR B0423 with cat 6A cable as necessary.

B0221 (BAN) – contains four (4) VA switches (becomes SSC B0221)

- GC shall provide and pull one (1) fiber pair between this existing cabinet and new TR B0423 for an ETR Jeron Nurse Call panel.
- JCI PACS panel location (two panels). GC shall coordinate with JCI and COR and connect to TR B0423 with cat 6A cable as necessary.
- Note: The GC shall coordinate with VA to relocate any rack-mounted equipment to the walls of the SSC so that the old rack can be demolished and removed. Existing network cable from this SSC to the infrastructure it supports MUST STAY and shall not be abandoned/demolished. Coordinate with the COR in the demolition and removal of the old rack and the FDU.

Room B0250

- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR B0423 with cat 6A cable as necessary.

B0464 (Telecom Room; Demarcation Room; B-wing)

- No work.

B0529A (BCS) – contains two (2) VA switches (becomes SSC B0529A)

- GC shall provide and pull one (1) fiber pair between this existing cabinet and new TR B0610E for an ETR Jeron Nurse Call panel.
- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR B0610E with cat 6A cable as necessary.
- Note: The GC shall coordinate with VA to relocate any rack-mounted equipment to the walls of the SSC so that the old rack can be demolished and removed. Existing network cable from this SSC to the infrastructure it supports MUST STAY and shall not be abandoned/demolished. Coordinate with the COR in the demolition and removal of the old rack and the FDU.

Room B0625 (Warehouse; near morgue elev double doors)

- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR B0622 with cat 6A cable as necessary.

B0627E (BCN) – contains four (4) VA and one (1) camera switches

- GC shall coordinate with VA Biomed to relocate the VGIA switch to TR B0622.
- JCI PACS panel location. GC shall coordinate with JCI and COR and connect to TR B0622 with cat 6A cable as necessary.
- Note: No fiber will be needed to remain in this DC at completion of work; therefore, the old rack and the FDU shall be demolished and removed.

BUILDING 70 – Medical College of Wisconsin (MCW) Equipment List

MCW will be responsible for the necessary disconnections, relocations, and re-terminations of the following equipment:

A/B-wing Data Closet (70-A-100A) equipment moves to 70-B-159 TR

- Two (2) C9300-48UXM 48-port switches
- Four (4) PWR-C1-1100WAC-P
- One (1) APC Smart UPS

C-wing Data Closet (70-C-102) equipment moves to 70-C-126

- Two (2) C9300-48UXM 48-port switches
- Four (4) PWR-C1-1100WAC-P
- One (1) APC Smart UPS

D-wing Data Closet (70-D-125) equipment will remain in this room.

- No relocation of MCW or VA switches. Coordination with MCW and VA OIT will be necessary.

E-wing Data Closet (70-E-100A) equipment moves to 70-E-104

- One (1) C9300-48UXM 48-port switch
- Two (2) PWR-C1-1100WAC-P
- One (1) APC Smart UPS

In addition to MCW hardware as noted above, MCW has 6-strand single mode fibers installed to each of the existing Building 70 data closets from the existing Building 111 3rd floor Data Center where MCW's network core distribution hardware is installed. Sequencing Note: New single mode fiber shall be re-installed from Building 111 core distribution equipment to the new Building 70 TRs along with the racking and electrical service in place **before** MCW can move any of their equipment.

MCW point of contact: Derek Hathaway; dhathawa@mcw.edu; 414-955-4189

VA Milwaukee Campus Buildings in which TRs/TEs serve multiple floors

BUILDING 3

Building 3 is a two-story building with no patient care services. A telecommunications room (TR) serving multiple floors was used because of the size of the building, and there are no patient care areas. The total building square footage is approximately 3,235 square feet. The basement is used only for storage. The TE is on Level One and serves all levels. The TE has one (1) data rack.

BUILDING 4

Building 4 is a three-story building with no patient care services. A telecommunications room (TR) serving multiple floors was used because of the size of the building, and there are no patient care areas. The total building square footage is approximately 10,566 square feet, with each floor about 3,522 square feet. The TE is on Level Two and serves all levels. The TE has one (1) data rack.

BUILDING 5

Building 5 is a three-story building with no patient care services. A telecommunications room (TR) serving multiple floors was used due to the size of the building, and there are no patient care areas. The total building square footage is approximately 17,760 square feet. The TE on Level One serves only this floor. The TE on Level Two serves Levels Two and Three. This TE has one (1) data rack.

BUILDING 6

Building 6 is a three-story building with no patient care services. Four TRs serving multiple floors were used. The sprawling building footprint is likened to four separate buildings with connecting corridors. The total building square footage is approximately 105,227 square feet. Three of the four building sections (A, B, and C wings) have TRs on Level One; each serves Levels Basement, One, and Two. The last section (D wing) has a TR on Level Two; serves Levels Basement, One, and Two. A TR on Level Three of C-wing serves only that floor.

- TR-6-A104 has two (2) racks and serves A-wing.
- TR-6-B103 has one (1) rack and serves B-wing.
- TR-6-C102 has three (3) racks and serves C-wing.
- TR-6-D203 has two (2) racks and serves D-wing.

BUILDING 7

Building 7 is a four-story building with limited patient care services (administrative in nature, only). A TR serving multiple floors was used due to the building size and limited patient care areas. The total building square footage is approximately 27,860 square feet, and each floor is about 6,965 square feet. The TR is in the basement with one (1) data rack.

BUILDING 43

Building 43 is a three-story building with patient care services on Level One only. A TR serving multiple floors was used due to the building size and limited patient care areas. The total building square footage is approximately 37,620 square feet and each floor is about 18,810 square feet. The TR on Level One serves only Level One. The TR on Level Two serves Levels Two and Three. There is no patient care on Levels Two and Three (staff offices only). This TR has (2) two data racks.

BUILDING 70

Building 70 is a three-story building with limited patient care services (administrative in nature, only). Several TRs serving multiple floors were used due to the building layout and limited patient care areas. The sprawling building footprint is likened to four separate buildings with connecting corridors. The total building square footage is 211,788 square feet. All four sections (A/B, C, D, and E wings) have TRs on Level One; each serves Levels Basement, One, and Two.

- TR-70-B159 has four (4) racks and serves A/B-wing.
- TR-70-C126 has four (4) racks and serves C-wing.
- TR-70-D125 has three (3) racks and serves D-wing.
- TR-70-E104 has four (4) racks and serves E-wing.

BUILDING 107

Building 107 is a two-story maintenance building with no patient care services. A telecommunications room (TR) serving multiple floors was used due to the size of the building and no patient care areas. The total building square footage is approximately 10,976 square feet, with each floor about 5,488 square feet. The TE is on the Mezzanine Level with one (1) data rack.

BUILDING 108

Building 108 is a two-story maintenance building with no patient care services. A telecommunications room (TR) serving multiple floors was used due to the size of the building and no patient care areas. The total building square footage is approximately 10,930 square feet, with each floor about 5,465 square feet. The TE is on Level Two with one (1) data rack.

BUILDING 109

Building 109 is a three-story building with limited patient care services (administrative in nature, only). A TR serving multiple floors was used due to the building size and limited patient care areas. The total building square footage is approximately 3,936 square feet, with each floor about 1,312 square feet. The TR is in the basement with one (1) data rack.

BUILDING 112

Building 112 is a two-story Boiler Plant building with no patient care services. A telecommunications room (TR) serving multiple floors was used due to the size of the building and no patient care areas. The total building square footage is approximately 21,204 square feet, with the first floor 10,602 feet and the basement floor 10602 square feet. The TE is on the Level One with one (1) data rack.

BUILDING 113

Building 113 is a two-story Chiller Plant building with no patient care services. A telecommunications enclosure (TE) serving multiple floors was used due to the size of the building and no patient care areas. The total building square footage is approximately 8,158 square feet, with the first floor 6287 square feet and the second floor 1871 square feet. The TE is on Level One with one (1) data rack.

BUILDING 146

Building 146 is a two-story Community Living Center building with patient care services. The one-story building has an exposed basement used for mechanical/electrical equipment. A TR serving multiple floors was used because the basement level is only a mechanical space, and the building is small. The total building square footage is approximately 8,420 square feet, with the basement 1,036 square feet. The TR is on the Basement Level with one (1) data rack.

BUILDING 147

Building 147 is a two-story Community Living Center building with patient care services. The one-story building has an exposed basement used for mechanical/electrical equipment. A TR serving multiple floors was used because the basement level is only a mechanical space, and the building is small. The total building square footage is approximately 8,420 square feet, with the basement 1,036 square feet. The TR is on the Basement Level with one (1) data rack.

BUILDING 148

Building 148 is a two-story Community Living Center building with patient care services. The one-story building has an exposed basement used for mechanical/electrical equipment. A TR serving multiple floors was used because the basement level is only a mechanical space, and the building is small. The total building square footage is approximately 8,420 square feet, with the basement 1,036 square feet. The TR is on the Basement Level with one (1) data rack.

SECTION 01 01 10 (SN)
SPECIAL NOTES

PART 1 – GENERAL

1.1 DESCRIPTION

This section specifies special requirements, processes, procedures, protocols, practices, prohibitions, protections, personnel matters, provisions for unique characteristics of the Milwaukee VAMC, and practical matters pertinent to construction.

1.2 RELATED WORK

A. Section 01 35 26 SAFETY REQUIREMENTS.
B. Section 01 00 00 GENERAL REQUIREMENTS.
C. Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS.
D. Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT.

PART 2 - PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 ANTE-ROOM CONSTRUCTION PRACTICES

A. Coordinate construction of anterooms (if applicable) with NFPA 241 and the Specification Section 01 35 26 SAFETY REQUIREMENTS. Anteroom construction require COR approval and shall be shown clearly on the Infection Control Plan.
B. Type “A” and “B” activities are those in which the fire/smoke hazard risks are MINIMAL. Type “C” and “D” activities are those in which the fire/smoke hazard risks are HIGH. The General Contractor is obligated to consider the specified containment measures with the costs included within the various contract items of work. Refer to the Appendix for the **Construction Barrier and Fire Risk Assessment Matrix of Precautions** for more information.
C. Type A (Minimal Fire Risk Activity/Construction): Proceed with work in area, including a ceiling permit as required, when working above ceilings.
D. Type B (Limited Fire Risk Activity/Construction):

1. Coordinate temporary construction partition installation with Specification Section 01 35 26 SAFETY REQUIREMENTS.
2. Provide plastic from floor to ceiling above and seal joints and penetrations. All plastic will be labeled with the VA ILSM once installed indicating the start of the limited duration period of construction. At openings, install “Z”-wall overlapping plastic flap barriers or equivalent.
3. “Edge Guard” or similar hard infection control barriers may be used in lieu of plastic sheeting.

E. Type C (Moderate Fire Risk Activity/Construction): Coordinate temporary construction partition installation with Specification Section 01 35 26 SAFETY REQUIREMENTS.

1. Ante-room construction (**as part of 1-hour construction barrier**):
   a. Anteroom shall be a 1-hour fire-rated smoke-tight temporary construction partition and shall be full height, extending through suspended ceilings to the floor slab or roof deck above.
   b. Anteroom shall be constructed from one-hour fire-rated 5/8-in type "X" gypsum board both sides of metal stud wall, mudded and taped in accordance with ASTM C840. "Double" gypsum board installation on one side (exterior) of the anteroom is authorized to achieve the 1-hour fire-rated smoke-tight temporary construction partition requirement with prior COR approval.
   c. In this case, the anteroom 1-hour fire-rated smoke-tight temporary construction partition walls will also function as an infection control barrier. Contractor shall add appropriate infection control measures. Refer to 01 35 26 SAFETY REQUIREMENTS for more information.
   d. Ante-room gypsum board walls shall be taped to the existing floors utilizing 2-in wide glass foil tape: 7.3 mil aluminum foil laminated glass cloth silver tape with silicone adhesive backing. Where the ante-room walls meet the existing deck or a 1-hour rated existing wall, the seams shall be fire-caulked.
   e. The anteroom must also have a dedicated heat detector installed. See paragraph below for heat detector requirements.
   f. Ante-room outer construction door opening requires a Class C, 45-minute fire-rated door with self-closing and self-latching devices.
   g. Ante-room inner door must at least be plastic Z-Type door.

2. Ante-room construction (**for infection control purposes only**):
   a. Anteroom ***need not*** be a 1-hour fire-rated smoke-tight temporary construction partition. Its walls ***do not need*** to go to the concrete deck above, nor is a hard ceiling required. At a minimum, the contractor must tape the top of the ante-room walls to the underside of the existing acoustical tile ceiling to achieve the smoke tight and infection control requirements.
   b. Anteroom shall be constructed from one-hour fire-rated 5/8-in type "X" gypsum board ***one*** side of metal stud wall, mudded and taped in accordance with ASTM C840.
   c. Contractor shall add appropriate infection control measures. Refer to 01 35 26 SAFETY REQUIREMENTS for more information.
   d. Anteroom gypsum board walls shall be taped to the existing floors, walls or ceilings utilizing 2-in wide glass foil tape: 7.3 mil aluminum foil laminated glass cloth silver tape with silicone adhesive backing. Where the ante-room walls meet the existing deck or a 1-hour rated existing wall, the seams shall be fire-caulked.
   e. The anteroom ***does not*** require a dedicated heat detector.

f. Anteroom outer construction door opening requires a Class C, 45-minute fire-rated door with self-closing and self-latching devices.
g. Anteroom inner construction door opening requires a Class C, 45-minute fire -rated door with self-closing and self-latching devices.

3. Provide heat detectors and notification devices (i.e., audio-visual devices) tied into the Building Siemens Pyrotronics System at the rate of one (1) detector per 1000 square foot of clear construction area. Heat detectors to be FPT-11 Addressable, Tri-Color LED, 135°F, Combination Fixed or Rate of Rise. The Contractor shall provide certification documentation once the heat detectors and notification devices (i.e., audio-visual devices) are installed and/or moved and tested prior to any construction work taking place in the space. Inside the construction space, existing units can be used if they are moved to the floor deck above.

   a. Heat detectors require monthly service checks and reports to the COR by the contractor to ensure they are working correctly.

4. Other than anteroom, all other temporary construction partitions shall be full height, extending through suspended ceilings to the floor slab or roof deck above and shall be one-hour fire-rated 5/8-in type "X" gypsum board both sides of metal stud wall, mudded and taped in accordance with ASTM C840. If sprinklers are installed per a hydraulically calculated stamped and certified system and sprinklers are operational on both sides of the temporary partition and ceilings are fully intact and complete, then the partition indicated above may be permitted to terminate at the ceiling in accordance with NFPA 241.
5. Coordinate with Section 01 01 10-SN Section 3.35 for Card Reader and Physical Access Control System (PACS) requirements at anteroom outer construction door.

F. Type D (Significant Fire Risk Activity/Construction):

1. All requirements for Type C construction activities above are required for Type D construction activities.
2. When required by the project, install one-hour fire-rated temporary construction partitions to maintain integrity of existing exit stair enclosures, exit passageways, fire-rated enclosures of hazardous areas, horizontal exits, smoke barriers, vertical shafts and openings and other enclosures as required by the current Life Safety Code NFPA 101. This may include new horizontal egress tunnels, exit stairs, etc. Coordinate these activities with the COR.

3.2 ASBESTOS-CONTAINING MATERIALS (ACM)

A. There are both friable and non-friable asbestos-containing materials (ACM) located within hospital complex. Inspection reports are available from Facilities Management.

B. ACM might be unforeseen and potentially discovered during work. Do not disturb ACM. Refer to Specifications Section 01 00 00 for procedures addressing discovery of ACM.
C. See Division 2 Specification Sections for applicable asbestos abatement details.
D. New work: no ACM allowed in new products.
E. Contractor to provide asbestos costs separately in invoices.

3.3 BADGES

A. All contractors working at Milwaukee VAMC shall be fingerprinted prior to being allowed to work on campus. During the Pre-Construction Period, the GC shall submit required paperwork (SAC forms) to get all non-badged employees fingerprinted and badged. Contractor ID badges can be obtained from PIV office typically 3-5 days after approved SAC form is received and fingerprints clear. ID badges are required for contractor employees working at VAMC Milwaukee.
B. Contractor:
   1. Furnish SAC form to each employee and subcontractor employee, regardless of how long they will be on site and even if already badged and have them fill out the form. Blank SAC form is included as appendix to this specification.
   2. When form is legibly completed by hand, scan each form with file name as above then dash then employee name (e.g., 08 SAC FORM – John Doe).
   3. Regarding SSN: last four only.
   4. Email form to VA COR.
C. VA and Requestor
   1. VA COR signs form, then emails Fingerprinting Office (fingerprinting) and PIV Office (badging) of pending visit from person named, forwarding form as email attachment.
   2. Contractor/Requestor visits Fingerprinting/PIV Office, building 70, E-wing south, ground floor.
   3. VA Fingerprinting Office will check to ensure proper form was received.
D. VA Processing
   1. Fingerprinting begins background check process.
   2. Assuming background check allows, then within 3 to 10 business days, VA should send to Contractor/Requestor notice that they may now obtain their Physical Access Control (PAC) badge.
   3. VA PIV Office staff take photo and issue PAC badge.
E. Badge Usage
   1. Wear badge, readily visible, above waist level, not on head or hard hat, when on grounds doing work.
   2. Lanyards and clips are not included but may be purchased at Canteen Store.
   3. Superintendent shall inspect personnel badge (should be visible).
   4. Badges allow keyless entry into restricted areas. Names, dates, and times of access are recorded by VA Police.

5. Badges will be valid for 90 days. The PM will notify PIV office to extend badge access for another 90 days if appropriate.
6. Badge wearer, not anyone else, must get badge issues taken care of. For example, it is not allowed to hand over badge to superintendent to walk them down to FM or PIV for entering code on back of badge, into SAM box system. Violations may result in suspension or revocation of construction access.

3.4 CLEAN-UP

A. All work activity within occupied portions of facility shall be immediately cleaned and restored to its original finished condition upon completion of activity. If activity continues into next workday, area shall be left safe, clean, and presentable.
B. Combustible storage and debris shall be kept to smallest quantity necessary for required daily operations. Construction area shall be kept clean as indicated in general requirements and conditions.
C. Public restrooms are not to be used for cleaning of tools or equipment, i.e., paintbrushes, rollers, finishing tools, etc. Janitor’s slop sinks are available for this purpose. If janitor’s closets are used, they must be cleaned. The contractor is responsible for any clogs, repairs to drains, and cleaning if their cleaning techniques damage VA property.
D. Slop sinks are not to be used for the cleaning of drywall mud tools. Contractor shall clean his tools/equipment/buckets outside.
E. Trash, combustible waste, and excess construction materials: Remove daily, dispose regularly to prevent accumulation.
F. All work for area must be confined within that space. Public corridors, stairwells, equipment rooms, and vacant floors are not to be used for storage of materials or as workshop. Tracking of construction dirt into public corridors or stairwells must be prevented. At end of each workday, combustible packaging, and crating materials for building products and equipment to be installed shall be removed from occupied building.
G. Provide dampened walk-off mats at entrances and exits from construction area.
H. If smoke detectors are covered during dust-producing activities, they must be uncovered daily.

3.5 COMPRESSED GAS CYLINDERS

A. Contractors who work with compressed gas cylinders must have specific training and must ensure that cylinders are secured properly when in use or in storage.
B. When compressed gas cylinders are not in use, caps must be in place.

3.6 CONFINED SPACE

A. Confined Spaces are clearly marked on campus. NO ENTRY is allowed into areas without prior approval by COR. NO ONE will be allowed to enter these areas without proper qualifications, equipment and training as required by OSHA Standards (29 CFR 1910.147)
B. Storm sewers, underground electrical vaults, and other areas that require confined space permits are identified on drawings.
C. All hospital personnel that would require entry into these spaces must abide by Confined Space Program Procedure.
D. It is sole responsibility Contractor to coordinate entry into of these spaces or other marked permit required confined spaces with COR.
E. Anyone entering permit-required confined space must follow Occupational Safety and Health Administration (OSHA) Regulations, 29 CFR 1910.120.
F. Submit Confined Space Entry program (and CSE Permit if needed) as part of APP (See Safety Specification 01 35 26).

3.7 CONSTRUCTION BARRICADES & TEMPORARY SIGNAGE

A. The Contractor is responsible to post and erect barricades, temporary signage, construction, and safety signs, ICRA Permits, ILSMs, and new egress routes as they apply. Barricades will be erected to restrict areas where hazardous operations are performed. Construction and safety signs shall consist of caution signs as determined and approved by COR. Egress signs, where egress has been altered for construction, shall be posted, and coordinated with approved ILSM and applicable hazardous warning signs. If egress is changed due to construction, provide temporary directional signs for changes as determined by COR and for construction of walkways, steps, or overhead protection scaffolding or like as required providing new means of egress. **Emergency egress plan shall be developed by Contractor and submitted for approval by VA Safety and COR before egress routes are altered.**
B. Exit signs inside construction space: Contractor to provide luminescent Exit Signs throughout construction space such that while standing in place within construction space, exit sign is visible and path of egress can be followed.
C. Exit signs outside construction space: Contractor will cover or relocate exit signs impacted due to their construction operations as directed by ILSM and COR.

3.8 CONSTRUCTION BARRIERS

A. Refer to paragraph 3.1 of this specification and the appendix table Construction Barrier and Fire Risk Assessment Matrix for more information.
B. The construction barrier consists of both existing walls and new construction (typically the anteroom) walls. The intent of the barrier is to provide a fire-rated and 1-hour construction partition around the construction area meeting the requirements of NFPA 241. Contractor must coordinate the erection of any new walls for construction barriers

with the Specification Section 01 35 26 SAFETY REQUIREMENTS and any additional infection control requirements.

C. The construction site must be surrounded by a 1-hour fire-rated gypsum board fire-stopped construction assembly. Infection control procedures (as may be also required) shall be initiated prior to any other construction activities.
D. All existing walls surrounding the construction area are to be inspected, repaired, patched and fire-stopped as required to bring them up to current fire-rated and smoke barrier construction requirement per NFPA 241.
E. Penetrations through the construction barriers or any other rated assembly (i.e., deck or ceiling) shall be plugged with a fire-resistant mineral wool filling and recorded with an ILSM Firestop Tag (see appendix). All penetrations are to be made temporarily fire and smoke resistant by the end of the construction day; and all penetrations shall be permanently fire-caulked within 30-days of being made.

3.9 CONSTRUCTION SITE PHONE

A. Contractor shall run wiring from local telephone closet to construction space for installation of VA phone in constitution space. Install phone before construction. VA will provide phone.

3.10 CONTRACTOR TRAINING & CERTIFICATES

A. Employees of Contractor and sub-contractor shall be aware of egress routes from construction areas. It is Contractor's responsibility to ensure employees are aware of fire alarm codes for building they are working in and participate in fire alarm drills and actual fire alarms.
B. Project Site Superintendent shall have 30-hour OSHA Construction Safety certificate. This certificate shall be submitted to COR prior to mobilization.
C. All subcontractor competent persons (CPs) shall have 30-hour OSHA Construction Safety certificate. This certificate shall be submitted to COR prior to mobilization.
D. Remaining employees of Contractor and sub-contractors shall have 10-hour OSHA certified Construction Safety course. These certificates shall be submitted to COR prior to mobilization.

3.11 CRANES & HEAVY LIFTING

A. Refer to Specification Section 01 35 26 SAFETY REQUIREMENTS for additional details.
B. Hoisting or lifting heavy materials/items requires prior review by COR.
C. Crane operations require workplans for VA approval and cannot commence without approved permit.

3.12 DELIVERIES

A. All material deliveries at Building 111 loading dock must be coordinated with COR and Receiving Department (Logistics/Supply Chain Warehouse) in advance.
B. Deliveries to other project sites/buildings on campus require coordination and approval of COR.

3.13 DRESS CODE

A. All contractor personnel must be appropriately dressed for their work. T-shirts or garments with obscene or suggestive messages are not permitted. Personnel found improperly dressed will be asked to leave facility. Contractors may not remove shirts or other clothing. No articles may include offensive statements/graphics.
B. Personal Protective Equipment is responsibility of Contractor. There are many situations that require specific personal protective equipment for worker safety per OSHA. Refer to the Safety Specification 01 35 26.
C. The Contractor shall provide four (4) sets of hard hats and safety glasses for each worksite for VA staff use.

3.14 ELEVATOR USAGE

A. Contractors shall not hold or block from use public elevators in building unless authorized by COR.
B. Within Building 111 (Main Hospital), contractors shall use B-bank freight elevators only for delivery and transportation of materials and demolition materials.

3.15 EMERGENCIES AND EMERGENCY SERVICES

A. Contractor shall respond to contract- and Contractor-created emergency services resulting from Contractor actions and installations, as determined by COR, with qualified staff personnel within one (1) hour of verbal notification during construction stages and warranty period. Offerors shall provide, in writing, evidence that they can satisfy this requirement prior to award.
B. First Aid/Medical Aid/Emergency Treatment for workers: Any Contractor who witnesses medical emergency is to pick up nearest VA phone and dial “911” or operator and describe condition of emergency. Primary phone to use: Contractor-installed construction phone. Post emergency phone numbers and treatment facilities if Contractor employees are injured on job or need medical treatment. If you dial “911” from a personal/cell phone; please follow up immediately with call to VA Police at 414-384-2000 x42222 with description of emergency.
C. Work site injuries must be reported to VA. VA has accident reporting form (form number 2162); refer to the SAFETY SPECIFICATION. Safety or Security and Police Service will initiate 2162. Once VA has completed supervisor’s portion injured individual will be required to complete narrative portion of report. Service chief responsible for contract is

also required to sign report and forward original report to Safety Section.

D. **Submit Fire Safety Plan** within 60 days of the NTP; see specification section 01 35 26 SAFETY REQUIREMENTS. Within VAMC, note that there is no difference between drill and actual fire.

E. Contractor will ensure that each employee on worksite knows where pull stations are in areas of work. VAMC policy for personnel IN THE AREA OF fire:
   1. **Rescue** anyone from area if necessary
   2. **Activate** nearest Pull Station
   3. **Contain** fire by closing doors in area
   4. **Extinguish** if possible or **Evacuate** area immediately

F. When NOT IN THE AREA OF fire:
   1. Contractors are to cease activities, stay in place, and wait for further instructions or drill cancellation.
   2. DO NOT move through hospital or use elevators.

G. Patients and visitors sometime become anxious or irritated because of their situation. If you are faced with patient or visitor that gets aggressive with you, simply call extension 42222 and say, "Code Green" and describe situation. Security will respond immediately.

3.16 EMPLOYEE FILE/RECORDS

A. General Contractor shall prepare an employee file for every contractor and subcontractor employee. The following records shall be accumulated for each employee and submitted as required:
   a. OSHA Training Certification (10-hr or 30-hr as required).
   b. SAC Form
   c. Non-Disclosure Agreement
   d. Specific Training Records (as required)

3.17 FIRE/SECURITY ALARM SYSTEMS

B. Cover and protect smoke/heat detectors with paper bags when raising dust or creating smoke in short duration (less than three days) ancillary work areas. Facilities Management, Graphics and Fire Marshall shall be notified when bagging smoke detectors. Remove paper bag upon completion of your work and at end of each workday.

C. Advise Graphic Control Center (Graphics) at extension 41010 and VA Police Dispatch Desk at extension 42222 prior to work which might result in Fire Alarm System or Security System being activated. This includes but is no limited to: Smoke Detectors, Water Flow Switches, Pull Stations, Sprinkler Heads, Motion Detectors, Door Contacts, and Security Door Controls. Likewise, have approved outage from Facilities Management.

D. Notification to Graphics/VA Police and having approved outage form does not absolve Contractor from following proper procedures to prevent system from activating. Examples of these best practices include covering smoke heads with paper bags, closing valves, containing dust, monitoring, and controlling security devices.

E. If system activates due to Contractor's failure to notify Graphics, or Contractor's failure to follow proper procedures, or Contractor's failure to obtain outage form, Modification/Settlement by Determination deduction of $2,500.00 per alarm/event will be issued to Contractor.
F. If fire alarm is accidentally tripped/activated, notify Graphics and Facilities Management immediately.
G. Fire and/or smoke doors shall not be propped open or prevented from closing and latching. This includes Infection Control/Construction doors, mechanical equipment rooms and utility closet doors.

3.18 FLU SHOT REQUIREMENT (SEPTEMBER 2020)

A. Per VHA Directive 1192.01 issued August 10, 2020, VA contractors are defined as Health Care Personnel as they work in VHA Medical Centers and could encounter VA employees, patients, and visitors.
B. It is VHA policy that medical facilities will achieve a mandatory seasonal influenza vaccination program by requiring all HCP to receive annual seasonal influenza vaccinations or obtain an exemption for medical or religious reasons. Compliance with this directive is a condition of the contract.
C. Contractors desiring a copy of VHA Directive 1192.01 may obtain one from the Contracting Office.

3.19 HAZARDOUS, FLAMMABLE MATERIALS AND WASTE

B. Caution must be used with flammable materials, i.e., adhesives, thinners, varnishes, etc.
C. All paints shall be low odor latex paint. Use odor reducing agents in paints and solvents. Ventilation shall be required if toxic or foul-smelling materials must be applied.
D. A listing of hazardous materials that will be used on job and their material safety data sheets (SDS) shall be made available to COR upon request before chemicals are used.
E. SDSs are available to Contractor for materials used in Medical Center; contact COR if required.
F. The VA GEMS Coordinator is responsible for this program and will brief Contractor during construction kickoff.
G. The Contractor may subscribe to online SDS service where SDS data sheets are available online in lieu of hard copies on job site.
H. Any excess or used chemicals will be removed from hospital promptly and properly disposed of by Contractor in accordance with federal, state, and local regulations.
I. Any hazardous waste generated at facility must be properly contained and labeled and stored in accordance with local, state, federal and hospital regulations.
J. Only one-day supply of paints, oils, and gas cylinders is permitted within facility, unless properly stored in flammable liquid storage container. Do not store flammable materials infacility unless stored in approved non-combustible storage cabinet or prior approval by GEMS Coordinator and COR.

K. Coordinate hazardous materials issues and concerns with COR and GEMS Coordinator.
L. Gasoline powered equipment shall not be used within confines of building on VAMC campus without specific written permission from Chief, Engineering Services.

3.20 HOT WORK PERMITS

A. Before cutting, brazing, soldering, or welding is conducted, obtain permission from COR through hot work permit.
B. Gas and oxygen canisters shall be properly chained and protected, and two 10-pound fire extinguishers shall be present.
C. A fire watch shall be maintained on worksite during hot work operations, and for **60** minutes after hot work is completed.
D. All burn permits will be completed, signed, and scanned within 48 hours and posted to specified file share site. Contractor shall return fire watch portion of hot work permit to COR upon completion of work.

3.21 HOURS OF WORK

A. Contract work shall be between 7:00am and 4:00pm. Verify shift or shifts required for construction areas with COR. If Contractor desires to work on "other than normal" or after (off-shift) hours (including federal holidays), they shall be scheduled with COR three weeks before start. These off-hours will be required to complete project in time allotted for contract at no additional cost. Upon approval, Contractor shall propose scope or extent of off-hour work due to individual Contractor resources available to accomplish this project in time allotted. In addition, these off-hours will be required for utility/service interruptions, and any/other work that may interrupt operation of occupied space, i.e., road construction, demolition, work in occupied areas, or work affecting occupied areas. Some noise producing demolition operations will be required to be scheduled for off work hours as directed by COR and described on drawings.
B. All outages not completely confined to the construction area shall be requested by the Contractor to be completed off-hours.
C. In some construction, buildings, floors, or wards may be occupied during performance of work. In other phases, areas of alterations will be vacated. Refer to Contract Documents for details. Take measures and provide material necessary for protecting existing equipment and property in affected areas of construction against dust and debris, so that equipment and affected areas to be used in Medical Center's operations will not be hindered. Permit access to VAMC personnel and patients through other construction areas, which serve as routes of access to such affected areas and equipment. Coordinate alteration work in areas occupied by VA so that Medical Center operations will continue during construction period. Contractor may be required to construct 7 feet tall by 5 feet wide metal stud and drywall tunnels through occupied space as deemed necessary by VA for access by Medical Center personnel and maintaining construction operations.

3.22 IDENTIFICATION AND LABELING

A. Identify equipment/valves/devices located above ceiling.
   1. Provide markers on removable ceiling and ceiling access panels to indicate locations of valves, dampers, smoke detectors and other mechanical items that may need servicing or adjustment.
   2. Use access panel markers (colored stickers or metal tack style) for acoustical tile ceilings.
   3. Color code and annotate markers as follows:

Color	**Notation**
Red	D – Fire Damper V – Valve (sprinkler shutoff) S – Smoke Detector H - Heat Detector
Yellow	V - Valve (steam, radiation, reheat and chilled water)
Gold	V - Valve (HVAC) D - Damper (HVAC)
Blue (valves only)	O - Oxygen V - Vacuum A - Medical Air N – Nitrogen NO – Nitrous Oxide EV – Anesthesia Evacuation T – Temperature control air

   4. Where fire protection devices are located inside ductwork, provide additional tag on duct access door identifying device inside with letter size equal to or greater than 1.5-in high.

B. Milwaukee Med Vac/Gas Valve Identification Legend:
   1. XX-BBB-FFF-SS-#
   2. Examples:
      a. O2-111-3AN-3/4”-1
      b. MA-144-1BN-1”
   3. “XX” = Type of Gas
      a. O2 = Oxygen
      b. MV = Medical Vacuum
      c. MA = Medical Air
      d. NO = Nitrous Oxide
      e. N2 = Nitrogen
      f. CO2 = Carbon Dioxide
   4. “BBB” = Building Number
      a. 111 = Building 111
      b. 070 = Building 70
      c. 006 = Building 6
   5. “FFF” = Floor and Wing
      a. For example, 3AN = 3rd Floor, A-wing, North
   6. “SS” = Valve Size
      a. For example, “3/4-in”, or “1-in”

7. The last number is a sequential number if there are multiple instances of redundant valves that need discrete identifiers.

3.23 INFECTION CONTROL

A. Refer to the drawings and Specification Section 01 35 26 SAFETY REQUIREMENTS for additional details.

3.24 INTERIM LIFE SAFETY MEASURES

A. Any life safety code violations incurred during construction or renovation must be resolved and will result in close coordination with COR and VA Safety to implement hospital's Interim Life Safety Measures (ILSMs). These measures are required by The Joint Commission and NFPA.
B. The hospital will document whether and to what extent ILSMs will be implemented for each project.
C. VA Safety will ensure what ILSMs are required by Contractor to temporarily compensate for hazards posted by existing Life Safety Code (LSC) deficiencies or construction activities in areas of Medical Center.
D. Implementation of ILSMs will be required in or adjacent to construction areas and throughout buildings with existing LSC deficiencies. ILSMs apply to both construction workers and affected hospital employees and will be implemented upon construction development and continuously enforced through construction completion.
E. ILSMs will require walkthrough inspections by Contractor's superintendent at daily intervals.
F. Training of workers and affected staff will always be significant part of Interim Life Safety Measures procedures.
G. Fire and/or smoke doors shall not be propped open or prevented from closing and latching. This includes Infection Control/Construction doors, mechanical equipment rooms and utility closet doors.

3.25 INSPECTIONS

A. A list of required inspections by VA personnel is included in Specification Section 01 32 16.15 PROJECT SCHEDULES.
B. Mechanical, plumbing, and electrical work shall be inspected by VAMC Facilities Management to include appropriate engineering service shop and COR prior to being put into operation or closing if work will be hidden by walls, ceilings, drop ceilings, cover plates, and access panels. Notify COR minimum of <u>two days</u> prior to inspection date; times and dates shall be scheduled and agreed upon by VA. Installations shall be inspected by VA personnel to verify compliance with state, federal, local, Veterans Affairs Codes, regulations, and contract requirements. If corrections, alterations, adjustments, or additional new construction are required, VA shall be notified within 48 hours of completion of such items. These inspections, corrections, or alterations shall be made at no additional cost.

3.26 LOCK OUT/TAG OUT

A. Refer to Specification Section 01 35 26 SAFETY REQUIREMENTS for additional details.
B. Lock Out/Tag Out - No contract worker can change status/ position of ANY switch, valve, or other energy source without prior approval from COR. All Lock Out/Tag Out activities need approval prior to being implemented. Any activity requiring Lockout/Tagout process must comply with Safety Requirements specification and VAMC policies.
C. Per OSHA Regulation 29 CFR 1910.147, Contractors must comply with OSHA's Safety Lock Out/Tag Out procedures.
D. Coordinate shutdowns with Facilities Management and COR.
E. Only VA staff is authorized to shut down utilities unless permission is specifically granted.

3.27 NOISE

A. Refer to 01 00 00 1.6G.
B. All hammer drilling, chipping, or pneumatic hammering (typical) operations shall be done at time and day determined by occupants on that floor and floors above and below. Coordinate this work via workplan through COR for approval.
C. The patients, visitors, and staff deserve consideration and quiet enjoyment of their premises. Anyone found being loud, rude, or otherwise annoying to patients, their guests, or staff will be asked to leave facility. Use of vulgar language will not be tolerated.
D. All work activity within occupied portions of facility shall be accomplished with minimal disruption to patients, physicians, visitors, and staff.
E. The playing of radios, tapes, and CD players is not permitted in occupied area. iPod or "Walk-man" radios/tapes/CD players are not permitted anywhere.
F. The playing of radios, tapes, and CD players is permitted in vacant areas but shall not be heard outside vacant area.
G. In inpatient areas, coordinate construction activities and debris removal with Nurse Manager or Charge Nurse to minimize disruption.

3.28 NON-DISCLOSURE AGREEMENT & PRIVACY/INFO SEC TRAINING

A. As directed or required by the Contracting Office, the General Contractor's employees shall complete necessary Privacy and Information Security training during pre-construction phase. The COR will provide this training so that VA-sensitive and patient information is safeguarded always and to prevent unlawful disclosure by contract employees.
B. In conjunction with the VA's ISO and PSO and depending on the access the contractor may have during construction (data closets, patient records rooms, etc.), the COR shall require the contractor fill out and submit a Non-Disclosure Agreement Form (VA Form 0752). The Contracting Office will supply these forms.

C. If contractor requires access to VA computers or to connect to the VA network, contractor will need to ensure that computers meet FIPS 140-2 requirements like standard encryption for VA password protection.

3.29 OSHA COMPLIANCE

A. All Contractors are subject to Occupational Safety and Health Administration (OSHA) regulations and are expected to enforce these standards in performance of their work.
B. OSHA regulations can be found in chapter 29 of Code of Federal Regulations (CFR). Failure on part of Contractor to comply with these standards and/or conduct their work in safe fashion will result in interruption in work schedule for which Contractor shall be solely responsible.
C. Any Contractor found deviating from regulatory standards or policy will immediately be issued stop work order and shall be responsible for contractual conflicts related to work stoppage.
D. Fire and/or smoke doors shall not be propped open or prevented from closing and latching. This includes Infection Control/Construction doors, mechanical equipment rooms and utility closet doors.

3.30 PARKING

A. Contractors shall not block fire lanes or other roadways. Contractors shall not park in patient, staff or visitor parking lot or structure. Violators will be ticketed. During large construction projects, staging site may be available for parking to Contractors.
B. All Contractors who require parking must contact Facilities Management for parking permit/decal for the Contractor Lot.
C. If special parking is required, permission will be granted and coordinated through Facilities Management. Until then, Contractors shall park in designated Contractor Parking Lot. Limited loading and unloading will be permitted at loading dock area.

3.31 PATIENT/VISITOR PRIVACY

A. Contractors shall not review, acknowledge, or move patient information or records.
B. Contractors shall not acknowledge patient or visitor unless spoken to - even if individual is known on personal basis.
C. Cell phones are to be used only in designated areas.

3.32 PENETRATIONS

A. All wall, floor and ceiling penetrations created by work on this contract, whether by demolition or new construction, shall be patched by Contractor or as assigned by Contractor. All patching materials shall be of like kind or suitable substitute approved by NFPA or UL. Approved Firestop products shall be utilized.
B. Penetrations must be located, marked, and sealed by Contractor responsible for penetration. As penetrations are sealed, COR shall be

contacted to inspect penetrations for proper sealing. Only one (1) type of fire sealant is permissible per penetration.

C. To ensure that penetrations are sealed, Contractors shall obtain Ceiling Access Permit from COR prior to work commencing. Permit shall be in this person's possession during work.
D. When penetration work and fire sealant work is complete, sign and return permit to COR for subsequent inspection and verification.
E. Photo-documentation in lieu of interim inspections may be performed to validate work; confirm with COR.
F. At end of each workday and prior to leaving work site, replace ceiling tiles temporarily removed to do work above finished ceilings in corridors.
G. If it is not practical to replace ceiling tiles daily, Contractor shall construct 7 feet tall by 5 feet wide metal stud and drywall tunnels through occupied spaces as deemed necessary by COR for access by VAMC personnel and maintaining construction operations. Upon first incident of Contractor not replacing ceiling tiles, this tunnel construction must commence immediately prior to further construction on the project.

3.33 PROTECTION OF WORK & ADJACENT AREAS

A. Refer to Specification Section 01 00 00 GENERAL REQUIREMENTS for additional details.
B. Contractor to provide drop cloths, Masonite, hard board, or plastic when working in occupied areas to avoid staining or damaging existing carpets or vinyl tile floors.
C. The Contractor shall preserve and protect structures, equipment, and vegetation on or adjacent to work site, which are not to be removed and which do not unreasonably interfere with work required under contract. Contractor shall repair damage to facilities resulting from failure to exercise reasonable care in performing work.
D. Any damage caused by Contractor's employees shall be reported to COR or Facilities Management Project Section immediately.

3.34 RESTROOM USAGE

A. Contractors shall utilize exterior toilet accommodations. Refer to Specification Section 01 00 00 GENERAL REQUIREMENTS for additional details.
B. Portable facilities are responsibility of Contractor.

3.35 SCHEDULING OF WORK

A. Refer to Specification Section 01 32 16.15 PROJECT SCHEDULES for additional details.
B. Schedule work areas with COR not less than <u>three weeks</u> in advance of commencement of work.
C. The VA requires detailed workplans from Contractor for evolutions that require review/approval from other entities in VA (i.e., VA Police, Grounds, Logistics, Users).

D. Notification does not guarantee date of scheduled outage or service interruption however COR will schedule such dates and inform Contractor. Date will be scheduled with medical center personnel when service interruption will minimize affect to hospital patients and operations. Contractor shall submit VA System Outage Request form to COR not less than three weeks in advance of intended commencement of outage work. As required, Contractor shall attend weekly pre-outage meetings with Engineering and staff to coordinate actual date of outage, duration, time of outage, phasing, and affected services. In addition, Contractor shall attend pre-outage meeting one hour prior to outage to coordinate communications, readiness, pre-outage checklist, document requirements, temporary measures, lock out tag out and other outage requirements and procedures.
E. Contractor shall attend weekly construction meetings.

3.36 SECURITY OF CONSTRUCTION SITES

A. Refer to Specification Section 01 00 00 GENERAL REQUIREMENTS for additional Security details.
B. All construction sites must be secured to prevent inappropriate access by patients, visitors, and employees. While such security fences, doors, and barricades are temporary, they must be substantially installed to control access to site. Existing security system (C-Cure9000 by Johnson Controls) shall be extended to each construction access door. Each construction door shall be provided with Card Reader and electric strike lock programmed to existing VA security system. Construction sites and security measures shall be monitored daily to ensure that security is maintained. COR will alert VA Police about construction project & site. At close of activity daily, before securing site or portions of site, Contractor shall ensure that there are no patients, visitors, or staff in area. If construction site problems arise, Contracting Officer and COR will take appropriate action to correct safety and security conditions up to and including Modification/Settlement by Determination deduction of $2,500.00 per each event (or notice from Police) that construction area was left unsecured.
C. Keys for access to construction/work areas may be issued to Contractor at discretion of COR. All keys will be assigned through SAM box and Contractor will be given access based on their VA ID Card. Upon completion of work, failure to return issued keys to COR will result in issuance of Modification/ Settlement by Determination in amount of $100.00 for each outstanding key. In addition, $50.00 fee will be paid to VA for each outstanding key. Keys are to be picked up and returned daily. If keys are not returned by end of day, modification of $50.00/key per day will be assessed against Contractor.
D. VA engineering, safety/fire department, and police staff shall have unencumbered right to access construction site to perform their assigned responsibilities.

E. Lock up worksite always to prevent patients and other unauthorized people from entering site. Contractors may lock up their tools etc., with personal locks.
F. Materials: Secure on job site, or in separate COR-authorized storage space. Hallways shall not be used for storage. Contractors shall manage their storage areas and assure sites are kept clean and safe (OSHA standards apply).
G. Any shared space(s) shall be accessible by Facilities Management. Do not block access to electric panels or fire protection equipment.
H. The need for job site security is much greater when work is being conducted in psychiatric areas to protect safety of patients. All job boxes, tools, etc., shall be locked up even when workers are on site unless there’s enough activity to assure that patients cannot access tools or site. Verify that no one is in construction area upon locking up site for evening.
I. Two evacuation routes from worksite shall be maintained always.
J. Access is limited to areas such as critical care and surgical units, as well as mechanical/electrical rooms, etc. Access can be obtained through Facilities Management.
K. VA Police reserve right to refuse access to anyone without prior authorization and identification.

3.37 SMOKING

A. The smoking policy at VAMC Milwaukee changed January 1, 2019. Smoking WILL NO LONGER BE PERMITTED ANYWHERE ON CAMPUS by contractor employees. A copy of hospital smoking policy will be supplied upon request.
B. Violation of the VAMC Milwaukee smoking policy may result in worker being removed from worksite for duration of project.
C. The General Contractor is responsible for the enforcement of this no smoking policy.

3.38 STOP WORK

A. VA Safety and COR have Director’s permission and authority to stop work whenever conditions pose imminent threat to life and health or threaten damage to equipment or buildings.

3.39 SUBCONTRACTORS

A. The Contractor has responsibility to assure that all subcontractors and their workers are properly trained and follow these specifications. Assistance from VA staff may be provided on case-by-case basis on technical issues.
B. The VA reserves right to approve of subcontractor being used to complete project. **A full list of subcontractors working on contract to include names, phone numbers, email address and address shall be provided prior to mobilization.**
C. Every subcontractor shall be fingerprinted and badged.

3.40 SUBMITTALS & SOLE SOURCE ITEMS

A. Refer to Specification Section 01 33 23 SUBMITTALS, RFIS, AND CBS for additional details.

B. Long lead time submittals: Contractor shall identify those material submittals that have long lead times and may impact schedule and period of performance. Those shall be the first submittals forwarded to the VA for review and approval. Examples include mechanical equipment (boilers, AHUs, chillers, CRACs), specialty telecommunications materials (Cat 6A network cable, PDUs, or other specialty equipment), and doors/hardware.

C. Preconstruction Submittals: Refer to the tables in 01 33 23 for the list of required PRECONSTRUCITON submittals. Most of the Contractor's preconstruction submittals shall be forwarded during the 60-day preconstruction period. Contractor shall not mobilize until all preconstruction submittals are approved. VA COR has 30-day review period at the end of the preconstruction submittal period.

D. Construction Submittals: Contractor shall submit in enough time to permit proper consideration and approval by government and be timed to permit adequate lead time for procurement of contract required items. Delivery of submittals to COR or verbal acknowledgement of receipt by COR **does not** constitute approval. Pay attention to fact that pre-construction activities (submittals) are distinct from construction and close-out activities with regards to overall period of performance.

E. Sole Source Items: There will be no substitutions for products and services listed as Sole Sourced with this solicitation. Contractor shall pay attention to the difference between Basis of Design and Sole Source items. Contracting Officer will utilize the FAR and VAAR 852.236-90 Restriction on submission and use of equal products.

3.41 SUPERINTENDENCE OF THE CONTRACT

A. Refer to 01 00 00 1.4.C. General Contractor shall appoint a full-time superintendent, employed by the General Contractor, to be responsible for the site supervision of the contract. The Government requires the contractor to dedicate 100% of the site superintendent's time to this contract during the Construction phase of the contract. The Contractor shall not allow the site superintendent to oversee multiple contracts concurrently while any contract is in the Construction phase of the contract.

3.42 TRAFFIC CONTROL

A. Contractors shall provide trained personnel and/or equipment, signage, barricades etc., to regulate traffic whenever construction operations affect traffic patterns.

3.43 TRENCHING

A. Refer to Specification Section 01 35 26 SAFETY REQUIREMENTS for additional details.

B. OSHA regulations and VA permits/inspections shall be followed and requested during trenching operations.

3.44 UNUSUALLY SEVERE WEATHER CONDITIONS

A. Claims by the contractor for delay attributed to unusually severe weather in accordance with FAR 52.249-10 must be supported by climatological data covering the period and the same period for the 10 preceding years. When the weather in question exceeds in intensity or frequency the 10-year average, the excess experienced shall be considered "unusually severe." Comparison shall be monthly. Whether or not unusually severe weather in fact delays the work will depend upon the effect of weather on the branches of work being performed during the time under consideration. Normal weather conditions in this region typically include freezing temperatures, snowstorms, rainfall, and other weather events that could delay certain exterior construction activities. Normal weather conditions are to be considered when bidding and preparing schedules.

3.45 WASTE MANAGEMENT

A. Refer to Specification Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT for additional details.
B. Other specifications have requirements for waste, debris, discarded materials, unsuitable materials, and contaminated soil.

3.46 WORK SITE REQUIREMENTS

A. Provide list of emergency contacts at entrance to construction site. This list shall include COR, Superintendent and VA Police contact information. See construction door sign template end of this specification.
B. Contractors are to maintain their work area as clean as possible while working and cleanup thoroughly daily.
C. Prior to utilities or critical systems being interrupted, submit outage request in writing (via outage request form) at least three weeks prior to expected outage date. Submit outage request to COR. Only Facilities Management personnel may shut off utilities unless otherwise authorized.
D. All Contractors are expected to use courtesy. Loud, vulgar, abusive language, sexual harassment and aggressive behavior will not be tolerated.
E. Contractors working above ceiling are required to replace disturbed ceiling tile by end of each day.
F. Prior to making penetrations in walls, floors, or ceilings, it is Contractor’s responsibility to identify affected rated wall systems. Contractor shall also X-Ray concrete floors/ceilings to avoid embedded conduit.

G. All repaired penetrations on rated wall systems must be completed using fire-rated material matching rating of wall system and must inspected by COR before ceiling tiles are replaced or area is concealed.
H. Temporary construction partitions of non-combustible materials shall be installed as required to provide fire rated and smoke tight separation between areas undergoing renovation and/or construction and adjoining areas that are occupied by facility.
I. Exits for occupied areas of building including rooms, suites, corridors, and floors shall not be blocked by construction or by construction materials. Exit may be blocked temporarily if it is unavoidable and adequate alternative measures are provided, such as signage, instructions to occupants and approved in advance by COR and VA Safety via ILSM process. ILSMs, if active, require daily inspections by Contractor to COR.
J. Existing fire protection systems including fire alarm systems, smoke detection systems, and sprinkler systems shall not be altered except as required for alteration and/or renovation by the contract. Any alteration to system shall be coordinated with COR. When sprinkler or fire and smoke detector systems are out of service for more than eight hours be responsible to institute Fire Watch till systems are operational.
K. Fire and/or smoke doors shall not be propped open or prevented from closing and latching. This includes Infection Control/Construction doors, mechanical equipment rooms and utility closet doors.
L. Locate existing fire extinguishers and pull stations in areas of work. Contractor’s Fire Safety Plan shall include fire extinguisher stand locations and Contractor shall provide fire extinguishers.
M. Fire hazard inspections shall be conducted daily by Contractor once construction starts and until work is turned back over to facility.
N. All temporary electrical wiring and equipment used for construction shall be installed and used in accordance with pertinent provisions of NFPA 70 and National Electrical Code.
O. Maintain construction site to permit access by fire department as necessary. Clear building construction areas of obstructions so that portions are accessible for fire department apparatus and permit emergency egress of patients and other personnel.
P. All necessary precautions shall be taken by Contractor to prevent accidental operation of existing smoke detectors by minimizing amount of dust generated in vicinity of smoke detectors. Any activity that may generate dust or smoke shall be reviewed with COR and Infection Control nurse.
Q. Apprentices are authorized to work on projects disciplines providing following requirements are met:
   1. Completion of OHSA-10 training, and certification turned in as required for other workers.
   2. Apprenticeship documentation turned in to contracting and continued direct supervision by journeyman.
   3. Apprentices are not allowed to work at Clement J Zablocki VA Medical Center on their own nor without continuous direct supervision.

R. When plastic is allowed for use as construction barriers it will only be able to be in place for 5 continuous calendar days (including days not worked such as weekends).

APPENDIX - STANDARD REQUIRED FORMS / TABLES / MATRICES

A. **Daily Log of Construction** - Completed daily by Contractor and scanned in and *posted weekly* via the VA-approved file transfer protocol.
B. **Daily Intermediate Life Safety Measures (ILSM) Inspection Form** - Completed daily by Contractor and scanned in and *posted weekly* via the VA-approved file transfer protocol.
C. **Construction Door Template** – Prepared by Contractor for posting on construction door. Submit to COR for approval prior to posting.
D. **SAC FORM** – Each contractor working on the contract shall have a completed SAC form on file with the COR.
E. **ILSM Temporary Barrier and FIRESTOP Tags** – GC to request when fire-rated assemblies have penetrations.

DAILY LOG OF CONSTRUCTION

M T W Th F

PROJECT:

BUILDING / LOCATION	CONTRACT NO. VA69D-	DATE
CONTRACTOR	CONTRACTOR SUPERINTENDENT	

WEATHER *(Rain, Snow, Cloudy, Windy, etc., OR NA if indoors)*	TEMP. High	TEMP. Low	SITE *CONDITIONS (CLEAN, DEBRIS, DUST, ETC.)*

NO. CONTRACTOR'S MEN BY JOB CATEGORIES	NO. SUB-CONTRACTOR'S MEN BY JOB CATEGORIES

EQUIPMENT ON JOB Brief description of size	No. Units	Working Yes	Working No	MATERIALS DELIVERED
				OFFICIAL VISITORS TO JOB SITE

STATUS OF WORK

ITEM NO. Brief description of work in progress, questionable performance, unforeseen developments on job etc. Include tests made and samples taken.

STATUS OF INFECTIOUS CONTROL MEASURES (NEGATIVE AIR FLOW, CLEAN WALK OFF MAT, ANTE-ROOM SECURE,…)

NEGATIVE AIR FLOW PRESSURE READING: _____

SAFETY COMMENTS

DIFFICULTIES WITH CONTRACTOR OR REPRESENTATIVE

UNFORESEEN DEVELOPMENTS ON JOB CONTINUED *(Describe conditions, action taken; person contacted, recommended actions)*

SIGNATURE	TITLE PROJECT SUPERINTENDENT

Daily Intermediate Life Safety Measures (ILSM) Inspection Form FORM QCA-01A

INSTRUCTIONS: This form is to be utilized when significant hazards posed by existing NFPA 101 deficiencies or construction activities are in progress. ILSM must be implemented upon project start and continuously enforced through project completion to provide level of life safety comparable to that described in Chapter 1-7, 31 and applicable occupancy chapters of Life Safety Code. WHERE APPLICABLE NOTE EXCEPTIONS ONLY OF AREA IDENTIFIED AS BEING DEFICIENT DURING INSPECTION AND EXPLAIN IN SUFFICIENT DETAIL IN COMMENTS SECTION OF THIS FORM. TURN COMPLETED FORMS INTO THE LHS SAFETY OFFICER.

WEEKLY ILSM FORM **PROJECT:**							
ILSM DESCRIPTIONS	MON	TUE	WED	THR	FRI	SAT	SUN
DATES							
1. Are exits readily accessible and provide unobstructed egress?							
2. If required, due to inaccessibility of existing, have alternate exits been established?							
3. If alternate exists have been established, are personnel in area informed and aware of their relocation and existence?							
4. Are existing and relocation exits clearly identified and able to be seen in event of emergency or fire?							
5. Are fire evacuation routes posted and do they reflect up-to-date changes and alternate escape routes due to construction deficiencies?							
6. Are written procedures and guidelines posted in immediate and adjacent areas for what to do and who to call in event of fire or emergency?							
7. Are personnel in immediate and adjacent areas aware and informed as to procedures and guidelines to follow in event of fire or emergency?							
8. Do fire alarms, detection, and suppression equipment and systems appear to be operational?							

WEEKLY ILSM FORM **PROJECT:**							
ILSM DESCRIPTIONS	MON	TUE	WED	THR	FRI	SAT	SUN
DATES							
9. If fire alarm or suppression systems are impaired or temporarily made nonfunctional has fire watch, as required or necessary, of area been established?							
10. If existing fire alarm or suppression systems/equipment are impaired, have measures been taken to provide equivalent equipment/systems for adequate protection? Note date of installation for equivalent measures to right.							
11. If fire alarm or suppression systems are impaired, are temporary equipment/systems being inspected and tested at least monthly?							
12. If temporary fire alarm or suppression systems are installed, are personnel in area aware and informed on how to operate or utilize in event of fire or emergency?							
13. Has “No Smoking” policy been posted, implemented and enforced in construction area?							
14. Are construction/remodel area storage, waste and debris being maintained to minimize potential for fire or safety hazards during daily operations?							
15. Are temporary partitions built to be smoke tight and of noncombustible/fire retardant materials to minimize spread of smoke or fire within building?							
16 Do electrical panels, temporary wiring, extension cords, tools and equipment appear to be installed, utilized, and functioning in safe manner?							
17. In general, are exterior construction site, buildings, and ground free of hazard and potential safety violations?							

WEEKLY ILSM FORM

PROJECT:

ILSM DESCRIPTIONS	MON	TUE	WED	THR	FRI	SAT	SUN
DATES							
18. If there is gas/arc welding or cutting being performed within building or on site, have additional fire safety precautions been taken and necessary equipment provided and utilized?							
19. If there is gas/arc welding or cutting being performed within building or on site, has Plant Operations department been notified?							
20. If there are hand and safety rails required, are they in place and maintained in good condition?							
21. Are extension cords that are being used 3 wire grounded type?							
22. If there are temporary electrical outlets provided, do they have ground fault protection at receptacle or at panel?							
23. I f hazardous chemicals are present and/or being used, are they being limited to amount needed and used daily?							
24. Are MSDS sheets readily available for hazardous chemicals that are present or being used?							
25. Do ladders and scaffolds appear to be in satisfactory condition and being utilized in safe manner?							
26. Is personnel protective equipment, such as safety glasses, hard hats and etc. needed or required and being used?							
27. If infection control is required, are appropriate policies and procedures known and being followed?							
28. If electrical equipment needs to be de-energized, are applicable “Lockout/Tagout” procedures being followed?							

WEEKLY ILSM FORM **PROJECT:**							
ILSM DESCRIPTIONS	MON	TUE	WED	THR	FRI	SAT	SUN
DATES							
PLACE INITIALS OF PERSON PERFORMING DAILY INSPECTION TO THE RIGHT.							

Inspection Results week of: _____
Project # _____
Contractor: _____
COR _____

CONSTRUCTION DOOR TEMPLATE

Construction Contacts **Emerg / Proj Info** **8.5 x 11 page** **See Following Page**	**Access Control Signs** **8.5 x 11 page** **Area Closed as we improve VA for Veterans** **NO ENTRY WITHOUT Appropriate PPE AND SAFETY TRAINING SIGN IN WITH SUPERINTENDENT** **Under Construction - Do Not Enter** **Hard Hat, Steel Toes & Safety Glasses Required.** **Contact COR for admittance.**
PCRA/ICRA PERMIT HERE	**ILSM HERE**

EMERGENCY CONTACTS

Project name:
Project number:

Emergency Police, Fire and Rescue
Your current location is…

VAMC 5000 W National Ave, Milwaukee WI.
Building _____; Room _____

IF INSIDE: **VA Phone….Dial 911**

Indicate nature of the emergency

IF OUTSIDE: **Personal Cell Phone….Dial 911, then call VAPD 414-384-2000 x42222**

Indicate location and that 911 has been called

For Unexpected Utility Discovery/Interruption:
VA Phone: x41010 (FM-Graphics)
414-384-2000 x41010 from personal cell phone

VA Project Manager Name:

Phone 1	Phone 2

Contractor Key Personnel:

Site Superintendent (1)/SSHO:

Name	Phone

Site Superintendent (2)/SSHO:

Name	Phone

Contractor's Project Manager:

Name	Phone

No entry without appropriate PPE and Safety training. Sign in with Superintendent.

Construction Barrier and Fire Risk Assessment Matrix
Patient Risk Group – VAMC Milwaukee

SAC-SPECIAL AGREEMENT CHECK
For Construction Contractors

NAME: (last/first/middle) _____

CITIZENSHIP: _____ SSN: _____ DOB: _____

ALIAS/none: _____ RACE: _____ SEX: _____

EYE COLOR: _____ HAIR COLOR: _____ HT: _____ WT: _____

PLACE OF BIRTH: (city/state/country) _____

RESIDENT ADDRESS: _____

SCARS, MARKS, TATTOO(S)/none: _____

TRADE/DISCIPLINE: _____ APPRENTICE / JOURNEYMAN / MASTER / NA

PO#: 695-_____ Contract Expiration Date: _____

Project Name: _____ Contract#: _____

Prime Contractor: _____

Prime Address: _____

Employing Sub-Contractor: _____

Sub-Contractor Address: _____

If privately owned vehicle is or will be, even once, parked on grounds

Driver's License#: _____ Plate#/State#: _____

Vehicle: Make: _____ Model: _____ Year: _____ Color: _____

Computer Access Required for Contract? __ Y / N __ Construction Door Access Needed? __Y / N __

Construction Door Name/Address: _____

Printed COR Name / COR Signature / Date

ILSM TEMPORARY BARRIER TAG

PROJECT: _____

PRIME CONTRACTOR: _____

SUB CONTRACTOR: _____

EMERGENCY CONTACT NO. _____

BARRIER INSTALLATION DATE: _____

BARRIER EXPIRATION DATE: _____

(MAX 3 DAYS)

ILSM FIRESTOP

PROJECT: _____

PRIME CONTR: _____

CORE CONTR: _____

PENETRATION DATE: _____

EXPIRATION DATE: _____

(MAX 30 DAYS)

- - - E N D - - -

SECTION 01 32 16.15
PROJECT SCHEDULES
(SMALL PROJECTS – DESIGN/BID/BUILD)

PART 1- GENERAL

1.1 DESCRIPTION

A. The Contractor shall develop a Critical Path Method (CPM) plan and schedule demonstrating fulfillment of the contract requirements (Project Schedule) and shall keep the Project Schedule up to date in accordance with the requirements of this section and shall utilize the plan for scheduling, coordinating, and monitoring work under this contract (including all activities of subcontractors, equipment vendors and suppliers). The Contractor may utilize the conventional Critical Path Method (CPM) or Network Analysis System technique to fulfill the scheduling requirement. In either case the final schedule shall be resource (cost) loaded and shall be utilized for progress payment requests.

B. For each construction progress meeting, submit a 3-week short interval production schedule (SIPS) to show current work in progress. SIPS shall reflect trades on site, days for each trade on site during the period and list issues/concerns/delays. Milestone dates shall agree with the CPM.

1.2 CONTRACTOR'S SCHEDULE CONSULTANT

A. The Contractor shall designate an outside consultant and authorized representative responsible for the Project Schedule including preparation, review, and progress reporting with and to the COR.

B. The Contractor's schedule consultant shall have direct project control and complete authority to act on behalf of the Contractor in fulfilling the requirements of this specification section.

C. **The Contractor shall submit a qualification proposal to the COR, within 15 days of award notification.** The qualification proposal shall include:

1. The name and address of the proposed consultant.
2. Information to show that the proposed consultant has the qualifications to meet the requirements specified in the preceding paragraph.
3. A representative sample of prior construction projects the proposed consultant has performed complete project scheduling services. These representative samples shall be of similar size and scope.

D. The Contracting Officer has the right to approve or disapprove the proposed consultant and will notify the Contractor of the VA decision within seven calendar days from receipt of the qualification proposal. In case of disapproval, the Contractor shall resubmit another consultant within 10 calendar days for renewed consideration. The

Contractor shall have their scheduling consultant approved prior to submitting any schedule for approval.

1.3 COMPUTER PRODUCED REPORTS

A. As required, the Contractor shall provide monthly computer-produced time/cost schedules and reports generated from the monthly project schedule updates. These monthly submissions shall include up to five different reports (including all pages) available within the user-defined reports of the scheduling software. A hard copy list of all project schedule changes and associated data shall be made available at the time of the monthly update and an electronic file of this data forwarded to the Contracting Officer upon request. These must substantively support the Contractor’s monthly payment request(s) and 3-week SIPS. If necessary, the Contracting Officer will identify the five different report formats that the Contractor shall provide.

B. The Contractor shall be responsible for the correctness and timeliness of computer-produced reports and schedules. The Contractor shall also be responsible for the accurate and timely submittal of the updated project schedule and all CPM data necessary to produce the computer reports and payment request that is specified.

C. The VA will report errors in computer-produced reports to the Contractor’s representative within ten (10) calendar days from receipt of reports. The Contractor shall reprocess the computer-produced reports when requested by the COR, to correct errors which affect the payment and schedule for the project.

1.4 THE PROJECT SCHEDULE AND SCHEDULE OF VALUES SUBMITTALS

A. **Within 30 calendar days of the Notice to Proceed and in accordance with 01 33 23 SUBMITTALS, RFIS, AND CBS, the Contractor shall submit the interim/initial Project Schedule.** This submittal does not need to be cost-loaded and shall include at least a computer-produced activity/event ID schedule showing project duration; phase completion dates (early/late). Each activity/event on the computer-produced schedule shall contain as a minimum, but not limited to, activity/event ID, activity/event description, duration, early start date, early finish date, late start date, late finish date and total float. Work activity/event relationships shall be restricted to finish-to-start or start-to-start without lead or lag constraints. Activity/event date constraints, not required by the contract, will not be accepted unless submitted to and approved by the COR. The Contractor shall make a separate written detailed request to the COR identifying these date constraints and secure the COR’s written approval before incorporating them into the network diagram. The COR’s separate approval of the interim Project Schedule shall not excuse the Contractor of this requirement. Logic events (non-work) will be permitted where necessary to reflect proper logic among work events but must have zero duration. The interim Project Schedule shall reflect the Contractor's approach to scheduling the complete project.

B. Within 30 calendar days after receipt of the interim Project Schedule submittal, the COR will do one or both of the following:

1. Notify the Contractor concerning his actions, opinions, and objections.
2. A meeting with the Contractor at or near the job site for joint review, correction or adjustment of the proposed plan will be scheduled if required. Within 14 calendar days after the joint review, the Contractor shall revise and shall submit the revised Project Schedule and the revised computer-produced activity/event ID schedule as specified by the Contracting Officer. The revised submission will be reviewed by the Contracting Officer and, if found to be as previously agreed upon, will be approved.

C. The approved interim schedule shall constitute the approved baseline schedule until subsequently revised in accordance with the requirements of this section.

D. **Within 60 calendar days of the Notice to Proceed, and in coordination with the interim Project Schedule submittal, the Contractor shall submit the project's Schedule of Values.**

E. **Upon approval of the interim Project Schedule and Schedule of Values, the Contractor shall submit the project's Final, cost-loaded, project schedule within 30 days of last approval.** See paragraph 1.5. The Contractor shall cost load all work activities/events except procurement activities and VA/AE inspections in the FINAL PROJECT SCHEDULE SUBMITTAL.

F. The final Project Schedule in its original form shall contain no contract changes or delays which may have been incurred during the final network diagram development period and shall reflect the entire contract duration as defined in the bid documents. These changes/delays shall be entered at the first update after the final Project Schedule has been approved. The Contractor should provide their requests for time and supporting time extension analysis for contract time because of contract changes/delays, after this update, and in accordance with Article, ADJUSTMENT OF CONTRACT COMPLETION.

1.5 WORK ACTIVITY/EVENT COST DATA

A. The cumulative amount of all cost-loaded work activities/events (including alternates) shall equal the total contract price. Prorate overhead, profit and general conditions on all work activities/events for the entire project length. The Contractor shall generate from this information cash flow curves indicating graphically the total percentage of work activity/event dollar value scheduled to be in place on early finish, late finish. These cash flow curves will be used by the COR to assist in determining approval or disapproval of the cost loading. Negative work activity/event cost data will not be acceptable except on VA issued contract changes.

B. The Contractor shall cost load work activities/events for test, balance and adjust various systems in accordance with the provisions in

Article, FAR 52.232 - 5 (PAYMENT UNDER FIXED-PRICE CONSTRUCTION CONTRACTS) and VAAR 852.232 - 70/71 (PAYMENT UNDER FIXED-PRICE CONSTRUCTION CONTRACTS).

C. In accordance with FAR 52.236 - 1 (PERFORMANCE OF WORK BY THE CONTRACTOR), the Contractor shall submit, simultaneously with the cost per work activity/event of the construction schedule required by this Section, a responsibility code for all activities/events of the project for which the Contractor's forces will perform the work.

1.6 PROJECT SCHEDULE REQUIREMENTS

A. Show on the project schedule the sequence of work activities/events required for complete performance of all items of work. The Contractor shall:

1. Show activities/events:

   a. Contractor's time required for submitting shop drawings, templates, fabrication, delivery and similar pre-construction work.
   b. Architect-Engineer's and COR review and approval of submittals (see specification 01 33 23 SUBMITTALS, RFIS, AND CBS.
   c. Interruption of VA facilities utilities, delivery of Government furnished equipment, and rough-in drawings, project phasing and any other specification requirements.
   d. Commissioning activities, test, balance and adjust various systems and pieces of equipment, maintenance and operation manuals, instructions, and preventive maintenance tasks.
   e. VA inspection and acceptance activity/event with a minimum duration of five workdays at the end of each phase and immediately preceding any VA move activity/event required by the contract phasing for that phase.

2. Show not only the activities/events for actual construction work for each trade category of the project but also trade relationships to indicate the movement of trades from one area to another for the trades who are performing work under this contract.
3. Break up the work into activities/events of a duration no longer than 20 workdays each or one reporting period, except as to non-construction activities/events (i.e., procurement of materials, delivery of equipment, concrete, and asphalt curing) and any other activities/events for which the COR may approve the showing of a longer duration.
4. Describe work activities/events clearly, so the work is readily identifiable for assessment of completion. Activities/events labeled "start," "continue," or "completion," are not specific and will not be allowed. Lead and lag time activities will not be acceptable.
5. The schedule shall be generally numbered in such a way to reflect either discipline, phase, or location of the work.

B. The Contractor shall submit the following supporting data in addition to the project schedule:

1. The appropriate project calendar including working days and holidays.
2. The planned number of shifts per day.
3. The number of hours per shift.
4. Failure of the Contractor to include this data shall delay the review of the submittal until the Contracting Officer is in receipt of the missing data.

C. To the extent that the Project Schedule or any revised Project Schedule shows anything not jointly agreed upon, it shall not be deemed to have been approved by the COR. Failure to include any element of work required for the performance of this contract shall not excuse the Contractor from completing all work required within any applicable completion date of each phase regardless of the COR's approval of the Project Schedule.

1.7 PAYMENT TO THE CONTRACTOR

A. **Monthly, the Contractor shall submit an application and certificate for payment using the AIA application and certificate for payment documents G702 & G703** reflecting updated schedule activities and cost data in accordance with the provisions of the following Article, PAYMENT AND PROGRESS REPORTING, as the basis upon which progress payments will be made pursuant to Article, FAR 52.232 – 5 (PAYMENT UNDER FIXED-PRICE CONSTRUCTION CONTRACTS) and VAAR 852.232 – 70/71 (PAYMENT UNDER FIXED-PRICE CONSTRUCTION CONTRACTS). The Contractor shall be entitled to a monthly progress payment upon approval of estimates as determined from the currently approved updated project schedule. Monthly payment requests shall include: a listing of all agreed upon project schedule changes and associated data; and an electronic file(s) of the resulting monthly updated schedule.

B. **Approval of the Contractor's monthly Application for Payment shall be contingent, among other factors, on the submittal of a satisfactory monthly update of the project schedule and as-built "snap-shot" update drawings/reports. Other monthly items are required – see specifications 01 00 00, 01 35 26, and 01 74 19.**

1.8 MONTHLY PROGRESS REPORTS AND SCHEDULE UPDATES

A. Monthly schedule update meetings may be held on dates mutually agreed to by the COR and the Contractor. The Contractor and their CPM consultant shall attend monthly schedule update meetings. The Contractor shall accurately update the Project Schedule and all other data required and provide this information to the COR three workdays in advance of the schedule update meeting. Job progress will be reviewed to verify:

1. Actual start and/or finish dates for updated/completed activities/ events.
2. Remaining duration for each activity/event started, or scheduled to start, but not completed.
3. Logic, time and cost data for change orders, and supplemental agreements that are to be incorporated into the Project Schedule.
4. Changes in activity/event sequence and/or duration which have been made, pursuant to the provisions of following Article, ADJUSTMENT OF CONTRACT COMPLETION.
5. Completion percentage for all completed and partially completed activities/events.
6. Logic and duration revisions required by this section of the specifications.
7. Activity/event duration and percentage complete shall be updated independently.

B. After completion of the joint review, the Contractor shall generate an updated computer-produced calendar-dated schedule and supply the Contracting Officer's representative with reports in accordance with this specification.

C. After completing the monthly schedule update, the scheduling consultant shall rerun all current period contract change(s) against the prior approved monthly project schedule. The analysis shall only include original workday durations and schedule logic agreed upon by the Contractor and COR for the contract change(s). When there is a disagreement on logic and/or durations, the Contractor shall use the schedule logic and/or durations provided and approved by the COR. After each rerun update, the resulting electronic project schedule data file shall be appropriately identified and submitted to the VA in accordance with the requirements listed in articles 1.4 and 1.7. This electronic submission is separate from the regular monthly project schedule update requirements and shall be submitted to the COR within fourteen (14) calendar days of completing the regular schedule update. **Before inserting the contract changes durations, care must be taken to ensure that only the original durations will be used for the analysis, not the reported durations after progress. In addition, once the final network diagram is approved, the Contractor must recreate all manual progress payment updates on this approved network diagram and associated reruns for contract changes in each of these update periods as outlined above for regular update periods. This will require detailed record keeping for each of the manual progress payment updates.**

D. Following approval of the CPM schedule, the VA, the Contractor, its approved CPM Consultant may meet to discuss the monthly updated schedule (COR discretion). The main emphasis shall be to address work activities to avoid slippage of project schedule and to identify any necessary actions required to maintain project schedule during the reporting period. The Government representatives and the Contractor should conclude the meeting with a clear understanding of those work

and administrative actions necessary to maintain project schedule status during the reporting period. This schedule coordination meeting will occur after each monthly project schedule update meeting utilizing the resulting schedule reports from that schedule update. If the project is behind schedule, discussions should include ways to prevent further slippage as well as ways to improve the project schedule status, when appropriate.

1.9 CONTRACTOR RESPONSIBILITY FOR COMPLETION

A. If it becomes apparent from the current revised monthly progress schedule that phasing or contract completion dates will not be met, the Contractor shall execute some or all the following remedial actions:

1. Increase construction manpower in such quantities and crafts as necessary to eliminate the backlog of work.
2. Increase the number of working hours per shift, shifts per working day, working days per week, the amount of construction equipment, or any combination of the foregoing to eliminate the backlog of work.
3. Reschedule the work in conformance with the specification requirements.

B. Prior to proceeding with any of the above actions, the Contractor shall notify and obtain approval from the COR for the proposed schedule changes. If such actions are approved, the representative schedule revisions shall be incorporated by the Contractor into the Project Schedule before the next update, at no additional cost to the Government.

1.10 CHANGES TO THE SCHEDULE

A. Within 30 calendar days after VA acceptance and approval of any updated project schedule, the Contractor shall submit a revised electronic file(s) and a list of any activity/event changes including predecessors and successors for any of the following reasons:

1. Delay in completion of any activity/event or group of activities/ events, which may be involved with contract changes, strikes, unusual weather, and other delays will not relieve the Contractor from the requirements specified unless the conditions are shown on the CPM as the direct cause for delaying the project beyond the acceptable limits.
2. Delays in submittals, or deliveries, or work stoppage are encountered which make rescheduling the work necessary.
3. The schedule does not represent the actual prosecution and progress of the project.
4. When there is, or has been, a substantial revision to the activity/event costs regardless of the cause for these revisions.

B. CPM revisions made under this paragraph which affect the previously approved computer-produced schedules for Government furnished equipment, vacating of areas by the VA facility, contract phase(s) and sub phase(s), utilities furnished by the Government to the Contractor, or any other previously contracted item, shall be furnished in writing to the Contracting Officer for approval.
C. Contracting Officer's approval for the revised project schedule and all relevant data is contingent upon compliance with all other paragraphs of this section and any other previous agreements by the Contracting Officer or the VA representative.
D. The cost of revisions to the project schedule resulting from contract changes will be included in the proposal for changes in work as specified in FAR 52.243 - 4 (Changes) and VAAR 852.243 - 70/71 (Changes - Supplemental) and will be based on the complexity of the revision or contract change, man hours expended in analyzing the change, and the total cost of the change.
E. The cost of revisions to the Project Schedule not resulting from contract changes is the responsibility of the Contractor.

1.11 ADJUSTMENT OF CONTRACT COMPLETION

A. The contract completion time will be adjusted only for reasons specified in this contract. Request for an extension of the contract completion date by the Contractor shall be supported with a justification, CPM data and supporting evidence as the COR may deem necessary for determination as to whether the Contractor is entitled to an extension of time under the provisions of the contract. Submission of proof based on revised activity/event logic, durations (in workdays) and costs are obligatory to any approvals. The schedule must clearly display that the Contractor has used, in full, all the float time available for the work involved in this request. The Contracting Officer's determination as to the total number of days of contract extension will be based upon the current computer-produced calendared schedule for the time in question and all other relevant information.
B. Actual delays in activities/events which, according to the computer-produced calendar-dated schedule, do not affect the extended and predicted contract completion dates shown by the critical path in the network, will not be the basis for a change to the contract completion date. The Contracting Officer will review the facts within a reasonable time after receipt of such justification and supporting evidence, review the facts and advise the Contractor in writing of the Contracting Officer's decision.
C. The Contractor shall submit each request for a change in the contract completion date to the Contracting Officer in accordance with the provisions specified under FAR 52.243 - 4 (Changes) and VAAR 852.243 - 70/71 (Changes - Supplemental). The Contractor shall include, as a part of each change order proposal, a sketch showing all CPM logic revisions, duration (in workdays) changes, and cost changes, for work

in question and its relationship to other activities on the approved network diagram.

D. All delays due to non-work activities/events such as RFI's, WEATHER, STRIKES, and similar non-work activities/events shall be analyzed on a month-by-month basis.

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SECTION 01 33 23
SUBMITTALS, RFIS AND CONSTRUCTION BULLETINS

1.1 DESCRIPTION

A. This specification defines the general requirements and procedures for contractor's submittals, RFIs, and Construction Bulletins (CBs). A submittal is information submitted for VA review to establish compliance with the contract documents. An RFI is a detailed request for information regarding the construction. A CB is part of the change process and could include modified or new drawings and specifications to be incorporated by the General Contractor into the contract. CBs are generally issued by the Contracting Office via the Request for Proposal (RFP) process.

B. Detailed submittal requirements are found in the technical sections of the contract specifications. The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective technical specifications at no additional cost to the government.

C. **VA approval of a submittal does not relieve the Contractor of the responsibility for any error which may exist.** The Contractor is responsible for fully complying with all contract requirements and the satisfactory construction of all work, including the need to check, confirm, and coordinate the work of all subcontractors for the project. Non-compliant material incorporated in the work will be removed and replaced at the Contractor's expense.

1.2 DEFINITIONS

A. Preconstruction Submittals: Submittals which are required prior to allowing contractor mobilization (starting construction). The below table identifies the preconstruction submittals required for this contract and the timeframe for the Contractor to comply.

Preconstruction Submittal	**Reference**	**Due**
Surety Bonds & Certificates of Insurance		Prior to NTP
SF 1413s (Subcontractor List)		Pursuant to FAR 52.222-11
Schedule Consultant Qualification Proposal	01 32 16.15	Within 15d of award
Project Management Team Memo (PM, Supt, QCM/CPM, SSHO)	01 00 00/ 01 35 26	Within 60d of NTP
Construction Site Security Plan	01 00 00	Within 60d of NTP
Non-Disclosure Agreements	01 00 00	As Required
Logistics Plan	01 00 00	Within 60d of NTP

Construction Phasing Plan(s) *	01 00 00	Within 60d of NTP
Existing Conditions Survey	01 00 00	Within 60d of NTP
Construction Schedule (Interim)	01 32 16.15	Within 30d of NTP
Schedule of Values	01 32 16.15	Within 60d of NTP
Construction Baseline Schedule (Final)	01 32 16.15	Within 30d of VA approval of Initial Schedule and Schedule of Values
Submittal Register	01 33 23	Within 60d of NTP
Accident Prevention Plan	01 35 26	Within 60d of NTP
Activity Hazard Analyses	01 35 26	With APP or Within 60d of NTP, or 15d prior to Activity
OSHA Certificates and Applicable Training Documents	01 35 26	Within 60d of NTP
Infection Control Plan(s) *	01 35 26	Within 60d of NTP
Fire Safety Plan	01 35 26	Within 60d of NTP
Environmental Protection Plan	01 57 19	Within 60d of NTP
Construction Waste Management Plan	01 74 19	Within 60d of NTP
Sustainable Construction Spreadsheet	01 81 13	Within 30d of Kickoff

*** NOTE: EVERY NEW PHASE / WORKSITE SHALL REQUIRE A NEW INFECTION CONTROL AND PHASING PLAN FOR VA REVIEW AND APPROVAL.**

B. Shop Drawings: Drawings, diagrams, and schedules specifically prepared to illustrate some portion of the work. Drawings prepared by or for the Contractor to show how multiple systems and interdisciplinary work will be integrated and coordinated.

C. Product Data: Catalog cuts, illustrations, schedules, diagrams, performance charts, instructions, and brochures, which describe and illustrate size, physical appearance, and other characteristics of materials, systems, or equipment for some portion of the work. Samples of warranty language when the contract requires extended product warranties.

D. Samples: Physical examples of materials, equipment, or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged. Color samples from the manufacturer's standard line (or custom color samples if specified) to be used in selecting or approving colors for the project. Field samples and mock-ups constructed to establish standards by which the ensuing work can be judged.

E. Design Data: Calculations, mix designs, analyses, or other data pertaining to a part of work.
F. Test Reports: Report which includes findings of a test required to be performed by the Contractor on an actual portion of the work. Report which includes finding of a test made at the job site or on sample taken from the job site, on portion of work during or after installation.
G. Certificates: Document required of Contractor, or of a manufacturer, supplier, installer, or subcontractor through Contractor. The purpose is to document procedures, acceptability of methods, or personnel qualifications for a portion of the work.
H. Manufacturer's Instructions: Pre-printed material describing installation of a product, system, or material, including special notices and MSDS concerning impedances, hazards, and safety precautions.
I. Manufacturer's Field Reports: Documentation of the testing and verification actions taken by manufacturer's representative at the job site on a portion of the work, during or after installation, to confirm compliance with manufacturer's standards or instructions. The documentation must indicate whether the material, product, or system has passed or failed the test.
J. Operation and Maintenance Data: Manufacturer data that is required to operate, maintain, troubleshoot, and repair equipment, including manufacturer's help, parts list, and product line documentation. This data shall be incorporated in an operations and maintenance manual.
K. Closeout Submittals: Documentation necessary to properly close out a construction contract. For example, warranty documents, Record Drawings and as-built drawings. Also, submittal requirements necessary to properly close out a phase of construction on a multi-phase contract.

1.3 THE SUBMITTAL REGISTER AND LOG

A. **Submit initial Submittal Register meeting requirements as listed below and in accordance with Section 01 33 23 SUBMITTALS within 60 calendar days of the Notice to Proceed.**
B. The initial submittal register shall be created by the General Contractor. An example format for the Contractor’s initial Submittal Register is included as an appendix to this Specification and will be provided in electronic Excel format upon request.
C. The Submittal Register is a list items of equipment and materials for which submittals are required by the specifications. This list may not be all inclusive and additional submittals may be required by the specifications. The Contractor is not relieved from supplying submittals required by the contract documents, but which have been omitted from the submittal register.
D. The Submittal Register will serve as a scheduling document for submittals and will be used to control submittal actions throughout the contract period. As the Contractor tracks submittals, the Submittal Register shall become known as the Submittal Log.
E. Upon review and approval of the General Contractor’s initial Submittal Register submittal, the COR will upload the final Submittal Register to

Opcenter. This final Submittal Register will contain additional submittals as required. Opcenter is VA Milwaukee's online, web-based workflow monitoring (RFIs and submittals) and file transfer program. VA will offer training on use of Opcenter to allow Contractor to create new submittals, including monthly schedule updates, redline markups, SAC forms and AHAs.

F. The Contractor's submittal log shall be made available to the COR or the Contracting Officer at any time.
G. The Contractor shall maintain and keep current his Submittal Log as submittal actions occur until final acceptance of work the Contracting Officer.
H. Submittal Log updates are required monthly as an administrative document for review before monthly invoices can be accepted or approved.

1.4 SUBMITTAL SCHEDULING

A. Submittals are to be scheduled, submitted, reviewed, and approved prior to the acquisition of the material or equipment.
B. Coordinate scheduling, sequencing, preparing, and processing of submittals with performance of work so that work will not be delayed by submittal processing. Allow time for potential resubmittal.
C. No delay costs or time extensions will be allowed for time lost in late submittals or resubmittals.
D. All submittals are required to be approved prior to the start of the specified work activity.

1.5 SUBMITTAL PREPARATION

A. Each submittal is to be complete and in sufficient detail to allow ready determination of compliance with contract requirements.
B. Collect required data for each specific material, product, unit of work, or system into a single submittal. Prominently mark choices, options, and portions applicable to the submittal. Partial submittals will not be accepted for expedition of construction effort. Submittal will be returned without review if incomplete.
C. If available product data is incomplete, provide Contractor-prepared documentation to supplement product data and satisfy submittal requirements.
D. All irrelevant or unnecessary data shall be removed from the submittal to facilitate accuracy and timely processing. Submittals that contain the excessive amount of irrelevant or unnecessary data will be returned with review.
E. Provide a transmittal form for each submittal with the following information:

1. Project title, location, and number.
2. Construction contract number.
3. Date of the drawings and revisions.

4. Name, address, and telephone number of subcontractors, supplier, manufacturer, and any other subcontractor associated with the submittal.
5. List paragraph number of the specification section and sheet number of the contract drawings by which the submittal is required.
6. Resubmittals (due to rejection or conditional reasons) will automatically be categorized by the VA – approved submittal file transfer system (Opcenter).
7. Product identification and location in project.

F. The Contractor is responsible for reviewing and certifying that all submittals follow contract requirements before submitting for VA review. Proposed deviations from the contract requirements are to be clearly identified. All deviations submitted must include a side-by-side comparison of item being proposed against item specified. Failure to point out deviations will result in the VA requiring removal and replacement of such work at the Contractor's expense.
G. Stamp, sign, and date each submittal transmittal form indicating action taken.
H. Contractor shall stamp the submittal transmittal form to certify that the submittal meets contract requirements and has been approved by the General Contractor.

1.6 SUBMITTAL FORMAT AND TRANSMISSION

A. Provide submittals in electronic format, except for material samples. Use PDF as the electronic format, unless otherwise specified or directed by the Contracting Officer.
B. Compile the electronic submittal file as a single, complete document. Name the electronic submittal file specifically according to its contents (i.e., “08 14 00 WOOD DOORS”).
C. Electronic files must be of sufficient quality that all information is legible. Generate PDF files from original documents so that the text included in the PDF file is both searchable and can be copied. If documents are scanned, Optical Character Resolution (OCR) routines are required.
D. Contractor shall use VA-approved FTP site (Opcenter) for submittals.
E. Provide hard copies of submittals ONLY when requested by the COR. Up to three additional hard copies of any submittal may be requested at the discretion of the COR, at no additional cost to the VA.

1.7 SAMPLES

A. Submit two sets of physical samples showing range of variation, for each required item. Submit samples directly to the COR as well as electronic cover sheet through Opcenter.
B. Where samples are specified for selection of color, finish, pattern, or texture, submit the full set of available choices for the material or product specified.

C. When color, texture, or pattern is specified by naming a particular manufacturer and style, include one sample of that manufacturer and style, for comparison.
D. Before submitting samples, the Contractor is to ensure that the materials or equipment will be available in quantities required in the project. No change or substitution will be permitted after a sample has been approved.
E. The VA reserves the right to disapprove any material or equipment which previously has proven unsatisfactory in service.
F. Physical samples supplied maybe requested back for use in the project after reviewed and approved.

1.8 OPERATION AND MAINTENANCE DATA

A. Submit data specified for a given item within 30 calendar days after the item is delivered to the contract site.
B. In the event the Contractor fails to deliver O&M Data within the time limits specified, the Contracting Officer may withhold from progress payments 50 percent of the price of the item with which such O&M Data are applicable.

1.9 TEST REPORTS

A. COR may require specific test after work has been installed or completed which could require contractor to repair test area at no additional cost to contract. Coordinate with Commissioning Agent.

1.10 AE AND VA REVIEW OF SUBMITTALS AND RFIS

A. VA will act as FINAL reviewer submittals for compliance with technical requirements of contract documents. Review will be only for conformance with applicable codes, standards, and contract requirements.
B. Period of review for submittals begins when AE receives submittal from Contractor.
C. Period of review for each resubmittal is same as for initial submittal.
D. AE review is 14 calendar days to respond to VA regarding submittals. VA review period is 14 calendar days for submittals to return to GC, for a total of 28 calendar days.
E. AE review is 7 calendar days to respond to VA regarding RFIs. VA review period is 7 calendar days for RFIs to return to GC, for a total of 14 calendar days.
F. VA will return submittals to Contractor with following notations:

1. “Acknowledged”: This notation acknowledges that the Contractor submitted in accordance with the Contract.
2. "Approved": This notation authorizes Contractor to proceed with work covered.
3. "Conditionally Approved as Noted; No Re-Submittal Required": This notation authorizes Contractor to proceed with work covered provided Contractor incorporates noted comments and makes noted corrections.

4. “Conditionally Approved as Noted; Re-submittal Required”: This notation indicates a partial approval (shall be noted by VA) and a partial disapproval (also shall be noted by VA). This notation authorizes Contractor to proceed with work covered provided Contractor incorporates noted comments and makes noted corrections. Contractor shall also RE-SUBMIT that portion (either rejected or missing) of submittal as noted by VA.
5. "Disapproved/Rejected, Revise and Resubmit": This notation indicates noncompliance with contract requirements or that submittal is incomplete. Resubmit with appropriate changes and corrections. No work shall proceed for this item until resubmittal is approved.

G. Requests for Information (RFIs):

1. Fully functional systems in every trade are intended through the full set of contract documents (Scope of Work, Drawings, and Specifications, and FAR and VAAR clauses).
2. RFIs will be considered and answered as “Clarifications only – no modification” unless for significant unforeseen hidden atypical conditions not normally encountered at this site (per FAR 52.236-2 Differing Site Conditions (APR 1984)), and where design intent is impossible to build. At this site, hidden condition locations (e. g., above-ceilings, behind chase walls, and below ground) typically contain obstructions, abandoned unmarked utilities and debris, and equipment not shown on plans. Provide work around such conditions, such as minor offsets to new routings, temporary supports, and reasonable modifications to existing conditions not detailed on plans.
3. Examples of situations to be considered “Clarification only – no modification” are those that should have been readily apparent during bidding, and may include situations now covered in the new clause VAAR 852.236-71 Specifications and Drawings for Construction (APR 2019), incorporated by reference into this contract:

   a. Where new work connects to existing with no connection detail, or where drawing requirement is shown one place but not another.
   b. Conflicting contract requirements where system intent is clear and buildable.
   c. Temporary supports needed either to shore up existing conditions, or for new work as it is built into, around, over, under, though, or otherwise in conflict with existing conditions.
   d. New utility routings interfering with existing site conditions not detailed on plans, resulting in minor offsets and work arounds for new work as it is built into, around, over, under, though, or otherwise in conflict with existing conditions.
   e. Winter conditions, unless contractor proves by independent weather analysis submittal that statistically significant (beyond two standard deviations worse than average based on entire weather data history) adverse weather conditions have occurred.

4. Work shall proceed without delay unless impossible to build using means and methods typical in type of construction defined. Disagreement with COR's determination of RFIs answered "Clarifications only – no modification" shall not delay work, in keeping with FAR 52.211-10 Commencement, Prosecution, and Completion of Work.

1.11 CONSTRUCTION BULLETINS

A. An answered RFI that states "a Construction Bulletin (CB)and Request for Proposal (RFP) shall be issued to resolve this changed work" requires work by the AE and VA before issuance.
B. The AE shall prepare a draft CB for VA review which is due to VA via Opcenter within seven (7) days of the answered RFI. Every effort shall be made to issue an approved CB/RFP to the Contractor within 14 calendar days of the answered RFI.

1.12 APPROVED SUBMITTALS

A. The VA approval of submittals is not to be construed as a complete check, and indicates only that the general method of construction, materials, detailing, and other information are satisfactory.
B. VA approval of a submittal does not relieve the Contractor of the responsibility for any error which may exist. The Contractor is responsible for fully complying with all contract requirements and the satisfactory construction of all work, including the need to check, confirm, and coordinate the work of all subcontractors for the project. Non-compliant material incorporated in the work will be removed and replaced at the Contractor's expense.
C. After submittals have been approved, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.
D. Retain a copy of all approved submittals at project site, including approved samples.

1.13 WITHHOLDING OF PAYMENT

A. Payment for materials incorporated in the work will not be made if required approvals have not been obtained.

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NUMBER	NAME	REFERENCE	DESCRIPTION
01 00 00	**General Requirements-PM Team**	1.4.A	Submit entire PM Team memorandum within 60 days of NTP
01 00 00	**General Requirements-Sec Plan**	1.5.A	Submit site security plan within 60 days of NTP
01 00 00	**General Requirements-Log Plan**	1.6.A	Submit logistics plan within 60 days of NTP
01 00 00	**General Requirements-Overall Phasing Plan**	1.6.I.1	Submit overall construction phasing plan within 60 days of NTP
01 00 00	**Phasing Plan Specific (1)**	1.6	GC shall submit individividual phasing plans for specific work pieces. Coordinate with the Infection Control Plan. For example, each TR/TE will require its own phaing plan. The civil/site work will require its own phasing plan (with probable multiple sub-phases), the Bldg 111 work in the "old kitchen" for DEMARC and ELEC ROOM construction will need their own phasing plans. The COR will open additional submittal line items this specification for the GC upon request.
01 00 00	**Phasing Plan Specific (2)**	1.6	GC shall submit individividual phasing plans for specific work pieces. Coordinate with the Infection Control Plan. For example, each TR/TE will require its own phaing plan. The civil/site work will require its own phasing plan (with probable multiple sub-phases), the Bldg 111 work in the "old kitchen" for DEMARC and ELEC ROOM construction will need their own phasing plans. The COR will open additional submittal line items this specification for the GC upon request.
01 00 00	**Phasing Plan Specific (3)**	1.6	GC shall submit individividual phasing plans for specific work pieces. Coordinate with the Infection Control Plan. For example, each TR/TE will require its own phaing plan. The civil/site work will require its own phasing plan (with probable multiple sub-phases), the Bldg 111 work in the "old kitchen" for DEMARC and ELEC ROOM construction will need their own phasing plans. The COR will open additional submittal line items this specification for the GC upon request.

01 00 00	**Phasing Plan Specific (4)**	1.6	GC shall submit individividual phasing plans for specific work pieces. Coordinate with the Infection Control Plan. For example, each TR/TE will require its own phaing plan. The civil/site work will require its own phasing plan (with probable multiple sub-phases), the Bldg 111 work in the "old kitchen" for DEMARC and ELEC ROOM construction will need their own phasing plans. The COR will open additional submittal line items this specification for the GC upon request.
01 00 00	**Phasing Plan Specific (5)**	1.6	GC shall submit individividual phasing plans for specific work pieces. Coordinate with the Infection Control Plan. For example, each TR/TE will require its own phaing plan. The civil/site work will require its own phasing plan (with probable multiple sub-phases), the Bldg 111 work in the "old kitchen" for DEMARC and ELEC ROOM construction will need their own phasing plans. The COR will open additional submittal line items this specification for the GC upon request.
01 00 00	**Phasing Plan Specific (6)**	1.6	GC shall submit individividual phasing plans for specific work pieces. Coordinate with the Infection Control Plan. For example, each TR/TE will require its own phaing plan. The civil/site work will require its own phasing plan (with probable multiple sub-phases), the Bldg 111 work in the "old kitchen" for DEMARC and ELEC ROOM construction will need their own phasing plans. The COR will open additional submittal line items this specification for the GC upon request.
01 00 00	**General Requirements-ECS**	1.7.A	Submit ECS within 60 days of NTP. GC may want to prepare multiple existing condition surveys before work at each location. For example - a survey of each building before work begins in that building. COR will open new ECS submittals upon request for the GC.
01 00 00	**General Requirements-Re-Survey (coord with punchlist inspection response)**	1.7.D	GC will provide response document to each AE/VA provided punchlist inspection. The re-survey and punchlist response shall be the same requirement. There may be multiple re-surveys after work at each location. COR will open new re-survey submittals upon request for the GC.
01 00 00	**General Requirements-WPDES permit**	1.9.D	Submit proof of WPDES permit to the state/WDNR

01 00 00	**General Requirements-Final As-Built Drawings**	1.14.E	Final electronic red-lines (roll-up submittal of all red-lines/as-builts). Submit to COR for review by AE and consolidation into final electronic DWG/PDF as-builts
01 01 10	**Special Notes-Subcontractor List**	3.39.B	Provide list of all subcontractors to include company names, address, phone number, email
01 32 16.15	**Project Schedules-Schedule Consultant**	1.2.C	Submit qualificaiton proposal of the scheduling consultant within 15 days of award
01 32 16.15	**Project Schedules-INITIAL Schedule**	1.4.A	Submit initial schedule within 30 days of NTP. Submit PDF.
01 32 16.15	**Project Schedules-Schedule of Values**	1.4.D	Submit schedule of values - coordinated with Initial Schedule - within 60 days of NTP
01 32 16.15	**Project Schedules-FINAL Schedule**	1.4.E	Submit Final cost loaded Schedule after interim schedule and SOV are approved (within 30 days of last approval)
01 32 16.15	**Project Schedules-Monthly Update & Pay Request & Progress Report**	1.7	Submit application for payment monthly. Additionally provide monthly progress report and/or redline as-built submittal. This submittal pkg includes updated schedule (01 32 16.15, 1.8), photographic milestones (01 00 00, 1.32.A), CHST/CSP monthly safety report (01 35 26, 1.10.B), exposure-hours worked roll-up (01 35 26, 1.11.C), and all waste manifests for the period (01 74 19, 1.5B). Only after meeting the requirements above for as-built update, schedule update, safety reports, progress photos, exposure-hours, & waste manifests will the government enterain review of the pencil copy invoice. Contractor shall utilize AIA forms G702/G703. Refer also to 01 00 00 1.14.C for more details.
01 32 16.15	**Project Schedules-Monthly Update & Pay Request & Progress Report**	1.7	Submit application for payment monthly. Additionally provide monthly progress report and/or redline as-built submittal. This submittal pkg includes updated schedule (01 32 16.15, 1.8), photographic milestones (01 00 00, 1.32.A), CHST/CSP monthly safety report (01 35 26, 1.10.B), exposure-hours worked roll-up (01 35 26, 1.11.C), and all waste manifests for the period (01 74 19, 1.5B). Only after meeting the requirements above for as-built update, schedule update, safety reports, progress photos, exposure-hours, & waste manifests will the government enterain review of the pencil copy invoice. Contractor shall utilize AIA forms G702/G703. Refer also to 01 00 00 1.14.C for more details.

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01 33 23	**Submittals - submittal log**	1.3.A	Submit submittal log/register in Excel format within 60 days of NTP. VA shall supply Excel template.
01 35 26	**Safety Requirements-APP**	1.5.C	Accident Prevention Plan required within 60 days of NTP; include all AHAs that you know will be part of the project (demolition, ladder work, electrical work, LO/TO)
01 35 26	**Safety Requirements-AHAs**	1.6.C.3	AHA #1 - if not included in APP; 15days prior to activity
01 35 26	**Safety Requirements-AHAs**	1.6.C.3	AHA #2 - if not included in APP; 15days prior to activity
01 35 26	**Safety Requirements-AHAs**	1.6.C.3	AHA #3 - if not included in APP; 15days prior to activity
01 35 26	**Safety Requirements-AHAs**	1.6.C.3	AHA #4 - if not included in APP; 15days prior to activity
01 35 26	**Safety Requirements-AHAs**	1.6.C.3	AHA #5 - if not included in APP; 15days prior to activity
01 35 26	**Safety Requirements- CHST/CSP qualification statement; third-party agreement**	1.8.F	Submit quals/certs for third-party CHST/CSP
01 35 26	**Safety Requirements-Training Docs**	1.9.E	Submit employee training records as requried and coordinate with OSHA certifications/SAC Forms/NDAs
01 35 26	**Safety Requirements-IC Plan**	1.13.C	Submit an overall infection control plan (GC policies and procedures); showing conformance with NFPA 241 and drawing expectations within 60 days of NTP. Note that each new jobsite/location/setup shall require a new IC plan. Coordinate with individual phasing plans. COR will open new submittals in OpCenter as requested by the GC.
01 35 26	**Safety Requirements-Fire Safety Plan**	1.16.A	Submit fire safety and egress plan - site specific - and in accordance with 29 CFR 1926 - within 60 days of NTP
01 74 19	**Construction Waste Management Plan**	1.5.A	Provide Construction Waste Management Plan within 60 days of NTP

01 74 19	**Construction Waste Management**	1.5.B	Monthly waste manifest summary report - see 01 32 16.15 monthly submittal requirement. Consolidate with single submittal if possible.
01 74 19	**Construction Waste Management**	1.5.C	Final Report - Waste management. Submit during closeout as a roll up of all waste generating and disposal activities.
01 81 13	**Sustainable Construction Requirements-Reports**	1.5.A	Within 30 days of Construction Kickoff Meeting (not NTP), provide narrative sustainability plan using spreadsheet attached at end of spec.
01 81 13	**Sustainable Construction Requirements-Reports**	1.5.C	Within 14 days after substantial completion provide final version of the tracking spreadsheet originally provided above

SECTION 01 35 26
SAFETY REQUIREMENTS

1.1 APPLICABLE PUBLICATIONS:

A. Latest publications listed below form part of this Article to extent referenced. Publications are referenced in text by basic designations only.

B. American Society of Safety Professionals (ASSP):
- A10.1-2011.....Pre-Project & Pre-Task Safety and Health Planning
- A10.34-2012.....Protection of the Public on or Adjacent to Construction Sites
- A10.38-2013.....Basic Elements of an Employer's Program to Provide a Safe and Healthful Work Environment American National Standard Construction and Demolition Operations
- Z359.0-2012.....Definitions and Nomenclature Used for Fall Protection and Fall Arrest
- Z359.1-2016.....The Fall Protection Code

C. American Society for Testing and Materials (ASTM):
- E84-2013.....Surface Burning Characteristics of Building Materials

D. The Facilities Guidelines Institute (FGI):
- FGI Guidelines-2010Guidelines for Design and Construction of Healthcare Facilities

E. National Fire Protection Association (NFPA):
- 10-2018.....Standard for Portable Fire Extinguishers
- 30-2018.....Flammable and Combustible Liquids Code
- 51B-2019.....Standard for Fire Prevention During Welding, Cutting and Other Hot Work
- 70-2020.....National Electrical Code
- 70B-2019.....Recommended Practice for Electrical Equipment Maintenance
- 70E-2018 .....Standard for Electrical Safety in the Workplace
- 241-2019.....Standard for Safeguarding Construction, Alteration, and Demolition Operations
- 703-2024.....Standard for Fire Retardant-Treated Wood and Fire-Retardant Coatings for Building Materials

F. The Joint Commission (TJC)
- TJC Manual .....Comprehensive Accreditation and Certification Manual

G. U.S. Nuclear Regulatory Commission
- 10 CFR 20 .....Standards for Protection Against Radiation

H. U.S. Occupational Safety and Health Administration (OSHA):
- 29 CFR 1904 .....Reporting and Recording Injuries & Illnesses
- 29 CFR 1910 .....Safety and Health Regulations for General Industry
- 29 CFR 1926 .....Safety and Health Regulations for Construction Industry
- CPL 2-0.124.....Multi-Employer Citation Policy

1.2 DEFINITIONS:

A. Critical Lift. A lift with the hoisted load exceeding 75% of the crane's maximum capacity; lifts made out of the view of the operator (blind picks); lifts involving two or more cranes; personnel being hoisted; and special hazards such as lifts over occupied facilities, loads lifted close to power-lines, and lifts in high winds or where other adverse environmental conditions exist; and any lift which the crane operator believes is critical.

B. OSHA "Competent Person" (CP). One who can identify existing and predictable hazards in the surroundings and working conditions which are unsanitary, hazardous, or dangerous to employees, and who has the authorization to take prompt corrective measures to eliminate them (see 29 CFR 1926.32(f)).

1. CP Confined Space. The CP Confined Space, is a person meeting the competent person requirements as defined by OSHA's Confined Space Standard with a thorough knowledge of 29 CFR 1910.146, and designated in writing to be responsible for the immediate supervision, implementation and monitoring of the confined space program, who through training, knowledge and experience in confined space entry is capable of identifying, evaluating and addressing existing and potential confined space hazards and, who has the authority to take prompt corrective measures with regard to such hazards.
2. CP Cranes and Rigging. The CP Cranes and Rigging is a person who has been designated in writing to be responsible for the immediate supervision, implementation and monitoring of the Crane and Rigging Program, who through training, knowledge and experience in crane and rigging is capable of identifying, evaluating and addressing existing and potential hazards and, who has the authority to take prompt corrective measures regarding such hazards.
3. CP Excavation/Trenching. The CP Excavation/Trenching, is a person meeting the competent person requirements as defined in 29 CFR 1926, who has been designated in writing to be responsible for the immediate supervision, implementation and monitoring of the excavation/trenching program, who through training, knowledge and experience in excavation/trenching is capable of identifying, evaluating and addressing existing and potential hazards and, who has the authority to take prompt corrective measures with regard to such hazards.
4. CP Fall Protection. The CP Fall Protection, is a person meeting the competent person requirements in accordance with ASSE/SAFE Z359.0, who has been designated in writing by the employer to be responsible for immediate supervising, implementing and monitoring of the fall protection program, who through training, knowledge and experience in fall protection and rescue systems and equipment, is capable of identifying, evaluating and addressing existing and potential fall hazards and, who has the authority to take prompt corrective measures with regard to such hazards.
5. CP Scaffolding. The CP Scaffolding is a person meeting the competent person requirements and designated in writing by the employer to be responsible for immediate supervising, implementing and monitoring of the scaffolding program. The CP for Scaffolding has enough training, knowledge and experience in scaffolding to

correctly identify, evaluate and address existing and potential hazards and has the authority to take prompt corrective measures with regard to these hazards. CP qualifications must be documented and include experience on the specific scaffolding systems/types being used, assessment of the base material that the scaffold will be erected upon, load calculations for materials and personnel, and erection and dismantling. The CP for scaffolding must have a documented, minimum of 8-hours of scaffold training to include training on the specific type of scaffold being used (e.g. mast-climbing, adjustable, tubular frame).

6. CP Trainer. The CP Trainer is qualified in the material presented, and who possesses a working knowledge of applicable technical regulations, standards, equipment and systems related to the subject matter on which they are training Competent Persons. A CP Trainer must be familiar with the typical hazards and the equipment used in the industry they are instructing. The training provided by the CP Trainer must be appropriate to that specific industry. The competent person trainer must evaluate the knowledge and skills of the competent persons as part of the training process.

C. High Risk Activities are activities that involve work at heights, crane and rigging, excavations and trenching, scaffolding, electrical work, and confined space entry.

D. "Qualified Person" (QP) means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, the work, or the project.

1. QP Fall Protection is a person meeting the requirements of ASSE/SAFE Z359.0, with a recognized degree or professional certificate and with extensive knowledge, training and experience in the fall protection and rescue field who is capable of designing, analyzing, and evaluating and specifying fall protection and rescue systems.

E. High Visibility Accident. Any mishap which may generate publicity or high visibility.

F. Mishap: A mishap is any unplanned, undesired event that occurs during the course of work being performed. This includes accidents, incidents, and near misses.

G, Mishap Criticality Categories

1. No impact/Near-Miss - Near miss incidents that shall be investigated and reported to the VA within 24 hours.
2. Minor incident/impact - Incidents that require first aid or result in minor equipment damage (less than $5,000). These incidents must be investigated and reported to the VA within 24 hours.
3. Moderate incident/impact - Any work-related injury or illness that results in any of the following. These incidents must be investigated and are required to be reported to the VA within two (2) hours.

   a. Days away from work (time lost after day of injury)
   b. Restricted work
   c. Transfer to another job
   d. Medical treatment beyond first aid

e. Loss of consciousness
f. A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in (a) through (e) above or,
g. Any incident that leads to major equipment damage (greater than $5,000).

4. Major incident/impact – A mishap that leads to fatalities, hospitalizations, amputations, and losses of an eye as a result of contractors' activities. An incident which leads to major property damage (greater than $20,000) and/or may generate publicity or high visibility. These incidents must be investigated and are required to be reported to the VA as soon as practical, but not later than two (2) hours after the incident.

H. Load Handling Equipment (LHE). LHE is a term used to describe cranes, hoists and all other hoisting equipment (hoisting equipment means equipment, including crane, derricks, hoists and power operated equipment used with rigging to raise, lower or horizontally move a load).
I. Medical Treatment. Treatment administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first aid treatment even through provided by physician or registered personnel.

1.3 SUBMITTAL REQUIREMENTS:

A. Preconstruction Submittals. **Submit the following in accordance with Section 01 33 23 SUBMITTALS within 60 calendar days of the Notice to Proceed meeting.**

1. Accident Prevention Plan (APP) to support the requirements of Section 1.5. Mobilization cannot proceed without an accepted APP.
2. Project Manager, Superintendent, SSHO, QCM memorandum of designation (see 01 00 00 GENERAL REQUIREMENTS).
3. Training records for SSHO and CPs/QPs to support the requirements of Section 1.10.
4. OSHA 10-hour certificates are required for all workers on site and the OSHA 30-hour certificates are required for Trade CPs and QPs, SSHO, CSP/CSHT, and Superintendent. (OSHA 10 & 30 certificates must be dated within the last five (5) years, or they will be considered VOID.)
5. Fire Safety Plan to support the requirements of Section 1.17.

B. B. Reports During Construction (as required)

1. Monthly Contractor Health Safety and Environmental (HS&E) Performance Report
2. Notifications and Reports
3. Mishap Reports
4. Near-Miss Reports
5. LHE Inspection Reports
6. Monthly Exposure Hour Reports

C. Work Plans (as required)

1. Standard Lift Plan
2. Critical Lift Plan

3. Activity Hazard Analysis (AHA)
4. Confined Space Entry Permit
5. Hot Work Permit
6. Radiography Operation Planning Worksheet
7. Portable Gauge Operations Planning Worksheet

D. Certificates of Training for CP, QP (as required)

1. Contractor Safety Self-Evaluation Checklist
2. Crane Operators/Riggers Certifications
3. Certificate of Compliance
4. Mobile Cranes Inspection Certificate
5. License Certificates
6. Machinery & Mechanized Equipment Certification Form

1.4 REGULATORY REQUIREMENTS

A. In addition to the detailed requirements included in the provisions of this contract, comply with 29 CFR 1926, 29 CFR 1910 as incorporated by reference within 29 CFR 1926, ASSP A10.34, and all applicable federal, state, and local laws, ordinances, criteria, rules and regulations. Submit matters of interpretation of standards for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements govern except with specific approval and acceptance by the COR.

1.5 ACCIDENT PREVENTION PLAN (APP):

A. The APP (aka Construction Safety & Health Plan) shall interface with the Contractor's overall safety and health program. Include any portions of the Contractor's overall safety and health program referenced in the APP in the applicable APP element and ensure it is **site-specific**. The Government considers the Contractor to be the "controlling authority" for all worksite safety and health of each subcontractor(s). The Contractor shall be responsible for informing their subcontractors of the safety provisions under the terms of the contract and the penalties for noncompliance, coordinating the work to prevent one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out.

B. The APP shall be prepared as follows:

1. Written in English by a qualified person who is employed by the Contractor articulating the specific work and hazards pertaining to the contract (model language can be found in ASSE A10.33). Specifically articulating the safety requirements found within these VA contract safety specifications.
2. Address both the Contractor’s and the subcontractor’s work operations.
3. States measures to be taken to control hazards associated with materials, services, or equipment provided by suppliers.
4. Address all the elements/sub-elements and in order as follows:

a. **SIGNATURE SHEET.** Title, signature, and phone number of the following:

1) Plan preparer (Qualified Person such as corporate safety staff person or contracted Certified Safety Professional with construction safety experience)
2) Plan approver (company/corporate officers authorized to obligate the company)
3) Plan concurrence (e.g., Chief of Operations, Corporate Chief of Safety, Corporate Industrial Hygienist, project manager or superintendent, project safety professional). Provide concurrence of other applicable corporate and project personnel (Contractor).

b. **BACKGROUND INFORMATION.** List the following:

1) Contractor,
2) Contract number,
3) Project name, and
4) Brief project description, description of work to be performed, and location; phases of work anticipated (these will require an AHA).

c. STATEMENT OF SAFETY AND HEALTH POLICY. Provide a copy of current corporate/company Safety and Health Policy Statement, detailing commitment to providing a safe and healthful workplace for all employees. The Contractor's written safety program goals, objectives, and accident experience goals for this contract should be provided. The Statement of Safety and Health Policy must be signed by a company executive.

d. **RESPONSIBILITIES & LINES OF AUTHORITIES.** Provide the following:

1) A statement of the employer's ultimate responsibility for the implementation of his SOH program.
2) Identification and accountability of personnel responsible for safety at both corporate and project level. Contracts specifically requiring safety or industrial hygiene personnel shall include a copy of their resumes.
3) The names of Competent and/or Qualified Person(s) and proof of competency/qualification to meet specific OSHA Competent/ Qualified Person(s) requirements must be attached.
4) A statement that no work shall be performed unless a designated competent person is present on the job site.
5) Requirements for pre-task Activity Hazard Analysis (AHAs).
6) Lines of authority.
7) Policies and procedures regarding noncompliance with safety requirements (including disciplinary actions for violation of safety requirements) should be identified.

e. **SUBCONTRACTORS AND SUPPLIERS.** Provide procedures for coordinating SOH activities with other employers on the job site.

1) Identification of subcontractors and suppliers (if known).
2) Safety responsibilities of subcontractors and suppliers.

f. **TRAINING**

1) Site-specific SOH orientation training at the time of initial hire or assignment to the project for every employee before working on the project site is required.

2) Mandatory training and certifications that are applicable to this project (including crane operator, rigger, crane signal person, fall protection, electrical lockout/NFPA 70E, machine/equipment lockout, or confined space) and any requirements for periodic retraining/recertification are required.
3) Procedures for ongoing safety and health training for supervisors and employees shall be established to address changes in site hazards/conditions.
4) **OSHA 10-hour training is required for all workers on site and the OSHA 30-hour training is required for Trade Competent Persons (CPs), SSHO, CSP/CSHT and Superintendent. Both OSHA 10 and 30 certificates must be dated within the last five (5) years or they will be considered VOID.**

g. **SAFETY AND HEALTH INSPECTIONS**

1) Specific assignment of responsibilities for a minimum daily job site safety and health inspection during periods of work activity: Who will conduct (e.g., "Site Safety and Health CP"), proof of inspector's training/qualifications, when inspections will be conducted, procedures for documentation, deficiency tracking system, and follow-up procedures.
2) Any external inspections/certifications that may be required (e.g., contracted CSP or CSHT).

h. **ACCIDENT/INCIDENT INVESTIGATION & REPORTING.** The Contractor shall conduct mishap investigations of all Moderate and Major as well as all High Visibility Incidents. The APP shall include accident/incident investigation procedure and identify person(s) responsible for providing the following to the COR:

1) Monthly HS&E Performance Report (exposure hours daily).
2) Mishap Investigation Reports.
3) Project site injury and illness logs.
4) Near-Miss Reports.

i. **PLANS (PROGRAMS, PROCEDURES) REQUIRED.** Based on a risk assessment of contracted activities and on mandatory OSHA compliance programs, the Contractor shall address all applicable occupational, patient, and public safety risks in site-specific compliance and accident prevention plans. These Plans shall include but are not be limited to procedures for addressing the risks associates with the following:

1) Emergency response
2) Contingency for severe weather
3) Fire Prevention
4) Medical Support
5) Posting of emergency telephone numbers
6) Prevention of alcohol and drug abuse
7) Site sanitation (housekeeping, drinking water, toilets)
8) Night operations and lighting
9) Hazard communication program
10) Welding/Cutting "Hot" work
11) Electrical Safe Work Practices (Electrical LOTO/NFPA 70E)
12) General Electrical Safety

13) Hazardous energy control (Machine LOTO)
14) Site-Specific Fall Protection & Prevention
15) Excavation/trenching (Excavation Permit included as appendix) and Include Excavation Permit as appendix to this spec.
16) Asbestos abatement
17) Lead abatement
18) Crane Critical lift
19) Respiratory protection
20) Health hazard control program
21) Radiation Safety Program
22) Abrasive blasting
23) Heat/Cold Stress Monitoring
24) Crystalline Silica Monitoring (Assessment)
25) Demolition plan (to include engineering survey)
26) Formwork and shoring erection and removal
27) Pre-Cast Concrete
28) Public (Mandatory compliance with ANSI/ASSE A10.34-2012)
29) Sub-contractor or cross-trade coordination

C. **Submit the APP in accordance with Section 01 33 23 SUBMITTALS, RFIS, AND CBS within 60 calendar days of the Notice to Proceed meeting.** Mobilization cannot proceed without an accepted APP.
D. Once approved, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP will be cause for stopping of work, at the discretion of the Contracting Officer in accordance with FAR Clause 52.236-13, *Accident Prevention*, until the matter has been rectified.
E. Once work begins, changes to the accepted APP shall be made with the knowledge and concurrence of the COR, facility construction Safety Officer, project superintendent, and SSHO. Should any severe hazard exposure, i.e., imminent danger, become evident, stop work in the area, secure the area, and develop a plan to remove the exposure and control the hazard. Notify the Contracting Officer within 24 hours of discovery. Eliminate/remove the hazard. In the interim, take all necessary action to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public and the environment.

1.6 ACTIVITY HAZARD ANALYSES (AHAS):

A. AHAs are also known as Job Hazard Analyses, Job Safety Analyses, and Activity Safety Analyses. Before beginning each work activity involving a type of work presenting hazards not experienced in previous project operations or where a new work crew or sub-contractor is to perform the work, the Contractor(s) performing that work activity shall prepare an AHA (sample electronic AHA forms can be found on the US Army Corps of Engineers web site).
B. AHAs shall define the activities being performed and identify the work sequences, the specific anticipated hazards, site conditions, equipment, materials, and the control measures to be implemented to eliminate or reduce each hazard to an acceptable level of risk.
C. Work shall not begin until the AHA for the work activity has been accepted by the COR and discussed with all engaged in the activity, including the Contractor, subcontractor(s), and facility construction Safety Officer at preparatory and initial control phase meetings.

1. The names of the CP/QP required for a particular activity (for example, excavations, scaffolding, fall protection, other activities as specified by OSHA and/or other State and Local agencies) shall be identified and included in the AHA. Certification(s) of their competency/qualification shall be submitted to the COR for acceptance prior to the start of that work activity.
2. The AHA shall be reviewed and modified as necessary to address changing site conditions, operations, or change of competent/ qualified person(s).

   a. If more than one CP/QP is used on the AHA activity, a list of names shall be submitted as an attachment to the AHA. Those listed must be Competent/Qualified for the type of work involved in the AHA and familiar with current site safety issues.
   b. If a new CP/QP (not on the original list) is added, the list shall be updated (an administrative action not requiring an updated AHA). The new person shall acknowledge in writing that he or she has reviewed the AHA and is familiar with current site safety issues.

3. **Submit AHAs in accordance with Section 01 33 23 SUBMITTALS, RFIS, AND CBS with the Accident Prevention Plan (APP); or at least 15 calendar days prior to the start of that specific activity.** Subsequent AHAs as shall be formatted as amendments to the APP. The analysis should be used during daily inspections to ensure the implementation and effectiveness of the activity's safety and health controls.
4. The AHA list will be reviewed periodically (at least monthly) at the Contractor supervisory safety meeting and updated as necessary when procedures, scheduling, or hazards change.
5. Develop the AHAs using the project schedule as the basis for the activities performed. All activities listed on the project schedule will require an AHA. The AHAs will be developed by the contractor, supplier, or subcontractor and provided to the Contractor for review and approval and then submitted to the COR.

1.7 NTP, CONSTRUCTION KICKOFF, AND SAFETY MEETINGS:

A. Notice to Proceed (NTP) will start the contractor’s “clock” for pre-construction submittals. The NTP is separate from and mutually exclusive of the Construction Kickoff Meeting. The date of NTP starts the preconstruction submittal timeline. Only the COR, Contracting Officer, and General Contractor are required at the NTP Meeting.
B. The Construction Kickoff Meeting will be coordinated by the COR and will be held 30-60 days after the NTP meeting, depending upon preconstruction submittal approvals and the planned mobilization date. It will include the Contractor, VA shops, OIT, EMS, SCM, HTM, Safety, VA Police, Infection Control Nurse, and Users. Contractor representatives who have a responsibility or significant role in implementation of the APP, as required by 29 CFR 1926.20(b)(1), shall attend the Construction Kickoff Meeting to gain a mutual understanding of its implementation. This includes the project superintendent, subcontractor superintendents, and any other assigned safety and health professionals.
C. Contractor representatives who have a responsibility or significant role in implementation of the accident prevention program, as required

by 29 CFR 1926.20(b)(1), on the project shall attend the Construction Kickoff Meeting to gain a mutual understanding of its implementation. This includes the project superintendent, subcontractor superintendents, and any other assigned safety and health professionals.

D. Discuss the details of the submitted APP to include incorporated plans, programs, procedures, and a listing of anticipated AHAs that will be developed and implemented during the performance of the contract. This list of proposed AHAs will be reviewed at the conference and an agreement will be reached between the Contractor and the COR as to which phases will require an AHA. In addition, establish a schedule for the preparation, submittal, review, and acceptance of AHAs to preclude project delays.

E. Deficiencies in the submitted APP will be brought to the attention of the Contractor within 14 calendar days of submittal, and the Contractor shall revise the plan to correct deficiencies and re-submit it for acceptance. Do not begin work until there is an accepted APP.

F. Conduct safety meetings to review past activities, plan for new or changed operations, review pertinent aspects of appropriate AHA (by trade), establish safe working procedures for anticipated hazards, and provide pertinent Safety and Occupational Health (SOH) training and motivation. Conduct meetings at least once a month for all supervisors on the project location. The SSHO, supervisors, foremen, or CDSOs must conduct meetings at least once a week for the trade workers. Document meeting minutes to include the date, persons in attendance, subjects discussed, and names of individual(s) who conducted the meeting. Maintain documentation on-site and furnish copies to the Contracting Officer on request. Notify the Contracting Officer of all scheduled meetings seven calendar days in advance.

1.8 PROJECT MANAGER, SUPERINTENDENT, SITE SAFETY AND HEALTH OFFICER (SSHO), COMPETENT PERSONS (CP), QUALITY CONTROL MANAGER (QCM), AND CONSTRUCTION HEALTH AND SAFETY TECHNICIAN(CHST)/CERTIFIED SAFETY PROFESSIONAL (CSP):

A. The General Contractor shall designate a full-time Project Manager for the contract. The Project Manager shall be an employee of the General Contractor. The Project Manager shall be OSHA 30 qualified, current within the past five years.

B. The General Contractor shall designate a full-time Superintendent for the contract. The Superintendent shall be an employee of the General Contractor. This individual shall exclusively superintend the work on the contract, including all subcontractors, vendors, and suppliers, and shall not superintend any other contracts on the VA Milwaukee campus during the approved construction schedule. The Project Superintendent shall be OSHA 30 qualified, current within the past five years.

   a. The Superintendent and Project Manager shall not be the same individual.
   b. The Superintendent shall be available to the COR or VA Safety Officer on the project site during work.
   c. The Superintendent may not perform any duties for the sub-contractor as a designated competent person.

C. The General Contractor shall designate a full-time Site Safety and Health Officer (SSHO) for the contract. The SSHO shall be an employee of the General Contractor. This individual shall administer the

General Contractor's Safety Program and government-accepted Accident Prevention Plan (APP). The SSHO shall have no other duties. The SSHO shall hold a current professional safety certification and have at least three (3) years of dedicated construction safety related experience. The SSHO shall ensure that the requirements of the VA and of 29 CFR 1926.16 are met for the project. The SSHO must be at the work site at all times during construction activities. The Superintendent and SSHO shall not be the same individual. If the SSHO is off-site for a period longer than one shift (8 hours), and not exceeding five shifts (40 hours), a pre-approved Alternate SSHO shall be provided and shall fulfill the same roles and responsibilities as the primary SSHO. The Alternate SSHO shall have the same required training, experience, and qualifications as the SSHO. When the SSHO is temporarily (not to exceed 8 hours) off-site, a Designated Representative (DR) from the Prime Contractors' staff, as identified in the APP or AHA may be used in lieu of an Alternate SSHO and shall be on the project site, at all times, when work is being performed. Note that the DR is a collateral duty safety position, with safety duties in addition to their full-time occupation.

D. Each sub-contractor shall designate a minimum of one CP in compliance with 29 CFR 1926.20 (b)(2) that will be identified as a CP to administer their individual safety programs. All specialized Competent Persons for the work crews will be supplied by the respective sub-contractors as required by 29 CFR 1926 (i.e., Asbestos, Plumbing, Electrical, Cranes & Derricks, Demolition, Fall Protection, Fire Safety/Life Safety, Ladder, Rigging, Scaffolds, and Trenches/ Excavations).

   1. Competent Persons may have collateral duties as the sub-contractor's superintendent and/or work crew lead persons as well as fill more than one specialized CP role.
   2. The repeated presence of uncontrolled hazards during a sub-contractor's work operations will result in the designated CP as being deemed incompetent and result in the required removal of the employee in accordance with FAR Clause 52.236-5: Material and Workmanship, Paragraph (c).

E. The General Contractor shall designate a full-time Quality Control Manager (QCM) and Communications Project Manager (CPM) for the contract. The QCM/CPM may be an employee of the General Contractor or may be from the lead telecommunications subcontractor and shall be a separate and qualified individual from the General Contractor's Project Manager, Superintendent, and Safety Professional/SSHO.

F. The General Contractor shall designate a third-party Certified Health and Safety Technician (CHST) or Certified Safety Professional (CSP) for the contract. The CHST/CSP shall sub-contract these services. Refer to 1.10 INSPECTIONS for CHST/CSP requirements and duties. The CHST/CSP shall not be the same individual as the Project Manager, QCM/CPM, Superintendent, or SSHO. **Submit qualifications and certifications for this third-party CHST/CSP in accordance with Section 01 33 23 SUBMITTALS, RFIS, AND CBS within 60 calendar days of the Notice to Proceed meeting.**

G. The Superintendent and SSHO shall maintain a presence on the site during construction operations in accordance with FAR Clause 52.236-6: *Superintendence by the Contractor*. CPs will maintain presence during

their construction activities in accordance with the above-mentioned clause. **A listing of the designated Project Manager, Superintendent, SSHO, QCM/CPM, CHST/CSP and all known CPs shall be submitted prior to the start of work** in conjunction with the APP or the training documentation as listed in the Training Section below.

H. Any deviation from portions of Section 1.8 must be approved by the VA Projects Supervisor or Chief Engineer in writing.

1.9 TRAINING:

A. The General Contractor's Superintendent and SSHO shall meet the requirements of all applicable OSHA standards and be capable (through training, experience, and qualifications) of ensuring that the requirements of 29 CFR 1926.16 and other appropriate Federal, State, and local requirements are met for the project. As a minimum the individuals shall have completed the OSHA 30-hour Construction Safety class and have five (5) years of construction industry safety experience or three (3) years if he/she possesses a Certified Safety Professional (CSP) or certified Construction Safety and Health Technician (CSHT) certification or have a safety and health degree from an accredited university or college.

B. All designated CPs shall have completed the OSHA 30-hour Construction Safety course within the past five (5) years.

C. In addition to the OSHA 30 Hour Construction Safety Course, all CPs with high hazard work operations such as operations involving asbestos, electrical, cranes, demolition, work at heights/fall protection, fire safety/life safety, ladder, rigging, scaffolds, and trenches/ excavations shall have a specialized formal course in the hazard recognition & control associated with those high hazard work operations. Documented "repeat" deficiencies in the execution of safety requirements will require retaking the requisite formal course.

D. All other construction workers shall have the OSHA 10-hour Construction Safety Outreach course and any necessary safety training to be able to identify hazards within their work environment. OSHA 10-hour certifications must be current within the last five years.

E. **Submit training records associated with the above training requirements in accordance with Section 01 33 23 SUBMITTALS, RFIS, AND CBS within 60 calendar days of the Notice to Proceed meeting.**

F. Prior to any worker for the contractor or subcontractors beginning work, they shall undergo a safety briefing provided by the Superintendent/SSHO or his/her designated representative. As a minimum, this briefing shall include information on the site-specific hazards, construction limits, VAMC safety guidelines, means of egress, break areas, work hours, locations of restrooms, use of VAMC equipment, emergency procedures and accident reporting. Documentation shall be provided to the COR that individuals have undergone contractor's safety briefing.

G. Ongoing safety training will be accomplished in the form of weekly documented safety meeting (i.e., "Toolbox Talks".)

1.10 INSPECTIONS:

A. The Superintendent and SSHO shall conduct DAILY safety inspections of the site and each of the subcontractors CPs shall conduct DAILY safety inspections of their work operations as required by 29 CFR 1926.20(b)(2). Each week, the Superintendent/SSHO shall conduct a

formal documented inspection of the entire construction areas with the subcontractors' "Trade Safety and Health CPs" present in their work areas. Coordinate with, and report findings and corrective actions weekly to the COR.

B. A Certified Safety Professional (CSP) with specialized knowledge in construction safety or a certified Construction Safety and Health Technician (CSHT) shall randomly conduct a monthly site safety inspection. **Submit Safety Report each month in accordance with Section 01 33 23 SUBMITTALS, RFIS, AND CBS in conjunction with other monthly requirements (pay requests, progress reports, exposure hours, schedule updates, project photos). See Section 01 00 00 and 01 32 16.15 for additional information.** The CSP or CSHT shall be a third-party and independently contracted individual. The CSP or CSHT will provide their certificate number on the required report for verification as necessary.

1. Results of the monthly inspections shall be documented with tracking of the identified hazards to abatement.
2. The COR shall be notified immediately prior to start of the inspection and invited to accompany the inspection.
3. Identified hazard and controls shall be discussed to come to a mutual understanding to ensure abatement and prevent future reoccurrence.
4. A report on the inspection findings with status of abatement shall be provided to the COR within one week of the onsite inspection.

1.11 MISHAPS, OSHA 300 LOGS, AND EXPOSURE-HOURS:

A. The Contractor shall establish and maintain a Near-Miss and Mishap reporting, recordkeeping, and analysis system to track and analyze all injuries and illnesses, high visibility incidents, and accidental property damage (both government and contractor) that occur on site. Notify and provide an initial report to the COR as soon as practical, but no more than two hours after any Moderate or Major Mishap, High Visibility Incidents, or any weight handling and hoisting equipment mishap. No Impact/Near-Miss and Minor Mishaps shall be reported within 24 hours or as soon as practical. Within the notification the sender shall include contractor name; contract title; type of contract; name of activity, installation or location where mishap occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of mishap (to include type of construction equipment used and PPE used). Preserve the conditions and evidence on the Mishap site until the COR determines whether a government investigation will be conducted.

B. Conduct a mishap investigation for all Mishaps including mishaps resulting in at least $20,000 in damages without injury, to establish the root cause(s) of the mishap. The Mishap investigation shall include images, five whys, the injured person's firsthand account, any witness accounts, methods of procedures, related AHA to the task, and corrective action plan signed by the president, vice president, or appropriate corporate-level leadership identified in the company's org chart for the project. Additionally, complete the VA Form 2162 (or equivalent) and provide the report to the COR within seven (7) calendar days of the accident. The COR will provide copies of any required or special forms.

C. **Submit a summation of all exposure-hours worked by the Contractor and associated sub-contractors for each month in accordance with Section 01 33 23 SUBMITTALS, RFIS, AND CBS in conjunction with other monthly requirements (pay requests, progress reports, safety reports, schedule updates, project photos). See Section 01 00 00 and 01 32 16.15 for additional information.**
D. A summation of all Minor, Moderate, and Major incidents experienced on site by the Contractor and associated sub-contractors for each month will be provided to the COR monthly. The Contractor and associated sub-contractors' OSHA 300 logs will be made available to the COR upon request.

1.12 PERSONAL PROTECTIVE EQUIPMENT (PPE):

A. PPE is governed in all areas by the nature of the work the employee is performing. For example, specific PPE required for performing work on electrical equipment is identified in NFPA 70E, Standard for Electrical Safety in the Workplace.
B. Any PPE above and beyond the Mandatory PPE identified below and determined by the Contracting Officer or their Representative to be necessary in the performance of the Governments duties relative to this contract, shall be provided to the Government upon written notification by the Contracting Officer and at no additional expense to the Government. All PPE provided to the Government shall also be accompanied by any relevant or required training necessary to ensure its proper use.
C. Mandatory Minimum PPE includes:

1. Hard Hats – Unless written authorization is given by the Contracting Officer Representative in circumstances of work operations that have limited potential for falling object hazards such as during finishing work or minor remodeling. With authorization to relax the requirement of hard hats, if a worker becomes exposed to an overhead falling object hazard, then hard hats would be required in accordance with the OSHA regulations.
2. Safety glasses - Unless written authorization is given by the Contracting Officer Representative in circumstances of no eye hazards, appropriate safety glasses meeting the ANSI Z.87.1 standard must be worn by each person on site.
3. Appropriate Safety Shoes – Based on the hazards present, safety shoes meeting the requirements of ASTM F2413-11 shall be worn by each person on site unless written authorization is given by Contracting Officer Representative in circumstances of no foot hazards.
4. Hearing protection - Use personal hearing protection at all times in designated noise hazardous areas or when performing noise hazardous tasks.
5. High-visibility Safety Apparel – Appropriate brightly colored clothing that feature some type of reflective material on them, such as safety vests, shall be worn by personnel or visitors on construction sites.

1.13 PRE-CONSTRUCTION & INFECTION CONTROL RISK ASSESSMENT (PCRA/ICRA)

A. Control of all construction-associated hazards that affect VA medical facilities, their occupants, services and mission-essential functions and capabilities is critical in all medical center facilities.
B. A draft Preconstruction Risk Assessment (PCRA) for construction is included as Appendix A to this specification. The PCRA identifies the potential hazards present in this contract solicitation as well as the required mitigations. The PCRA will be formalized and reviewed in detail at the Construction Kickoff Meeting with the General Contractor and their team. A PCRA permit (see last page of Appendix A) will be issued by the government. There will be as many PCRA permits as phases of the work. PCRAs are also used to create individual Infection Control Risk Assessment (ICRA) permits for each phase of the project.
C. Infection Prevention is critical. Interior construction activities causing disturbance of existing dust, or creating new dust, must be conducted within ventilation-controlled areas that minimize the flow of airborne particles into patient areas. A detailed analysis of potential risks for infectious disease transmission affecting the care, treatment or services of patients or residents will be conducted by stakeholders, the COR, the Infection Preventionist(s) and the Contractor. The completed and signed PCRA permit serves as the baseline for the ICRA permit. Appendix B to this specification contains the guidelines and requirements for the issuance of an ICRA permit. ICRA permits shall be issued by the VA Infection Preventionist and will be enforced during this project to include required mitigation actions/activities. ICRAs will be re-validated and updated as needed based on changes in original designs, affected individuals, area(s) or location(s), scope, contractor means and methods, infection prevention and control requirements, differing site conditions, phasing, contractor competencies and capabilities, and infectious disease outbreaks.
D. Regarding dust control, the Contractor shall verify that dust will not be introduced into the facility through intake vents or building openings. HEPA filtration on intake vents is required where dust may be introduced. Dust created from disturbance of soil such as from vehicle movement will be wetted with use of a water truck as necessary. All cutting, drilling, grinding, sanding, or disturbance of materials shall be accomplished with tools equipped with either local exhaust ventilation (i.e. vacuum systems) or wet suppression controls.
E. A dust and infection control program shall be established and maintained as part of the Contractor’s Infection Control preventive measures (workplan) utilizing the FGI Guidelines for Design and Construction of Healthcare Facilities as a reference. Prior to start of work, and in accordance with the Contract Documents, **prepare an Infection Control Plan detailing project-specific dust protection measures with associated product data, and submit in accordance with Section 01 33 23 SUBMITTALS, RFIS, AND CBS within 60 calendar days of the Notice to Proceed meeting**.
F. Products and Materials. The GC is responsible for the following:

1. Fire retardant polyethylene, 6-mil thickness meeting local fire codes.
2. Barrier Doors: Self-closing, one-hour, fire-rated in steel frame, painted.

3. Dust-proof, one-hour, fire-rated drywall.
4. High Efficiency Particulate Air (HEPA) equipped filtration machine rated at 95% capture of 0.3 microns including pollen, mold spores and dust particles. HEPA filters should have ASHRAE 85 or other prefilters to extend the useful life of the HEPA filter. Provide both primary and secondary filtrations units. Maintenance of equipment and replacement of the HEPA filters and other filters will be in accordance with manufacturer's instructions.
5. Multi-channel particulate counter; capable of measuring down to 0.3 microns.
6. Exhaust Hoses: Heavy duty, flexible steel reinforced ventilation Blower Hose.
7. Adhesive Walk-off Mats: Provide minimum size mats of 24 inches x 36 inches.
8. Disinfectant: EPA-registered, hospital-approved disinfectant or equivalent product.
9. Portable Ceiling Access Module (Shark Tank or "Minty").

1.14 TUBERCULOSIS SCREENING – NOT USED

1.15 FIRE SAFETY

A. Fire Safety Plan: Establish and maintain a site-specific fire protection program in accordance with 29 CFR 1926. **Prior to start of work, prepare and submit a plan detailing project-specific fire safety measures, including periodic status reports in accordance with Section 01 33 23 SUBMITTALS, RFIS, AND CBS within 60 calendar days of the Notice to Proceed meeting.** This plan may be an element of the Accident Prevention Plan.
B. Site and Building Access: Maintain free and unobstructed access to facility emergency services and for fire, police and other emergency response forces in accordance with NFPA 241.
C. For work occurring at a VA medical facility, coordinate with the facility Safety Manager/Officer, as several aspects of this section directly relate to interim life safety measures required in or adjacent to construction affecting occupied buildings accredited by The Joint Commission.
D. Separate temporary facilities, such as trailers, storage sheds, and dumpsters, from existing buildings and new construction by distances in accordance with NFPA 241. For small facilities with less than 20 feet exposing overall length, separate by 10 feet.
E. Temporary Construction Partitions:

1. Install and maintain temporary construction partitions to provide smoke-tight and fire-resistive separations between construction areas and adjoining areas. Construct partitions of fire-rated gypsum board on both sides of fire-retardant metal steel studs. Extend the partitions through suspended ceilings to floor slab deck or roof. Seal joints and penetrations with and approved fire-stopping material. At door openings, install Class C, ¾ hour fire-rated doors with self-closing devices.
2. Install 1-hour fire-rated temporary construction partitions as shown 1n drawings to maintain integrity of existing exit stair enclosures, exit passageways, fire-rated enclosures of hazardous areas, horizontal exits, smoke barriers, vertical shafts and openings enclosures.

3. Close openings in smoke barriers and fire-rated construction to maintain fire ratings. Seal penetrations with listed through-penetration firestop materials in accordance with Section 07 84 00, FIRESTOPPING.

F. Temporary Heating and Electrical: Install, use and maintain installations in accordance with 29 CFR 1926, NFPA 241 and NFPA 70.
G. Means of Egress: Do not block exiting for occupied buildings, including paths from exits to roads. Minimize disruptions and coordinate with the COR.
H. Egress Routes for Construction Workers: Maintain free and unobstructed egress. Inspect daily. Report findings and corrective actions weekly to the COR.
I. Fire Extinguishers: Provide and maintain extinguishers in construction areas and temporary storage areas in accordance with 29 CFR 1926, NFPA 241 and NFPA 10.
J. Flammable and Combustible Liquids: Store, dispense and use liquids in accordance with 29 CFR 1926, NFPA 241 and NFPA 30.
K. Existing Fire Protection: Do not impair automatic sprinklers, smoke and heat detection, and fire alarm systems, except for portions immediately under construction, and temporarily for connections. Provide fire watch for impairments more than four hours in a 24-hour period. Request interruptions in accordance with the specifications and coordinate with the COR. Temporary fire protection systems (heat detectors) located in construction areas shall be tested as coordinated with the specifications. Parameters for the testing and results of any tests performed shall be recorded by the medical center and copies provided to the COR.
L. Smoke Detectors: Prevent accidental operation. Remove temporary covers at end of work operations each day. Coordinate with the COR.
M. Hot Work: Perform and safeguard hot work operations in accordance with NFPA 241 and NFPA 51B. Coordinate with COR and obtain permits at least 48-hours in advance. Designate contractor's responsible project-site fire prevention program manager to permit hot work.
N. Fire Hazard Prevention and Safety Inspections: Inspect entire construction areas weekly. Coordinate with, and report findings and corrective actions weekly to COR.
O. Smoking: Smoking is prohibited at VAMC Milwaukee.
P. Dispose of waste and debris in accordance with NFPA 241. Remove from buildings daily. Refer to CONSTRUCTION WASTE MANAGEMENT Specification 01 74 19.
Q. If required, submit documentation to the COR that personnel have been trained in the fire safety aspects of working in areas with impaired structural or compartmentalization features.

1.16 ELECTRICAL

A. All electrical work shall comply with NFPA 70 (NEC), NFPA 70B, NFPA 70E, 29 CFR Part 1910 Subpart J - General Environmental Controls, 29 CFR Part 1910 Subpart S - Electrical, and 29 CFR 1926 Subpart K in addition to other references required by contract.
B. Qualified persons performing electrical work under this contract shall be licensed journeyman or master electricians. All apprentice electricians performing under this contract shall be deemed unqualified persons unless they are working under the immediate supervision of a licensed electrician or master electrician.

C. Electrical work shall be accomplished de-energized and in the Electrically Safe Work Condition (refer to NFPA 70E for Work Involving Electrical Hazards, including Exemptions to Work Permit). A Contractor, subcontractor, or temporary worker who fails to fully comply with this requirement is subject to immediate termination in accordance with FAR clause 52.236-5(c). Only in exceedingly rare circumstances is energized work permitted. The Chief Engineer with approval of the Medical Center Director will make the determination if the circumstances would meet the exception outlined above. An AHA and permit specific to energized work activities will be developed, reviewed, and accepted by the VA prior to the start of that activity.

1. Development of a Hazardous Electrical Energy Control Procedure is required prior to de-energization. A single Simple Lockout/Tagout Procedure for multiple work operations can only be used for work involving qualified person(s) de-energizing one set of conductors or circuit part source. Task specific Complex Lockout/Tagout Procedures are required at all other times.
2. Verification of the absence of voltage after de-energization and lockout/tagout is NOT considered "energized electrical work" (live work) under NFPA 70E, and shall only be performed by qualified persons wearing appropriate shock protective (voltage rated) gloves and arc rate personal protective clothing and equipment, using Underwriters Laboratories (UL) tested and appropriately rated contact electrical testing instruments or equipment appropriate for the environment in which they will be used.
3. Personal Protective Equipment (PPE) and electrical testing instruments will be readily available for inspection by the COR.

D. Before beginning electrical work, an Activity Hazard Analysis (AHA) shall be conducted to include Shock Hazard and Arc Flash Hazard analyses (NFPA Tables can be used only as a last alterative and it is strongly suggested a full Arc Flash Hazard Analyses be conducted). Work shall not begin until the AHA for the work activity and permit for energized work has been reviewed and accepted by the COR and discussed with all engaged in the activity, including the Contractor, subcontractor(s), and Government on-site representatives at preparatory and initial control phase meetings.

E. Ground-fault circuit interrupters. GFCI protection shall be provided where an employee is operating or using cord- and plug-connected tools related to construction activity supplied by 125-volt, 15-, 20-, or 30-ampere circuits. Where employees operate or use equipment supplied by greater than 125-volt, 15-, 20-, or 30- ampere circuits, GFCI protection or an assured equipment grounding conductor program shall be implemented in accordance with NFPA 70E - 2015, Chapter 1, Article 110.4(C)(2).

1.17 FALL PROTECTION

A. The fall protection (FP) threshold height requirement is 4ft in government-occupied sites, unless the OSHA 29 CFR 1926 requirements are more stringent, to include steel erection activities, systems-engineered activities (prefabricated) metal buildings, residential (wood) construction and scaffolding work. For work occurring at new "greenfield" sites or sites with 24/7 Contractor controlled 100% restricted access, the fall protection (FP) threshold height may be

increased to 6ft unless the OSHA 29 CFR 1926 requirements are more stringent.

1. The use of a Safety Monitoring System (SMS) as a fall protection method is prohibited.
2. The use of Controlled Access Zone (CAZ) as a fall protection method is prohibited.
3. A Warning Line System (WLS) may ONLY be used on floors or flat or low-sloped roofs (between 0 - 18.4 degrees or 4:12 slope) and shall be erected around all sides of the work area (See 29 CFR 1926.502(f) for construction of WLS requirements). Working within the WLS does not require FP. No worker shall be allowed in the area between the roof or floor edge and the WLS without FP. FP is required when working outside the WLS.
4. Fall protection while using a ladder will be governed by OSHA requirements.

1.18 SCAFFOLDS AND OTHER WORK PLATFORMS

A. Scaffolds and other work platforms shall comply with 29 CFR 1926 Subpart L.
B. The fall protection (FP) threshold height requirement is 4 ft as stated in Section 1.18.
C. The following hierarchy and prohibitions shall be followed in selecting appropriate work platforms.

1. Scaffolds, platforms, or temporary floors shall be provided for all work except that can be performed safely from the ground or similar footing.
2. Ladders less than 20 feet may be used as work platforms only when use of small hand tools or handling of light material is involved.
3. Ladder jacks, lean-to, and prop-scaffolds are prohibited.
4. Emergency descent devices shall not be used as working platforms.

D. Contractors shall use a scaffold tagging system in which all scaffolds are tagged by the Competent Person. Tags shall be color-coded: green indicates the scaffold has been inspected and is safe to use; red indicates the scaffold is unsafe to use. Tags shall be readily visible, made of materials that will withstand the environment in which they are used, be legible and shall include:

1. The Competent Person’s name and signature.
2. Dates of initial and last inspections.

E. Mast Climbing work platforms: When access ladders, including masts designed as ladders, exceed 20 ft (6 m) in height, positive fall protection shall be used.

1.19 EXCAVATION AND TRENCHES

A. Excavation and trenching work shall comply with 29 CFR 1926 Subpart P. Excavations less than 5 feet in depth require evaluation by the contractor’s “Competent Person” (CP) for determination of the necessity of an excavation protective system where kneeing, laying in, or stooping within the excavation is required.
B. Excavations and trenches 24 inches in depth or greater shall require a written trenching and excavation permit. The permit shall have two

sections; one section will be completed prior to digging or drilling and the other will be completed prior to personnel entering the excavations greater than 5 feet in depth. Each section of the permit shall be provided to the COR prior to proceeding with digging or drilling and prior to proceeding with entering the excavation. After completion of the work and prior to opening a new section of an excavation, the permit shall be closed out and provided to the COR. The permit shall be maintained onsite, and the first section of the permit shall include the following:

1. Estimated start time & stop time.
2. Specific location and nature of the work.
3. Indication of the contractor's "Competent Person" (CP) in excavation safety with qualifications and signature. Formal course in excavation safety is required by the contractor's CP.
4. Indication of whether soil or concrete removal to an offsite location is necessary.
5. Indication of whether soil samples are required to determine soil contamination.
6. Indication of coordination with local authority (i.e. "One Call") or contractor's effort to determine utility location with search and survey equipment.
7. Indication of review of site drawings for proximity of utilities to digging/drilling.

C. The second section of the permit for excavations greater than five feet in depth shall include the following:

1. Determination of OSHA classification of soil. Soil samples will be from freshly dug soil with samples taken from different type layers as necessary and placed at a safe distance from the excavation by the excavating equipment. A pocket penetrometer will be utilized in determination of the unconfined compression strength of the soil for comparison against OSHA table (Less than 0.5 Tons/FT2 – Type C, 0.5 Tons/FT2 to 1.5 Tons/FT2 – Type B, greater than 1.5 Tons/FT2 – Type A without condition to reduce to Type B).
2. Indication of selected protective system (sloping/benching, shoring, shielding). When soil classification is identified as "Type A" or "Solid Rock", only shoring or shielding or Professional Engineer designed systems can be used for protection. A Sloping/Benching system may only be used when classifying the soil as Type B or Type C. Refer to Appendix B of 29 CFR 1926, Subpart P for further information on protective systems designs.
3. Indication of the spoil pile being stored at least 2 feet from the edge of the excavation and safe access being provided within 25 feet of the workers.
4. Indication of assessment for a potential toxic, explosive, or oxygen deficient atmosphere where oxygen deficiency (atmospheres containing less than 19.5 percent oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist. Internal combustion engine equipment is not allowed in an excavation without providing force air ventilation to lower the concentration to below OSHA PELs, providing sufficient oxygen levels, and atmospheric testing as necessary to ensure safe levels are maintained.

C. As required by OSHA 29 CFR 1926.651(b)(1), the estimated location of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably may be expected to be encountered during excavation work, shall be determined prior to opening an excavation.

   1. The planned dig site will be outlined/marked in white prior to locating the utilities.
   2. Used of the American Public Works Association Uniform Color Code is required for the marking of the proposed excavation and located utilities.
   3. 811 will be called two business days before digging on all local or State lands and public Right-of Ways.
   4. Digging will not commence until all known utilities are marked.
   5. Utility markings will be maintained

D. Excavations will be hand-dug or excavated by other similar safe and acceptable means as excavation operations approach within 3 to 5 feet of identified underground utilities. Exploratory bar or other detection equipment will be utilized as necessary to further identify the location of underground utilities.
E. Excavations greater than 20 feet in depth require a Professional Engineer designed excavation protective system.

1.20 CRANES

A. Crane work shall comply with 29 CFR 1926 Subpart CC.
B. Prior to operating a crane, the operator must be licensed, qualified or certified to operate the crane. Thus, all the provisions contained with Subpart CC are effective and there is no “Phase In” date.
C. A detailed lift plan for all lifts shall be submitted to the COR 14 days prior to the scheduled lift complete with route for truck carrying load, crane load analysis, crane and path of swing and all other elements of a critical lift plan where the lift meets the definition of a critical lift. Critical lifts require a more comprehensive lift plan to minimize the potential of crane failure and/or catastrophic loss. The plan must be reviewed and accepted by the General Contractor before being submitted to the VA for review. The lift will not be allowed to proceed without prior acceptance of this document by the COR.
D. Crane operators shall not carry loads over the public. Crane operators shall not carry loads over any occupied building unless:

   1. The top two or more floors are vacated under the lift affected area AND a Contractor provided engineering analysis, performed by a Professional Engineer, demonstrates that overhead protection provided by the roof and vacated floors is sufficient to protect against the potential loss of a load being lifted or a minimum of 300 psf of protection is provided, whichever is greater.
   2. Or, overhead protection is designed by a Professional Engineer and installed over the roof by the Contractor to protect the occupants below. The installed system shall be sufficient to protect against the potential loss of a load being lifted or a minimum of 300 psf of protection is provided, whichever is greater.
   3. Or, a formal request may be submitted to the Contracting Officer for documentation, if available, indicating the roof of the building has been previously designed and constructed using a reinforced concrete

roof slab or other means to provide overhead protection from construction activities specifically associated with the vertical or horizontal expansion of the same building AND a Contractor provided engineering analysis, performed by a Professional Engineer, demonstrates that overhead protection provided by the roof is sufficient to protect against the potential loss of a load being lifted or a minimum of 300 psf of protection is provided, whichever is greater.

1.21 CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)

A. Installation, maintenance, and servicing of equipment or machinery shall comply with 29 CFR 1910.147 except for specifically referenced operations in 29 CFR 1926 such as concrete & masonry equipment [1926.702(j)], heavy machinery & equipment [1926.600(a)(3)(i)], and process safety management of highly hazardous chemicals (1926.64). Control of hazardous electrical energy during the installation, maintenance, or servicing of electrical equipment shall comply with Section 1.15 to include NFPA 70E and other VA specific requirements discussed in the section.

1.22 CONFINED SPACE ENTRY

A. Confined space entry shall comply with 29 CFR 1926, Subpart AA except for specifically referenced operations in 29 CFR 1926 such as excavations/trenches [1926.651(g)].
B. A site-specific Confined Space Entry Plan (including permitting process) shall be developed and submitted to the COR.

1.23 WELDING, BRAZING AND CUTTING

A. As specified in Section 1.16, Hot Work: Perform and safeguard hot work operations in accordance with NFPA 241 and NFPA 51B. Coordinate with COR. Obtain permits from COR at least 14 days in advance. Designate Contractor's responsible project-site fire prevention program manager to permit hot work.

1.24 LADDERS

A. Ladder use shall comply with 29 CFR 1926 Subpart X.
B. Portable ladders shall be of sufficient length and shall be placed so that workers will not stretch or assume a hazardous position.
C. Manufacturer safety labels shall be in place on ladders.
D. Step Ladders shall not be used in the closed position.
E. Top steps or cap of step ladders shall not be used as a step.
F. Portable ladders, used as temporary access, shall extend at least three (3) ft above the upper landing surface.

   1. When a 3-ft extension is not possible, a grasping device (such as a grab rail) shall be provided to assist workers in mounting and dismounting the ladder.
   2. In no case shall the length of the ladder be such that ladder deflection under a load would, by itself, cause the ladder to slip from its support.

G. Ladders shall be inspected for visible defects daily and after any occurrence that could affect their safe use. Broken or damaged ladders shall be immediately tagged "DO NOT USE," or with similar wording, and

withdrawn from service until restored to a condition meeting their original design.

1.25 FLOOR & WALL OPENINGS

A. Floor and wall openings shall comply with 29 CFR 1926 Subpart M.
B. Floor and roof holes/openings are those that measure over 2 in in any direction of a walking/working surface which persons may trip or fall into or where objects may fall to the level below. Skylights located in floors or roofs are considered floor or roof hole/openings.
C. Floor and roof holes/openings are those into which a person can accidentally walk or fall through shall be guarded either by a railing system with toe boards along all exposed sides or a load-bearing cover. When the cover is not in place, the opening or hole shall be protected by a removable guardrail system or shall be attended when the guarding system has been removed, or other fall protection system.

1. Covers shall be capable of supporting, without failure, at least twice the weight of the worker, equipment and material combined.
2. Covers shall be secured when installed, clearly marked with the word "HOLE", "COVER" or "Danger, Roof Opening-Do Not Remove" or color-coded or equivalent methods (e.g., red or orange "X"). Workers must be made aware of the meaning for color coding and equivalent methods.
3. Roofing material, such as roofing membrane, insulation or felts, covering or partly covering openings or holes, shall be immediately cut out. No hole or opening shall be left unattended unless covered.
4. Non-load-bearing skylights shall be guarded by a load-bearing skylight screen, cover, or railing system along all exposed sides.
5. Workers are prohibited from standing/walking on skylights.

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VHA Pre-Construction Risk Assessment (PCRA)

PCRA Introductory Information and Instructions

Use this template as a baseline for performing facility Pre-Construction Risk Assessments (PCRA) for Construction, Renovation, and Maintenance work (referred to as the "activity" in this document). The template provides minimum requirements for categorizing activity type(s) and safety risk to determine the level of precautions needed to prevent impact related to Construction, Renovation and Maintenance on patients, employees, and contractors.

Ensure that the activity statement of work and any drawings available are used for the PCRA assessment and included in the project file with the completed PCRA.

Communication and coordination of all types of activity with affected areas are to be included among the control measures. The development of communication and coordination plans must begin during the activity planning phase.

Facilities may customize this template to incorporate site-specific information and requirements.

NOTE: *This VHA PCRA template pertains specifically to non-infection-related safety for Construction, Renovation, and Maintenance activities. It must be used in conjunction with the VHA Infection Control Risk Assessment (ICRA) for the activity, if required, which specifically addresses infection risks outside the scope of this PCRA.*

PERMIT: See the last page of this document for a fillable permit form to be used for posting at the activity site.

Activity Location:	VAMC Milwaukee (695)
Activity Name, Number, and/or Brief Description:	VAMC Milwaukee (695) EHRM Infrastructure Upgrades 695-21-700

Table 1 - Construction, Renovation, and/or Maintenance Activity Type and Control Measures

NOTE: *If any of the bulleted criteria in a higher activity type pertains to the work that will be done (even if the other criteria are in a lower type), use the higher activity type for the VHA PCRA.*

Controls defined in Table 1 for the activity must be in place before the activity begins and maintained until work is completed and the area is activated. Control measures for each activity must also include the control measures in the preceding row(s).

As the activity progresses, a full re-evaluation of remaining activity type and risk is required prior to changing the level of control measures.

Activity Type determined from Table 1: Large Scale

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VHA Pre-Construction Risk Assessment (PCRA)

Table 1: Every question must be answered with an "X" answering if part of project (yes or no).

If "Yes" is answered as part of project, the work is the type noted – inspect/upkeep, small scale or large scale. Always default to the highest category.

Activity Type and Description		Part of Project (Yes or No)		Actions Taken	Inspect/ Upkeep	Small Scale Const / Renov	Large Scale Const /Renov
		Yes	No				
1	Work that can be completed in a single shift, not to exceed 10 hours. - Patients, employees and/or visitors may be in the area depending on the activity. - Work shall not create dust or debris. - Work shall not create vapors or fumes.		X	Daily inspections of the site are to be conducted by the General Contractor and documented on their daily log.			
2	Prolonged work that may take longer than a single shift but not exceeding six months. - Patients and employees will not be in the area until activity is completed.		X	Daily inspections of the site are to be conducted by the General Contractor and documented on their daily log.			
3	Prolonged work exceeding six months. - Patients and employees shall not to be in the area until activity is completed.	X		Daily inspections of the site are to be conducted by the General Contractor and documented on their daily log.			
4a	Removal of ceiling tile, ceiling system, or other MEP chase inside an approved and designated infection control and construction barrier. - For visual inspections only.		X	Activity shall not impact any MEP/FP utility system without express VA approval and permit.			
4b	Removal of ceiling tile, ceiling system, or other MEP chase inside an approved and designated infection control and construction barrier. - New work that impacts existing MEP/FP systems.	X		Activity shall not impact any MEP/FP utility system without express VA approval and permit.			
4c	Removal of ceiling tile, ceiling system, or other MEP chase outside an approved and designated infection control and construction barrier. - For visual inspections only.		X	- Impacts to ceilings are limited to 1 tile per 50 square feet with limited exposure time (not to exceed an hour for each tile) within the shift. - Alternately, Contractor may utilize "Shark Tank" and ensure all impacted ceiling is inside the "Shark Tank" system.			
4d	Removal of ceiling tile, ceiling system, or other MEP chase outside an approved and designated infection control and construction barrier. - New work that impacts existing MEP/FP systems.	X		- Impacts to ceilings are limited to 1 tile per 50 square feet with limited exposure time (not to exceed an hour for each tile) within the shift. - Alternately, Contractor may utilize "Shark Tank" and ensure all impacted ceiling is inside the "Shark Tank" system.			
5	Work includes minor interior updates (replacing floor or ceiling tiles, carpentry work to include hanging signage, and painting).	X		- If outside an approved and designated infection control and construction barrier, immediately replace any ceiling			

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VHA Pre-Construction Risk Assessment (PCRA)

Activity Type and Description		Part of Project (Yes or No)		Actions Taken	Inspect/ Upkeep	Small Scale Const / Renov	Large Scale Const /Renov
		Yes	No				
				tile or close access panels upon completion of work. - Contractor activity shall not create vibrations or noise outside of the IC/CN barrier.			
6	MEP/FP system maintenance that does not require Lock Out Tag Out (LOTO). This includes plumbing on potable systems limited to faucet replacement, steam trap replacement, and electrical work such as replacement of bulbs, receptacles, or switches.	X		Site specific safety plan and AHA (see APP), and hazard communication required to be provided by the contractor and approved where a contact is in place.			
7	Work will impact egress routes (corridors, stairwells, exit distances)	X		- ILSMs are required and staff training (VA Safety). VA will produce the ILSM for the Contractor to post and maintain. - Exit signage changes or alterations are the responsibility of the Contractor.			
8	Work will impact traffic flow requiring alternate routes.	X		- ILSMs are required and staff training (VA Safety). VA will produce the ILSM for the Contractor to post and maintain. - Exit signage changes or alterations are the responsibility of the Contractor.			
9	Construction Site Security is required.	X		Construction SFICs shall be provided to the Contractor for construction doors. Contactor provides necessary hardware for the IC/CN barrier door system. Card Readers are required for IC/CN door.			
10	Work creating some noise and vibration due to power tool use.	X		Excessive noise and vibration producing work (exceeding 80 dB) shall be scheduled outside of normal working hours, weekends, Federal Holidays. Regular shift in the OR Suite: 7am-4pm.			
11	Site shall require VA phone for emergency use.	X		Jobsite shall require hardwired landline phone for emergencies. VA will provide phone; Contractor shall run wire to nearest telephone closet.			
12	Work includes selective demolition/ removal of existing floor covering, casework, lay-in ceiling, or other architectural elements that may create the potential for falling objects	X		- Work only behind approved infection control and construction barriers. - PPE is required.			

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VHA Pre-Construction Risk Assessment (PCRA)

Activity Type and Description		Part of Project (Yes or No)		Actions Taken	Inspect/ Upkeep	Small Scale Const / Renov	Large Scale Const /Renov
		Yes	No				
				- Contractor shall provide and adhere to approved Infection Control Plan. - Post signed ICRA Permit.			
13	Work creating some noise and vibration due to power tool use.	X		Excessive noise and vibration producing work (exceeding 80 dB) shall be scheduled outside of normal working hours, weekends, Federal Holidays. Regular shift in the OR Suite: 7am-4pm.			
14	Work includes selective demolition/ removal of preexisting floor covering, casework, lay-in ceiling, or other architectural elements that will cause penetrations in fire or smoke barrier.	X		- Work only behind approved infection control and construction barriers. - PPE is required. - Contractor shall provide and adhere to approved Infection Control Plan. - Post signed ICRA Permit and signed/approved PCRA.			
15	Work includes selective demolition/ removal of preexisting floor covering, casework, lay-in ceiling, or other architectural elements that will disturb asbestos, lead, or other hazardous materials like ACM.	X		ACM, Lead, Silica removal/ stabilization/abatement plan and monitoring per specification. Infection control barriers and negative air HEPA units are installed (dust control plan). ICRA Permit in place.			
16	Work includes selective demolition/ removal of preexisting floor covering, casework, lay-in ceiling, or other architectural elements that will disturb asbestos, lead, or other hazardous materials like lead.	X		ACM, Lead, Silica removal/ stabilization/abatement plan and monitoring per specification. Infection control barriers and negative air HEPA units are installed (dust control plan). ICRA Permit in place.			
17	Work includes selective demolition/ removal of preexisting floor covering, casework, lay-in ceiling, or other architectural elements that will disturb asbestos, lead, or other hazardous materials like silica.	X		ACM, Lead, Silica removal/ stabilization/abatement plan and monitoring per specification. Infection control barriers and negative air HEPA units are installed (dust control plan). ICRA Permit in place.			

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VHA Pre-Construction Risk Assessment (PCRA)

Activity Type and Description		Part of Project (Yes or No)		Actions Taken	Inspect/ Upkeep	Small Scale Const / Renov	Large Scale Const /Renov
		Yes	No				
18	Plumbing work that includes new work (installation of new fixtures) that does not require system shutdowns, outages or LOTO because of the availability of local shut off valves.		X	- Contractor shall follow site specific APP and AHAs for these activities. - Contractor shall formally request utility outage permits per the Specifications. - Coordinate outages 3 weeks in advance, provide temporary utilities as required, LOTO procedures in place and staff trained on their use. - As applicable, and after piping/work is complete, run water lines affected for 10 minutes and complete flushing logs.			
19	Plumbing work includes new work and demo/abandonments that will require LOTO, utility outages, use of compressed gas cylinders, and system **shutdown and startup.** - Updated and relocated medical gas systems in the OR ceilings. - Existing plumbing/ steam systems are impacted. Demo/abandonment of 2nd floor domestic water and steam piping.	X		- Contractor shall follow site specific APP and AHAs for these activities. - Contractor shall formally request utility outage permits per the Specifications. - Coordinate outages 3 weeks in advance, provide temporary utilities as required, LOTO procedures in place and staff trained on their use. - As applicable, and after piping/work is complete, run water lines affected for 10 minutes and complete flushing logs. - Medgas recertification procedures by a third party.			
20	Electrical work that includes installation of conduit and wire for receptacles or equipment that will include LOTO or system isolation.	X		- Contractor shall follow site specific APP and AHAs for these activities. - Contractor shall formally request utility outage permits per the Specifications. - Coordinate outages 3 weeks in advance, provide temporary utilities as required, LOTO procedures in place and staff trained on their use.			
21	Electrical work that includes the installation of electrical feeders or distribution panels for an area or for new devices such as terminal units, fans etc. requiring LOTO and system isolation.	X		- Contractor shall follow site specific APP and AHAs for these activities. - Contractor shall formally request utility outage permits per the Specifications. - Coordinate outages 3 weeks in advance, provide temporary utilities as required, LOTO			

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VHA Pre-Construction Risk Assessment (PCRA)

Activity Type and Description		Part of Project (Yes or No)		Actions Taken	Inspect/ Upkeep	Small Scale Const / Renov	Large Scale Const /Renov
		Yes	No				
				procedures in place and staff trained on their use.			
22	Mechanical or AHU work that includes fan shutdown/startup and HVAC work such as replacement of a single diffuser, single terminal unit, a single device and the installation of ductwork, diffusers, and terminal units for an area that may require work on ladders or rigging, hoisting, or lifting of equipment or materials overhead.	X		- Contractor shall follow site specific APP and AHAs for these activities. - Contractor shall formally request utility outage permits per the Specifications. - Coordinate outages 3 weeks in advance, provide temporary utilities as required, LOTO procedures in place and staff trained on their use.			
23	Mechanical or AHU work that includes the installation of air handling equipment, associated ductwork, diffusers, heat exchangers, terminal units and controls requiring lifting and support of equipment and systems.	X		- Contractor shall follow site specific APP and AHAs for these activities. - Contractor shall formally request utility outage permits per the Specifications. - Coordinate outages 3 weeks in advance, provide temporary utilities as required, LOTO procedures in place and staff trained on their use.			
24	Fire Alarm System work that includes **modification** of existing fire alarm and suppression systems requiring system outages and ILSMs or obstruction of exits and or impact on corridors.	X		- Contractor shall follow site specific APP and AHAs for these activities. - Contractor shall formally request utility outage permits per the Specifications. - Coordinate outages 3 weeks in advance, provide temporary utilities as required, LOTO procedures in place and staff trained on their use.			
25	Fire Alarm System work that includes **installation** of fire alarm and suppression systems requiring outages of those systems and ILSMs or closure of exits/corridors	X		- Contractor shall follow site specific APP and AHAs for these activities. - Contractor shall formally request utility outage permits per the Specifications. - Coordinate outages 3 weeks in advance, provide temporary utilities as required, LOTO procedures in place and staff trained on their use.			
26	Work includes architectural, structural, roofing, or any other work that may cause vapors or fumes.	X		- Follow specification submittal requirements on VOC maximums allowed.			

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VHA Pre-Construction Risk Assessment (PCRA)

Activity Type and Description		Part of Project (Yes or No)		Actions Taken	Inspect/ Upkeep	Small Scale Const / Renov	Large Scale Const /Renov
		Yes	No				
				- Ensure construction area is well ventilated and negative air requirements are met.			
27	Work includes the installation building components that requires transport of significant materials through building and up elevators.	X		Use of B-Bank service elevators not exceeding weight limit. Refer to the Division 1 specifications.			
28	Work includes excavation or the use of heavy equipment.	X		- Contractor is responsible for all utility locates. - Contractor shall provide trench and excavation safety plan (part of APP/AHA) for VA review and approval. - Contractor shall implement dust control measures. - Contractor shall abide by equipment exhaust, noise, and vibration limits.			
29	Work includes confined space entry is required (permit required or not)		X	Confined entry plan in place and staff trained			
30	Crane lifts are required as part of the Contractor's work.		X	- Contractor shall provide a crane lift plan for review and approval. Identify crane placement, swing, and load evaluation. - Contractor shall differentiate between critical and non-critical crane lifts/picks. - Identify lifts over buildings, blind lifts, or other unique considerations. - VA will issue crane permit upon lift plan approval.			
31	Work includes elevated work on roofs or other elevated structures (scaffolds).	X		- Fall protection plan (APP and AHA) in place and staff trained. - Comply with OSHA and VA standards. - Scaffolding requirements for PE stamps.			
32	Work includes welding, soldering, brazing, grinding, cutting or use of torches requiring burn permits.	X		Hot Work or burn permits in place and staff trained			
33	There are impacts to existing Data / Telephone / Wireless systems.	X		- Contractor shall follow site specific APP and AHAs for these activities. - Contractor shall formally request utility outage permits per the Specifications. - Coordinate outages 3 weeks in advance, provide temporary utilities as required, LOTO procedures in place and staff trained on their use.			

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VHA Pre-Construction Risk Assessment (PCRA)

Activity Type and Description		Part of Project (Yes or No)		Actions Taken	Inspect/ Upkeep	Small Scale Const / Renov	Large Scale Const /Renov
		Yes	No				
34	There are impacts to existing Natural Gas Service.		X	- Contractor shall follow site specific APP and AHAs for these activities. - Contractor shall formally request utility outage permits per the Specifications. - Coordinate outages 3 weeks in advance, provide temporary utilities as required, LOTO procedures in place and staff trained on their use.			
35	There are impacts to the existing Pneumatic Tube System - are there modifications to the existing system, interruptions to service or installation of new?		X	Coordinate outages 3 weeks in advance, provide temporary utilities as required, general broadcast.			
36	Are there moves to patients or staff involved? Coord with Arch Shop, Move Team & Planner. How will this affect start of project? How are patient services impacts being handled?	X		Coordination and phasing identified in construction documents.			

Activity Type and Description	Control Measures
Inspection/upkeep generally defined as follows: • Work can be completed in a single shift, not to exceed 10 hours. • Patients, employees and/or visitors may be in the area depending on the activity. • Work that does not create dust or debris. • Work that does not create vapors or fumes. • Removal of ceiling tile or access to mechanical or electrical chase for visual inspection that will not impair fire safety systems and are limited to 1 tile per 50 square feet with limited exposure time (not to exceed an hour for each tile) within the shift. • Minor interior updates (e.g., replacing floor or ceiling tiles, carpentry work to include hanging signage, and painting with hand tools) that do not create vibration or noise. • Limited building system maintenance that does not require Lock Out Tag Out (LOTO) such as plumbing on potable systems limited to faucet replacement, steam trap replacement etc. and electrical work such as replacement of bulbs, receptacles, or switches.	1. Immediately replace any ceiling tile, close access panels, etc., upon completion of work. 2. Site visits of construction area are required weekly by member of multi-disciplinary team. Site visits will be documented on standard checklist. 3. Site specific safety plan, task hazard analysis, and hazard communication required to be provided by the contractor and approved where a contact is in place. For internal work the shop involved must work with Safety to ensure proper precautions are in place. 4. Must address identified hazards and controls that will be implemented to ensure minimal impact to patients, employees, contractors and facility. 5. Communication and coordination plan for all affected areas
Small scale Construction, Renovation and general maintenance/repair work, generally defined as follows: • Prolonged work that may take longer than a single shift but not exceeding six months. • Patients and employees are not to be in the area until activity is completed. • Work that creates some noise and vibration due to power tool use.	**All control measures in the row above and the following:** 1. Hazard communication chemical inventory required to be provided by the contractor and approved. 2. Where construction, Renovation and maintenance are done in an accredited facility, and ILSM assessment is required to be done

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• Selective demolition/removal of preexisting floor covering, casework, lay-in ceiling, or other architectural elements that may
  ○ disturb asbestos, lead or silica
  ○ create the potential for falling objects
  ○ create vibration and/or noise in excess of 80 dB(A) in surrounding areas.
  ○ cause penetrations in fire or smoke barrier
• Plumbing work such as the installation of new sinks, showers and toilets and associated plumbing that requires utility outages or work on the steam system that may require:
  ○ LOTO
  ○ The use of compressed gas cylinders
• Electrical work such as installation of conduit and wire for lighting, receptacles and switches for an area, the installation of conduit and wire for new devices such as terminal units, fans etc. Electrical work such as installation of cabling/wiring/conduit for a single device, installation of new device such as a light fixture that require LOTO.
• Air Handler and/or fan shutdown/startup and HVAC work such as replacement of a single diffuser, single terminal unit, a single device and the installation of ductwork, diffusers, and terminal units for an area that may require:
  ○ Work on ladders
  ○ Rigging, hoisting or lifting of equipment or materials overhead
• Modification of existing fire alarm and suppression systems requiring system outages and ILSMs or obstruction of exits and or impact on corridors.
• Architectural, structural, or any other work that may cause vapors or fumes such as:
  ○ Roofing work
  ○ Flooring work
  ○ Painting or other large-scale use of such substances.
	and ILSMs put into place in accordance with TJC LS.01.02.01 and the local facility policy including Fire watch if necessary. Staff is trained and the ILSM is verified regularly
	3. Hot Work or burn permits in place and staff trained
	4. LOTO procedures in place and staff trained on their use
	5. Site visits will be reviewed using the criteria in standardized guide.
	6. Daily inspections of the site are to be conducted by the General Contractor or shop supervisor and documented on their daily log.

<u>Large-scale</u> <u>construction, renovation, or maintenance generally defined as follows</u>:
• Work exceeding 6 months in duration.
• Patients and employees are not to be in the area until activity is completed.
• Excavation or heavy equipment use taking place
  ○ Dig safe required utility location
  ○ Trench safety
  ○ Dust control plan
  ○ Equipment exhaust, Noise, Vibration
• Confined space entry required (permit required or not)
• Requires crane work
  ○ General crane work
  ○ Lift over buildings
• Includes elevated work
  ○ Roof work, fall protection
  ○ Window work, scaffolding and fall protection
  ○ Odor control
• Welding, cutting or use of torches requiring burn permits
• Demolition of building components and infrastructure including removal of multiple doors, walls, framing, ceilings, flooring, piping, electrical and HVAC that may
  ○ require asbestos, lead or silica abatement
	<u>All control measures in the two rows above</u> and the following Activity Hazard Analyses and Control Plans (check all that apply):
	1. Excavation safety plan in place ☐
	2. Dust control plan in place ☐
	3. Pollution prevention plan in place ☐
	4. Dig safe paper work in place ☐
	5. Crane lift plan in place ☐
	  a. Crane placement
	  b. Crane swing
	  c. Crane load evaluation
	6. Fall protection plan in place and staff trained ☐
	7. Confined entry plan in place and staff trained ☐

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○ create the potential for falling objects ○ create vibration and/or noise in excess of 90 dB(A) in surrounding areas. ○ cause breaches to fire or smoke barrier • The installation building components such as new walls, ceilings and doors including framing, drywall and associated plaster work that requires transport of significant materials through building and up elevators i.e., weight limits of floors and elevators • Plumbing work requiring LOTO and system shutdown and startup such as the installation of: ○ new medical gas systems, ○ steam/heating hot water, condensate systems, ○ Potable water and sanitary drainage, multiple sinks, showers and toilets including associated plumbing. • Electrical work such as installation of electrical feeders, distribution panels, conduit and wire for lighting, receptacles and switches for an area, the installation of conduit and wire for new devices such as terminal units, fans etc. requiring LOTO and system isolation. • Installation of fire alarm and suppression systems requiring outages of those systems and ILSMs or closure of exits/corridors • Mechanical work such as the installation of air handling equipment, associated ductwork, diffusers, heat exchangers, terminal units and controls requiring lifting and support of equipment and systems.	

Table 2. Affected Adjacent Area Assessment

In addition to the minimum precautions noted above for the Activity Type, it is critical that the activity be coordinated with the areas adjacent to the activity to ensure operations in those areas are not disrupted or impacted. List the adjacent areas in Table 2 below and develop activity-specific coordination plans and associated communication plans with each area to address activity work that could impact or disrupt the operation of the areas, in general as follows:

- If adjacent area is **vacant** (e.g., work outside, construction of new building, etc.):
  - Coordination is typically not necessary other than potentially traffic flow and pedestrian access.
- If adjacent area is **non-continuously occupied** (e.g., areas where outpatient care is provided, employee health, etc.):
  - Develop a list of activities that will potentially impact or disrupt the operation of the area (e.g., work involving noise, vibration or exit obstruction) and meet with POC to coordinate execution of work in a way that mitigates the impact (e.g., conduct work after hours).
- If adjacent area is **occupied continuously** (e.g., areas where inpatient care is provided, residential areas such as Community Living Centers, etc.):
  - Develop a list of activities that will potentially impact or disrupt the operation of the area (e.g., work involving noise, vibration or exit obstruction) and meet with POC to coordinate execution of work in a way that mitigates the impact (e.g., move affected party temporarily).

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VHA Pre-Construction Risk Assessment (PCRA)

Area	Service(s)/Type(s) of Area(s) *(e.g., OR, Unit/Ward, Sterile Processing, Administrative, etc)**	Point of Contact (POC)	POC Contact Information	Construction plan communicated to POC?
Activity Area**	Note: This project impacts the entire campus including work on all floors in buildings 3, 4, 5, 6, 7, 20, 43, 70, 97, 102, 107, 108, 109, 111, 112, 113, 123, 144, 146, 147, and 148.			
Area Above				
Area Below				
Adjacent Area 1				
Adjacent Area 2				
Adjacent Area 3				
Adjacent Area 4				

* There may be more than one Service/type of area for each row. List all. The information entered on this table must be used in the ICRA if required.

** List the area(s) in which the construction/renovation/maintenance activity will occur.

Infection Control Risk Assessment (ICRA)

Consult with Infection Prevention and Control regarding the assessment of potential infection risks associated with the activity and the need for control measures. See VHA Directive 7715 and the VHA ICRA Template for more information.

Is an ICRA required for the Activity? Yes ☒ No ☐

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Pre-Construction Risk Assessment (PCRA) Permit

This page must be posted at the entrance to the project area, or other designated area

Unique permit number:			
Location and brief description of construction/renovation/maintenance			
Project manager		Project start date	
Contact phone number		Completion date	
Contractor or lead shop		Permit expiration date	

Activity Type *Inspection/Upkeep, Small-scale, or Large-scale)*	

Activity Type	**Control measures to be in place for the duration of the activity** *(Check the box for the Activity Type to indicate the Control Measures)*
Inspection/Upkeep ☐	1. Immediately replace any ceiling tile, close access panels, etc., upon completion of work. 2. Site visits of construction area are required weekly by member of multi-disciplinary team. Site visits will be documented on standard checklist. 3. Site specific safety plan, task hazard analysis, and hazard communication required to be provided by the contractor and approved. 4. Must address identified hazards and controls that will be implemented to ensure minimal impact patients, employees, contractors and facility. 5. Communication and coordination plan for all affected areas
Small-scale ☐	**<u>All control measures in the row above</u> and the following:** 1. Hazard communication chemical inventory required to be provided by the contractor and approved. 2. ILSMs in place and staff trained on situation 3. Hot Work or burn permits in place and staff trained 4. LOTO procedures in place and staff trained on their use 5. Site visits will be reviewed using the criteria in standardized guide. 6. Daily inspections of the site are to be conducted by the General Contractor and documented on their daily log.
Large-scale ☐	**<u>All control measures in both rows above</u> and the following Activity Hazard Analyses and Control Plans as applicable (check all that apply):** 1. Excavation safety plan in place ☐ 2. Dust control plan in place ☐ 3. Asbestos abatement plan in place ☐ 4. Lead abatement plan in place ☐ 5. Silicia removal plan in place ☐ 6. Pollution prevention plan in place ☐ 7. Dig safe paperwork in place ☐ 8. Crane lift plan in place ☐ a. Crane placement b. Crane swing c. Crane load evaluation 9. Fall protection plan in place and staff trained ☐ 10. Confined entry plan in place and staff trained ☐

Additional requirements:			
Is an Infection Control Risk Assessment (ICRA) required for the Activity? Yes ☐ No ☐ Infection Prevention and Control signature: Date:			
Project Manager signature		Date	
Safety Officer signature		Date	
Chair, Construction Safety Committee signature		Date	

*The location of all Activity Hazard Analyses and Control Plans (excavation, dust, pollution, etc.) as applicable shall be identified on this permit and shall be made available to all workers on the job.

VHA Infection Control Risk Assessment for Construction, Renovation and Maintenance

Introductory Information and Instructions

Use this template as a baseline for performing facility Infection Control Risk Assessments (ICRAs) for construction, renovation, and maintenance work (referred to as the "activity" in this document). The template provides minimum requirements for categorizing activity types and patient risk to determine the level of precautions needed to prevent infection risks. Facilities may customize this template to incorporate site-specific information and/or to add more stringent criteria.

This VHA ICRA template pertains specifically to infection prevention. It must be used if required by the VHA Pre-Construction Risk Assessment (PCRA) for the activity. *NOTE: The PCRA addresses other activity-related safety concerns (e.g., vibration, noise, hazardous materials) outside the scope of the ICRA.*

To complete the template:

1. Use **Table 1** to identify the category of the construction, renovation and/or maintenance activity.
2. Use **Table 2** to identify the areas affected by the activity.
3. Use **Table 3** to identify the overall patient risk category that will be affected by the activity.
4. Use **Table 4** to determine the level of infection prevention and control precautions needed for the activity.

Once all 4 steps above are completed: Refer to **Table 5** for the minimum required control measures for the level of infection prevention and control precautions needed for the activity. Refer to **Table 6** for the minimum infection prevention and control measures required on completion of the activity.

PERMIT: See the last page of this document for a fillable permit form to be used for posting at the activity site as needed.

Table 1 - Construction, Renovation, and/or Maintenance Activity Category

NOTE: *If any of the bulleted criteria in a higher activity category pertains to the work that will be done (even if the other criteria are in a lower category), use the higher activity category for the VHA ICRA.*

Activity Category determined from Table 1 (*A, B, C, or D*): ☐

Category A	**Inspection and/or facility upkeep generally defined as follows**: • Work can be completed in a single shift, not to exceed 10 hours. • Patients and/or employees may be in the area depending on the activity. • Work that does not create dust or debris. • Removal of ceiling tile or access to mechanical or electrical chase for visual inspection limited to 1 tile per 50 square feet with limited exposure time (not to exceed an hour for each tile) within the shift. • Minor interior updates (e.g., replacing floor or ceiling tiles, carpentry work to include hanging signage, and painting without sanding) that do not create dust or debris. • Limited building system maintenance such as basic plumbing on potable systems (e.g., faucet replacement) or basic electrical work such as replacement of light bulbs, receptacles, or switches.
Category B	**General maintenance and repair work generally defined as follows:** • Prolonged inspection and work that may take longer than a single shift but not exceeding a week. • Patients and employees are not to be in the area until activity is completed. • Work that creates minimal dust and debris.

	• Interior finish or surface repairs, updates, or modifications such as repair of firewalls and barriers, and new flooring that produces minimal dust and debris. Controlled sanding activities (e.g., wet or dry sanding) that produce minimal dust and debris. • Plumbing work such as installation or replacement of a single fixture or piping for a single fixture. Any work on sanitary plumbing including snaking of drains. • Electrical work such as installation of cabling/wiring/conduit for a single device, installation of new device such as a light fixture that produces minimal dust and debris. • Air Handler and/or fan shutdown/startup and HVAC work such as replacement of a single diffuser, single terminal unit or a single device that produces minimal dust and debris.
Category C	**Small-scale construction, renovation, or maintenance generally defined as follows**: • Work requiring longer than a single week to complete but not exceeding 6 months. • Patients and employees are not to be in the area until activity is completed. • Demolition/removal of preexisting floor covering, casework, lay-in ceiling, or other architectural elements. • Demolition/removal of more than 32 ft^2 of drywall/framing, hard ceilings, and doors/framing and minimal infrastructure such as electrical circuits and branch piping. • Installation of new walls, ceilings and doors including framing, drywall/plaster and associated work. • Plumbing work such as the installation of new sinks, showers and toilets and associated plumbing. • Shut down of sections of potable water systems. • Electrical work such as installation of conduit and wire for lighting, receptacles and switches for an area, the installation of conduit and wire for new devices such as terminal units, fans etc. • Modification of existing fire alarm and suppression systems. • Mechanical work such as the installation of ductwork, diffusers, and terminal units for an area.

Category D	**Large-scale construction, renovation, or maintenance generally defined as follows**:
	• Work exceeding 6 months in duration.
	• Patients and employees are not to be in the area until activity is completed.
	• Large-scale demolition of building components and infrastructure including removal of multiple doors, walls, framing, ceilings, flooring, piping, electrical and HVAC.
	• The installation building components such as new walls, ceilings and doors including framing, drywall and associated plaster work.
	• Plumbing work such as the installation of:
	  ○ new medical gas systems,
	  ○ steam/heating hot water, condensate systems,
	  ○ multiple sinks, showers and toilets including associated plumbing.
	• Shutdown of potable water, steam/heating hot water, condensate, and medical gas systems.
	• Electrical work such as installation of electrical feeders, distribution panels, conduit and wire for lighting, receptacles and switches for an area, the installation of conduit and wire for new devices such as terminal units, fans etc.
	• Installation of fire alarm and suppression systems.
	• Electrical shutdown of multiple panels.
	• Mechanical work such as the installation of air handling equipment, associated ductwork, diffusers, heat exchangers, terminal units and controls.

Table 2 - Affected Area Assessment

Identify the areas and associated patients that will be affected by the construction/renovation/maintenance activity (see the Figure for a visual representation of adjacent affected areas).

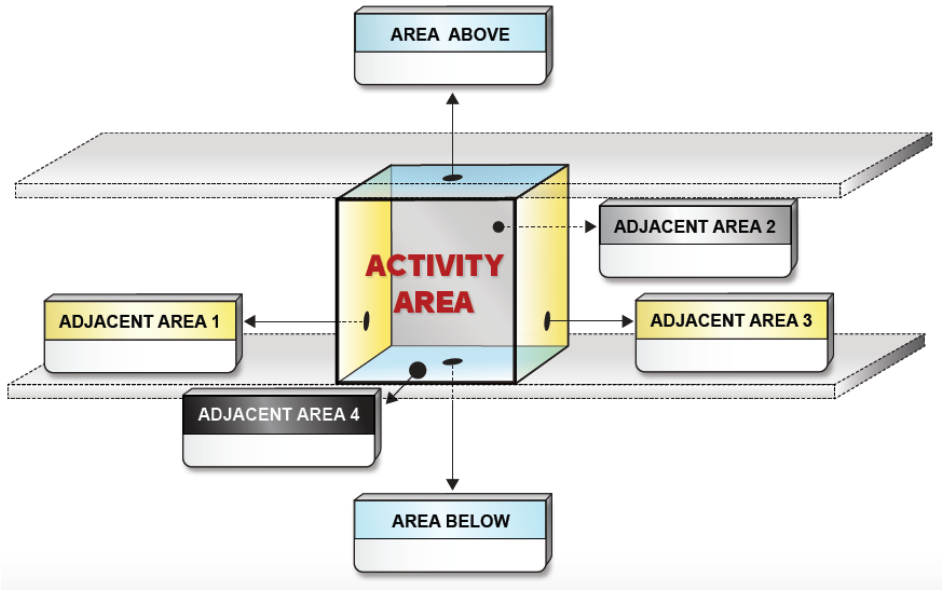

Figure: Isometric drawing of affected area assessment

Area	Service(s)/Type(s) of Area(s) *(e.g., OR, Unit/Ward, Sterile Processing, Administrative, etc.)**	Point of Contact (POC)	POC Contact Information
Activity Area**			
Area Above			
Area Below			
Adjacent Area 1			
Adjacent Area 2			
Adjacent Area 3			
Adjacent Area 4			

* There may be more than one Service/type of area for each row. List all.

** List the area(s) in which the construction/renovation/maintenance activity will occur. ***NOTE: When the Activity Category is B, C, or D, the control measures are determined by the Patient Risk in the adjacent affected areas.***

Table 3 - Patient Risk Category

Using Table 3, identify the patient risk category for each area listed in Table 2. Of the patient risk categories identified, select the one with the greatest risk as the overall Patient Risk Category for the activity.

Overall Patient Risk Category determined from Table 3 (*Low, Medium, High, or Highest*): [ ]

Low Risk	Medium Risk	High Risk	Highest Risk
Non-patient care areas such as:	Patient care support areas such as:	Patient care areas such as:	Procedural, invasive, sterile support and highly compromised patient care areas such as:
• Public hallways and gathering areas not in clinical areas • Office areas not in clinical areas • Breakrooms not in clinical areas • Bathrooms or locker rooms not in clinical areas • Mechanical/electrical rooms not in clinical areas	• Waiting areas • Clinical engineering (biomedical) • Materials management • Sterile processing department – dirty side • Kitchen, cafeteria, gift shop, coffee shop, and food kiosks	• Patient care rooms and areas, including spinal cord injury units • All acute care units, including mental health • All outpatient units and clinics • Emergency department • Community Living Centers, domiciliaries, and transitional residences • Employee health • Pharmacy – general work zone • Medication rooms and clean utility rooms • Imaging suites – diagnostic imaging • Laboratory	• All transplant units • All intensive care units • All oncology units and chemotherapy/infusion centers • OR theaters and restricted areas • Hemodialysis units • Procedural rooms* • Pharmacy compounding area • Sterile processing department – clean side • Transfusion services • Imaging suites – interventional imaging • Dedicated isolation wards/units for infectious diseases

* Procedural Rooms are designated for the performance of patient care activities that may require high-level disinfected or sterile instruments and some environmental controls but is not required to be performed with the environmental controls of an operating room (OR). The room is intended for procedures that are performed in an aseptic surgical field and penetrates the protective surfaces of a patient's body (e.g., subcutaneous tissue, mucous membranes, cornea) or entry into or opening of a sterile body cavity. Examples of these spaces include, and are not limited to, Cardiac Catheterization Suites, Electrophysiology Suites, Endovascular/GI Suites, Angio Suites and other spaces which may have high risk patient populations.

Table 4 - Level of Infection Prevention and Control Precautions

Match the Overall Patient Risk Category (*Low, Medium, High, Highest*) determined from Table 3 with the planned Construction/Renovation/Maintenance Activity Category (*A, B, C, D*) from Table 1 to determine the minimum Level of Infection Prevention and Control Precautions (*I, II, III, or IV*) using Table 4 below.

Level of Precautions determined from Table 4 (*I, II, III, or IV*): ☐

Patient Risk Category	**Activity Category**			
	A	**B**	**C**	**D**
Low Risk	I	II	II	III
Medium Risk	I	II	III	IV
High Risk	I	II	IV	IV
Highest Risk	II	III	IV	IV

An infection prevention and control permit is required for Level III and Level IV. Consult with Infection Prevention and Control for Level I and Level II.

Table 5 - Required Infection Prevention and Control Measures, by Level of Precautions

Controls defined below for the Level of Precautions identified for the activity must be in place before the activity begins and maintained until work is completed and the area is activated. Control measures for each Precaution Level must also include the control measures in the preceding Level(s).

As the activity progresses, a full re-evaluation of remaining activity type and patient risk is required prior to downgrading the Level of Precautions.

Level of Precautions	**Control Measures**
Level I	1. Perform work activity in a manner that does not create dust. 2. Immediately replace any ceiling tile, close access panels, etc., upon completion of work. 3. Any materials and equipment being brought into the facility must be free of contaminants and loose material.
Level II	**All control measures in Level I and the following:** 1. Provide active means to control airborne dust from dispersing into occupied areas and/or water mist surface to control dust (e.g., Mobile Dust Containment Cart or some other system). 2. Ensure worker clothing is clean and free of visible dust before leaving the work area. 3. Remove or isolate air diffusers (supply and return) to protect the HVAC system from dust and reduce air turbulence. Rebalance system to address diffuser isolation.

	4. When the work involves or impacts potable water systems including stagnation due to reduced usage, the piping shall be flushed twice a week or isolated from the main system. 5. Seal doors to prevent dust migration. 6. Contain all trash and debris in the work area. Perform daily cleaning and disposal of trash (covered) from work area using an identified exit route. 7. Any equipment, tools, or materials removed from the work area must be in sealed containers and/or cleaned of dust and debris prior to removal from the area. 8. Nonporous/smooth and cleanable containers (with a hard lid) must be used to transport trash and debris from the construction areas. These containers must be damp-wiped cleaned and free of visible dust/debris before leaving the contained work area. 9. Install a sticky (dust collection) mat at entrance of contained work area based on facility policy. Sticky mats must be changed routinely and when visibly soiled. 10. Maintain clean surroundings when area is not contained by damp mopping or HEPA vacuuming surfaces at least daily.
Level III	**<u>All control measures in Levels I and II</u> and the following:** 1. Ensure availability of equipment for cleaning hands. 2. Construct and complete critical barriers meeting NFPA 241 requirements. Barriers must extend to the ceiling or if ceiling tile is removed, to the deck above. 3. All (plastic or hard) barrier construction activities must be completed in a manner that prevents dust release. Plastic barriers must be effectively affixed to floor and ceiling (or floor/roof deck above) and secure from movement or damage. 4. Seal all penetrations in containment barriers, including floors and ceiling, using approved materials (UL schedule firestop if applicable for barrier type). 5. Maintain .01 inches /water gauge negative pressurization of the entire workspace by use of HEPA exhaust air systems directed outdoors, or comply with the alternative method outlined in Appendix A of this document. These control measures must be maintained continuously 24/7 for the duration of the project. HEPA filtered exhaust if discharged directly to the outdoors must be at a distance of 25 feet or greater from entrances, air intakes and operable windows. Exhausting discharged air into shared or recirculating HVAC systems, or other shared exhaust systems (e.g., bathroom exhaust) is <u>prohibited</u>. 6. Install a differential pressure sensing device (e.g., magnehelic, manometer, or digital monitoring) on exterior of work containment to continually monitor and document negative pressurization. The “ball in the wall” or similar apparatus are <u>not acceptable</u>.
Level IV	**<u>All control measures in Levels I, II and III</u> and the following:** 1. Barriers must be hard barriers unless temporary to install final barrier. 2. Containment must include an anteroom to ensure pressure control. Anteroom must be large enough for equipment staging, cart cleaning, workers’ PPE and cleaning. 3. Worker clothing and/or PPE must be removed or clean and free of visible dust before leaving the work area anteroom. HEPA vacuuming of clothing or use of cover suits is acceptable. 4. Workers must wear shoe covers or have a method to clean shoes in anteroom. Shoe covers must be removed prior to exiting the anteroom to the occupied space (non-work area). Damaged shoe covers must be changed immediately.

Table 6 - Minimum Infection Prevention and Control Measures Required Upon Completion of the Activity

Controls defined below shall be completed upon completion of the activity and inspected prior to terminating measures defined in Table 5.

Level of Precautions	Measures
Levels I - II	**Cleaning:** 1. Clean work areas including all environmental surfaces, high horizontal surfaces and flooring materials. 2. Check all supply and return air registers for dust accumulation on upper surfaces as well as air diffuser surfaces. **HVAC Systems:** 1. Remove isolation of HVAC system in areas where work is being performed. Verify that HVAC systems are clean and operational. 2. Verify the HVAC systems meet original airflow and air exchange design specifications. **Water systems:** 1. Until the potable water system is activated and in use, flushing shall continue at least twice per week in accordance with VHA Directive 1061.
Levels III - IV	Construction areas must be inspected by an infection preventionist and engineering representative (and others as determined by the facility) for final activity/project close out and removal of infection prevention and control measures. **Work Area Cleaning:** 1. Clean work areas including all environmental surfaces, high horizontal surfaces and flooring materials. 2. Check all supply and return air registers for dust accumulation on upper surfaces as well as air diffuser surfaces. **Removal of Critical Barriers:** 1. Critical barriers must remain in place during all work involving drywall removal, creation of dust and activities beyond simple touch-up work. The barrier may NOT be removed until a work area cleaning has been performed. Additional cleaning may be needed after removal of barrier. 2. All (plastic or hard) barrier removal activities must be completed in a manner that prevents dust release. Use the following precautions when removing hard barriers: i. Carefully remove screws and painter tape. ii. If dust will be generated during screw removal, use hand-held HEPA vacuum. iii. Drywall cutting is prohibited during removal process. iv. Clean all stud tracks with HEPA vacuum before removing outer hard barrier. v. Use a plastic barrier to enclose area if dust could be generated. **Negative Air Requirements:** 1. The use of negative air must be designed to remove contaminants from the work area. 2. Negative air devices (fans, filters, monitoring and documentation equipment) must remain operational at all times and in place for a period after completion of dust creating activities to remove contaminants from the work area and before removal of critical barriers. **HVAC systems:** 1. Upon removal of critical barriers, remove isolation of HVAC system in areas where work is being performed. 2. Verify that HVAC systems are clean and operational. 3. Verify and document through a TAB the HVAC systems meets original airflow and air exchange design specifications. **Water systems:** 1. Until the potable water system is activated and in use, flushing shall continue at least twice per week in accordance with VHA Directive 1061.

Infection Prevention and Control Construction/Renovation/Maintenance Permit

This page must be posted at the entrance to the project area for Level III and Level IV activities.

Unique permit number:			
Location of construction/renovation/maintenance			
Project manager		Project start date	
Contact phone number		Completion date	
Contractor		Permit expiration date	

Activity Category (*A, B, C, or D*)		Overall Patient Risk Category (*Low, Medium, High, or Highest*)		Level of Infection Prevention and Control Precautions (*I, II, III, or IV*)	

Level of Precautions	**Control measures to be in place for the duration of the activity** *(Check the box for the activity's Level of Precautions to indicate the Control Measures)*
Level I ☐	1. Perform work activity in a manner that does not create dust. 2. Immediately replace any ceiling tile, close access panels, etc., upon completion of work. 3. Any materials and equipment being brought into the facility must be free of contaminants and loose material.
Level II ☐	**All control measures in Level I and the following:** 1. Provide active means to control airborne dust from dispersing into occupied areas and/or water mist surface to control dust (e.g., Mobile Dust Containment Cart or some other system). 2. Ensure worker clothing is clean and free of visible dust before leaving the work area. 3. Remove or isolate air diffusers (supply and return) to protect the HVAC system from dust and reduce air turbulence. Rebalance system to address diffuser isolation. 4. When the work involves or impacts potable water systems including stagnation due to reduced usage, the piping shall be flushed twice a week or isolated from the main system 5. Seal doors, to prevent dust migration. 6. Contain all trash and debris in the work area. Perform daily cleaning and disposal of trash (covered) from work area using an identified exit route. 7. Any equipment, tools, or materials removed from the work area must be in sealed containers and/or cleaned of dust and debris prior to removal from the area. 8. Nonporous/smooth and cleanable containers (with a hard lid) must be used to transport trash and debris from the construction areas. These containers must be damp-wiped cleaned and free of visible dust/debris before leaving the contained work area. 9. Install a sticky (dust collection) mat at entrance of contained work area based on facility policy. Sticky mats must be changed routinely and when visibly soiled. 10. Maintain clean surroundings when area is not contained by damp mopping or HEPA vacuuming surfaces at least daily.
Level III ☐	**All control measures in Levels I and II and the following:** 1. Ensure availability of equipment for cleaning hands. 2. Construct and complete critical barriers meeting NFPA 241 requirements. Barriers must extend to the ceiling or if ceiling tile is removed, to the deck above. 3. All (plastic or hard) barrier construction activities must be completed in a manner that prevents dust release. Plastic barriers must be effectively affixed to floor and ceiling (or floor/roof deck above) and secure from movement or damage. 4. Seal all penetrations in containment barriers, including floors and ceiling, using approved materials (UL schedule firestop if applicable for barrier type). 5. Maintain .01 inches /water gauge negative pressurization of the entire workspace by use of HEPA exhaust air systems directed outdoors, or comply with the alternative method outline in Appendix A of the VHA ICRA template. These control measures must be maintained continuously 24/7 for the duration of the project. Exhausting discharged air into shared or recirculating HVAC systems, or other shared exhaust systems (e.g., bathroom exhaust) is prohibited. **Check box to indicate exhaust method:** Exterior ☐ Alternative Interior Method ☐ 6. Install a differential pressure sensing device (e.g., magnehelic, manometer, or digital monitoring) on exterior of work containment to continually monitor and document negative pressurization. The "ball in the wall" or similar apparatus are not acceptable.
Level IV ☒	**All control measures in Levels I, II and III and the following:** 1. Barriers must be hard barriers unless temporary to install final barrier. 2. Containment must include an anteroom to ensure pressure control, Anteroom must be large enough for equipment staging, cart cleaning, workers' PPE and cleaning. 3. Worker clothing and/or PPE must be removed or clean and free of visible dust before leaving the work area anteroom. HEPA vacuuming of clothing or use of cover suits is acceptable. 4. Workers must wear shoe covers or have a method to clean shoes in anteroom Shoe covers must be removed prior to exiting the anteroom to the occupied space (non-work area). Damaged shoe covers must be changed immediately.

Additional requirements:			
Project Manager signature		Date	
Infection Preventionist signature		Date	

Appendix A: Alternative To Outdoor Exhaust Requirements

This Appendix provides an equivalent ICRA control measure to requirements detailed in this VHA ICRA template (Table 5 Level III, item 5) that would allow interior construction space exhaust.

Interior Construction Space Exhaust:

If the facility is not able to exhaust to the building exterior, the Healthcare Environment and Facilities program office has identified an alternate industry-recognized standard interior exhaust procedure that is accepted as providing an equivalent level of infection prevention and control (IPC), and safety. The alternate interior exhaust procedure is implemented by completing the following:

a. If exhaust is directed indoors, then the system must be HEPA filtered. Prior to start of work, including assembly of the ICRA barriers, initial baseline air sampling measurements for particulate levels must be taken in the planned area of discharge. Once containment is erected and completed, HEPA filtration must then be verified by particulate measurement, using a particle counter with multi-channel capabilities to measure down to 0.3 microns, to confirm that the discharge of the HEPA unit does not exceed the baseline particulate count of the area to which the exhaust is directed. Verification must continue at least three times per day (once every 8 hours), 7 days per week, during the use of the negative air machine and HEPA filter. Any exceedance must trigger a work stoppage and an immediate response and resolution. All particulate measurements, including the baseline measurement, must be documented and retrievable.
b. To accommodate the sampling, the negative air pressure machine must be fitted with a 2 ft section of rigid ductwork at the discharge. The sample port for monitoring must be in the rigid ductwork section.
c. Vapor generating processes must be assessed and appropriate filtration must be installed to mitigate transmission to the facility.
d. Engineering must do a complete flow and pressure analysis and document the area to which the air is being discharged to ensure the flow and pressure relationships in that area are not being adversely impacted by the additional flow. Ideally, this is done as part of the construction package to ensure the design is implementable and no additional HVAC changes are required to accommodate the exhaust from the negative air equipment.
e. Install device on exterior of work containment to continually monitor negative pressurization. To ensure proper pressure is continuously maintained, the device(s) shall have a visual pressure indicator, data collection and alarm.
f. Exhaust must be directed to Low Risk areas as defined in Table 3 in this VHA ICRA template. Ideally this discharge must be located so as not to impinge on high traffic areas or create a nuisance with noise or excessive airflow.
   NOTE: *Exhaust into shared or recirculating HVAC systems, or other shared exhaust systems (e.g., bathroom exhaust) is not acceptable.*

SECTION 01 42 19
REFERENCE STANDARDS

PART 1 - GENERAL

1.1 DESCRIPTION

This section specifies the availability and source of references and standards specified in the project manual under paragraphs APPLICABLE PUBLICATIONS and/or shown on the drawings.

1.2 AVAILABILITY OF SPECIFICATIONS LISTED IN THE GSA INDEX OF FEDERAL SPECIFICATIONS, STANDARDS AND COMMERCIAL ITEM DESCRIPTIONS FPMR PART 101-29 (FAR 52.211-1) (AUG 1998)

A. The GSA Index of Federal Specifications, Standards and Commercial Item Descriptions, FPMR Part 101-29 and copies of specifications, standards, and commercial item descriptions cited in the solicitation may be obtained for a fee by submitting a request to - GSA Federal Supply Service, Specifications Section, Suite 8100, 470 East L'Enfant Plaza, SW, Washington, DC 20407, Telephone (202) 619-8925, Facsimile (202) 619-8978.

B. If the General Services Administration, Department of Agriculture, or Department of Veterans Affairs issued this solicitation, a single copy of specifications, standards, and commercial item descriptions cited in this solicitation may be obtained free of charge by submitting a request to the addressee in paragraph (a) of this provision. Additional copies will be issued for a fee.

1.3 AVAILABILITY FOR EXAMINATION OF SPECIFICATIONS NOT LISTED IN THE GSA INDEX OF FEDERAL SPECIFICATIONS, STANDARDS AND COMMERCIAL ITEM DESCRIPTIONS (FAR 52.211-4) (JUN 1988)

The specifications and standards cited in this solicitation can be examined at the following location:

DEPARMENT OF VETERANS AFFAIRS
Office of Construction & Facilities Management
Facilities Quality Service (00CFM1A)
425 Eye Street N.W, (sixth floor)
Washington, DC 20001
Telephone Numbers: (202) 632-5249 or (202) 632-5178
Between 9:00 AM - 3:00 PM

1.4 AVAILABILITY OF SPECIFICATIONS NOT LISTED IN THE GSA INDEX OF FEDERAL SPECIFICATIONS, STANDARDS AND COMMERCIAL ITEM DESCRIPTIONS (FAR 52.211-3) (JUN 1988)

The specifications cited in this solicitation may be obtained from the associations or organizations listed below.

AA	Aluminum Association Inc. http://www.aluminum.org
AABC	Associated Air Balance Council https://www.aabc.com
AAMA	American Architectural Manufacturer's Association http://www.aamanet.org
AASHTO	American Association of St Highway and Transportation Officials http://www.aashto.org
AATCC	American Association of Textile Chemists and Colorists http://www.aatcc.org
ACGIH	American Conference of Governmental Industrial Hygienists http://www.acgih.org
ACI	American Concrete Institute http://www.aci-int.net
ACPA	American Concrete Pipe Association http://www.concrete-pipe.org
ACPPA	American Concrete Pressure Pipe Association http://www.acppa.org
ADC	Air Diffusion Council http://flexibleduct.org
AGA	American Gas Association http://www.aga.org
AGC	Associated General Contractors of America http://www.agc.org
AGMA	American Gear Manufacturers Association, Inc. http://www.agma.org
AH	American Hort https://www.americanhort.org
AHAM	Association of Home Appliance Manufacturers http://www.aham.org

AIA	American Institute of Architects http://www.aia.org
AISC	American Institute of Steel Construction http://www.aisc.org
AISI	American Iron and Steel Institute http://www.steel.org
AITC	American Institute of Timber Construction https://aitc-glulam.org
AMCA	Air Movement and Control Association, Inc. http://www.amca.org
ANSI	American National Standards Institute, Inc. http://www.ansi.org
APA	The Engineered Wood Association http://www.apawood.org
ARI	Air-Conditioning and Refrigeration Institute http://www.ari.org
ARPM	Association for Rubber Product Manufacturers https://arpm.com
ASABE	American Society of Agricultural and Biological Engineers https://www.asabe.org
ASCE	American Society of Civil Engineers http://www.asce.org
ASHRAE	American Society of Htg, Refrg, and Air-Cond Engineers http://www.ashrae.org
ASME	American Society of Mechanical Engineers http://www.asme.org
ASSE	American Society of Sanitary Engineering International http://www.asse-plumbing.org
ASTM	American Society for Testing and Materials International http://www.astm.org
AWI	Architectural Woodwork Institute https://www.awinet.org
AWS	American Welding Society https://www.aws.org
AWWA	American Water Works Association https://www.awwa.org

BHMA Builders Hardware Manufacturers Association
https://www.buildershardware.com

BIA The Brick Industry Association
http://www.gobrick.com

CAGI Compressed Air and Gas Institute
https://www.cagi.org

CGA Compressed Gas Association, Inc.
https://www.cganet.com

CI The Chlorine Institute, Inc.
https://www.chlorineinstitute.org

CISCA Ceilings and Interior Systems Construction Association
https://www.cisca.org

CISPI Cast Iron Soil Pipe Institute
https://www.cispi.org

CLFMI Chain Link Fence Manufacturers Institute
https://www.chainlinkinfo.org

CPA Composite Panel Association
https://www.compositepanel.org

CPMB Concrete Plant Manufacturers Bureau
https://www.cpmb.org

CRA California Redwood Association
http://www.calredwood.org

CRSI Concrete Reinforcing Steel Institute
https://www.crsi.org

CTI Cooling Technology Institute
https://www.cti.org

DHA Decorative Hardwoods Association
https://www.decorativehardwoods.org

DHI Door and Hardware Institute
https://www.dhi.org

EGSA Electrical Generating Systems Association
http://www.egsa.org

EEI Edison Electric Institute
https://www.eei.org

EPA United States Environmental Protection Agency
https://www.epa.gov

ETL ETL Testing Services
http://www.intertek.com

FAA Federal Aviation Administration
https://www.faa.gov

FCC Federal Communications Commission
https://www.fcc.gov

FPS Forest Products Society
http://www.forestprod.org

GANA Glass Association of North America
http://www.glasswebsite.com

FM Factory Mutual Global Insurance
https://www.fmglobal.com

GA Gypsum Association
https://gypsum.org

GSA General Services Administration
https://www.gsa.gov

HI Hydraulic Institute
http://www.pumps.org

ICC International Code Council
https://shop.iccsafe.org

ICEA Insulated Cable Engineers Association
https://www.icea.net

ICAC Institute of Clean Air Companies
http://www.icac.com

IEEE Institute of Electrical and Electronics Engineers
https://www.ieee.org\

IGMA Insulating Glass Manufacturers Alliance
https://www.igmaonline.org

IMSA International Municipal Signal Association
http://www.imsasafety.org

MBMA Metal Building Manufacturers Association
https://www.mbma.com

MSS Mnfrs Standardization Society of the Valve and Fittings Industry
http://msshq.org

NAAMM National Association of Architectural Metal Manufacturers
https://www.naamm.org

PHCC Plumbing-Heating-Cooling Contractors Association
https://www.phccweb.org

NBS National Bureau of Standards
See - NIST

NBBI The National Board of Boiler and Pressure Vessel Inspectors
https://www.nationalboard.org

NEC National Electric Code
See - NFPA National Fire Protection Association

NEMA National Electrical Manufacturers Association
https://www.nema.org

NFPA National Fire Protection Association
https://www.nfpa.org

NHLA National Hardwood Lumber Association
https://www.nhla.com

NIH National Institute of Health
https://www.nih.gov

NIST National Institute of Standards and Technology
https://www.nist.gov

NELMA Northeastern Lumber Manufacturers Association, Inc.
http://www.nelma.org

NPA National Particleboard Association
(See CPA, Composite Panel Association)

NSF National Sanitation Foundation
http://www.nsf.org

OSHA Occupational Safety and Health Administration (Labor Dept.)
https://www.osha.gov

PCA Portland Cement Association
https://www.cement.org

PCI Precast Prestressed Concrete Institute
https://www.pci.org

PPI Plastics Pipe Institute
https://www.plasticpipe.org

PEI Porcelain Enamel Institute
http://www.porcelainenamel.com

PTI Post-Tensioning Institute
http://www.post-tensioning.org

RFCI Resilient Floor Covering Institute
https://www.rfci.com

RIS Redwood Inspection Service (Western Wood Products Assn.)
https://www.wwpa.org

SCMA Southern Cypress Manufacturers Association
http://www.cypressinfo.org

SDI Steel Door Institute
http://www.steeldoor.org

SJI Steel Joist Institute
https://www.steeljoist.org

SMACNA Sheet Metal & A/C Contractors Nat'l Assoc.
https://www.smacna.org

SSPC The Society for Protective Coatings
https://www.sspc.org

STI Steel Tank Institute
https://www.steeltank.com

SWI Steel Window Institute
https://www.steelwindows.com

TCNA Tile Council of North America
https://www.tcnatile.com

TEMA Tubular Exchanger Manufacturers Association
http://www.tema.org

TPI Truss Plate Institute
https://www.tpinst.org

UBC The Uniform Building Code
(See ICC)

UL Underwriters' Laboratories Incorporated
https://www.ul.com

ULC Underwriters' Laboratories of Canada
https://www.ulc.ca

WCLB West Coast Lumber Inspection Bureau
http://www.wclib.org

WDMA Window and Door Manufacturers Association
https://www.wdma.com

WRCLA Western Red Cedar Lumber Association
https://www.realcedar.com

WWPA Western Wood Products Association
http://www.wwpa.org

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SECTION 01 45 29
TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.1 DESCRIPTION:

A. This section specifies materials testing activities and inspection services required during project construction to be provided by a Testing Laboratory retained by the General Contractor.

1.2 APPLICABLE PUBLICATIONS:

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

B. American Association of State Highway and Transportation Officials (AASHTO):

T27-11.....Standard Method of Test for Sieve Analysis of Fine and Coarse Aggregates

T96-02 (R2006).....Standard Method of Test for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

T99-10.....Standard Method of Test for Moisture-Density Relations of Soils Using a 2.5 Kg (5.5 lb.) Rammer and a 305 mm (12 in.) Drop

T104-99 (R2007).....Standard Method of Test for Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate

T180-10.....Standard Method of Test for Moisture-Density Relations of Soils using a 4.54 kg (10 lb.) Rammer and a 457 mm (18 in.) Drop

T191-02(R2006).....Standard Method of Test for Density of Soil In-Place by the Sand-Cone Method

T310-13.....Standard Method of Test for In-place Density and Moisture Content of Soil and Soil-aggregate by Nuclear Methods (Shallow Depth)

C. American Concrete Institute (ACI):

506.4R-94 (R2004).....Guide for the Evaluation of Shotcrete

D. American Society for Testing and Materials (ASTM):

A370-12.....Standard Test Methods and Definitions for Mechanical Testing of Steel Products

A416/A416M-10.....Standard Specification for Steel Strand, Uncoated Seven-Wire for Prestressed Concrete

C31/C31M-10.....Standard Practice for Making and Curing Concrete Test Specimens in the Field

C33/C33M-11a.....Standard Specification for Concrete Aggregates

C39/C39M-12.....Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens

C109/C109M-11b.....Standard Test Method for Compressive Strength of Hydraulic Cement Mortars
C136-06.....Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
C138/C138M-10b.....Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
C140-12.....Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units
C143/C143M-10a.....Standard Test Method for Slump of Hydraulic Cement Concrete
C172/C172M-10.....Standard Practice for Sampling Freshly Mixed Concrete
C173/C173M-10b.....Standard Test Method for Air Content of freshly Mixed Concrete by the Volumetric Method
C330/C330M-09.....Standard Specification for Lightweight Aggregates for Structural Concrete
C567/C567M-11.....Standard Test Method for Density Structural Lightweight Concrete
C780-11.....Standard Test Method for Pre-construction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry
C1019-11.....Standard Test Method for Sampling and Testing Grout
C1064/C1064M-11.....Standard Test Method for Temperature of Freshly Mixed Portland Cement Concrete
C1077-11c.....Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
C1314-11a.....Standard Test Method for Compressive Strength of Masonry Prisms
D422-63(2007).....Standard Test Method for Particle-Size Analysis of Soils
D698-07e1.....Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort
D1140-00(2006).....Standard Test Methods for Amount of Material in Soils Finer than No. 200 Sieve
D1143/D1143M-07e1.....Standard Test Methods for Deep Foundations Under Static Axial Compressive Load
D1188-07e1.....Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Samples
D1556-07.....Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
D1557-09.....Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft lbf/ft3 (2,700 KNm/m3))
D2166-06.....Standard Test Method for Unconfined Compressive Strength of Cohesive Soil

D2167-08).....Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method
D2216-10.....Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
D2974-07a.....Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils
D3666-11.....Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials
D3740-11.....Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as used in Engineering Design and Construction
D6938-10.....Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
E94-04(2010).....Standard Guide for Radiographic Examination
E164-08.....Standard Practice for Contact Ultrasonic Testing of Weldments
E329-11c.....Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection
E543-09.....Standard Specification for Agencies Performing Non-Destructive Testing
E605-93(R2011).....Standard Test Methods for Thickness and Density of Sprayed Fire Resistive Material (SFRM) Applied to Structural Members
E709-08.....Standard Guide for Magnetic Particle Examination
E1155-96(R2008).....Determining FF Floor Flatness and FL Floor Levelness Numbers
F3125/F3125M-15.....Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions

E. American Welding Society (AWS):
D1.D1.1M-10.....Structural Welding Code-Steel

1.3 REQUIREMENTS:

A. Accreditation Requirements: Construction materials testing laboratories must be accredited by a laboratory accreditation authority and will be required to submit a copy of the Certificate of Accreditation and Scope of Accreditation. The laboratory's scope of accreditation must include the appropriate ASTM standards (i.e., E329, C1077, D3666, D3740, A880, E543) listed in the technical sections of

the specifications. Laboratories engaged in Hazardous Materials Testing shall meet the requirements of OSHA and EPA. The policy applies to the specific laboratory performing the actual testing, not just the "Corporate Office."

B. Inspection and Testing: Testing laboratory shall inspect materials and workmanship and perform tests described herein and additional tests requested by the contract. When it appears materials furnished, or work performed by Contractor fail to meet construction contract requirements, Testing Laboratory shall direct attention of COR to such failure.

C. Written Reports: Testing laboratory shall submit test reports to Contractor who shall submit to the COR via the submittal process, unless other arrangements are agreed to in writing by the COR. Reports of tests that fail to meet construction contract requirements shall be clearly noted with red highlighting/clouds on the documents.

D. Verbal Reports: Give verbal notification to COR immediately of any irregularity.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 EARTHWORK:

A. General: The Testing Laboratory shall provide qualified personnel, materials, equipment, and transportation as required to perform the services identified/required herein, within the agreed to schedule and/or time frame. The work to be performed shall be as identified herein and shall include but not be limited to the following:

1. Observe fill and subgrades during proof-rolling to evaluate suitability of surface material to receive fill or base course. Provide recommendations to the COR regarding suitability or unsuitability of areas where proof-rolling was observed. Where unsuitable results are observed, witness excavation of unsuitable material and recommend to COR extent of removal and replacement of unsuitable materials and observe proof-rolling of replaced areas until satisfactory results are obtained.
2. Provide part time observation of fill placement and compaction and field density testing in building areas and provide part time observation of fill placement and compaction and field density testing in pavement areas to verify that earthwork compaction obtained is in accordance with contract documents.
3. Provide supervised geotechnical technician to inspect excavation, subsurface preparation, and backfill for structural fill.

B. Testing Compaction:

1. Determine maximum density and optimum moisture content for each type of fill, backfill and subgrade material used, in compliance with the appropriate testing method or ASTM requirement.

2. Make field density tests in accordance with the appropriate testing method or ASTM requirement wherever possible. Field density tests shall be utilized on a case-by-case basis only if there are problems with the validity of the results from the primary method due to specific site field conditions. Should the testing laboratory propose these alternative methods, they should provide satisfactory explanation to the COR before the tests are conducted.

   a. Foundation Wall Backfill: One test per 100 feet of each layer of compacted fill but in no case fewer than two tests.
   c. Pavement Subgrade: One test for each 400 square yards, but in no case fewer than two tests.
   d. Curb, Gutter, and Sidewalk: One test for each 300 linear feet, but in no case fewer than two tests.
   e. Trenches: One test at maximum 100-foot intervals per 4 foot of vertical lift and at changes in required density, but in no case fewer than two tests.
   f. Footing Subgrade: At least one test for each layer of soil on which footings will be placed. Subsequent verification and approval of each footing subgrade may be based on a visual comparison of each subgrade with related tested subgrade when acceptable to COR. In each compacted fill layer below footings, perform one field density test for every 100 feet. Verify subgrade is level, all loose or disturbed soils have been removed, and correlate actual soil conditions observed with those indicated by test borings.

C. Fill and Backfill Material Gradation: One test per 100 cubic yards stockpiled or in-place source material. Gradation of fill and backfill material shall be determined in accordance with the appropriate testing method or ASTM requirement.
D. Testing for Footing Bearing Capacity: Evaluate if suitable bearing capacity material is encountered in footing subgrade.
E. Testing Materials: Test suitability of on-site and off-site borrow as directed by COR.

3.2 FOUNDATION PILES: NOT USED

3.3 FOUNDATION CAISSONS: NOT USED

3.4 LANDSCAPING:

A. Test topsoil for organic materials, pH, phosphate, potash content, and gradation of particles.

   1. Test for organic material by using ASTM D2974.
   2. Determine percent of silt, sand, clay, and foreign materials such as rock, roots, and vegetation.

B. Submit laboratory test report of topsoil to COR.

3.5 ASPHALT CONCRETE PAVING:

A. Aggregate Base Course:

1. Determine maximum density and optimum moisture content for aggregate base material in accordance with the appropriate testing method or ASTM requirement.
2. Make a minimum of three field density tests on each day's final compaction on each aggregate course in accordance with the appropriate testing method or ASTM requirement.
3. Sample and test aggregate as necessary to ensure compliance with specification requirements for gradation, wear, and soundness as specified in the applicable state highway standards and specifications.

B. Asphalt Concrete:

1. Aggregate: Sample and test aggregates in stockpile and hot-bins as necessary to ensure compliance with specification requirements for gradation (AASHTO T27), wear (AASHTO T96), and soundness (AASHTO T104).
2. Temperature: Check temperature of each load of asphalt concrete at mixing plant and at site of paving operation.
3. Density: Make a minimum of two field density tests in accordance with ASTM D1188 of asphalt base and surface course for each day's paving operation.

3.6 SITE WORK CONCRETE:

Test site work concrete including materials for concrete as required in Article CONCRETE of this section.

3.7 POST-TENSIONING OF CONCRETE: NOT USED

3.8 CONCRETE:

A. Batch Plant Inspection and Materials Testing:

1. Perform continuous batch plant inspection until concrete quality is established to satisfaction of COR and perform periodic inspections thereafter as determined by COR.
2. Periodically inspect and test batch proportioning equipment for accuracy and report deficiencies to COR.
3. Sample and test mix ingredients as necessary to ensure compliance with specifications.
4. Sample and test aggregates daily and as necessary for moisture content. Test the dry rodded weight of the coarse aggregate whenever a sieve analysis is made, and when it appears there has been a change in the aggregate.
5. Certify, in duplicate, ingredients and proportions and amounts of ingredients in concrete conform to approved trial mixes. When

concrete is batched or mixed off immediate building site, certify (by signing, initialing, or stamping thereon) on delivery slips (duplicate) that ingredients in truck-load mixes conform to proportions of aggregate weight, cement factor, and water-cement ratio of approved trial mixes.

B. Field Inspection and Materials Testing:

1. Provide a technician at site of placement at all times to perform concrete sampling and testing.
2. Review the delivery tickets of the ready-mix concrete trucks arriving on-site. Notify the Contractor if the concrete cannot be placed within the specified time limits or if the type of concrete delivered is incorrect. Reject any loads that do not comply with the Specification requirements. Rejected loads are to be removed from the site at the Contractor’s expense. Any rejected concrete that is placed will be subject to removal.
3. Take concrete samples at point of placement in accordance with ASTM C172. Mold and cure compression test cylinders in accordance with ASTM C31. Make at least three cylinders for each 50 cubic yards or less of each concrete type, and at least three cylinders for any one day's pour for each concrete type. Label each cylinder with an identification number. COR may require additional cylinders to be molded and cured under job conditions.
4. Perform slump tests in accordance with ASTM C143. Test the first truck each day, and every time test cylinders are made. Test pumped concrete at the hopper and at the discharge end of the hose at the beginning of each day’s pumping operations to determine change in slump.
5. Determine the air content of concrete per ASTM C173. For concrete required to be air-entrained, test the first truck and every 25 cubic yards thereafter each day. For concrete not required to be air-entrained, test every 100 cubic yards at random. For pumped concrete, initially test concrete at both the hopper and the discharge end of the hose to determine change in air content.
6. If slump or air content fall outside specified limits, make another test immediately from another portion of same batch.
7. Perform unit weight tests in compliance with ASTM C138 for normal weight concrete and ASTM C567 for lightweight concrete. Test the first truck and each time cylinders are made.
8. Notify laboratory technician at batch plant of mix irregularities and request materials and proportioning check.
9. Verify that specified mixing has been accomplished.
10. Environmental Conditions: Determine the temperature per ASTM C1064 for each truckload of concrete during hot weather and cold weather concreting operations:

    a. When ambient air temperature falls below 40 degrees F, record maximum and minimum air temperatures in each 24-hour period;

record air temperature inside protective enclosure; record minimum temperature of surface of hardened concrete.

b. When ambient air temperature rises above 85 degrees F, record maximum and minimum air temperature in each 24-hour period; record minimum relative humidity; record maximum wind velocity; record maximum temperature of surface of hardened concrete.

11. Inspect the reinforcing steel placement, including bar size, bar spacing, top and bottom concrete cover, proper tie into the chairs, and grade of steel prior to concrete placement. Submit detailed report of observations.
12. Observe conveying, placement, and consolidation of concrete for conformance to specifications.
13. Observe condition of formed surfaces upon removal of formwork prior to repair of surface defects and observe repair of surface defects.
14. Observe curing procedures for conformance with specifications, record dates of concrete placement, start of preliminary curing, start of final curing, end of curing period.
15. Observe preparations for placement of concrete:

    a. Inspect handling, conveying, and placing equipment, inspect vibrating and compaction equipment.
    b. Inspect preparation of construction, expansion, and isolation joints.

16. Observe preparations for protection from hot weather, cold weather, sun, and rain, and preparations for curing.
17. Observe concrete mixing:

    a. Monitor and record amount of water added at project site.
    b. Observe minimum and maximum mixing times.

18. Measure concrete flatwork for levelness and flatness as follows:

    a. Perform Floor Tolerance Measurements F_F and F_L in accordance with ASTM E1155. Calculate the actual overall F- numbers using the inferior/superior area method.
    b. Perform all floor tolerance measurements within 48 hours after slab installation and prior to removal of shoring and formwork.
    c. Provide the COR with the results of all profile tests, including a running tabulation of the overall F_F and F_L values for all slabs installed to date, within 72 hours after each slab installation.

19. Other inspections:

    a. Grouting under base plates.
    b. Grouting anchor bolts and reinforcing steel in hardened concrete.

C. Laboratory Tests of Field Samples:

1. Test compression test cylinders for strength in accordance with ASTM C39. For each test series, test one cylinder at 7 days and one cylinder at 28 days. Use remaining cylinder as a spare tested as directed by COR. Compile laboratory test reports as follows: Compressive strength test shall be result of one cylinder, except when one cylinder shows evidence of improper sampling, molding or testing, in which case it shall be discarded and strength of spare cylinder shall be used.
2. Make weight tests of hardened lightweight structural concrete in accordance with ASTM C567.
3. Furnish certified compression test reports to COR as Div 03 submittal. In test report, indicate the following information:

   a. Cylinder identification number and date cast.
   b. Specific location at which test samples were taken.
   c. Type of concrete, slump, and percent air.
   d. Compressive strength of concrete in psi.
   e. Weight of lightweight structural concrete in pounds per cubic feet.
   f. Weather conditions during placing.
   g. Temperature of concrete in each test cylinder when test cylinder was molded.
   h. Maximum and minimum ambient temperature during placing.
   i. Ambient temperature when concrete sample in test cylinder was taken.
   j. Date delivered to laboratory and date tested.

3.9 REINFORCEMENT: NOT USED

3.10 SHOTCRETE: NOT USED

3.11 PRESTRESSED CONCRETE: NOT USED

3.12 ARCHITECTURAL PRECAST CONCRETE: NOT USED

3.13 MASONRY: NOT USED

3.14 STRUCTURAL STEEL:

A. General: Provide shop and field inspection and testing services to certify structural steel work is done in accordance with contract documents. Welding shall conform to AWS D1.1 Structural Welding Code.
B. Prefabrication Inspection:

   1. Review design and shop detail drawings for size, length, type and location of all welds to be made.
   2. Approve welding procedure qualifications either by pre-qualification or by witnessing qualifications tests.
   3. Approve welder qualifications by certification or retesting.
   4. Approve procedure for control of distortion and shrinkage stresses.
   5. Approve procedures for welding in accordance with applicable sections of AWS D1.1.

C. Fabrication and Erection:

1. Weld Inspection:

a. Inspect welding equipment for capacity, maintenance and working condition.
b. Verify specified electrodes and handling and storage of electrodes in accordance with AWS D1.1.
c. Inspect preparation and assembly of materials to be welded for conformance with AWS D1.1.
d. Inspect preheating and interpass temperatures for conformance with AWS D1.1.
e. Measure 25 percent of fillet welds.
f. Welding Magnetic Particle Testing: Test in accordance with ASTM E709 for a minimum of:

1) 20 percent of all shear plate fillet welds at random, final pass only.
2) 20 percent of all continuity plate and bracing gusset plate fillet welds, at random, final pass only.
3) 100 percent of tension member fillet welds (i.e., hanger connection plates and other similar connections) for root and final passes.
4) 20 percent of length of built-up column member partial penetration and fillet welds at random for root and final passes.
5) 100 percent of length of built-up girder member partial penetration and fillet welds for root and final passes.

g. Welding Ultrasonic Testing: Test in accordance with ASTM E164 and AWS D1.1 for 100 percent of all full penetration welds, braced and moment frame column splices, and a minimum of 20 percent of all other partial penetration column splices, at random.
h. Verify that correction of rejected welds are made in accordance with AWS D1.1.
i. Testing and inspection do not relieve the Contractor of the responsibility for providing materials and fabrication procedures in compliance with the specified requirements.

2. Bolt Inspection:

a. Inspect high-strength bolted connections in accordance AISC Specifications for Structural Joints Using ASTM F3125 Bolts.
b. Slip-Critical Connections: Inspect 10 percent of bolts, but not less than 2 bolts, selected at random in each connection in accordance with AISC Specifications for Structural Joints Using ASTM F3125 Bolts. Inspect all bolts in connection when one or more are rejected.

c. Fully Pre-tensioned Connections: Inspect 10 percent of bolts, but not less than 2 bolts, selected at random in 25 percent of connections in accordance with AISC Specification for Structural Joints Using ASTM F3125 Bolts. Inspect all bolts in connection when one or more are rejected.
d. Bolts installed by turn-of-nut tightening may be inspected with calibrated wrench when visual inspection was not performed during tightening.
e. Snug Tight Connections: Inspect 10 percent of connections verifying that plies of connected elements have been brought into snug contact.
f. Inspect field erected assemblies; verify locations of structural steel for plumbness, level, and alignment.

D. Submit inspection reports, record of welders and their certification, and identification, and instances of noncompliance to COR as Div 05 submittal.

3.15 STEEL DECKING: NOT USED

3.16 SHEAR CONNECTOR STUDS: NOT USED

3.17 SPRAYED-ON FIREPROOFING: NOT USED

3.18 TYPE OF TEST:

Approximate Number of Tests Required

A. Earthwork:	
Laboratory Compaction Test, Soils:	1 per pit
Field Density, Soils (AASHTO T191, T205, or T310)	2 per 4’ lift
B. Aggregate Base:	
Laboratory Compaction	1 per prod./type
Field Density	3 per patch
Aggregate, Base Course Gradation (AASHTO T27)	1 per prod./type
D. Asphalt Concrete:	
Field Density	2 per base course & 2 per surf/day
Aggregate, Asphalt Concrete Gradation (AASHTO T27)	1 per prod./type
E. Concrete:	
Making and Curing Concrete Test Cylinders (ASTM C31)	3 per 150 CY, or 3 per 5000 SF
Compressive Strength, Test Cylinders (ASTM C39)	3 per 150 CY, or 3 per 5000 SF
Concrete Slump Test (ASTM C143)	1 per hour
Concrete Air Content Test (ASTM C173)	1 per hour
Flatness and Levelness Readings (ASTM E1155)	14 days

F. Inspection:
Technical Personnel (Man-days) 100 man-days

G. Technical Personnel: minimum 24 months

1. Technicians to perform tests and inspection listed above. Laboratory will be equipped with concrete cylinder storage facilities, compression machine, cube molds, proctor molds, balances, scales, moisture ovens, slump cones, air meter, and all necessary equipment for compaction control.

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SECTION 01 57 19
TEMPORARY ENVIRONMENTAL CONTROLS

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section specifies the control of environmental pollution and damage that the Contractor must consider for air, water, and land resources. It includes management of visual aesthetics, noise, solid waste, radiant energy, and radioactive materials, as well as other pollutants and resources encountered or generated by the Contractor. The Contractor is obligated to consider specified control measures with the costs included within the various contract items of work.

B. Environmental pollution and damage are defined as the presence of chemical, physical, or biological elements or agents which:

1. Adversely affect human health or welfare,
2. Unfavorably alter ecological balances of importance to human life,
3. Effect other species of importance to humankind, or
4. Degrade the utility of the environment for aesthetic, cultural, and historical purposes.

C. Definitions of Pollutants:

1. Air Pollution: Means the presence in the atmosphere of one or more air contaminants in such quantities and of such duration as is or tends to be injurious to human health or welfare, animal or plant life, or property, or would unreasonably interfere with the enjoyment of life or property.
2. Chemical Waste: Petroleum products, bituminous materials, salts, acids, alkalis, herbicides, pesticides, organic chemicals, and inorganic wastes.
3. Debris: Combustible and noncombustible wastes, such as leaves, tree trimmings, ashes, and waste materials resulting from construction or maintenance and repair work.
4. Hazardous Waste: By-products of society that can pose a substantial or potential hazard to human health or the environment when improperly managed. It is a solid waste that possesses at least one of four characteristics (ignitability, corrosivity, reactivity and toxicity), or appears on special Wisconsin Department of Natural Resources (DNR) or U.S. Environmental Protection Agency (EPA) lists. The regulatory definition of hazardous waste is found in Wis. Admin. Code § NR 661.
5. Rubbish: Combustible and noncombustible wastes such as paper, boxes, glass/crockery, metal and lumber scrap, tin cans, and bones.
6. Sanitary Wastes:

a. Sewage: Means the water-carried wastes created in and to be conducted away from residences, industrial establishments, and public buildings as defined in Wis. Stat. § 101.01, with such surface water or groundwater as may be present.
b. Garbage: Refuse and scraps resulting from preparation, cooking, dispensing, and consumption of food.

7. Sediment: Soil and other debris that has been eroded and transported by runoff water or deposited by runoff away from its original location.
8. Solid Waste: Any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant or air pollution control facility and other discarded or salvageable materials, including solid, liquid, semisolid, or contained gaseous materials resulting from industrial, commercial, mining and agricultural operations, and from community activities, but does not include solids or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges which are point sources subject to permits under Wis. Stat. § 283, or source material, as defined in Wis. Stat. § 254.31(10), special nuclear material, as defined in Wis. Stat. § 254.31(11), or byproduct material, as defined in Wis. Stat. § 254.31(1).
9. Surface Discharge: The term "Surface Discharge" implies that the water is discharged with possible sheeting action and subsequent soil erosion may occur. Waters that are surface discharged may terminate in drainage ditches, storm sewers, creeks, and/or "water of the United States" and would require a permit to discharge water from the governing agency.

1.2 QUALITY CONTROL

A. Establish and maintain quality control for the environmental protection of all items set forth herein.
B. Record on daily reports any problems in complying with laws, regulations, and ordinances. Note any corrective action taken.

1.3 REFERENCES

A. Refer to Specification 01 00 00 GENERAL REQUIREMENTS Paragraph 1.9 regarding the requirement for a Wisconsin Pollutant Discharge Elimination System (WPDES) permit.
B. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.
C. U.S. National Archives and Records Administration (NARA):
33 CFR 328.....Definitions
C. Wisconsin DNR Definitions webpage:
http://dnr.wi.gov/topic/Waste/Definitions.html
D. Wis. Admin Code § NR 141, NR 400, NR 500, NR 660, and NR 661.

E. Wisconsin Statute Ch. 289
F. Wisconsin DNR Solid and Hazardous Waste Codes and Statutes webpage: http://dnr.wi.gov/topic/Waste/Laws.html

1.4 SUBMITTALS

A. In accordance with Section, 01 33 23, SUBMITTALS, RFIS AND CONSTRUCTION BULLETINS, furnish the following:

1. Environmental Protection Plan: **Within 60 days of the NTP, the Contractor shall prepare and submit a written and/or graphic Environmental Protection Plan including, but not limited to, the following**:

a. Name(s) of person(s) within the Contractor's organization who is (are) responsible for ensuring adherence to the Environmental Protection Plan.
b. Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the site.
c. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.
d. Description of the Contractor's environmental protection personnel training program.
e. A list of Federal, State, and local laws, regulations, and permits concerning environmental protection, pollution control, noise control and abatement that are applicable to the Contractor's proposed operations and the requirements imposed by those laws, regulations, and permits.
f. Methods for protection of features to be preserved within authorized work areas including trees, shrubs, vines, grasses, ground cover, landscape features, air and water quality, fish and wildlife, soil, historical, and archeological and cultural resources.
g. Procedures to provide the environmental protection that comply with the applicable laws and regulations. Describe the procedures to correct pollution of the environment due to accident, natural causes, or failure to follow the procedures as described in the Environmental Protection Plan.
h. Permits, licenses, and the location of the solid waste disposal area.
i. Drawings showing locations of any proposed temporary excavations or embankments, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials. Include as part of an Erosion Control Plan approved by the District Office of the U.S. Soil Conservation Service and the Department of Veterans Affairs.
j. Environmental Monitoring Plans for the job site including land, water, air, and noise.

k. Work Area Plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas.
l. Show how this plan interacts with the Erosion Control Plan.
m. Inclusion of “best management practices” and methodologies.

B. Approval of the Contractor's Environmental Protection Plan will not relieve the Contractor of responsibility for adequate and continued control of pollutants and other environmental protection measures.

1.5 PROTECTION OF ENVIRONMENTAL RESOURCES

A. Protect environmental resources within the project boundaries and those affected outside the limits of permanent work during the entire period of this contract. Confine activities to areas defined by the specifications and drawings.
B. Protection of Land Resources: Prior to construction, identify all land resources to be preserved within the work area. Do not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and landforms without permission from the COR. Do not fasten or attach ropes, cables, or guys to trees for anchorage unless specifically authorized, or where special emergency use is permitted. Provide erosion control plans, in phases where required.

1. Work Area Limits: Prior to any construction, mark the areas that require work to be performed under this contract. Mark or fence isolated areas within the general work area that are to be saved and protected. Protect monuments, works of art, and markers before construction operations begin. Convey to all personnel the purpose of marking and protecting all necessary objects.
2. Protection of Landscape: Protect trees, shrubs, vines, grasses, landforms, and other landscape features shown on the drawings to be preserved by marking, fencing, or using any other approved techniques.

a. Box and protect from damage existing trees and shrubs to remain on the construction site.
b. Immediately repair all damage to existing trees and shrubs by trimming, cleaning, and painting with antiseptic tree paint.
c. Do not store building materials or perform construction activities closer to existing trees or shrubs than the farthest extension of their limbs.

3. Reduction of Exposure of Unprotected Erodible Soils: Plan and conduct earthwork to minimize the duration of exposure of unprotected soils. Clear areas in reasonably sized increments only as needed to use. Form earthwork to final grade as shown. Immediately protect side slopes and back slopes upon completion of rough grading.

4. Temporary Protection of Disturbed Areas: Construct diversion ditches, benches, and berms to retard and divert runoff from the construction site to protected drainage areas approved under paragraph 208 of the Clean Water Act.

   a. Sediment Basins: Trap sediment from construction areas in temporary or permanent sediment basins that accommodate the runoff of a local 10 (design year) storm. After each storm, pump the basins dry and remove the accumulated sediment. Control overflow/drainage with paved weirs or by vertical overflow pipes, draining from the surface.
   b. Reuse or conserve the collected topsoil sediment as directed by the COR. Topsoil use and requirements are specified in Section 31 20 00, EARTHWORK.
   c. Institute effluent quality monitoring programs as required by Federal, State, and local environmental agencies.

5. Erosion and Sedimentation Control Devices: The erosion and sediment controls selected and maintained by the Contractor shall be such that water quality standards are not violated as a result of the Contractor's activities. Construct or install all temporary and permanent erosion and sedimentation control features as shown on the drawings. Proposed modifications may be shown on the Contractor’s Environmental Protection Plan. Maintain temporary erosion and sediment control measures such as berms, dikes, drains, sedimentation basins, grassing, and mulching, until permanent drainage and erosion control facilities are completed and operative. Utilize informational guidance provided by the Wisconsin DNR on their webpage (http://dnr.wi.gov/topic/stormwater/standards/) regarding storm water technical standards, models, and BMPs. Use the technical standards to plan, design, install, and maintain erosion/sediment control and storm water management practices to assist in complying with Wis. Admin. Code § NR 151.
6. Manage borrow areas on Government property to minimize erosion and to prevent sediment from entering nearby water courses or lakes.
7. Manage and control spoil areas on Government property to limit spoil to areas as shown on the drawings or as proposed on the Environmental Protection Plan. Prevent erosion of soil or sediment from entering nearby water courses or lakes.
8. Protect adjacent areas from despoilment by temporary excavations and embankments.
9. The contractor is responsible for obtaining the appropriate Wisconsin Pollutant Discharge Elimination System (WPDES) permit(s) coverage and any local jurisdiction approvals pertaining to the project, if applicable. All permit requirements shall be followed, including completing required storm water pollution prevention plans (SWPPPs), inspections, and documentation. Document all SWPPP requirements for the duration of the project and submit weekly to the COR.

10. Handle and dispose of solid wastes in such a manner that will prevent contamination of the environment. Place solid wastes (excluding clearing debris) in containers that are emptied on a regular schedule. Transport all solid waste off Government property and dispose of waste in compliance with Federal, State, and local requirements. Reference specification 01 74 19 for waste management requirements.
11. Store hazardous/chemical waste away from the work areas in corrosion-resistant containers that are compatible with the waste and dispose of waste in accordance with Federal, State, and local regulations. Hazardous waste must be labeled according to 40 CFR 262.15.
12. Handle discarded materials other than those included in the solid waste category as directed by the COR.

C. Protection of Water Resources: Keep construction activities under surveillance, management, and control to avoid pollution of surface and ground waters and sewer systems. Implement management techniques to control water pollution by the listed construction activities that are included in this contract.

1. Washing and Curing Water: Do not allow wastewater directly derived from construction activities to enter water areas. Collect and place wastewater in retention ponds allowing the suspended material to settle, the pollutants to separate, or the water to evaporate.
2. Control movement of materials and equipment at stream crossings during construction to prevent violation of water pollution control standards of the Federal, State, or local government.
3. Monitor water areas affected by construction.

D. Protection of Fish and Wildlife Resources: Keep construction activities under surveillance, management, and control to minimize interference with, disturbance of, or damage to fish and wildlife. Prior to beginning construction operations, list species that require specific attention along with measures for their protection. Utilize U.S. Fish and Wildlife Service (fws.gov) to research threatened and endangered species in the area.

E. Protection of Air Resources: Keep construction activities under surveillance, management, and control to minimize pollution of air resources. Burning is not permitted on the job site. Keep activities, equipment, processes, and work operated or performed, in strict accordance with the State of Wisconsin and Federal emission and performance laws and standards. Maintain ambient air quality standards set by the Environmental Protection Agency, for those construction operations and activities specified.

1. Particulates: Control dust particles, aerosols, and gaseous by-products from all construction activities, processing, and preparation of materials (such as from asphaltic batch plants) at

all times, including weekends, holidays, and hours when work is not in progress.

2. Particulates Control: Maintain all excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and all other work areas within or outside the project boundaries free from particulates which would cause a hazard or a nuisance. Sprinklering, chemical treatment of an approved type, light bituminous treatment, baghouse, scrubbers, electrostatic precipitators, or other methods are permitted to control particulates in the work area.
3. Hydrocarbons and Carbon Monoxide: Control monoxide emissions from equipment to Federal and State allowable limits.
4. Odors: Control odors of construction activities and prevent obnoxious odors from occurring.

F. Reduction of Noise: Minimize noise using every action possible. Perform noise-producing work in less sensitive hours of the day or week as directed by the COR. Maintain noise-produced work at or below the decibel levels and within the time periods specified.

1. Perform exterior construction activities involving repetitive, high-level impact noise only between 8 a.m. and 4 p.m. unless otherwise permitted by the COR. Repetitive impact noise on the property shall not exceed the following dB limitations:

Time Duration of Impact Noise	Sound Level in dB
More than 12 minutes in any hour	70
Less than 30 seconds of any hour	85
Less than three minutes of any hour	80
Less than 12 minutes of any hour	75

2. Provide sound-deadening devices on equipment and take noise abatement measures that are necessary to comply with the requirements of this contract, consisting of, but not limited to, the following:

a. Maintain maximum permissible construction equipment noise levels at 50 feet (dBA):

EARTHMOVING		MATERIALS HANDLING	
FRONT LOADERS	75	CONCRETE MIXERS	75
BACKHOES	75	CONCRETE PUMPS	75
DOZERS	75	CRANES	75
TRACTORS	75	DERRICKS IMPACT	75
SCAPERS	80	PILE DRIVERS	95

GRADERS	75	JACK HAMMERS	75
TRUCKS	75	ROCK DRILLS	80
PAVERS, STATIONARY	80	PNEUMATIC TOOLS	80
PUMPS	75	BLASTING	80
GENERATORS	75	SAWS	75
COMPRESSORS	75	VIBRATORS	75

b. Use shields or other physical barriers to restrict noise transmission.
c. Provide soundproof housings or enclosures for noise-producing machinery.
d. Use efficient silencers on equipment air intakes.
e. Use efficient intake and exhaust mufflers on internal combustion engines that are maintained so equipment performs below noise levels specified.
f. Line hoppers and storage bins with sound deadening material.
g. Conduct truck loading, unloading, and hauling operations so that noise is kept to a minimum.

3. Measure sound level for noise exposure due to the construction at least once every five successive working days while work is being performed above 55 dB(A) noise level. Measure noise exposure at the property line or 50 feet from the noise source, whichever is greater. Measure the sound levels on the A weighing network of a General-Purpose sound level meter at slow response. To minimize the effect of reflective sound waves at buildings, take measurements at three to six feet in front of any building face. Submit the recorded information to the COR noting any problems and the alternatives for mitigating actions.

G. Restoration of Damaged Property: If any direct or indirect damage is done to public or private property resulting from any act, omission, neglect, or misconduct, the Contractor shall restore the damaged property to a condition equal to that existing before the damage at no additional cost to the Government. Repair, rebuild, or restore property as directed or make good such damage in an acceptable manner.
H. Final Clean-up: On completion of project and after removal of all debris, rubbish, and temporary construction, Contractor shall leave the construction area in a clean condition satisfactory to the COR. Cleaning shall include off the station disposal of all items and materials not required to be salvaged, as well as all debris and rubbish resulting from demolition and new work operations.

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SECTION 01 58 16
TEMPORARY INTERIOR SIGNAGE

PART 1 GENERAL

A. This section specifies temporary interior signs. When the contractor's work blocks doors and/or exits, or otherwise impacts egress in the facility, the General Contractor is to provide all temporary signage to reroute personnel and block the doors or exits. Locations to be determined based on the Safety-issued ILSM.

PART 2 PRODUCTS

2.1 TEMPORARY SIGNS

A. Fabricate from 110-pound mat finish white paper.

B. Cut to 4-inch wide by 12-inch-long size tag.

C. Punch 1/8-inch diameter hole centered on 4-inch dimension of tag. Edge of hole spaced approximately 1/2-inch from one end on tag. Reinforce hole on both sides with gummed cloth washer or other suitable material capable of preventing tie pulling through paper edge.

D. Attach to tag with steel wire twist tie, leaving 6-inch-long free ends.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install temporary signs as directed by COR.

B. Mark on signs with felt tip marker having approximately 1/8-inch-wide stroke for clearly legible numbers or letters.

C. Identify room with numbers as designated on floor plans.

3.2 LOCATION

A. Install on doors that have room, corridor, and space numbers shown.

B. Doors that do not require signs are as follows:

1. Corridor barrier doors with same number.
2. Folding doors or partitions.
3. Toilet or bathroom doors within and between rooms.
4. Communicating doors in partitions between rooms.
5. Closet doors within rooms.

C. Replace missing, damaged, or illegible signs.

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SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT

PART 1 – GENERAL

1.1 DESCRIPTION

A. This section specifies the requirements for the management of non-hazardous building construction and demolition waste.
B. Waste disposal in landfills shall be minimized to the greatest extent possible. Of the inevitable waste that is generated, as much of the waste material as economically feasible shall be salvaged, recycled, or reused.
C. Contractor shall use all reasonable means to divert construction and demolition waste from landfills and incinerators, and facilitate their salvage and recycling to be not limited to the following:

1. Waste Management Plan development and implementation. Reference Appendix A this specification for a sample Construction Waste Management Plan.
2. Techniques to minimize waste generation.
3. Sorting and separating waste materials.
4. Salvage of existing materials and items for reuse or resale.
5. Recycling materials that cannot be reused or sold.

D. At a minimum the following shall be diverted from landfills:

1. Clean/Uncontaminated Soil (Note: The Clement J. Zablocki VA Medical Center (5000 W. National Ave. Milwaukee, WI 53295) is listed on the Wisconsin Department of Natural Resources (DNR) Bureau for Remediation and Redevelopment Tracking System (BRRTS) [BRRTS No. 02-41-563846]. Soils excavated at the Medical Center are typically contaminated with low levels of lead, petroleum volatile organic compounds (PVOCs), polycyclic aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs). All soil spoils are assumed to be contaminated unless an exemption is approved. If an exemption from the landfill requirement is desired, the contractor is responsible for all expenses related to sample collection, laboratory analysis, reporting, interpretation of the results, coordinating with Wisconsin Department of Natural Resources (DNR) to obtain approval to dispose of soils at a non-licensed landfill or other site. For soil spoils that must be disposed of offsite without an approved exemption from the DNR, the contractor is responsible for obtaining approval from a licensed landfill prior to disposal. The contractor must consult with the Milwaukee VAMC Green Environmental Management System (GEMS) Program Manager at least four weeks prior to shipment of soil spoils offsite so as not to cause any project delays.)
2. Inert materials (concrete, masonry, and asphalt).
3. Clean dimensional wood and pallet wood.

4. Green waste (biodegradable landscaping materials).
5. Engineered wood products (plywood, particle board, etc.).
6. Metal products (steel, wire, beverage containers, copper, etc.).
7. Sheathings
8. Cardboard, paper, and packaging.
9. Bitumen roofing materials.
10. Plastics (ABS, PVC, etc.).
11. Carpet and/or pad.
12. Gypsum board.
13. Insulation.
14. Paint.

E. The following regulated waste require special handling, storage and disposal and must be segregated:

1. Hazardous Wastes (including oil-based paint, cleaning chemicals, other miscellaneous chemicals, etc.).
2. Used Oil and Antifreeze.
3. Electronical Waste (E-waste).
4. Universal Wastes (aerosol cans, batteries, lamps, mercury-containing equipment [thermostats, switches, etc.], pesticides, etc.).
5. Polychlorinated biphenyl (PCB) ballasts and non-PCB ballasts.

1.2 RELATED WORK

A. Section 01 00 00, GENERAL REQUIREMENTS
B. Section 02 41 00, DEMOLITION

1.3 QUALITY ASSURANCE

A. Contractor shall practice efficient waste management when sizing, cutting, and installing building products. Processes shall be employed to ensure the generation of as little waste as possible. Construction demolition waste includes products of the following:

1. Excess or unusable construction materials.
2. Packaging used for construction products.
3. Poor planning and/or layout.
4. Construction error.
5. Over ordering.
6. Weather damage.
7. Contamination.
8. Mishandling.
9. Breakage.

B. Establish and maintain the management of non-hazardous building construction and demolition waste set forth herein. Conduct a site assessment to estimate the types of materials that will be generated by demolition and construction.

C. Contractor shall develop and implement procedures to recycle construction and demolition waste to a minimum of 50 percent.
D. Contractor shall be responsible for implementation of any special programs involving rebates or similar incentives related to recycling. Any revenues or savings obtained from salvage or recycling shall accrue to the contractor.
E. Contractor shall provide for all demolition, removal and legal disposal of materials and regulated waste. The Contractor shall ensure that facilities used for recycling, reuse and disposal shall be permitted for the intended use to the extent required by the State of Wisconsin. The Wisconsin Department of Natural Resources C&D website https://dnr.wi.gov/topic/Demo/Debris.html provides guidance and resources for diverting construction waste from the landfill.
F. Contractor shall assign a specific area to facilitate separation of materials for reuse, salvage, recycling, and return. Such areas are to be kept neat and clean and clearly marked in order to avoid contamination or mixing of materials.
G. Contractor shall provide on-site instructions and supervision of separation, handling, salvaging, recycling, reuse and return methods to be used by all parties during waste generating stages.
H. Record on daily reports any problems in complying with laws, regulations and ordinances with corrective action taken.

1.4 TERMINOLOGY

A. Class III Landfill: A landfill that accepts non-hazardous resources such as household, commercial and industrial waste resulting from construction, remodeling, repair, and demolition operations.
B. Clean: Untreated and unpainted; uncontaminated with adhesives, oils, solvents, mastics and like products.
C. Construction and Demolition Waste: Solid waste resulting from the construction, demolition or razing of buildings, roads, and other structures.
D. Dismantle: The process of parting out a building in such a way as to preserve the usefulness of its materials and components.
E. Disposal: Acceptance of solid waste at a legally operating facility for land filling (including Class III landfills).
F. EPA Subtitle C Landfill: A landfill which is authorized under the Resource Conservation and Recovery Act (RCRA) to accept hazardous waste for disposal.
G. EPA Subtitle D Landfill: A landfill that accepts non-hazardous resources such as household, commercial and industrial waste resulting from construction, remodeling, repair, and demolition operations.
H. Hazardous Waste: By-products of society that can pose a substantial or potential hazard to human health or the environment when improperly managed. It is a solid waste that possesses at least one of four characteristics (ignitability, corrosivity, reactivity and toxicity) or appears on special DNR or EPA lists (P-, U-, K-, or F- lists). The regulatory definition of hazardous waste is found in s. NR 661, Wis.

Adm. Code. Examples of hazardous waste include, but are not limited to xylene, toluene, acetone, kerosene, and petroleum distillates.

I. Inert Backfill Site: A location to which inert materials are taken for filling an excavation, shoring or other soil engineering operation.
J. Inert Fill Site: A facility that can legally accept inert waste, such as asphalt and concrete exclusively for disposal.
K. Inert Solids/Inert Waste: Non-liquid solid resources including, but not limited to, soil and concrete that does not contain hazardous waste or soluble pollutants at concentrations more than water-quality objectives established by a regional water board and does not contain significant quantities of decomposable solid resources.
L. Mixed Debris: Loads that include commingled recyclable and non-recyclable materials generated at the construction site.
M. Mixed Debris Recycling Facility: A solid resource processing facility that accepts loads of mixed construction and demolition debris for recovering re-usable and recyclable materials and disposing non-recyclable materials.
N. Permitted Waste Hauler: A company that holds a valid permit to collect and transport solid waste from individuals or businesses for recycling or disposal.
O. Recycling: The process of sorting, cleansing, treating, and reconstituting materials for using the altered form in the manufacture of a new product. Recycling does not include burning, incinerating or thermally destroying solid waste.

1. On-site Recycling – Materials that are sorted and processed on site for use in an altered state in the work, i.e., concrete crushed for use as a sub-base in paving.
2. Off-site Recycling – Materials hauled to a location and used in an altered form in the manufacture of new products.

P. Recycling Facility: A facility that can legally accept waste to recycle and may include a facility where waste has been generated.
Q. Reuse: Materials that are recovered for use in the same form, on-site or off-site.
R. Return: To give back reusable items or unused products to vendors for credit.
S. Salvage: To remove waste materials from the site for resale or re-use by a third party.
T. Solid Waste: Any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant or air pollution control facility and other discarded or salvageable materials, including solid, liquid, semisolid, or contained gaseous materials resulting from industrial, commercial, mining and agricultural operations, and from community activities, but does not include solids or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges which are point sources subject to permits under Wisconsin Statute Chapter 283, or source material, as

defined in s. 254.31(10), special nuclear material, as defined in s. 254.31(11), or byproduct material, as defined in s.254.31(1).

U. Source-Separated Materials: Materials that are sorted by type at the site for reuse and recycling.

V. Transfer Station: A facility that can legally accept solid waste for the purpose of temporarily storing the materials for re-loading onto other trucks and transporting them to a landfill for disposal or recovering some materials for re-use or recycling.

1.5 SUBMITTALS

A. **In accordance with Section 01 33 23 SUBMITTALS, RFIS, AND CBS and within 60 days of the NTP, furnish the to the COR a written Construction Waste Management Plan (CWMP).** A sample CWMP is attached as Appendix A to this specification. The plan shall include, but not be limited to, the following information:

1. Procedures to be used for debris management.
2. Target Waste Diversion Rate (a minimum of 50% by weight)
3. Techniques to be used to minimize waste generation.
4. Analysis of the estimated job site waste to be generated:

   a. List of each material and quantity to be salvaged, reused, recycled.
   b. List of each material and quantity proposed to be taken to a Subtitle D Landfill.
   c. List of each regulated waste item and quantity proposed to be taken to a Subtitle C Landfill

5. Detailed description of the Means/Methods to be used for material handling.

   a. On site: Material separation, storage, protection where applicable.
   b. Off site: Transportation means and destination. Include list of materials.

      1) Description of materials to be site-separated and self-hauled to designated facilities.
      2) Description of mixed materials to be collected by designated waste haulers and removed from the site.

         a) The names and locations of mixed debris reuse and recycling facilities or sites.
         b) The names and locations of trash disposal landfill facilities or sites.
         c) Documentation that the facilities or sites are approved to receive the materials.

6. Designated Manager responsible for instructing personnel, supervising, documenting and administering over meetings relevant to the CWMP.

B. **In accordance with Section 01 33 23 SUBMITTALS, RFIS, AND CBS provide a monthly submittal summary of construction and demolition debris diversion and disposal, quantifying all materials generated at the work site and disposed of or diverted from disposal through recycling.** Coordinate this monthly report/submittal with other Division 01 monthly requirements for payment (schedule update, progress report or as-built, manhours worked, milestone photos, and the CHST/CPS safety report). The monthly waste summary shall include:

1. Target waste diversion rate by material and an overall diversion rate.
2. Waste diversion rate by material and an overall diversion rate.

C. **Submit a Final Report** documenting the results of implementation of the CWMP submitted to the COR and GEMS Program Manager at the conclusion of the project - during closeout.

1.6 APPLICABLE PUBLICATIONS

A Publications listed below form a part of this specification to the extent referenced. Publications are referenced by the basic designation only. If criteria requirements conflict, the most stringent requirements shall be met.
B. U.S. Green Building Council (USGBC): LEED Green Building Rating System for New Construction.

1. Green Building Initiative (GBI): Green Globes for New Construction 2019.

1.7 RECORDS

A. Maintain records to document the quantity of waste generated; the quantity of waste diverted through sale, reuse, or recycling; the quantity of waste disposed by landfill or incineration; and % total waste diverted.
B. Separate out materials and recycle them. Submit monthly report from construction and demolition recycling facility.

PART 2 - PRODUCTS

2.1 MATERIALS

A. List of each material and quantity to be salvaged, recycled, reused.
B. List of each material and quantity proposed to be taken to a landfill.
C. Material tracking data: Receiving parties, dates removed, transportation costs, weight tickets, tipping fees, manifests, invoices, net total costs or savings.

PART 3 - EXECUTION

3.1 COLLECTION

A. Provide all necessary containers, bins, and storage areas to facilitate effective waste management. The Contractor shall provide waste carts and dumpsters for the project. Coordinate location of dumpster with

the COR prior to mobilization and indicate location on CWMP and Logistics Plan. Contractor shall locate dumpster at the VA, location approved by COR but shall be responsible for securing the dumpster so that it can only be used by the Contractor and his agents.

B. Clearly identify containers, bins, and storage areas so that recyclable materials are separated from trash and can be transported to respective recycling facility for processing.

C. Hazardous waste shall be separated, stored, disposed of per the City of Milwaukee Solid Waste Regulations Chapter 79, Wisconsin Department of Natural Resources Chapters NR 660-679, and Title 40 of the Code of Federal Regulations parts 239-282.

3.2 DISPOSAL

A. Contractor shall be responsible for transporting and disposing of materials that cannot be delivered to a source-separated or mixed materials recycling facility to a transfer station or disposal facility that can accept the materials in accordance with state and federal regulations.

B. Construction or demolition materials with no practical reuse or that cannot be salvaged or recycled shall be disposed of at a landfill.

3.3 REPORTS

A. With each application for progress payment, submit a summary of construction and demolition debris diversion and disposal including beginning and ending dates of period covered (i.e., a waste manifest; see 1.5.B this specification).

B. Quantify all materials diverted from landfill disposal through salvage or recycling during the period with the receiving parties, dates removed, transportation costs, weight tickets, manifests, invoices. Include the net total costs or savings for each salvaged or recycled material.

C. Quantify all materials disposed of during the period with the receiving parties, dates removed, transportation costs, weight tickets, tipping fees, manifests, invoices. Include the net total costs for each disposal.

D. Submit a copy of all hazardous waste and special waste manifests to the COR.

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SECTION 01 74 19A
APPENDIX A – CONSTRUCTION WASTE MANAGEMENT PLAN TEMPLATE

Introduction.

This site-based **Construction Waste Management Plan (CWMP)** has been developed to manage the non-hazardous building construction and demolition waste by diverting waste from the landfills through salvaging, recycling, or reusing building materials for the Department of Veterans Affairs during construction activities. The CWMP has been designed to establish records to quantify construction and demolition debris diversion and disposal. Based on the work that is scheduled to be part of the contract and the engineering practices to be implemented in conjunction with the work, every effort is being made to protect the people, assets, and the environment of the Department of Veterans Affairs.

Contents.

A. ORGANIZATION AND RESPONSIBILITIES
- **Job Site Superintendent**
- **General Contractor**
- **All Other On-site Personnel**
- **Construction/Renovation Area**

B. SITE DESCRIPTION
C. PERSONNEL
D. WASTE MANAGEMENT GOALS
E. PLAN IMPLEMENTATION, OVERSIGHT & ENFORCEMENT
F. MEETINGS & COMMUNICATION
G. SITE ASSESSMENT: DISPOSAL AND HANDLING
H. WASTE AUDITING PROCEDURES
I. WASTE MANAGEMENT DOCUMENTATION

A. ORGANIZATION AND RESPONSIBILITIES

This construction project has been authorized by and is under the supervision of the Department of Veterans Affairs, Milwaukee, WI.

- **Job Site Superintendent:** ***[Superintendent Name]*** will be the on-site employee responsible for the implementation and enforcement of the CWMP and is so delegated by ***[Prime Contractor Name].***
- **Prime Contractor:** ***[Prime Contractor Name]*** will oversee the work of all construction staff and subcontractors. The Contractor will be responsible for instituting the measures as outlined in this CWMP and ensuring their effectiveness.
- **All Other On-site Personnel:** All other on-site construction personnel, including all subcontractors, will be responsible for adhering to the CWMP as established by ***[Prime Contractor Name]*** as well as any additional practices, laws, and regulations for ensuring a safe work environment.
- **Construction/Renovation Area:** The work will take place at the Department of Veterans Affairs Medical Center, Milwaukee Wisconsin. The main construction area is contained at the ***[Contract Location]*** as shown on the drawings.

B. SITE DESCRIPTION

[Edit as necessary]

C. PERSONNEL

As required in Specification Section 01 74 19 Construction Waste Management, all construction workers will be aware of the CWMP through the project's Pre-Construction Meeting as well as the Project Kick-Off Meeting conducted by ***[Prime Contractor Name].*** The meetings will consist of the information contained in this CWMP, including, but not limited to the construction limits, waste management goals, plan implementation, oversight and enforcement, meetings and communication, documentation, site assessment-expected wastes, disposal and handling, trade contractor waste management plan, waste management progress report, and work area limits, as well as the safety guidelines of the VA. Upon completing this briefing ***[Superintendent Name]*** will enforce the CWMP throughout the life of the project. Weekly contractor meetings will include the CWMP as well as the Environmental

Protection Plan in specification section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS to ensure new and all workers onsite are aware of the requirements and procedures.

D. WASTE MANAGEMENT GOALS

This CWMP is the responsibility of the Prime Contractor and to be enforced for all subcontractors by the Prime Contractor. By effectively managing this CWMP, ***[Prime Contractor Name]*** will recycle or salvage (for reuse) all feasible materials to a minimum of **50 percent by weight.** The Waste Management Plan outlines the expected wastes to be confronted on site, means of disposal and handling methods, and required documentation. The ***[Prime Contractor Name]*** will provide non-hazardous waste manifest identifying weight of all waste generated per delivery (dumpster). This CWMP is in conjunction with specification section 01 74 19 CONSTRUCTION WASTE MANAGEMENT.

E. PLAN IMPLEMENTATION, OVERSIGHT & ENFORCEMENT

[Prime Contractor Name] will monitor, implement, and document this plan throughout the construction of this project. Monitoring of on-site compliance with this plan will be performed by the ***[Prime Contractor Name]*** Superintendent(s) daily. During demolition, the demolition contractor will provide one metal scrap dumpster and one mixed waste dumpster that will be used for all materials. The metal dumpster will be taken by ***[Demolition Subcontractor Name, Address]*** for recycling. The mixed waste dumpster will be taken to ***[Company 1 Name, address]***, where it will be sorted and separated for recycling. Any non-recyclable material will be sent to landfill. Recyclable material will be weighed and recorded by ***[Company 1 Name, address]***. During reconstruction, there will be one dumpster provided for mixed waste. The mixed waste dumpster will be taken to ***[Company 2 Name]***, where it will be sorted and separated for recycling. Records will be provided in accordance with LEED Reference Guide and LEED Template. The reports will be submitted monthly.

F. MEETINGS AND COMMUNICATION

Every trade contractor and subcontractor will be required to attend a Pre-Construction Meeting and Project Kick-Off Meeting. New construction personnel that are unable to attend are required to attend a brief safety meeting that will include a construction waste training session before being allowed to

work on the site. Further, the Demolition Debris Management Plan will be on the agenda at regular construction meetings to update the project team on the status of ***[Prime Contractor Name]*** goals for diverted waste and what measures may need to be implemented if these goals are not being met.

G. SITE ASSESSMENT: DISPOSAL & HANDLING

Contractor to provide dumpsters for processing recyclables and waste. Examples include 1) Concrete materials, 2) Metal, and 3) mixed waste. These to be sorted at landfill site or recycling facility.

Upon approval, ***[Prime Contractor Name]*** may use the VA-provided cardboard dumpster for all cardboard materials. The following table lists expected wastes on this project, their disposal method, and handling procedures:

Hauler:

[Company Name, Contact, Address]

Recycling:

[Company Name, Contact, Address]

Item	Disposal method	Handling Procedure	Destination/Recipient
Masonry	Recycle	Concrete dumpster	[ACME WASTE, INC.]
Concrete	Recycle	Concrete dumpster	[ACME WASTE, INC.]
Scrap Metals	Recycle	Metal dumpster	[ACME WASTE, INC.]
Cardboard	Recycle or reuse	Cardboard dumpster	VA-provided cardboard dumpster (permission required)
Drywall	Recycle	Mixed dumpster	[ACME WASTE, INC.]
Wood (clean)	Recycle	Mixed dumpster	[ACME WASTE, INC.]
Plumbing Fixtures	Recycle	Mixed dumpster	[ACME WASTE, INC.]
Glass	Recycle	Mixed dumpster	[ACME WASTE, INC.]
Plastics (noncontaminated)	Recycle	Mixed dumpster	[ACME WASTE, INC.]

Plastics (contaminated)	Landfill	Mixed dumpster	[ACME WASTE, INC.]
Ceiling Tile	Recycle	Mixed dumpster	[ACME WASTE, INC.]
Wiring	Recycle/Salvage	Reuse, salvage or recycle	[Subcontractor Name]
Light Fixtures	Recycle/Salvage	Reuse, salvage or recycle	[Subcontractor Name]
Lamps (Universal Waste)	Recycle/Salvage	Reuse, salvage or recycle	[Subcontractor Name]
Ballasts	Recycle/Salvage	Reuse, salvage or recycle	[Subcontractor Name]
Carpet	Recycle	Mixed dumpster or recycle	[Company Name]
Inert Materials	Recycle	Concrete dumpster	[Company Name]
Clean Soil	Reuse	Reuse throughout project	[Contractor Name]
Contaminated Soil	Licensed Landfill	Dumpster or Pile with runoff prevention	[Contractor Name]
Hazardous wastes	Subtitle C Landfill	Store in compatible containers with proper labeling	[Contractor Name]
All Other Non-hazardous Wastes	Landfill	Reduce waste where possible, research recycling or reuse opportunities	[Company Name]

H. WASTE AUDITING

All subcontractors are responsible for daily site cleanup and ensuring that all recycling containers are kept free of contamination. ***[Prime Contractor Name]*** representatives shall be responsible for daily checks of trash and recycling containers to check for and ensure the removal of contamination.

Violators will be required to re-sort any misplaced waste and, if the problem continues, pay the cost of ***[Prime Contractor Name]*** time to sort recyclables from the trash. ***[Prime Contractor Name]*** representatives shall be responsible for contacting haulers for collection service.

I. DOCUMENTATION

Documentation of the waste management plan will consist of the following:

1. Records will be provided in accordance with LEED Reference Guide and LEED Template.
2. Records will include the amount of material salvaged, recycled, and re-used.
3. Records will include a list of materials taken to the landfill.
4. Material tracking data shall be provided indicating receiving parties, dates, weight tickets, tipping fees, manifests and the total resulting cost or savings.

The quantities in the report will be updated by ***[Prime Contractor Name]*** based on information provided by each Trade Contractor and the independent hauler under contract to provide the metal dumpsters. Each Trade Contractor shall be responsible for providing the following documentation for any waste generated on site that is not deposited in the dumpsters provided by ***[Prime Contractor Name].***

1. A record of the type and quantity (by weight) of each material salvaged, reused, recycled, or disposed in a manner other than that provided by ***[Prime Contractor Name]*** through their independent hauler.
2. Disposal receipts: Provide copies of all receipts issued by a disposal facility for CDL waste that is disposed in a landfill.
3. Recycling Receipts: Provide copies of all receipts issued by an approved recycling facility.
4. Salvaged materials document: Types and quantities (by weight) for materials salvaged for reuse on site, sold, or donated to a third party.

This documentation will then be compiled by ***[Prime Contractor Name]*** in monthly waste tracking reports and furnished to the COR (Contracting Officer’s Representative). At the end of the project, a final report documenting the results of the implementation of the CWMP will be furnished to the COR.

SECTION 01 81 13
SUSTAINABLE CONSTRUCTION REQUIREMENTS

PART 1 - GENERAL

1.1 DESCRIPTION

A. This Section describes general requirements and procedures to comply with federal mandates and U.S. Department of Veterans Affairs (VA) policies for sustainable construction.
B. The Architect/Engineer (AE) has selected materials and utilized integrated design processes that achieve the Government's objectives. The Contractor shall maintain and support these objectives in developing means and methods for performing work and in proposing product substitutions or changes to specified processes. Obtain approval from the Contracting Officer for all changes and substitutions to materials or processes. Proposed changes must meet, or exceed, materials or processes specified.

1.2 RELATED WORK

A. Section 01 74 19 CONSTRUCTION WASTE MANANGEMENT
B. Section 01 91 00 GENERAL COMMISSIONING REQUIREMENTS

1.3 DEFINITIONS

A. Recycled Content: Recycled content of materials is defined according to Federal Trade Commission Guides for the Use of Environmental Marketing Claims (16 CFR Part 260). Recycled content value of a material assembly is determined by weight. Recycled fraction of assembly is multiplied by cost of assembly to determine recycled content value.

   1. "Post-Consumer" material is defined as waste material generated by households or by commercial, industrial, and institutional facilities in their role as end users of the product, which can no longer be used for its intended purpose.
   2. "Pre-Consumer" material is defined as material diverted from waste stream during the manufacturing process. Excluded is reutilization of materials such as rework, regrind, or scrap generated in a process and capable of being reclaimed within the same process that generated it.

B. Biobased Products: Biobased products are derived from plants and other renewable agricultural, marine, and forestry materials and provide an alternative to conventional petroleum derived products. Biobased products include diverse categories such as lubricants, cleaning products, inks, fertilizers, and bioplastics.
C. Low Pollutant-Emitting Materials: Materials and products which are minimally odorous, irritating, or harmful to comfort and well-being of installers and occupants.

D. Volatile Organic Compounds (VOCs): Chemicals that are emitted as gases from certain solids or liquids. VOCs include a variety of chemicals, some of which may have short- and long-term adverse health effects.

1.4 REFERENCE STANDARDS

A. Carpet and Rug Institute Green Label Plus program
B. U.S. Department of Agriculture BioPreferred program (USDA BioPreferred)
C. U.S. Environmental Protection Agency Comprehensive Procurement Guidelines (CPG)
D. U.S. Environmental Protection Agency WaterSense Program (WaterSense)
E. U.S. Environmental Protection Agency ENERGY STAR Program (ENERGY STAR)
F. U. S. Department of Energy Federal Energy Management Program (FEMP)
G. Green Electronic Council EPEAT Program (EPEAT)

1.5 SUBMITTALS

A. **Within 30 days of the Construction Kickoff Meeting, and in accordance with 01 33 23 SUBMITTALS, RFIS, AND CBS, submit a narrative plan for complying with requirements stipulated within this section.** In lieu of a narrative plan, the Contractor may use the attached spreadsheet template (last page of spec) to meet this requirement. Indicate individual(s) responsible for implementing the plan.
B. Plan/Spreadsheet must note the following:

1. Recycled Content: Submit product data from manufacturers indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content (excluding MEP systems equipment and components).
2. Biobased Content: Submit product data for products to be installed or used which are included in any of the USDA BioPreferred program's product categories. Data to include percentage of biobased content and source of biobased material.
3. Low Pollutant-Emitting Materials: Submit product data confirming compliance with relevant requirements for all materials on Project.
4. For applicable products and equipment, submit product documentation confirming ENERGY STAR label, FEMP certification, WaterSense, and/or EPEAT certification.

C. Closeout Submittals: Within 14 days after Substantial Completion provide the final version of 018113 tracking spreadsheet template.
D. Construction Indoor Air Quality (IAQ) Management Plan: Not Required.

1.6 QUALITY ASSURANCE

A. Construction Kickoff Meeting: Discuss the Project Sustainable Action Plan content as applies to submittals, project delivery, and other Sustainable Construction Requirements. This is to develop a mutual understanding of the Sustainable Construction Requirements and coordination of contractor's management of these requirements with the Contracting Officer and the Construction Quality Manager.

B. Construction Weekly Meetings: Status of compliance with Sustainable Construction Requirements of these specifications will be an agenda item at regular job meetings conducted during the course of work at the site.

1.7 APPLICABLE PUBLICATIONS

A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only. Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.
B. Green Seal Standard GS-11, Paints, 1st Edition, May 20, 1993.
C. Green Seal Standard GC-03, Anti-Corrosive Paints, 2nd Edition, January 7, 1997.
D. Green Seal Standard GC-36, Commercial Adhesives, October 19, 2000.
E. South Coast Air Quality Management District (SCAQMD) Rule 1113, Architectural Coatings, rules in effect on January 1, 2004.
F. South Coast Air Quality Management District (SCAQMD) Rule 1168, July 1, 2005, and rule amendment date of January 7, 2005.
G. Sheet Metal and Air Conditioning National Contractors' Association (SMACNA) IAQ Guidelines for Occupied Buildings under Construction, 2nd Edition (ANSI/SMACNA 008-2008), Chapter 3.
H. California Department of Public Health Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers, Version 1.1, Emission Testing method for California Specification 01350 (CDPH Standard Method V1.1-2010).
I. Federal Trade Commission Guides for the Use of Environmental Marketing Claims (16 CFR Part 260).
J. ASHRAE Standard 52.2-2007.

PART 2 – PRODUCTS

2.1 PERFORMANCE CRITERIA

A. Construction waste diversion from landfill disposal must comprise at least 50 percent of total construction waste, excluding land clearing debris and soil. Alternative daily cover (ADC) does not qualify as material diverted from disposal.
B. Low Pollutant-Emitting Materials:

1. Adhesives, sealants and primers applied on site within the weather-proofing membrane must comply with VOC limits of SCAQMD Rule 1168:

a. Flooring Adhesives and Sealants:

1) Indoor carpet adhesives: 50 g/L.
2) Wood Flooring Adhesive: 100 g/L.
3) Rubber Floor Adhesives: 60 g/L.
4) Subfloor Adhesives: 50 g/L.

5) Ceramic Tile Adhesives and Grout: 65 g/L.
6) Cove Base Adhesives: 50 g/L.
7) Multipurpose Construction Adhesives: 70 g/L.
8) Porous Material (Except Wood) Substrate: 50 g/L.
9) Wood Substrate: 30 g/L.
10) Architectural Non-Porous Sealant Primer: 250 g/L.
11) Architectural Porous Sealant Primer: 775 g/L.
12) Other Sealant Primer: 750 g/L.
13) Structural Wood Member Adhesive: 140 g/L.
14) Sheet-Applied Rubber Lining Operations: 850 g/L.
15) Top and Trim Adhesive: 250 g/L.
16) Architectural Sealant: 250 g/L.
17) Other Sealant: 420 g/L.

b. Non-Flooring Adhesives and Sealants:

1) Drywall and Panel Adhesives: 50 g/L.
2) Multipurpose Construction Adhesives: 70 g/L.
3) Structural Glazing Adhesives: 100 g/L.
4) Metal-to-Metal Substrate Adhesives: 30 g/L.
5) Plastic Foam Substrate Adhesive: 50 g/L.
6) Porous Material (Except Wood) Substrate Adhesive: 50 g/L.
7) Wood Substrate Adhesive: 30 g/L.
8) Fiberglass Substrate Adhesive: 80 g/L.
9) Architectural Non-Porous Sealant Primer: 250 g/L.
10) Architectural Porous Sealant Primer: 775 g/L.
11) Other Sealant Primer: 750 g/L.
12) PVC Welding Adhesives: 510 g/L.
13) CPVC Welding Adhesives: 490 g/L.
14) ABS Welding Adhesives: 325 g/L.
15) Plastic Cement Welding Adhesives: 250 g/L.
16) Adhesive Primer for Plastic: 550 g/L.
17) Contact Adhesive: 80 g/L.
18) Special Purpose Contact Adhesive: 250 g/L.
19) Structural Wood Member Adhesive: 140 g/L.
20) Sheet Applied Rubber Lining Operations: 850 g/L.
21) Top and Trim Adhesive: 250 g/L.
22) Architectural Sealants: 250 g/L.
23) Other Sealants: 420 g/L.

2. Aerosol adhesives applied on site within the weatherproofing membrane must comply with the following Green Seal GS-36.

a. Aerosol Adhesive, General-Purpose Mist Spray: 65% VOCs by weight.
b. Aerosol Adhesive, General-Purpose Web Spray: 55% VOCs by weight.
c. Special-Purpose Aerosol Adhesive (All Types): 70% VOCs by weight.

3. Paints and coatings applied on site within the weatherproofing membrane must comply with the following criteria:

a. VOC content limits for paints and coatings established in Green Seal Standard GS-11.
b. VOC content limit for anti-corrosive and anti-rust paints applied to interior ferrous metal substrates of 250 g/L established in Green Seal GC-03.
c. Clear wood finishes, floor coatings, stains, primers, sealers, and shellacs applied to interior elements must not exceed VOC content limits established in SCAQMD Rule 1113.
d. Comply with the following VOC content limits:

1) Anti-Corrosive/Antirust Paints: 250 g/L.
2) Clear Wood Finish, Lacquer: 550 g/L.
3) Clear Wood Finish, Sanding Sealer: 350 g/L.
4) Clear Wood Finish, Varnish: 350 g/L.
5) Floor Coating: 100 g/L.
6) Interior Flat Paint, Coating or Primer: 50 g/L.
7) Interior Non-Flat Paint, Coating or Primer: 150 g/L.
8) Sealers and Undercoaters: 200 g/L.
9) Shellac, Clear: 730 g/L.
10) Shellac, Pigmented: 550 g/L.
11) Stain: 250 g/L.
12) Clear Brushing Lacquer: 680 g/L.
13) Concrete Curing Compounds: 350 g/L.
14) Japans/Faux Finishing Coatings: 350 g/L.
15) Magnesite Cement Coatings: 450 g/L.
16) Pigmented Lacquer: 550 g/L.
17) Waterproofing Sealers: 250 g/L.
18) Wood Preservatives: 350 g/L.
19) Low-Solids Coatings: 120 g/L.

4. Carpet installed in building interior must comply with one of the following:

a. Meet testing and product requirements of the Carpet and Rug Institute Green Label Plus program.
b. Maximum VOC concentrations specified in CDPH Standard Method V1.1-2010, using office scenario at the 14-day time point.

5. Each non-carpet flooring element installed in building interior which is not inherently non-emitting (stone, ceramic, powder-coated metals, plated or anodized metal, glass, concrete, clay brick, and unfinished or untreated solid wood flooring) must comply with one of the following:

a. Meet requirements of the FloorScore standard as shown with testing by an independent third-party.
b. Maximum VOC concentrations specified in CDPH Standard Method V1.1-2010, using office scenario at 14-day time point.

6. Composite wood and agrifiber products used within the weatherproofing membrane must contain no added urea-formaldehyde resins.
7. Laminating adhesives used to fabricate on-site and shop-applied composite wood and agrifiber assemblies must not contain added urea-formaldehyde.

C. Recycled Content:

1. Any products being installed or used that are listed on EPA Comprehensive Procurement Guidelines designated product list must meet or exceed the EPA's recycled content recommendations. The EPA Comprehensive Procurement Guidelines categories include:

   a. Building insulation.
   b. Cement and concrete.
   c. Consolidated and reprocessed latex paint.
   d. Floor tiles.
   e. Flowable fill.
   f. Laminated paperboard.
   g. Modular threshold ramps.
   h. Nonpressure pipe.
   i. Patio blocks.
   j. Railroad grade crossing surfaces.
   k. Roofing materials.
   l. Shower and restroom dividers/partitions.
   m. Structural fiberboard.
   n. Nylon carpet and nylon carpet backing.
   o. Compost and fertilizer made from recovered organic materials.
   p. Hydraulic mulch.
   q. Lawn and garden edging.
   r. Plastic lumber landscaping timbers and posts.
   s. Park benches and picnic tables.
   t. Plastic fencing.
   u. Playground equipment.
   v. Playground surfaces.
   w. Bike racks.

D. Biobased Content:

1. Materials and equipment being installed or used that are listed on the USDA BioPreferred program product category list must meet or exceed USDA's minimum biobased content threshold. Refer to individual specification sections for detailed requirements applicable to that section.

   a. USDA BioPreferred program categories include:

      1) Adhesive and Mastic Removers.

2) Carpets.
3) Cleaners.
4) Composite Panels.
5) Corrosion Preventatives.
6) Erosion Control Materials.
7) Dust Suppressants.
8) Fertilizers.
9) Floor Cleaners and Protectors.
10) Floor Coverings (Non-Carpet).
11) Glass Cleaners.
12) Hydraulic Fluids.
13) Industrial Cleaners.
14) Interior Paints and Coatings.
15) Mulch and Compost Materials.
16) Multipurpose Cleaners.
17) Multipurpose Lubricants.
18) Packaging Films.
19) Paint Removers.
20) Plastic Insulating Foam.
21) Pneumatic Equipment Lubricants.
22) Roof Coatings.
23) Wastewater Systems Coatings.
24) Water Tank Coatings.
25) Wood and Concrete Sealers.
26) Wood and Concrete Stains.

E. Materials, products, and equipment being installed which fall into a category covered by the WaterSense program must be WaterSense-labeled or meet or exceed WaterSense program performance requirements, unless disallowed for infection control reasons.

1. WaterSense categories include:

a. Bathroom Faucets
b. Irrigation Controllers
c. Pre-Rinse Spray Valves
d. Residential Toilets
e. Showerheads
f. Spray Sprinkler Bodies
g. Urinals

F. Materials, products, and equipment being installed which fall into any of the following product categories must be Energy Star-labeled.

1. Applicable Energy Star product categories as of 09/14/2017 include:

a. Appliances:

1) Air Purifiers and Cleaners.

2) Clothes Dryers (Residential).
3) Clothes Washers (Commercial & Residential).
4) Dehumidifiers.
5) Dishwashers (Residential).
6) Freezers (Residential).
7) Refrigerators (Residential).

b. Electronics and Information Technology:

1) Audio/Video Equipment.
2) Computers.
3) Data Center Storage.
4) Digital Media Player.
5) Enterprise Servers.
6) Imaging Equipment.
7) Monitors.
8) Professional Displays.
9) Set-Top and Cable Boxes.
10) Telephones.
11) Televisions.
12) Uninterruptible Power Supplies.
13) Voice over Internet Protocol (VoIP) Phones.

c. Food Service Equipment (Commercial):

1) Dishwashers.
2) Fryers.
3) Griddles.
4) Hot Food Holding Cabinets.
5) Ice Makers.
6) Ovens.
7) Refrigerators and Freezers.
8) Steam Cookers.
9) Vending Machines.

d. Heating and Cooling Equipment:

1) Air-Source Heat Pumps (Residential).
2) Boilers.
3) Ceiling Fans (Residential).
4) Central Air Conditioners (Residential).
5) Ductless Heating and Cooling (Residential).
6) Furnaces (Residential).
7) Water Heaters.
8) Geothermal Heat Pumps (Residential).
9) Light Commercial Heating and Cooling Equipment.
10) Room Air Conditioners (Residential).
11) Ventilation Fans (Residential).

e. Other:

1) Decorative Light Strings.
2) Electric Vehicle Supply Equipment.
3) Laboratory-Grade Refrigerators and Freezers.
4) Light Bulbs.
5) Light Fixtures.
6) Pool Pumps.
7) Roof Products.
8) Water Coolers.
9) Windows, Doors, and Skylights.

G. Materials, products, and equipment being installed which fall into any of the following categories must be FEMP-designated. FEMP-designated product categories as of 09/14/2017 include:

1. Boilers (Commercial).
2. Dishwashers (Commercial).
3. Electric Chillers, Air-Cooled (Commercial).
4. Electric Chillers, Water-Cooled (Commercial).
5. Exterior Lighting.
6. Fluorescent Ballasts.
7. Fluorescent Lamps, General Service.
8. Ice Machines, Water-Cooled.
9. Industrial Lighting (High/Low Bay).
10. Light Emitting Diode (LED) Luminaires.

H. Electronic products and equipment being installed which fall into any of the following categories shall be EPEAT registered. Electronic products and equipment covered by EPEAT program as of 09/14/2017 include:

1. Computers.
2. Displays.
3. Imaging Equipment.
4. Televisions.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

A. Construction Indoor Air Quality Management: Not Required

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Sustainable Construction Materials Reporting Document

Instructions:

The following tables correspond to requirements as set forth in the preceding Specification 01 81 13. Each table lists materials/products, the corresponding reference specification in the Construction Documents, and options that comply with the sustainability specification.

For each product/material, Contractor shall list the "green" certification OR green attribute (% recycled content, VOC content, etc.).

If a "green" product is listed, specify the source (vendor/manufacturer) and brief description.

If an environmentally preferred material is not available or otherwise not feasible to use in construction, indicate "NA" and reasoning under source description.

Helpful websites to find "green" materials:

https://spot.ul.com/
https://lookforwatersense.epa.gov/products/
https://www.energystar.gov/productfinder/

Recycled and Biobased Content

Recycled Content				
Material/ Product	**Applicable Divisions/ Specifications**	**Note certifications: GREENGUARD, UL ECOLOGO, GREENSEAL**	**If no certification, note % recycled content**	**Source/description**
Building insulation	Division 07			
Cement and concrete	Division 03 and 04			
Latex Paint	09 91 00			
Gypsum	09 29 00			
Non-pressure pipe	Div 22 33 40 00			
Pneumatic equipment lubricants	22 15 00			

Biobased content				
Material/ Product	**Applicable Divisions/ Specifications**	**Note certifications: GREENGUARD, UL ECOLOGO, GREENSEAL**	**If no certification, note % recycled content**	**Source/description**
Adhesives and mastic removers	Divisions 02 through 33			
Corrosion Preventatives	Division 22 & 23			
Dust Suppressants				
Floor cleaners and protectors	09 65 13			
Glass & Industrial cleaners				
Interior paints, coatings and removers	09 91 00			

Water Saving Products

Material/Product	Applicable specification	Watersense product? (Y/N/NA)	Flow rate
Div 22 water fixtures	22 40 00		

Energy Star Products

Item	Applicable Division/ Specification	EnergyStar (Y/N/NA)	FEMP (Y/N/NA)	EPEAT (Y/N/NA)	Other energy-saving features	Source / Description
Appliances:						
UPS	Div 26					
Heating and Cooling equipment:						
Heating and cooling equipment	Division 23		N/A	N/A		
Other:						
Exterior Lighting	26 56 00	NA		N/A		
Interior Lighting & Fixtures	26 51 00		N/A	N/A	LED - all	
Windows, doors, and skylights	Division 08		N/A	N/A		

VOC Content – Finishes/Adhesives/Flooring

Item	Applicable Specification	VOC Content Limit (g/L)	List certifications: GREENGUARD, UL ECOLOGO, GREENSEAL	Comply (Y/N)	Source/Description
Anti-rust paints	09 91 00	250			
Clear wood finish, Lacquer	09 91 00	550			
Clear Wood finish, sanding sealer	09 91 00	350			

Clear Wood finish, varnish	09 91 00	350			
Floor coating	09 91 00	100			
Interior flat paint, coating or primer	09 91 00	50			
Interior non-flat paint, coating or primer	09 91 00	150			
Sealers and Undercoaters	09 91 00	200			
Shellac, Clear	09 91 00	730			
Stain	09 91 00	250			
Clear brushing lacquer	09 91 00	680			
Concrete curing compounds	09 91 00	350			
Japans/Faux finishing coatings	09 91 00	350			
Magnesite cement coating	09 91 00	450			
Pigmented Lacquer	09 91 00	550			
Waterproofing Sealer	09 91 00	250			
Wood preservatives	09 91 00	350			
Low-solids coatings	09 91 00	120			
Flooring adhesives					
Rubber flooring & cove base adhesive	09 65 13	60			
Multipurpose construction adhesive	Div 09	70			
Porous material (not wood) substrate	Div 09	50			
Wood substrate	Div 09	30			
Architectural non-porous sealant primer	Div 09	250			
Architectural porous sealant primer	Div 09	775			
Other sealant primer	Div 09	750			
Structural wood member adhesive	Div 09	140			
Sheet-applied rubber lining operations	Div 09	850			
Top and trim adhesive	Div 09	250			
Architectural sealant	07 92 00	250			
Other sealants	Div 09	420			
Non-Flooring Sealants					
Drywall/panel adhesive	Div 09	50			

Multipurpose construction adhesive	Multiple	70			
Structural glazing adhesive	Div 08	100			
Metal-to-metal substrate adhesive	Div 07, 09	30			
Plastic form substrate adhesive	Div 07, 09	50			
Porous material (not wood) substrates	Div 07, 09	50			
Wood substrate adhesives	Div 07, 09	30			
Fiberglass substrate adhesive	Div 07, 09	80			
Architectural non-porous sealant primer	Div 07, 09	250			
Architectural porous sealant primer	Div 07, 09	775			
Other sealant primer	Div 07, 09	750			
PVC welding adhesive	Div 07, 09	510			
CPVC welding adhesive	Div 07, 09	490			
ABS welding adhesive	Div 07, 09	325			
Plastic cement welding adhesive	Div 07, 09	250			
Adhesive primer for plastic	Div 07, 09	550			
Contact adhesive	Div 07, 09	80			
Special purpose contact adhesive	Div 07, 09	250			
Structural wood member adhesive	Div 07, 09	140			
Sheet applied rubber lining operations	Div 07, 09	850			
Tom and trim adhesive	Div 09	250			
Architectural sealant	07 92 00	250			
Other sealants	Div 09	420			
Aerosols – must comply with Green Seal GS-36					
General Purpose mist spray	10 21 16 13 34 19 06 21 00 06 20 00 10 22 19	65%			
General Purpose web spray		55%			
Special Purpose aerosol adhesive (all types)		70%			

SECTION 01 91 00
GENERAL COMMISSIONING REQUIREMENTS

PART 1 - GENERAL

1.1 COMMISSIONING DESCRIPTION

A. This Section 01 91 00 GENERAL COMMISSIONING REQUIREMENTS shall form the basis of the construction phase commissioning process and procedures. The Commissioning Agent (CxA) shall add, modify, and refine the commissioning procedures, as approved by the Department of Veterans Affairs (VA), to suit field conditions and actual manufacturer's equipment, incorporate test data and procedure results, and provide detailed scheduling for all commissioning tasks. If these additions, modifications or edits by the CxA constitute a contract change in the opinion of the General Contractor (GC), the Contracting Officer (CO) shall intervene, and the contract change process shall be implemented as specified in FAR 52.243 – 4 (Changes) and VAAR 852.243 – 70/71 (Changes – Supplemental).

B. This specification provides directions to the GC with regards to his Commissioning Services responsibilities. It is a reference as well to the CxA.

C. Various sections of the project specifications require equipment startup, testing, and adjusting services. Requirements for startup, testing, and adjusting services specified in Division 23, Division 26, Division 27, and Division 28 series sections of these specifications are intended to be provided in coordination with the commissioning services and are not intended to duplicate services.

D. The GC shall coordinate the work required by individual specification sections with the commissioning services requirements specified herein. This includes the completion of the pre-functional checklists (PFCs) in the CxA-approved format(s).

E. The GC shall support warranty phase commissioning activities as directed by the VA and CxA at the ten-month (approximately) timeframe of the warranty phase.

F. Where individual testing, adjusting, or related services are required in the project specifications and not specifically required by this commissioning requirements specification, the specified services shall be provided and copies of documentation, as required by those specifications, shall be submitted to the VA and the CxA to be indexed for future reference.

G. Where training or educational services for VA are required and specified in other sections of the specifications, including but not limited to the divisions listed above, these services are intended to be provided in addition to the training and educational services specified herein.

H. Commissioning is a systematic process of verifying that the building systems perform interactively according to the construction documents and the VA’s operational needs. **The commissioning process shall**

encompass and coordinate the system documentation, equipment startup, control system calibration, testing and balancing, performance testing, O&M manual production, and training. Commissioning during the construction and post-occupancy phases is intended to achieve the following specific objectives according to the contract documents:

1. Verify that the applicable equipment and systems are installed in accordance with the contact documents and according to the manufacturer's recommendations.
2. Verify and document proper integrated performance of equipment and systems.
3. Verify that Operations & Maintenance documentation is complete.
4. Verify that all components requiring service can be accessed, serviced, and removed without disturbing nearby components including ducts, piping, cabling, or wiring.
5. Verify that the VA's operating personnel are adequately trained to enable them to operate, monitor, adjust, maintain, and repair building systems in an effective and energy-efficient manner.
6. Document the successful achievement of the commissioning objectives listed above.

I. The commissioning process does not take away from or reduce the responsibility of the General Contractor to provide a finished and fully functioning product.

1.2 CONTRACTUAL RELATIONSHIPS

A. For this construction project, the Department of Veterans Affairs contracts with a GC to provide construction services. The contracts are administered by the VA Contracting Officer and the COR as the designated representative of the Contracting Officer. On this project, the authority to modify the contract in any way is strictly limited to the authority of the Contracting Officer.
B. For this construction project, only two contract parties are recognized and communications on contractual issues are strictly limited to VA COR and the GC. It is the practice of the VA to require that communications between other parties to the contracts (Subcontractors and Vendors) be conducted through the GC. It is also the practice of the VA that communications between other parties of the project (CxA and Architect/Engineer - AE) be conducted through the COR.
C. Commissioning is a process that relies upon frequent and direct communication, as well as collaboration between all parties to the construction process. For this project, individual systems are designated for Commissioning (rather than Whole Building Commissioning). See Article 1.7 this specification. By its nature, a high level of communication and cooperation between the CxA and all other parties (GC, AE, Subcontractors, Vendors, third party testing agencies, etc.) is essential to the success of the Commissioning effort.

D. With these fundamental practices in mind, the commissioning process described herein has been developed to recognize that, in the execution of the Commissioning Process, the CxA must develop effective methods to communicate with every member of the construction team involved in delivering commissioned systems while simultaneously respecting the exclusive contract authority of the Contracting Officer and COR. Thus, the procedures outlined in this specification must be executed within the following limitations:

1. No communication (verbal or written) from the CxA shall be deemed to constitute direction that modifies the terms of any contract between the VA and the GC.
2. Commissioning issues identified by the CxA shall be delivered to the COR and copied to the GC *for information only* in order to expedite the communication process. These issues must be understood as the professional opinion of the CxA and as suggestions for resolution.
3. In the event that any commissioning issues and suggested resolutions are deemed by the COR to require either an official interpretation of the construction documents or require a modification of the contract documents, the Contracting Officer shall issue an official directive to this effect.
4. All parties to the Commissioning Process shall be individually responsible for alerting the COR of any issues that they deem constitute a potential contract change prior to acting on these issues.
5. Authority for resolution or modification of design and construction issues rests solely with the Contracting Officer, with appropriate technical guidance from the COR, AE, and CxA.

1.3 RELATED WORK

A. Section 01 00 00 GENERAL REQUIREMENTS
B. Section 01 32 16.15 PROJECT SCHEDULES
C. Section 01 33 23 SUBMITTALS, RFIS, AND CBS
D. Section 21 08 00 COMMISSIONING OF FIRE SUPPRESION SYSTEMS
E. Section 23 08 00 COMMISSIONING OF HVAC SYSTEMS
F. Section 26 08 00 COMMISSIONING OF ELECTRICAL SYSTEMS
G. Section 27 08 00 COMMISSIONING OF COMMUNICATIONS SYSTEMS
H. Section 28 08 00 COMMISSIONING OF ELECTRONIC SAFETY AND SECURITY SYSTEMS

1.4 SUMMARY - NOT USED

1.5 ACRONYMS

List of Acronyms	
Acronym	Meaning
AE	Architect / Engineer Design Team
AHJ	Authority Having Jurisdiction

List of Acronyms	
Acronym	Meaning
ASHRAE	Association Society for Heating Air Condition and Refrigeration Engineers
BOD	Basis of Design
BSC	Building Systems Commissioning
CCTV	Closed Circuit Television
CD	Construction Documents
CMMS	Computerized Maintenance Management System
CO	Contracting Officer (VA)
COR	Contracting Officer’s Representative (see also VA-RE)
COBie	Construction Operations Building Information Exchange
CPC	Construction Phase Commissioning
Cx	Commissioning
CxA	Commissioning Agent
CxM	Commissioning Manager (GC representative/manager of Cx)
CxR	Commissioning Representative (subcontractor representative of Cx)
DPC	Design Phase Commissioning
FPT	Functional Performance Test
GBI-GG	Green Building Initiative - Green Globes
GC	General Contractor
HVAC	Heating, Ventilation, and Air Conditioning
LEED	Leadership in Energy and Environmental Design
NC	Department of Veterans Affairs National Cemetery
NCA	Department of Veterans Affairs National Cemetery Administration
NEBB	National Environmental Balancing Bureau
O&M	Operations & Maintenance
OPR	Owner’s Project Requirements
PFC	Pre-Functional Checklist
PFT	Pre-Functional Test
SD	Schematic Design
SO	Site Observation
TAB	Test Adjust and Balance
VA	Department of Veterans Affairs
VAMC	VA Medical Center
VA CFM	VA Office of Construction and Facilities Management
VACO	VA Central Office
VA PM	VA Project Manager
VA-COR	VA Contracting Officer’s Representative
USGBC	United States Green Building Council

1.6 DEFINITIONS

Acceptance Phase Commissioning: Commissioning tasks executed after most construction has been completed, most site observations and static

tests have been completed, and Pre-Functional Testing has been completed and accepted. The main commissioning activities performed during this phase are verification that the installed systems are functional by conducting Systems Functional Performance tests and Owner Training.

Accuracy: The capability of an instrument to indicate the true value of a measured quantity.

Back Check: A back check is a verification that an agreed upon solution to a design comment has been adequately addressed in a subsequent design review.

Basis of Design (BOD): The Engineer's Basis of Design is comprised of two components: the Design Criteria and the Design Narrative. These documents record the concepts, calculations, decisions, and product selections used to meet the Owner's Project Requirements (OPR) and to satisfy applicable regulatory requirements, standards, and guidelines.

Benchmarks: Benchmarks are the comparison of a building's energy usage to other similar buildings and to the building itself. For example, ENERGY STAR Portfolio Manager is a frequently used and nationally recognized building energy benchmarking tool.

Building Information Modeling (BIM): Building Information Modeling is a parametric database which allows a building to be designed and constructed virtually in 3D and provides reports both in 2D views and as schedules. This electronic information can be extracted and reused for pre-populating facility management CMMS systems. Building Systems Commissioning (BSC): NEBB acronym used to designate its commissioning program.

Calibrate: The act of comparing an instrument of unknown accuracy with a standard of known accuracy to detect, correlate, report, or eliminate by adjustment any variation in the accuracy of the tested instrument.

CCTV: Closed circuit Television. Normally used for security surveillance and alarm detections as part of a special electrical security system.

COBie: Construction Operations Building Information Exchange (COBie) is an electronic industry data format used to transfer information developed during design, construction, and commissioning into the Computer Maintenance Management Systems (CMMS) used to operate facilities. See the Whole Building Design Guide website for further information (http://www.wbdg.org/resources/cobie.php)

Commissionability: Defines a design component or construction process that has the necessary elements that allow a system or component to be effectively measured, tested, operated, and commissioned.

CxA: The qualified Commissioning Professional who administers the Cx process by managing the Cx team and overseeing the Commissioning Process. Where CxA is used in this specification it means the CxA, members of his staff or appointed members of the commissioning team. Note that LEED uses the term Commissioning Authority in lieu of CxA.

Commissioning Checklists: Lists of data or inspections to be verified to ensure proper system or component installation, operation, and function. Verification checklists are developed and used during all

phases of the commissioning process to verify that the Owner's Project Requirements (OPR) are being achieved.

Commissioning Design Review: The commissioning design review is a collaborative review of the design professionals design documents for items pertaining to the following: owner's project requirements; basis of design; operability and maintainability including documentation; functionality; training; energy efficiency, control systems' sequence of operations including building automation system features; commissioning specifications and the ability to functionally test the systems.

Commissioning Issue: A condition identified by the CxA or other member of the Commissioning Team that adversely affects the commissionability, operability, maintainability, or functionality of a system, equipment, or component. A condition that is in conflict with the Contract Documents and/or performance requirements of the installed systems and components. (See also - Commissioning Observation)

Commissioning Manager (CxM): A qualified individual appointed by the GC to manage the commissioning process on behalf of the GC.

Commissioning Observation: An issue identified by the CxA or other member of the Commissioning Team that does not conform to the project OPR, contract documents or standard industry best practices. (See also Commissioning Issue)

Commissioning Plan: A document that outlines the commissioning process, commissioning scope and defines responsibilities, processes, schedules, and the documentation requirements of the Commissioning Process.

Commissioning Process: A quality focused process for enhancing the delivery of a project. The process focuses upon verifying and documenting that the facility and all of its systems, components, and assemblies are planned, designed, installed, tested, can be operated, and maintained to meet the Owner's Project Requirements.

Commissioning Report: The final commissioning document which presents the commissioning process results for the project. Cx reports include an executive summary, the commissioning plan, issue log, correspondence, and all appropriate check sheets and test forms.

Commissioning Representative (CxR): An individual appointed by a sub-contractor to manage the commissioning process on behalf of the sub-contractor.

Commissioning Specifications: The contract documents that detail the objective, scope and implementation of the commissioning process as developed in the Commissioning Plan.

Commissioning Team: Individual team members whose coordinated actions are responsible for implementing the Commissioning Process.

Construction Phase Commissioning: All commissioning efforts executed during the construction process after the design phase and prior to the Acceptance Phase Commissioning.

Contract Documents (CD): Contract documents include design and construction contracts, price agreements and procedure agreements. Contract Documents also include all final and complete drawings,

specifications and all applicable contract modifications or supplements.

Construction Phase Commissioning (CPC): All commissioning efforts executed during the construction process after the design phase and prior to the Acceptance Phase Commissioning.

Coordination Drawings: Drawings showing the work of all trades that are used to illustrate that equipment can be installed in the space allocated without compromising equipment function or access for maintenance and replacement. These drawings graphically illustrate and dimension manufacturers' recommended maintenance clearances. On mechanical projects, coordination drawings include structural steel, ductwork, major piping and electrical conduit and show the elevations and locations of the above components.

Data Logging: The monitoring and recording of temperature, flow, current, status, pressure, etc. of equipment using stand-alone data recorders.

Deferred System Test: Tests that cannot be completed at the end of the acceptance phase due to ambient conditions, schedule issues or other conditions preventing testing during the normal acceptance testing period.

Deficiency: See "Commissioning Issue".

Design Criteria: A listing of the VA Design Criteria outlining the project design requirements, including its source. These are used during the design process to show the design elements meet the OPR.

Design Intent: The overall term that includes the OPR and the BOD. It is a detailed explanation of the ideas, concepts, and criteria that are defined by the owner to be important. The design intent documents are utilized to provide a written record of these ideas, concepts, and criteria.

Design Narrative: A written description of the proposed design solutions that satisfy the requirements of the OPR.

Design Phase Commissioning (DPC): All commissioning tasks executed during the design phase of the project.

Environmental Systems: Systems that use a combination of mechanical equipment, airflow, water flow and electrical energy to provide heating, ventilating, air conditioning, humidification, and dehumidification for the purpose of human comfort or process control of temperature and humidity.

Executive Summary: A section of the Commissioning report that reviews the general outcome of the project. It also includes any unresolved issues, recommendations for the resolution of unresolved issues and all deferred testing requirements.

Functionality: This defines a design component or construction process which shall allow a system or component to operate or be constructed in a manner that shall produce the required outcome of the OPR.

Functional Test Procedure (FTP): A written protocol that defines methods, steps, personnel, and acceptance criteria for tests conducted on components, equipment, assemblies, systems, and interfaces among systems.

Industry Accepted Best Practice: A design component or construction process that has achieved industry consensus for quality performance and functionality. Refer to the current edition of the NEBB Design Phase Commissioning Handbook for examples.

Installation Verification: Observations or inspections that confirm the system or component has been installed in accordance with the contract documents and to industry accepted best practices.

Integrated System Testing: Integrated Systems Testing procedures entail testing of multiple integrated systems performance to verify proper functional interface between systems. Typical Integrated Systems Testing includes verifying that building systems respond properly to loss of utility, transfer to emergency power sources, re-transfer from emergency power source to normal utility source; interface between HVAC controls and Fire Alarm systems for equipment shutdown, interface between Fire Alarm system and elevator control systems for elevator recall and shutdown; interface between Fire Alarm System and Security Access Control Systems to control access to spaces during fire alarm conditions; and other similar tests as determined for each specific project.

Issues Log: A formal and ongoing record of problems or concerns – and their resolution – that have been raised by members of the Commissioning Team during the course of the Commissioning Process.

Lessons Learned Workshop: A workshop conducted to discuss and document project successes and identify opportunities for improvements for future projects.

Maintainability: A design component or construction process that shall allow a system or component to be effectively maintained. This includes adequate room for access to adjust and repair the equipment. Maintainability also includes components that have readily obtainable repair parts or service.

Manual Test: Testing using hand-held instruments, immediate control system readouts or direct observation to verify performance (contrasted to analyzing monitored data taken over time to make the 'observation').

Owner's Project Requirements (OPR): A written document that details the project requirements and expectations of how the building and its systems shall be used and operated. These include project goals, measurable performance criteria, cost considerations, benchmarks, success criteria, and supporting information.

Peer Review: A formal in-depth review separate from the commissioning review processes. The level of effort and intensity is much greater than a typical commissioning facilitation or extended commissioning review. The VA usually hires an independent third-party (called the IDIQ A/E) to conduct peer reviews.

Precision: The ability of an instrument to produce repeatable readings of the same quantity under the same conditions. The precision of an instrument refers to its ability to produce a tightly grouped set of values around the mean value of the measured quantity.

Pre-Design Phase Commissioning: Commissioning tasks performed prior to the commencement of design activities that include project programming and the development of the commissioning process for the project.

Pre-Functional Checklist (PFC): A form used by the GC to verify that appropriate components are onsite, correctly installed, set up, calibrated, functional and ready for functional testing.

Pre-Functional Test (PFT): An inspection or test that is done before functional testing. PFT's include installation verification and system and component start up tests.

Procedure or Protocol: A defined approach that outlines the execution of a sequence of work or operations. Procedures are used to produce repeatable and defined results.

Range: The upper and lower limits of an instrument's ability to measure the value of a quantity for which the instrument is calibrated.

Resolution: This word has two meanings in the Cx Process. The first refers to the smallest change in a measured variable that an instrument can detect. The second refers to the implementation of actions that correct a tested or observed deficiency.

Site Observation Visit: On-site inspections and observations made by the CxA for the purpose of verifying component, equipment, and system installation, to observe GC testing, equipment start-up procedures, or other purposes.

Site Observation Reports (SO): Reports of site inspections and observations made by the CxA. Observation reports are intended to provide early indication of an installation issue which shall need correction or analysis.

Special System Inspections: Inspections required by a local code authority prior to occupancy and are not normally a part of the commissioning process.

Static Tests: Tests or inspections that validate a specified static condition such as pressure testing. Static tests may be specification or code initiated.

Start Up Tests: Tests that validate the component or system are ready for automatic operation in accordance with the manufactures requirements.

Systems Manual: A system-focused composite document that includes all information required for the owner-operators to operate the systems.

Test Procedure: A written protocol that defines methods, personnel, and expectations for tests conducted on components, equipment, assemblies, systems, and interfaces among systems.

Testing: The use of specialized and calibrated instruments to measure parameters such as temperature, pressure, vapor flow, air flow, fluid flow, rotational speed, electrical characteristics, velocity, and other data in order to determine performance, operation, or function.

Testing, Adjusting, and Balancing (TAB): A systematic process or service applied to heating, ventilating, and air-conditioning (HVAC) systems and other environmental systems to achieve and document air and hydronic flow rates. The standards and procedures for providing these services are referred to as "Testing, Adjusting, and Balancing" and are

described in the Procedural Standards for the Testing, Adjusting and Balancing of Environmental Systems, published by NEBB or AABC.

Thermal Scans: Thermographic pictures taken with an Infrared Thermographic Camera. Thermographic pictures show the relative temperatures of objects and surfaces and are used to identify leaks, thermal bridging, thermal intrusion, electrical overload conditions, moisture containment, and insulation failure.

Training Plan: A written document that details, in outline form, the expectations of the operator training. Training agendas should include instruction on how to obtain service, operate, startup, shutdown and maintain all systems and components of the project.

Trending: Monitoring over a period of time with the building automation system.

Unresolved Commissioning Issue: Any Commissioning Issue that, at the time that the Final Report or the Amended Final Report is issued has not been either resolved by the construction team or accepted by the VA.

Validation: The process by which work is verified as complete and operating correctly:

1. First party validation occurs when a firm or individual verifying the task is the same firm or individual performing the task.
2. Second party validation occurs when the firm or individual verifying the task is under the control of the firm performing the task or has other possibilities of financial conflicts of interest in the resolution (Architects, Designers, General Contractors and Third Tier Subcontractors or Vendors).
3. Third party validation occurs when the firm verifying the task is not associated with or under control of the firm performing or designing the task.

Verification: The process by which specific documents, components, equipment, assemblies, systems, and interfaces among systems are confirmed to comply with the criteria described in the Owner’s Project Requirements.

Warranty Phase Commissioning: Commissioning efforts executed after a project has been completed and accepted by the Owner. Warranty Phase Commissioning includes follow-up on verification of system performance, measurement and verification tasks and assistance in identifying warranty issues and enforcing warranty provisions of the construction contract.

Warranty Visit: A commissioning meeting and site review where all outstanding warranty issues and deferred testing are reviewed and discussed.

Whole Building Commissioning: Commissioning of building systems such as Building Envelope, HVAC, Electrical, Special Electrical (Fire Alarm, Security & Communications), Plumbing and Fire Protection as described in this specification.

1.7 SYSTEMS TO BE COMMISSIONED

A. Commissioning of a system or systems specified for this project is part of the construction process. Documentation and testing of these systems, as well as training of the VA's Operation and Maintenance (O&M) personnel, is required in cooperation with the VA and the CxA.
B. The following systems shall be commissioned as part of this project:

Systems To Be Commissioned	
System	**Description**
Fire Suppression System	
Fire Sprinkler Systems	Wet pipe system adjustments/modifications
HVAC	
Direct Digital Control System**	Operator Interface Computer, Operator Workstation (including graphics, point mapping, trends, alarms), Network Communications Modules and Wiring, Integration Panels. [DDC Control panels shall be commissioned with the systems controlled by the panel].
HVAC Air Handling Systems**	Computer Room mini-split (DX) units to include noise/vibration control; DDC control panels
Electrical	
Grounding & Bonding Systems	Witness 3rd party testing, review reports
Electric Power Monitoring Systems	Metering, sub-metering, power monitoring systems, PLC control systems
Electrical System Protective Device Study	Review reports, verify field settings consistent with Study
Low-Voltage Distribution System	Normal power distribution system, Life-safety power distribution system, critical power distribution system, equipment power distribution system, switchboards, distribution panels, panelboards, verify breaker testing results. New generators, ATS and dist. panels.
Lighting & Lighting Control** Systems	Emergency lighting, occupancy sensors, lighting control systems
Communications	
Grounding & Bonding	Witness 3rd party testing, review reports
Structured Cabling Sys	Witness 3rd party testing, review reports
Electronic Safety and Security (Div 28)	
Grounding & Bonding	Witness 3rd party testing, review reports
Physical Access Control Systems	Witness 3rd party testing, review reports. New TRs have card readers/PIN pads.
Fire Detection & Alarm	100% device acceptance testing, battery draw-down test, verify system monitoring, verify interface with other systems.
Video Surveillance System	Witness 3rd party testing, review reports

1.8 COMMISSIONING TEAM

A. The commissioning team shall consist of, but is not limited to, representatives of GC, including Project Superintendent and subcontractors, installers, schedulers, suppliers, and specialists deemed appropriate by the VA and CxA.
B. Members Appointed by GC:

1. GC' Commissioning Manager: The designated person, company, or entity that plans, schedules, and coordinates the commissioning activities for the construction team.
2. GC's Commissioning Representative(s): Individual(s), each having authority to act on behalf of the entity he or she represents, explicitly organized to implement the commissioning process through coordinated actions.

C. Members Appointed by VA:

1. CxA: The designated person, company, or entity that plans, schedules, and coordinates the commissioning team to implement the commissioning process. The VA shall engage the CxA under a separate contract. For this project, the third-party CxA contract is in place with DAV Energy.
2. User: Representatives of the facility user and O&M personnel.
3. AE: Representative of the architect and engineering design professionals.

1.9 VA'S COMMISSIONING RESPONSIBILITIES

A. Appoint an individual, company or firm to act as the CxA.
B. Assign O&M personnel and schedule them to participate in commissioning team activities including, but not limited to, the following:

1. Coordination meetings.
2. Training for O&M in new systems, subsystems, and equipment.
3. Testing meetings.
4. Witness and assist in Systems Functional Performance Testing.
5. Demonstration of operation of systems, subsystems, and equipment.

C. Provide the Construction Documents, prepared by AE and approved by VA, to the CxA and for use in managing the commissioning process, developing the commissioning plan, systems manuals, and reviewing the O&M training plan.

1.10 GC'S COMMISSIONING RESPONSIBILITIES

A. The GC shall assign a Commissioning Manager to manage commissioning activities of the GC and subcontractors.
B. The GC shall ensure that the commissioning responsibilities outlined in these specifications are included in all subcontracts and that subcontractors comply with the requirements of these specifications.

C. The GC shall ensure that each subcontractor assign representatives with expertise and authority to act on behalf of the subcontractor and schedule them to participate in and perform commissioning team activities including, but not limited to, the following:

1. Participate in commissioning coordination meetings.
2. Conduct O&M training sessions in accordance with approved training plans.
3. Verify that Work is complete, and systems are operational according to the Contract Documents, including calibration of instrumentation and controls.
4. Evaluate commissioning issues and observations identified in the Commissioning Issues Log, field reports, test reports or other commissioning documents. In collaboration with entity responsible for system and equipment installation, recommend corrective action.
5. Review and comment on commissioning documentation.
6. Complete PFCs as directed by the VA and CxA.
7. Participate in meetings to coordinate Systems Functional Performance Testing.
8. Provide schedule for O&M data submittals, equipment startup, and testing to CxA for incorporation into the commissioning plan.
9. Provide information to the CxA for developing commissioning plan.
10. Participate in training sessions for VA's O&M personnel.
11. Provide technicians who are familiar with the construction and operation of installed systems and who shall develop specific test procedures to conduct Systems Functional Performance Testing of installed systems.

1.11 CXA'S COMMISSIONING RESPONSIBILITIES

A. Organize and lead the commissioning team.
B. Prepare the commissioning plans (preliminary and final).
C. Review and comment on selected submittals from the GC for general conformance with the Construction Documents. Review and comment on the ability to test and operate the system and/or equipment, including providing gauges, controls and other components required to operate, maintain, and test the system. Review and comment on performance expectations of systems and equipment and interfaces between systems relating to the Construction Documents.
D. As practical during the construction phase, conduct an initial construction phase coordination meeting for the purpose of reviewing the commissioning activities and establishing tentative schedules for O&M submittals; O&M training sessions; TAB Work; Pre-Functional Checklists, Systems Functional Performance Testing; and project completion.
E. Convene commissioning team meetings for the purpose of coordination, communication, and conflict resolution; discuss status of the commissioning processes. Responsibilities include arranging facilities, preparing agenda and attendance lists, and notifying

participants. The CxA shall prepare and distribute minutes to commissioning team members and attendees within five workdays of the commissioning meeting.

F. Observe construction and report progress, observations, and issues. Observe systems and equipment installation for adequate accessibility for maintenance and component replacement or repair, and for general conformance with the Construction Documents.
G. Prepare blank Project specific Pre-Functional Checklists and Systems Functional Performance Test procedures. Provide these documents to the GC so that they can be filled out and completed.
H. Coordinate Systems Functional Performance Testing schedule with the GC.
I. Witness selected startup systems.
J. Verify selected Pre-Functional Checklists completed and submitted by the GC.
K. Witness and document Systems Functional Performance Testing.
L. Compile test data, inspection reports, and certificates and include them in the systems manual and commissioning report.
M. Review and comment on O&M documentation and systems manual outline for compliance with the Contract Documents. O&M documentation requirements are specified in Section 01 00 00 GENERAL REQUIREMENTS.
N. Review O&M training program developed by the GC. Verify training plans provide qualified instructors to conduct training.
O. Prepare commissioning Field Observation Reports.
P. Prepare the Final Commissioning Report.
Q. Return to the site at 10 months (approximately) into the 12-month warranty period and review with facility staff the current building operation and the condition of outstanding issues related to the original and seasonal Systems Functional Performance Testing. Also interview facility staff and identify problems or concerns they may have regarding building operations as originally intended. Make suggestions for improvements and for recording these changes in the O&M manuals. Identify areas that may come under warranty or under the original construction contract. Assist facility staff in developing reports, documents, and requests for services to remedy outstanding problems.
R. Assemble the final commissioning documentation, including the Final Commissioning Report and Addendum to the Final Commissioning Report.

1.12 COMMISSIONING DOCUMENTATION

A. Commissioning Plan: A document, prepared by CxA, that outlines the schedule, allocation of resources, and documentation requirements of the commissioning process, and shall include, but is not limited, to the following:

1. Plan for delivery and review of submittals, systems manuals, and other documents and reports. Identification of the relationship of these documents to other functions and a detailed description of submittals that are required to support the commissioning processes.

Submittal dates shall include the latest date approved submittals must be received without adversely affecting commissioning plan.

2. Description of the organization, layout, and content of commissioning documentation (including systems manual) and a detailed description of documents to be provided along with identification of responsible parties.
3. Identification of systems and equipment to be commissioned.
4. Schedule of Commissioning Coordination meetings.
5. Identification of items that must be completed before the next operation can proceed.
6. Description of responsibilities of commissioning team members.
7. Description of observations to be made.
8. Description of requirements for O&M training.
9. Schedule for commissioning activities with dates coordinated with overall construction schedule.
10. Process and schedule for documenting changes on a continuous basis shall appear in Project Record Documents.
11. Process and schedule for completing prestart and startup checklists for systems, subsystems, and equipment to be verified and tested.
12. Preliminary Systems Functional Performance Test procedures.

B. Systems Functional Performance Test Procedures: The CxA shall develop Systems Functional Performance Test Procedures for each system to be commissioned, including subsystems, or equipment and interfaces or interlocks with other systems. Systems Functional Performance Test Procedures shall include a separate entry, with space for comments, for each item to be tested. Preliminary Systems Functional Performance Test Procedures shall be provided to the VA, AE, and GC for review and comment. The Systems Performance Test Procedure shall include test procedures for each mode of operation and provide space to indicate whether the mode under test responded as required. Each System Functional Performance Test procedure, regardless of system, subsystem, or equipment being tested, shall include, but not be limited to, the following:

1. Name and identification code of tested system.
2. Test number.
3. Time and date of test.
4. Indication of whether the record is for a first test or retest following correction of a problem or issue.
5. Dated signatures of the person performing test and of the witness, if applicable.
6. Individuals present for test.
7. Observations and Issues.
8. Issue number, if any, generated as the result of test.

C. Pre-Functional Checklists: The CxA shall prepare Pre-Functional Checklists. Pre-Functional Checklists shall be completed and signed by the GC, verifying that systems, subsystems, equipment, and associated

controls are ready for testing. The CxA shall spot check Pre-Functional Checklists to verify accuracy and readiness for testing. Inaccurate or incomplete Pre-Functional Checklists shall be returned to the GC for correction and resubmission.

D. Test and Inspection Reports: The CxA shall record test data, observations, and measurements on Systems Functional Performance Test Procedure. The report shall also include recommendations for system acceptance or non-acceptance. Photographs, forms, and other means appropriate for the application shall be included with data. CxA Will compile test and inspection reports and test and inspection certificates and include them in systems manual and commissioning report.

E. Corrective Action Documents: The CxA shall document corrective action taken for systems and equipment that fail tests. The documentation shall include any required modifications to systems and equipment and/or revisions to test procedures, if any. The CxA shall witness and document any retesting of systems and/or equipment requiring corrective action and document retest results.

F. Commissioning Issues Log: The CxA shall prepare and maintain Commissioning Issues Log that describes Commissioning Issues and Commissioning Observations that are identified during the Commissioning process. These observations and issues include, but are not limited to, those that are at variance with the Contract Documents. The Commissioning Issues Log shall identify and track issues as they are encountered, the party responsible for resolution, progress toward resolution, and document how the issue was resolved. The Master Commissioning Issues Log shall also track the status of unresolved issues.

1. Creating a Commissioning Issues Log Entry:

   a. Identify the issue with unique numeric or alphanumeric identifier by which the issue may be tracked.
   b. Assign a descriptive title for the issue.
   c. Identify date and time of the issue.
   d. Identify test number of test being performed at the time of the observation, if applicable, for cross reference.
   e. Identify system, subsystem, and equipment to which the issue applies.
   f. Identify location of system, subsystem, and equipment.
   g. Include information that may be helpful in diagnosing or evaluating the issue.
   h. Note recommended corrective action.
   i. Identify commissioning team members responsible for corrective action.
   j. Identify expected date of correction.
   k. Identify person that identified the issue.

2. Documenting Issue Resolution:

a. Log date correction is completed, or the issue is resolved.
b. Describe corrective action or resolution taken. Include description of diagnostic steps taken to determine root cause of the issue, if any.
c. Identify changes to the Contract Documents that may require action.
d. State that correction was completed, and system, subsystem, and equipment are ready for retest, if applicable.
e. Identify person(s) who corrected or resolved the issue.
f. Identify person(s) verifying the issue resolution.

G. Final Commissioning Report: The CxA shall document results of the commissioning process, including unresolved issues, and performance of systems, subsystems, and equipment. The Commissioning Report shall indicate whether systems, subsystems, and equipment have been properly installed and are performing according to the Contract Documents. This report shall be used by the Department of Veterans Affairs when determining that systems shall be accepted. This report shall be used to evaluate systems, subsystems, and equipment and shall serve as a future reference document during VA occupancy and operation. It shall describe components and performance that exceed requirements of the Contract Documents and those that do not meet requirements of the Contract Documents. The commissioning report shall include, but is not limited to, the following:

1. Lists and explanations of substitutions; compromises; variances with the Contract Documents; record of conditions; and, if appropriate, recommendations for resolution. Design Narrative documentation maintained by the CxA.
2. Commissioning plan.
3. Pre-Functional Checklists completed by the GC, with annotation of the CxA review and spot check.
4. Systems Functional Performance Test Procedures, with annotation of test results and test completion.
5, Commissioning Issues Log.
6. Listing of deferred and off-season test(s) not performed, including the schedule for their completion.

H. Addendum to Final Commissioning Report: The CxA shall prepare an Addendum to the Final Commissioning Report near the end of the Warranty Period. The Addendum shall indicate whether systems, subsystems, and equipment are complete and continue to perform according to the Contract Documents. The Addendum to the Final Commissioning Report shall include, but is not limited to, the following:

1. Documentation of deferred and off-season test(s) results.
2. Completed Systems Functional Performance Test Procedures for off season test(s).

3. Documentation that unresolved system performance issues have been resolved.
4. Updated Commissioning Issues Log, including status of unresolved issues.
5. Identification of Warranty Claims to be corrected by the GC.

I. Systems Manual: The CxA shall gather required information and compile the Systems Manual. The Systems Manual shall include, but is not limited to, the following:

1. Design Narrative, including system narratives, schematics, single-line diagrams, flow diagrams, equipment schedules, and changes made throughout the Project.
2. Reference to Final Commissioning Plan.
3. Reference to Final Commissioning Report.
4. Approved O&M Data as submitted by the GC.

1.13 SUBMITTALS

A. The CxA has the responsibility to prepare multiple Commissioning Services deliverables based on the final Construction Documents. These are not submittals in which the GC has a responsibility for producing and submitting. However, these documents shall be reviewed, completed, amended, and accepted by the GC during various phases.

1. Preliminary Commissioning Plan: The Preliminary Commissioning Plan shall be based on the bid set Construction Drawings and Specifications. It shall be reviewed by all parties and then codified as a Final Commissioning Plan once all parties agree to its contents.
2. Final Commissioning Plan: Based on the Preliminary Commissioning Plan and accepted edits or comments. The CxA shall deliver the Final Commissioning Plan.
3. Systems Functional Performance Test Procedures: The CxA shall deliver preliminary Systems Functional Performance Test Procedures to the GC and the VA for review and comment. The GC shall return review comments to the VA and the CxA. The CxA shall incorporate review comments into the Final Systems Functional Test Procedures to be used in Systems Functional Performance Testing.
4. Pre-Functional Checklists: The CxA shall deliver “blank” Pre-Functional Checklists to be completed by the GC and returned to the VA and CxA.
5. Test and Inspection Reports: The CxA shall deliver test and inspection reports to the VA with copies to the GC and the AE.
6. Corrective Action Documents: The CxA shall deliver corrective action documents to the VA COR with copies to the GC and the AE.
7. Preliminary Commissioning Report: The CxA shall deliver the Preliminary Commissioning Report for all parties to review and comment.

8. Final Commissioning Report: The CxA shall deliver the Final Commissioning Report. The Final Commissioning Report submittal shall incorporate comments as directed by the VA.
9. Data for Commissioning: The CxA shall request in writing from the GC specific information needed about each piece of commissioned equipment or system to fulfill requirements of the Commissioning Plan.

B. The GC shall submit detailed startup plans for all equipment (see Section 3.2 this specification).
C. Training Module Submittals (see Section 3.9 this specification).

1.14 COMMISSIONING PROCESS

A. The CxA shall be responsible for the overall management of the commissioning process as well as coordinating scheduling of commissioning tasks with the VA and the GC. As directed by the VA, the GC shall incorporate Commissioning tasks, including, but not limited to, Systems Functional Performance Testing (including predecessors) with the Master Construction Schedule.
B. Within 30 days of CxA contract award, the GC shall designate a specific individual as the Commissioning Manager (CxM) to manage and lead the commissioning effort on behalf of the GC. The CxM shall be the single point of contact and communications for all commissioning related services by the GC.
C. Within 30 days of CxA contract award, the GC shall ensure that each subcontractor designates specific Commissioning Representatives (CxR)individuals to be responsible for commissioning related tasks. The GC shall ensure the designated CxRs participate in the commissioning process as team members provide commissioning testing services, equipment operation, adjustments, and corrections if necessary. The GC shall ensure that all CxRs have sufficient authority to direct their respective staff to provide the services required, and to speak on behalf of their organizations in all commissioning-related contractual matters.

1.15 QUALITY ASSURANCE

A. Instructor Qualifications: Factory authorized service representatives shall be experienced in training, operation, and maintenance procedures for installed systems, subsystems, and equipment.
B. Test Equipment Calibration: The GC shall comply with test equipment manufacturer's calibration procedures and intervals. Recalibrate test instruments immediately whenever instruments have been repaired following damage or dropping. Affix calibration tags to test instruments. Instruments shall have been calibrated within six months prior to use.

1.16 COORDINATION

A. Management: The CxA shall coordinate the commissioning activities with the VA and GC. All commissioning team members shall work together to fulfill their contracted responsibilities and meet the objectives of the contract documents.
B. Scheduling: The GC shall work with the CxA and the VA to incorporate the commissioning activities into the construction schedule. The CxA shall provide sufficient information (including, but not limited to, tasks, durations, and predecessors) on commissioning activities to allow the GC and the VA to schedule commissioning activities. All parties shall address scheduling issues and make necessary notifications in a timely manner in order to expedite the project and the commissioning process. The GC shall update the Master Construction Schedule as directed by the VA.
C. Initial Schedule of Commissioning Events: The CxA shall provide the initial schedule of primary commissioning events in the Commissioning Plan and at the commissioning coordination meetings. The Commissioning Plan shall provide a format for this schedule. As construction progresses, more detailed schedules shall be developed by the GC with information from the CxA.
D. Commissioning Coordinating Meetings: The CxA shall conduct periodic Commissioning Coordination Meetings of the commissioning team to review status of commissioning activities, to discuss scheduling conflicts, and to discuss upcoming commissioning process activities. These meetings shall be held in conjunction with regularly scheduled weekly construction meetings.
E. Pretesting Meetings: The GC shall support CxA conducted pretest meetings of the commissioning team to review startup reports, Pre-Functional Checklist results, Systems Functional Performance Testing procedures, testing personnel and instrumentation requirements.
F. Systems Functional Performance Testing Coordination: The GC shall coordinate testing activities to accommodate required quality assurance and control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting. The GC shall coordinate the schedule times for tests, inspections, obtaining samples, and similar activities.

PART 2 - PRODUCTS

2.1 TEST EQUIPMENT

A. The GC shall provide all standard and specialized testing equipment required to perform Systems Functional Performance Testing. Test equipment required for Systems Functional Performance Testing shall be identified in the detailed System Functional Performance Test Procedure prepared by the CxA.
B. Data logging equipment and software required to test equipment shall be provided by the GC.

C. All testing equipment shall be of sufficient quality and accuracy to test and/or measure system performance with the tolerances specified in the Specifications. If not otherwise noted, the following minimum requirements apply: Digital thermometers shall have a certified calibration within the past year to an accuracy of 1.0°F and a resolution of + or - 0.2°F. All equipment shall be calibrated according to the manufacturer's recommended intervals and following any repairs to the equipment. Calibration tags shall be affixed or certificates readily available.

PART 3 - EXECUTION

3.1 COMMISSIONING PROCESS ROLES AND RESPONSIBILITIES

A. The following table outlines the roles and responsibilities for the Commissioning Team members during the Construction Phase:

Construction Phase		CxA = Comm. Agent COR = Contr. Ofc's Rep. AE = Design Arch/Engineer KTR = General Contractor O&M = Gov't Facility O&M					L = Lead P = Participate A = Approve R = Review O = Optional
Commissioning Roles & Responsibilities							
Category	Task Description	CxA	COR	AE	KTR	O&M	Notes
Meetings	Construction Commissioning Kick Off meeting	L	A	P	P	O	
	Commissioning Meetings	L	A	P	P	O	
	Project Progress Meetings	P	A	P	L	O	
	Controls Meeting	L	A	P	P	O	
Coordination	Coordinate with [OGC's, AHJ, Vendors, etc.] to ensure that Cx interacts properly with other systems as needed to support the OPR and BOD.	L	A	P	P	N/A	
Cx Plan & Spec	Final Commissioning Plan	L	A	R	R	O	
Schedules	Duration Schedule for Commissioning Activities	L	A	R	R	N/A	
OPR and BOD	Maintain OPR on behalf of Owner	L	A	R	R	O	
	Maintain BOD/DID on behalf of Owner	L	A	R	R	O	

Construction Phase		CxA = Comm. Agent COR = Contr. Ofc's Rep. AE = Design Arch/Engineer KTR = General Contractor O&M = Gov't Facility O&M					L = Lead P = Participate A = Approve R = Review O = Optional
Commissioning Roles & Responsibilities							
Category	Task Description	CxA	COR	AE	KTR	O&M	Notes
Document Reviews	TAB Plan Review	L	A	R	R	O	
	Submittal and Shop Drawing Review	R	A	R	L	O	
	Review GC Equipment Startup Checklists	L	A	R	R	N/A	
	Review Change Orders, ASI, and RFIs	L	A	R	R	N/A	
Site Observations	Witness Factory Testing	P	A	P	L	O	
	Construction Observation Site Visits	L	A	R	R	O	
Functional Test Protocols	Final Pre-Functional Checklists	L	A	R	R	O	
	Final Functional Performance Test Protocols	L	A	R	R	O	
Technical Activities	Issues Resolution Meetings	P	A	P	L	O	
Reports and Logs	Status Reports	L	A	R	R	O	
	Maintain Commissioning Issues Log	L	A	R	R	O	

B. The following table outlines the roles and responsibilities for the Commissioning Team members during the Acceptance Phase:

Acceptance Phase		CxA = CxA RE = COR A/E = Design Arch/Engineer KTR = General Contractor O&M = Gov't Facility O&M					L = Lead P = Participate A = Approve R = Review O = Optional
Commissioning Roles & Responsibilities							
Category	Task Description	CxA	RE	A/E	PC	O&M	Notes
Meetings	Commissioning Meetings	L	A	P	P	O	
	Project Progress Meetings	P	A	P	L	O	
	Pre-Test Coordination Meeting	L	A	P	P	O	
	Lessons Learned and Commissioning Report Review Meeting	L	A	P	P	O	
Coordination	Coordinate with [OGC's, AHJ, Vendors, etc.] to ensure that Cx interacts properly with other systems as needed to support OPR and BOD	L	P	P	P	O	
Cx Plan & Spec	Maintain/Update Commissioning Plan	L	A	R	R	O	
Schedules	Prepare Functional Test Schedule	L	A	R	R	O	
OPR and BOD	Maintain OPR on behalf of Owner	L	A	R	R	O	
	Maintain BOD/DID on behalf of Owner	L	A	R	R	O	
Document Reviews	Review Completed Pre-Functional Checklists	L	A	R	R	O	
	Pre-Functional Checklist Verification	L	A	R	R	O	

Acceptance Phase		CxA = CxA					L = Lead
Commissioning Roles & Responsibilities		RE = COR A/E = Design Arch/Engineer KTR = General Contractor O&M = Gov't Facility O&M					P = Participate A = Approve R = Review O = Optional
Category	Task Description	CxA	RE	A/E	PC	O&M	Notes
	Review Operations & Maintenance Manuals	L	A	R	R	R	
	Training Plan Review	L	A	R	R	R	
	Warranty Review	L	A	R	R	O	
	Review TAB Report	L	A	R	R	O	
Site Observations	Construction Observation Site Visits	L	A	R	R	O	
	Witness Selected Equipment Startup	L	A	R	R	O	
Functional Test Protocols	TAB Verification	L	A	R	R	O	
	Systems Functional Performance Testing	L	A	P	P	P	
	Retesting	L	A	P	P	P	
Technical Activities	Issues Resolution Meetings	P	A	P	L	O	
	Systems Training	L	S	R	P	P	
Reports and Logs	Status Reports	L	A	R	R	O	
	Maintain Commissioning Issues Log	L	A	R	R	O	
	Final Commissioning Report	L	A	R	R	R	
	Prepare Systems Manuals	L	A	R	R	R	

C. The following table outlines the roles and responsibilities for the Commissioning Team members during the Warranty Phase:

Warranty Phase		CxA = CxA RE = COR A/E = Design Arch/Engineer KTR = General Contractor O&M = Gov't Facility O&M					L = Lead P = Participate A = Approve R = Review O = Optional
Commissioning Roles & Responsibilities							
Category	Task Description	CxA	RE	A/E	KTR	O&M	Notes
Meetings	Post-Occupancy User Review Meeting	L	A	O	P	P	
Site Observations	Periodic Site Visits	L	A	O	O	P	
Functional Test Protocols	Deferred and/or seasonal Testing	L	A	O	P	P	
Technical Activities	Issues Resolution Meetings	L	S	O	O	P	
	Post-Occupancy Warranty Checkup and review of Significant Outstanding Issues	L	A		R	P	
Reports and Logs	Final Commissioning Report Amendment	L	A		R	R	
	Status Reports	L	A		R	R	

3.2 STARTUP, INITIAL CHECKOUT, AND PRE-FUNCTIONAL CHECKLISTS

A. The following procedures shall apply to all equipment and systems to be commissioned, according to Part 1, Systems to Be Commissioned.

1. Pre-Functional Checklists are important to ensure that the equipment and systems are hooked up and operational. These ensure that Systems Functional Performance Testing may proceed without unnecessary delays. Each system to be commissioned shall have a full Pre-Functional Checklist completed by the GC prior to Systems Functional Performance Testing. No sampling strategies are used.

   a. The Pre-Functional Checklist shall identify the trades responsible for completing the checklist. The GC shall ensure the appropriate trades complete the checklists.
   b. The CxA shall review completed Pre-Functional Checklists and field-verify the accuracy of the completed checklist using sampling techniques.

2. Startup and Initial Checkout Plan: The GC shall develop detailed startup plans for all equipment. The primary role of the GC in this process is to ensure that there is written documentation that each of the manufacturer recommended procedures have been completed. Parties responsible for startup shall be identified in the Startup Plan and in the checklist forms.

   a. The GC shall develop the full startup plan by combining (or adding to) the checklists with the manufacturer's detailed startup and checkout procedures from the O&M manual data and the field checkout sheets normally used by the GC. The plan shall include checklists and procedures with specific boxes or lines for recording and documenting the checking and inspections of each procedure and a summary statement with a signature block at the end of the plan.
   b. The full startup plan shall at a minimum consist of the following items:

      1) The Pre-Functional Checklists.
      2) The manufacturer's standard written startup procedures copied from the installation manuals with check boxes by each procedure and a signature block added by hand at the end.
      3) The manufacturer's normally used field checkout sheets.

   c. The CxA shall review the GC’s full startup plan. Final approval shall be by the VA.
   d. The GC shall review and evaluate the procedures and the format for documenting them, noting any procedures that need to be revised or added.

3. Sensor and Actuator Calibration:

a. All field installed temperature, relative humidity, CO2 and pressure sensors and gages, and all actuators (dampers and valves) on all equipment shall be calibrated using the methods described in the appropriate specifications.
b. All procedures used shall be fully documented on the Pre-Functional Checklists or other suitable forms, clearly referencing the procedures followed and written documentation of initial, intermediate, and results.

4. Execution of Equipment Startup:

a. Four weeks prior to equipment startup, the GC shall schedule startup and checkout with the VA and CxA. The performance of the startup and checkout shall be directed and executed by the GC.
b. The CxA shall observe the startup procedures for selected pieces of primary equipment.
c. The GC shall execute startup and provide the VA and CxA with a signed and dated copy of the completed startup checklists, and GC tests.
d. Only individuals that have direct knowledge and witnessed that a line-item task on the Startup Checklist was actually performed shall initial or check that item off. It is not acceptable for witnessing supervisors to fill out these forms.

3.3 DEFICIENCIES, NONCONFORMANCE, AND APPROVAL IN CHECKLISTS AND STARTUP

A. The GC shall clearly list any outstanding items of the initial startup and Pre-Functional Checklist procedures that were not completed successfully, at the bottom of the procedures form or on an attached sheet. The procedures form and any outstanding deficiencies shall be provided to the VA and the CxA within two days of completion.
B. The CxA shall review the report and submit comments to the VA. The CxA shall work with the GC to correct and verify deficiencies or uncompleted items. The CxA shall involve the VA and others as necessary. The GC shall correct all areas that are noncompliant or incomplete in the checklists in a timely manner and shall notify the VA and CxA as soon as outstanding items have been corrected. The GC shall submit an updated startup report and a Statement of Correction on the original noncompliance report. When satisfactorily completed, the CxA shall recommend approval of the checklists and startup of each system to the VA.
C. The GC shall be responsible for resolution of deficiencies as directed the VA.

3.4 PHASED COMMISSIONING

A. The project may require startup and initial checkout to be executed in phases. This phasing shall be planned and scheduled in a coordination meeting of the VA, CxA, and the GC. Results shall be added to the master construction schedule and the commissioning schedule.

3.5 DDC SYSTEM TRENDING FOR COMMISSIONING

A. Trending is a method of testing as a standalone method or to augment manual testing. The GC shall trend all points of the system or systems at intervals specified below.
B. Alarms are a means to notify the system operator that abnormal conditions are present in the system. Alarms shall be structured into three tiers – Critical, Priority, and Maintenance.

   1. Critical alarms are intended to be alarms that require the immediate attention of and action by the Operator. These alarms shall be displayed on the Operator Workstation in a popup style window that is graphically linked to the associated unit's graphical display. The popup style window shall be displayed on top of any active window within the screen, including non DDC system software.
   2. Priority level alarms are to be printed to a printer which is connected to the Operator’s Workstation located within the engineer’s office. Additionally, priority level alarms shall be able to be monitored and viewed through an active alarm application. Priority level alarms are alarms which shall require reaction from the operator or maintenance personnel within a normal work shift, and not immediate action.
   3. Maintenance alarms are intended to be minor issues which would require examination by maintenance personnel within the following shift. These alarms shall be generated in a scheduled report automatically by the DDC system at the start of each shift. The generated maintenance report shall be printed to a printer located within the engineer’s office.

C. The GC shall provide a wireless internet network in the building for use during controls programming, checkout, and commissioning. This network shall allow project team members to more effectively program, view, manipulate and test control devices while being in the same room as the controlled device.
D. The GC shall provide graphical trending through the DDC control system of systems being commissioned. Trending requirements are indicated below and included with the Systems Functional Performance Test Procedures. Trending shall occur before, during and after Systems Functional Performance Testing. The GC shall be responsible for producing graphical representations of the trended DDC points that show each system operating properly during steady state conditions as well as during the System Functional Testing. These graphical reports shall be submitted to the COR and CxA for review and analysis before, during dynamic operation, and after Systems Functional Performance Testing. The GC shall provide, but not limited to, the following trend requirements and trend submissions:

   1. Pre-testing, Testing, and Post-testing – Trend reports of trend logs and graphical trend plots are required as defined by the CxA. The

trend log points, sampling rate, graphical plot configuration, and duration shall be dictated by the CxA. At any time during the Commissioning Process the CxA may recommend changes to aspects of trending as deemed necessary for proper system analysis. The GC shall implement any changes as directed by the COR. Any pre-test trend analysis comments generated by the Commissioning Team should be addressed and resolved by the GC, as directed by the COR, prior to the execution of Systems Functional Performance Testing.

2. Dynamic plotting – The GC shall also provide dynamic plotting during Systems Functional Performance testing at frequent intervals for points determined by the Systems Functional Performance Test Procedure. The graphical plots shall be formatted and plotted at durations listed in the Systems Functional Performance Test Procedure.
3. Graphical plotting - The graphical plots shall be provided with a dual y-axis allowing 15 or more trend points (series) plotted simultaneously on the graph with each series in distinct color. The plots shall further require title, axis naming, legend etc. all described by the Systems Functional Performance Test Procedure. If this cannot be sufficiently accomplished directly in the Direct Digital Control System, then it is the responsibility of the GC to plot these trend logs in Microsoft Excel.
4. The following table indicates the points to be trended and alarmed by system. The Operational Trend Duration column indicates the trend duration for normal operations. The Testing Trend Duration column indicates the trend duration prior to Systems Functional Performance Testing and again after Systems Functional Performance Testing. The Type column indicates point type: AI = Analog Input, AO = Analog Output, DI = Digital Input, DO = Digital Output. In the Trend Interval Column, COV = Change of Value. The Alarm Type indicates the alarm priority; P = Priority and M = Maintenance. The Alarm Range column indicates when the point is considered in the alarm state. The Alarm Delay column indicates the length of time the point must remain in an alarm state before the alarm is recorded in the DDC. The intent is to allow minor, short-duration events to be corrected by the DDC system prior to recording an alarm.

Cooling Unit Trending and Alarms							
Point	**Type**	**Trend Interval**	**Operational Trend Duration**	**Testing Trend Duration**	**Alarm Type**	**Alarm Range**	**Alarm Delay**
Space Temperature	AI	15 Minutes	24 hours	3 days	P	±5°F from SP	10 min
SA Temperature	AI	15 Minutes	24 hours	3 days	P	±5°F from SP	10 min
Pre-Filter Status	AI	None	None	None	M	> SP	1 hour

Cooling Unit Trending and Alarms							
Point	**Type**	**Trend Interval**	**Operational Trend Duration**	**Testing Trend Duration**	**Alarm Type**	**Alarm Range**	**Alarm Delay**
Water Sensor: Drain Pan	DI	COV	24 hours	3 days	M	N/A	30 Min
Water Sensor: Floor Moisture	DI	COV	24 hours	3 days	M	N/A	30 Min
Condenser / Compressor Status	BI	15 Minutes	24 hours	3 days	N/A		
Air Handler ON/OFF	DO	COV	24 hours	3 days	M	Status <> Command	30 min
Supply Fan Status	DI	COV	24 hours	3 days	C	Status <> Command	10 min

E. The GC shall provide the following information prior to Systems Functional Performance Testing. Any documentation that is modified after submission shall be recorded and resubmitted to the COR and CxA.

1. Point-to-Point checkout documentation.
2. Sensor field calibration documentation including system name, sensor/point name, measured value, DDC value, and Correction Factor.
3. A sensor calibration table listing the referencing the location of procedures to following in the O&M manuals, and the frequency at which calibration should be performed for all sensors, separated by system, subsystem, and type. The calibration requirements shall be submitted both in the O&M manuals and separately in a standalone document containing all sensors for inclusion in the commissioning documentation. The following table is a sample that can be used as a template for submission.

SYSTEM		
Sensor	**Calibration Frequency**	**O&M Calibration Procedure Reference**
Discharge air temp	Once a year	Volume I Section D.3.aa
Discharge static pressure	Every 6 months	Volume II Section A.1.c

4. Loop tuning documentation and constants for each loop of the building systems. The documentation shall be submitted in outline or table separated by system, control type (e.g., heating valve temperature control); proportional, integral, and derivative constants, interval (and bias if used) for each loop. The following table is a sample that can be used as a template for submission.

AIR HANDLING UNIT AHU-1				
Control Reference	Proportional Constant	Integral Constant	Derivative Constant	Interval
Heating Valve Output	1000	20	10	2 sec.

3.6 SYSTEMS FUNCTIONAL PERFORMANCE TESTING

A. This paragraph applies to Systems Functional Performance Testing of systems for all referenced specification Divisions.

B. Objectives and Scope: The objective of Systems Functional Performance Testing is to demonstrate that each system is operating according to the Contract Documents. Systems Functional Performance Testing facilitates bringing the systems from a state of substantial completion to full dynamic operation. Additionally, during the testing process, areas of noncompliant performance are identified and corrected, thereby improving the operation, and functioning of the systems. In general, each system shall be operated through all modes of operation (seasonal, occupied, unoccupied, warm-up, cool-down, part- and full-load, fire alarm and emergency power) where there is a specified system response. The GC shall verify each sequence in the sequences of operation. Proper responses to such modes and conditions as power failure, freeze condition, low oil pressure, no flow, equipment failure, etc. shall also be tested.

C. Development of Systems Functional Performance Test Procedures: Before Systems Functional Performance Test procedures are written, the GC shall submit all requested documentation and a current list of change orders affecting equipment or systems, including an updated points list, program code, control sequences and parameters. Using the testing parameters and requirements found in the Contract Documents and approved submittals and shop drawings, the CxA shall develop specific Systems Functional Test Procedures to verify and document proper operation of each piece of equipment and system to be commissioned. The GC shall assist the CxA in developing the Systems Functional Performance Test procedures as requested by the CxA i.e. by answering questions about equipment, operation, sequences, etc. Prior to execution, the CxA shall provide a copy of the Systems Functional Performance Test procedures to the VA, the AE, and the GC, who shall review the tests for feasibility, safety, equipment and warranty protection.

D. Purpose of Test Procedures: The purpose of each specific Systems Functional Performance Test is to verify and document compliance with the stated criteria of acceptance given on the test form. Representative test formats and examples are found in the Commissioning Plan for this project. (The Commissioning Plan is issued as a separate document and is available for review.) The test procedure forms developed by the CxA shall include, but not be limited to, the following information:

1. System and equipment or component name(s)
2. Equipment location and ID number
3. Unique test ID number, and reference to unique Pre-Functional Checklists and startup documentation, and ID numbers for the piece of equipment
4. Date
5. Project name
6. Participating parties
7. A copy of the specification section describing the test requirements
8. A copy of the specific sequence of operations or other specified parameters being verified
9. Formulas used in any calculations
10. Required pretest field measurements
11. Instructions for setting up the test.
12. Special cautions, alarm limits, etc.
13. Specific step-by-step procedures to execute the test, in a clear, sequential, and repeatable format
14. Acceptance criteria of proper performance with a Yes / No check box to allow for clearly marking whether proper performance of each part of the test was achieved.
15. A section for comments.
16. Signatures and date block for the CxA. A place for the GC to initial to signify attendance at the test.

E. Test Methods: Systems Functional Performance Testing shall be achieved by manual testing (i.e., persons manipulate the equipment and observe performance) and/or by monitoring the performance and analyzing the results using the control system's trend log capabilities or by standalone data loggers. The GC and CxA shall determine which method is most appropriate for tests that do not have a method specified.

1. Simulated Conditions: Simulating conditions (not by an overwritten value) shall be allowed, although timing the testing to experience actual conditions is encouraged wherever practical.
2. Overwritten Values: Overwriting sensor values to simulate a condition, such as overwriting the outside air temperature reading in a control system to be something other than it really is, shall be allowed, but shall be used with caution and avoided when possible. Such testing methods often can only test a part of a system, as the interactions and responses of other systems shall be erroneous or not applicable. Simulating a condition is preferable. e.g., for the above case, by heating the outside air sensor with a hair blower rather than overwriting the value or by altering the appropriate setpoint to see the desired response. Before simulating conditions or overwriting values, sensors, transducers, and devices shall have been calibrated.
3. Simulated Signals: Using a signal generator which creates a simulated signal to test and calibrate transducers and DDC constants

is generally recommended overusing the sensor to act as the signal generator via simulated conditions or overwritten values.

4. Altering Setpoints: Rather than overwriting sensor values, and when simulating conditions is difficult, altering setpoints to test a sequence is acceptable. For example, to see the Air Conditioning compressor lockout initiate at an outside air temperature below 54°F, when the outside air temperature is above 54°F, temporarily change the lockout setpoint to be 4°F above the current outside air temperature.
5. Indirect Indicators: Relying on indirect indicators for responses or performance shall be allowed only after visually and directly verifying and documenting, over the range of the tested parameters, that the indirect readings through the control system represent actual conditions and responses. Much of this verification shall be completed during systems startup and initial checkout.

F. Setup: Each function and test shall be performed under conditions that simulate actual conditions as closely as is practically possible. The GC shall provide all necessary materials, system modifications, etc. to produce the necessary flows, pressures, temperatures, etc. necessary to execute the test according to the specified conditions. At completion of the test, the GC shall return all affected building equipment and systems, due to these temporary modifications, to their pretest condition.

G. Sampling: No sampling is allowed in completing Pre-Functional Checklists. Sampling is allowed for Systems Functional Performance Test Procedures execution. The CxA shall determine the sampling rate. If at any point, frequent failures are occurring and testing is becoming more troubleshooting than verification, the CxA may stop the testing and require the GC to perform and document a checkout of the remaining units, prior to continuing with Systems Functional Performance Testing of the remaining units.

H. Cost of Retesting: The cost associated with expanded sample System Functional Performance Tests shall be solely the responsibility of the GC. Any required retesting shall not be considered a justified reason for a claim of delay or for a time extension by the GC.

I. Coordination and Scheduling: The GC shall provide a minimum of 7 days' notice to the CxA and the VA regarding the completion schedule for the Pre-Functional Checklists and startup of all equipment and systems. The CxA shall schedule Systems Functional Performance Tests with the GC and VA. The CxA shall witness and document the Systems Functional Performance Testing of systems. The GC shall execute the tests in accordance with the Systems Functional Performance Test Procedure.

J. Testing Prerequisites: In general, Systems Functional Performance Testing shall be conducted only after Pre-Functional Checklists have been satisfactorily completed. The control system shall be sufficiently tested and approved by the CxA and the VA before it is used to verify performance of other components or systems. The air balancing and water balancing shall be completed before Systems

Functional Performance Testing of air-related or water-related equipment or systems are scheduled. Systems Functional Performance Testing shall proceed from components to subsystems to systems. When the proper performance of all interacting individual systems has been achieved, the interface or coordinated responses between systems shall be checked.

K. Problem Solving: The CxA shall recommend solutions to problems found, however the burden of responsibility to solve, correct and retest problems is with the GC.

3.7 DOCUMENTATION, NONCONFORMANCE AND APPROVAL OF TESTS

A. Documentation: The CxA shall witness and document the results of all Systems Functional Performance Tests using the specific procedural forms developed by the CxA for that purpose. Prior to testing, the CxA shall provide these forms to the VA and the GC for review and approval. The GC shall include the filled-out forms with the O&M manual data.

B. Nonconformance: The CxA shall record the results of the Systems Functional Performance Tests on the procedure or test form. All items of nonconformance issues shall be noted and reported to the VA on Commissioning Field Reports and/or the Commissioning Master Issues Log.

1. Corrections of minor items of noncompliance identified may be made during the tests. In such cases, the item of noncompliance and resolution shall be documented on the Systems Functional Test Procedure.
2. Every effort shall be made to expedite the systems functional Performance Testing process and minimize unnecessary delays, while not compromising the integrity of the procedures. However, the CxA shall not be pressured into overlooking noncompliant work or loosening acceptance criteria to satisfy scheduling or cost issues, unless there is an overriding reason to do so by direction from the VA.
3. As the Systems Functional Performance Tests progresses and an item of noncompliance is identified, the CxA shall discuss the issue with the GC and the VA.
4. When there is no dispute on an item of noncompliance, and the GC accepts responsibility to correct it:

   a. The CxA shall document the item of noncompliance and the GC's response and/or intentions. The Systems Functional Performance Test then continues or proceeds to another test or sequence. After the day's work is complete, the CxA shall submit a Commissioning Field Report to the VA. The CxA shall also note items of noncompliance and the GC’s response in the Master Commissioning Issues Log. The GC shall correct the item of noncompliance and report completion to the VA and CxA.

b. The need for retesting shall be determined by the CxA. If retesting is required, the CxA and the GC shall reschedule the test and the test shall be repeated.

5. If there is a dispute about item of noncompliance, regarding whether it is an item of noncompliance, or who is responsible:

a. The item of noncompliance shall be documented on the test form with the GC's response. The item of noncompliance with the GC’s response shall also be reported on a Commissioning Field Report and on the Master Commissioning Issues Log.
b. Resolutions shall be made at the lowest management level possible. Other parties are brought into the discussions as needed. Final interpretive and acceptance authority is with the Department of Veterans Affairs.
c. The CxA shall document the resolution process.
d. Once the interpretation and resolution have been decided, the GC shall correct the item of noncompliance, report it to the CxA. The requirement for retesting shall be determined by the CxA. If retesting is required, the CxA and the GC shall reschedule the test. Retesting shall be repeated until satisfactory performance is achieved.

C. Cost of Retesting: The cost to retest a System Functional Performance Test shall be solely the responsibility of the GC. Any required retesting by the GC shall not be considered a justified reason for a claim of delay or for a time extension by the GC.
D. Failure Due to Manufacturer Defect: If 10%, or three, whichever is greater, of identical pieces (size alone does not constitute a difference) of equipment fail to perform in compliance with the Contract Documents (mechanically or substantively) due to manufacturing defect, not allowing it to meet its submitted performance specifications, all identical units may be considered unacceptable by the VA. In such case, the GC shall provide the VA with the following:

1. Within one week of notification from the VA, the GC shall examine all other identical units making a record of the findings. The findings shall be provided to the VA within two weeks of the original notice.
2. Within two weeks of the original notification, the GC shall provide a signed and dated, written explanation of the problem, cause of failures, etc. and all proposed solutions which shall include full equipment submittals. The proposed solutions shall not significantly exceed the specification requirements of the original installation.
3. The VA shall determine whether a replacement of all identical units or a repair is acceptable.
4. Two examples of the proposed solution shall be installed by the GC and the VA shall be allowed to test the installations for up to one week, upon which the VA shall decide whether to accept the solution.

5. Upon acceptance, the GC shall replace or repair all identical items, at their expense and extend the warranty accordingly, if the original equipment warranty had begun. The replacement/repair work shall proceed with reasonable speed beginning within one week from when parts can be obtained.

E. Approval: The CxA shall note each satisfactorily demonstrated function on the test form. Formal approval of the Systems Functional Performance Test shall be made later after review by the CxA and by the VA. The CxA shall evaluate each test and report to the VA using a standard form. The VA shall give final approval on each test using the same form and provide signed copies to the CxA and the GC.

3.8 DEFERRED TESTING

A. Unforeseen Deferred Systems Functional Performance Tests: If any Systems Functional Performance Test cannot be completed due to the building structure, required occupancy condition or other conditions, execution of the Systems Functional Performance Testing may be delayed upon approval of the VA. These Systems Functional Performance Tests shall be conducted in the same manner as the seasonal tests as soon as possible. Services of the GC to conduct these unforeseen Deferred Systems Functional Performance Tests shall be negotiated between the VA and the GC.
B. Deferred Seasonal Testing: Deferred Seasonal Systems Functional Performance Tests are those that must be deferred until weather conditions are closer to the systems design parameters. The CxA shall review systems parameters and recommend which Systems Functional Performance Tests should be deferred until weather conditions more closely match systems parameters. The GC shall review and comment on the proposed schedule for Deferred Seasonal Testing. The VA shall review and approve the schedule for Deferred Seasonal Testing. Deferred Seasonal Systems Functional Performances Tests shall be witnessed and documented by the CxA. Deferred Seasonal Systems Functional Performance Tests shall be executed by the GC in accordance with these specifications.

3.9 O&M TRAINING REQUIREMENTS

A. Training Preparation Conference: Before O&M training, the CxA shall convene a training preparation conference to include COR, O&M personnel, and the GC. The purpose of this conference shall be to discuss and plan for Training and Demonstration of VA O&M personnel.
B. The GC shall provide training and demonstration as required by the appropriate specification sections. The Training and Demonstration shall include, but is not limited to, the following:

1. Review the Contract Documents.
2. Review installed systems, subsystems, and equipment.
3. Review instructor qualifications.

4. Review instructional methods and procedures.
5. Review training module outlines and contents.
6. Review course materials (including O&M manuals).
7. Review and discuss locations and other facilities required for instruction.
8. Review and finalize training schedule and verify availability of educational materials, instructors, audiovisual equipment, and facilities needed to avoid delays.
9. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

C. Training Module Submittals: The GC shall submit the following information to the VA and the CxA:

1. Instruction Program: Submit two copies of outline of instructional program for demonstration and training, including a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module. At completion of training, submit two complete training manuals for VA's use.
2. Qualification Data: Submit qualifications for facilitator and/or instructor.
3. Attendance Record: For each training module, submit list of participants and length of instruction time.
4. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.
5. Demonstration and Training Recording:

   a. General: Engage a qualified commercial photographer to record demonstration and training. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice. At beginning of each training module, record each chart containing learning objective and lesson outline.
   b. Video Format: Provide high quality video capable of being uploaded to Opcenter.
   c. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to show area of demonstration and training. Display continuous running time.
   d. Narration: Describe scenes on video recording by audio narration by microphone while demonstration and training are recorded. Include description of items being viewed. Describe vantage point, indicating location, direction (by compass point), and elevation or story of construction.

6. Transcript: Submit digitally.

D. Quality Assurance:

1. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
2. Instructor Qualifications: A factory authorized service representative, complying with requirements in Division 01 Section "Quality Requirements," experienced in O&M procedures and training.
3. Photographer Qualifications: A professional photographer who is experienced photographing construction projects.

E. Training Coordination:

1. Coordinate instruction schedule with VA's operations. Adjust schedule as required to minimize disrupting VA's operations.
2. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
3. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until O&M data has been reviewed and approved by the VA.

F. Instruction Program:

1. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections, and as follows:

   a. Fire protection systems, including fire alarm, and fire suppression systems.
   b. Intrusion detection systems.
   c. Conveying systems, including elevators, wheelchair lifts, escalators, and automated materials handling systems.
   d. Refrigeration systems, including, condensers, and distribution piping.
   e. HVAC systems, including air handling equipment, air distribution systems, and terminal equipment and devices.
   f. HVAC instrumentation and controls.
   g. Electrical distribution, including transformers, switchboards, panelboards, and motor controls.
   h. Lighting equipment and controls.
   i. Communication systems, including intercommunication, surveillance, nurse call systems, public address, mass evacuation, voice and data, and entertainment television equipment.
   j. Site utilities including lift stations, condensate pumping and return systems, and storm water pumping systems.

G. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participants are expected to master. For each module, include instruction for the following:

1. Basis of System Design, Operational Requirements, and Criteria: Include the following:

   a. System, subsystem, and equipment descriptions.
   b. Performance and design criteria if GC is delegated design responsibility.
   c. Operating standards.
   d. Regulatory requirements.
   e. Equipment function.
   f. Operating characteristics.
   g. Limiting conditions.
   h. Performance curves.

2. Documentation: Review the following items in detail:

   a. Emergency manuals.
   b. Operations manuals.
   c. Maintenance manuals.
   d. Project Record Documents.
   e. Identification systems.
   f. Warranties and bonds.
   g. Maintenance service agreements and similar continuing commitments.

3. Emergencies: Include the following, as applicable:

   a. Instructions on meaning of warnings, trouble indications, and error messages.
   b. Instructions on stopping.
   c. Shutdown instructions for each type of emergency.
   d. Operating instructions for conditions outside of normal operating limits.
   e. Sequences for electric or electronic systems.
   f. Special operating instructions and procedures.

4. Operations: Include the following, as applicable:

   a. Startup procedures.
   b. Equipment or system break-in procedures.
   c. Routine and normal operating instructions.
   d. Regulation and control procedures.
   e. Control sequences.
   f. Safety procedures.
   g. Instructions on stopping.

h. Normal shutdown instructions.
i. Operating procedures for emergencies.
j. Operating procedures for system, subsystem, or equipment failure.
k. Seasonal and weekend operating instructions.
l. Required sequences for electric or electronic systems.
m. Special operating instructions and procedures.

5. Adjustments: Include the following:

a. Alignments.
b. Checking adjustments.
c. Noise and vibration adjustments.
d. Economy and efficiency adjustments.

6. Troubleshooting: Include the following:

a. Diagnostic instructions.
b. Test and inspection procedures.

7. Maintenance: Include the following:

a. Inspection procedures.
b. Types of cleaning agents to be used and methods of cleaning.
c. List of cleaning agents and methods of cleaning detrimental to product.
d. Procedures for routine cleaning
e. Procedures for preventive maintenance.
f. Procedures for routine maintenance.
g. Instruction on use of special tools.

8. Repairs: Include the following:

a. Diagnosis instructions.
b. Repair instructions.
c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
d. Instructions for identifying parts and components.
e. Review of spare parts needed for O&M.

H. Training Execution:

1. Preparation: Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a combined training manual. Set up instructional equipment at instruction location.
2. Instruction:

a. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between GC and Department of

Veterans Affairs for number of participants, instruction times, and location.

b. Instructor: Engage qualified instructors to instruct VA's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

1) The GC shall furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
2) The VA shall furnish an instructor to describe VA's operational philosophy.
3) The VA shall furnish the GC with names and positions of participants.

3. Scheduling: Provide instruction at mutually agreed times. For equipment that requires seasonal operation, provide similar instruction at start of each season. Schedule training with the VA and the CxA with at least seven days' advance notice.
4. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of an oral, or a written, performance-based test.
5. Cleanup: Collect used and leftover educational materials and remove from Project site. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

I. Demonstration and Training Recording:

1. General: Engage a qualified commercial photographer to record demonstration and training. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice. At beginning of each training module, record each chart containing learning objective and lesson outline.
2. Video Format: Provide high quality video capable of being uploaded to Opcenter.
3. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to show area of demonstration and training. Display continuous running time.
4. Narration: Describe scenes on videotape by audio narration by microphone while demonstration and training are recorded. Include description of items being viewed. Describe vantage point, indicating location, direction (by compass point), and elevation or story of construction.

----- END -----

SECTION 02 41 00
DEMOLITION

PART 1 - GENERAL

1.1 DESCRIPTION:

This section specifies demolition and removal of buildings, portions of buildings, utilities, other structures and debris from trash dumps shown.

1.2 RELATED WORK:

A. Demolition and removal of roads, walks, curbs, and ongrade slabs outside buildings to be demolished:

B. Safety Requirements: Section 01 35 26 Safety Requirements Article, ACCIDENT PREVENTION PLAN (APP).

C. Disconnecting utility services prior to demolition: Section 01 00 00, GENERAL REQUIREMENTS.

D. Reserved items that are to remain the property of the Government: Section 01 00 00, GENERAL REQUIREMENTS.

E. Asbestos Removal: Section 02 82 11, TRADITIONAL ASBESTOS ABATEMENT.

F. Lead Paint: Section 02 83 33.13, LEAD-BASED PAINT REMOVAL AND DISPOSAL.

G. Environmental Protection: Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS.

H. Construction Waste Management: Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT.

I. Infectious Control: Section 01 35 26, SAFETY REQUIREMENTS.

1.3 PROTECTION:

A. Perform demolition in such manner as to eliminate hazards to persons and property; to minimize interference with use of adjacent areas, utilities and structures or interruption of use of such utilities; and to provide free passage to and from such adjacent areas of structures. Comply with requirements of GENERAL CONDITIONS Article, ACCIDENT PREVENTION.

B. Provide safeguards, including warning signs, barricades, temporary fences, warning lights, and other similar items that are required for protection of all personnel during demolition and removal operations. Comply with requirements of Section 01 00 00, GENERAL REQUIREMENTS, Article PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES AND IMPROVEMENTS.

C. Maintain fences, barricades, lights, and other similar items around exposed excavations until such excavations have been completely filled.

D. Provide enclosed dust chutes with control gates from each floor to carry debris to truck beds and govern flow of material into truck. Provide overhead bridges of tight board or prefabricated metal construction at dust chutes to protect persons and property from falling debris.

E. Prevent spread of flying particles and dust. Sprinkle rubbish and debris with water to keep dust to a minimum. Do not use water if it results in hazardous or objectionable condition such as, but not limited to; ice, flooding, or pollution. Vacuum and dust the work area daily.

F. In addition to previously listed fire and safety rules to be observed in performance of work, include following:
   1. No wall or part of wall shall be permitted to fall outwardly from structures.
   2. Maintain at least one stairway in each structure in usable condition to highest remaining floor. Keep stairway free of obstructions and debris until that level of structure has been removed.
   3. Wherever a cutting torch or other equipment that might cause a fire is used, provide and maintain fire extinguishers nearby ready for immediate use. Instruct all possible users in use of fire extinguishers.
   4. Keep hydrants clear and accessible at all times. Prohibit debris from accumulating within a radius of 4500 mm (15 feet) of fire hydrants.

G. Before beginning any demolition work, the Contractor shall survey the site and examine the drawings and specifications to determine the extent of the work. The contractor shall take necessary precautions to avoid damages to existing Medical Center; any damaged items shall be repaired or replaced as approved by the COR. The Contractor shall coordinate the work of this section with all other work and shall construct and maintain shoring, bracing, and supports as required. The Contractor shall ensure that structural elements are not overloaded and shall be responsible for increasing structural supports or adding new supports as may be required as a result of any cutting, removal, or demolition work performed under this contract. Do not overload structural elements. Provide new supports and reinforcement for

existing construction weakened by demolition or removal works. Repairs, reinforcement, or structural replacement must have COR's approval.

H. The work shall comply with the requirements of Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS.

I. The work shall comply with the requirements of Section 01 00 00, GENERAL REQUIREMENTS and Section 01 35 26, SAFETY REQUIREMENTS.

1.4 UTILITY SERVICES:

A. Demolish and remove outside utility service lines shown to be removed.

B. Remove abandoned outside utility lines that would interfere with installation of new utility lines and new construction.

PART 2 – PRODUCTS

2.1 SALVAGEABLE MATERIALS TO BE STORED BY OWNER (VA):

A. VA shall mark or tag existing materials, equipment or other items that are to be retained during a pre-demolition walk through (survey). Salvageable materials and items designated or marked to remain the property of the government shall be carefully removed by applicable trades, protected from damage and stored adjacent to the removal area as directed.

B. Consult the COR concerning any possible salvageable items prior to demolition thereof. Carefully remove and salvage any materials designated to be retained.

C. Any materials not wanted by the government shall be removed from the site by the contractor, without additional cost to the government. D. Removal from the area and the site to the government's storage area shall be by the contractor.

PART 3 – EXECUTION

3.1 DEMOLITION:

A. Completely demolish and remove buildings and structures, including all appurtenances related or connected thereto, as noted below:

1. As required for installation of new utility service lines.
2. To full depth within an area defined by hypothetical lines located 1500 mm (5 feet) outside building lines of new structures.

B. Debris, including brick, concrete, stone, metals and similar materials shall become property of Contractor and shall be disposed of by him daily, off the Medical Center to avoid accumulation at the demolition site. Materials that cannot be removed daily shall be stored in areas specified by the COR. Break up concrete slabs below grade that do not

require removal from present location into pieces not exceeding 600 mm (24 inches) square to permit drainage. Contractor shall dispose debris in compliance with applicable federal, state or local permits, rules and/or regulations.

C. In removing buildings and structures of more than two stories, demolish work story by story starting at highest level and progressing down to third floor level. Demolition of first and second stories may proceed simultaneously.

D. Remove and legally dispose of all materials, other than earth to remain as part of project work, from any trash dumps shown. Materials removed shall become property of contractor and shall be disposed of in compliance with applicable federal, state or local permits, rules and/or regulations. All materials in the indicated trash dump areas, including above surrounding grade and extending to a depth of 1500mm (5feet) below surrounding grade, shall be included as part of the lump sum compensation for the work of this section. Materials that are located beneath the surface of the surrounding ground more than 1500 mm (5 feet), or materials that are discovered to be hazardous, shall be handled as unforeseen. The removal of hazardous material shall be referred to Hazardous Materials specifications.

E. Remove existing utilities as indicated or uncovered by work and terminate in a manner conforming to the nationally recognized code covering the specific utility and approved by the COR. When Utility lines are encountered that are not indicated on the drawings, the COR shall be notified prior to further work in that area.

3.2 CLEAN-UP:

On completion of work of this section and after removal of all debris, leave site in clean condition satisfactory to COR. Clean-up shall include off the Medical Center disposal of all items and materials not required to remain property of the Government as well as all debris and rubbish resulting from demolition operations.

3.3 TEMPORARY PROTECTION:

A. Provide temporary bracing, shoring, needling and support during demolition, cutting, remodeling and related new construction necessary for the execution of the work and the protection of persons and property. Perform all work with appropriate supports, protection and methods to prevent collapse, settling or damage to property or persons. Provide adequate supports for the loads to be carried, with loads properly

distributed, and including to lower levels and sound bearing, if necessary.

B Provide protective covering and enclosures necessary to prevent damage to existing spaces and materials to remain.

C. Provide dust proof temporary enclosures (including above ceilings) separating areas under demolition and remodeling from the remainder of the buildings as well as temporary filters at ductwork. If work produces fumes or odors that impact patient care or staff operations, granulated active carbon filters shall be provided for all HVAC intake units where operations provide these odors or fumes. Provide temporary hinged doors in temporary enclosures where necessary. Temporary and permanent doors shall be completely sealed with tape or other suitable material during demolition work and shall remain sealed until dust has settled.

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SECTION 02 82 11
TRADITIONAL ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 SUMMARY OF THE WORK

. Contract Documents and Related Requirements: Drawings, general provisions of the contract, including general and supplementary conditions and other Division 01 specifications, shall apply to the work of this section. The contract documents show or describe the work to be done under the contract and related requirements and conditions impacting the project. Related requirements and conditions include applicable codes and regulations, notices and permits, existing site conditions and restrictions on use of the site, requirements for partial owner occupancy during the work, coordination with other work and the phasing of the work. In the event the Asbestos Abatement Contractor discovers a conflict in the contract documents and/or requirements or codes, the conflict must be brought to the immediate attention of the Contracting Officer for resolution. Whenever there is a conflict or overlap in the requirements, the most stringent shall apply. Any actions taken by the Contractor without obtaining guidance from the Contracting Officer shall become the sole risk and responsibility of the Asbestos Abatement Contractor. All costs incurred due to such action are also the responsibility of the Asbestos Abatement Contractor.

A. Extent of Work:

1. The estimated quantities of asbestos containing materials to be abated under this Section are to be determined, and shall generally include only materials that cannot be safely removed by the glovebag method, pursuant to Section 02 82 13.13. Refer to Section 02 82 13.13 for estimated abatement quantities. These quantities are for informational purposes only and are based on the best information available at the time of the specification preparation. The Contractor shall satisfy himself as the actual quantities to be abated. Nothing in this section may be interpreted as limiting the extent of work otherwise required by this contract and related documents.

2. Removal, clean-up and disposal of asbestos containing materials (ACM) and asbestos/waste contaminated elements in an appropriate regulated area for the following;
   Pipe insulation
   Pipe fittings
   Refer to Section 02 82 13.13, Glovebag Asbestos Abatement. Available to contractor upon request to COR
3.

B. Related Work:
   0. Section 02 41 00, DEMOLITION
   1. Section 02 82 13.13, GLOVEBAG ASBESTOS ABATEMENT
   2. SECTION 02 82 13.19, ASBESTOS FLOOR TILE AND MASTIC ABATEMENT
   3. SECTION 02 82 13.31, ASBESTOS TRANSITE ABATEMENT
   4. SECTION 02 83 33.13 LEAD BASED PAINT REMOVAL AND DISPOSAL

C. Tasks:
   0. The work tasks are summarized briefly as follows:
      . Pre-abatement activities including pre-abatement meeting(s), inspection(s), notifications, permits, submittal approvals, regulated area preparations, emergency procedures arrangements, and standard operating procedures for asbestos abatement work.
      a. Abatement activities including removal, encapsulation, enclosure, clean-up and disposal of ACM waste, recordkeeping, security, monitoring, and inspections.
      b. Cleaning and decontamination activities including final visual inspection, air monitoring and certification of decontamination.

D. Contractors Use of Premises:
   1. The Contractor and Contractor's personnel shall cooperate fully with the VA representative/consultant to facilitate efficient use of buildings and areas within buildings. The Contractor shall perform the work in accordance with the VA specifications, drawings, phasing plan and in compliance with any/all applicable Federal, State and Local regulations and requirements.
   2. The Contractor shall use the existing facilities in the building strictly within the limits indicated in contract documents as well as the approved VA Design and Construction Procedures. VA Design and Construction Procedures drawings of partially occupied buildings will show the limits of regulated areas; the placement of

decontamination facilities; the temporary location of bagged waste ACM; the path of transport to outside the building; and the temporary waste storage area for each building/regulated area. Any variation from the arrangements shown on drawings shall be secured in writing from the VA representative through the pre-abatement plan of action. The following limitations of use shall apply to existing facilities shown on drawings:

1.1 VARIATIONS IN QUANTITY

. The quantities and locations of ACM as indicated on the drawings and the extent of work included in this section are estimated which are limited by the physical constraints imposed by occupancy of the buildings and accessibility to ACM. Accordingly, minor variations (+/- 10 percent) in quantities of ACM within the regulated area are considered as having no impact on contract price and time requirements of this contract. Where additional work is required beyond the above variation, the contractor shall provide unit prices for newly discovered ACM and those prices shall be used for additional work required under the contractor.

1.2 STOP ASBESTOS REMOVAL

. If the Contracting Officer; their field representative; the facility Safety Officer/Manager or their designee, or the VA Professional Industrial Hygienist/Certified Industrial Hygienist (VPIH/CIH) presents a verbal **Stop Asbestos Removal Order**, the Contractor/Personnel shall immediately stop all asbestos removal and maintain HEPA filtered negative pressure air flow in the containment and adequately wet any exposed ACM. If a verbal Stop Asbestos Removal Order is issued, the VA shall follow-up with a written order to the Contractor as soon as it is practicable. The Contractor shall not resume any asbestos removal activity until authorized to do so in writing by the VA Contracting Officer. A stop asbestos removal order may be issued at any time the VA Contracting Officer determines abatement conditions/activities are not within VA specification, regulatory requirements or that an imminent hazard exists to human health or the environment. Work stoppage will continue until conditions have been corrected to the satisfaction of the VA. Standby time and costs for corrective actions will be borne by the Contractor, including the VPIH/CIH time. The occurrence of any of

the following events shall be reported immediately by the Contractor's competent person to the VA Contracting Office or field representative using the most expeditious means (e.g., verbal or telephonic), followed up with written notification to the Contracting Officer as soon as practical. The Contractor shall immediately stop asbestos removal/disturbance activities and initiate fiber reduction activities if:

3. Airborne PCM analysis results equal to or greater than 0.01 f/cc above background levels inside the building but outside the regulated area;
4. breach or break in regulated area containment barrier(s);
5. less than -0.02 inch WCG pressure in the regulated area;
6. serious injury/death at the site;
7. fire/safety emergency at the site;
8. respiratory protection system failure;
9. power failure or loss or inadequate use of wetting agent;
10. any visible emissions observed outside the regulated area; or
11. failure to follow project specification requirements.

1.3 DEFINITIONS

. General: Definitions and explanations here are neither complete nor exclusive of all terms used in the contract documents, but are general for the work to the extent they are not stated more explicitly in another element of the contract documents. Drawings must be recognized as diagrammatic in nature and not completely descriptive of the requirements indicated therein.

A. Glossary:

Abatement - Procedures to control fiber release from asbestos-containing materials. Includes removal, encapsulation, enclosure, demolition, and renovation activities related to asbestos containing materials (ACM).

Adequately wet - Sufficiently mixed or penetrated with liquid to prevent the release of particulates. If visible emissions are observed coming from the ACM, then that material has not been adequately wetted.

Aerosol - Solid or liquid particulate suspended in air.

Aggressive method - Removal or disturbance of building material by sanding, abrading, grinding, or other method that breaks, crumbles, or disintegrates intact ACM.

Aggressive air sampling - EPA AHERA defined clearance sampling method using air moving equipment such as fans and leaf blowers to aggressively disturb and maintain in the air residual fibers after abatement.

AHERA - Asbestos Hazard Emergency Response Act. Asbestos regulations for schools issued in 1987.

Aircell - Pipe or duct insulation made of corrugated cardboard which contains asbestos.

Air monitoring - The process of measuring the fiber content of a known volume of air collected over a specified period of time. The NIOSH 7400 Method, Issue 3, Fifth Edition is used to determine the fiber levels in air. For personal samples, area air samples and clearance air testing using Phase Contrast Microscopy (PCM) analysis, the NIOSH Method 7402 (Issue 2, Fourth Edition) can be used when it is necessary to confirm fibers counted by PCM as being asbestos. The AHERA TEM analysis may be used for background, area samples and clearance samples when required by this specification, or at the discretion of the VPIH/CIH as appropriate.

Air sample filter - The filter used to collect fibers which are then counted. The filter is made of mixed cellulose ester (MCE) membrane for PCM (Phase Contrast Microscopy, 25 mm, 3-piece with 2 inches Static Extension Cowl, 0.8 micron pore size) and MCE for TEM (Transmission Electron Microscopy, 25 mm, 3-piece with 2 inches Static Extension Cowl, 0.45 micron pore size).

Amended water - Water to which a surfactant (wetting agent) has been added to increase the penetrating ability of the liquid.

Asbestos - Includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos, and any of these minerals that have been chemically treated or altered. Asbestos also includes PACM, as defined below.

Asbestos Hazard Abatement Plan (AHAP) - Asbestos work procedures required to be submitted by the contractor before work begins.

Asbestos-containing material (ACM) - Any material containing more than one percent of asbestos.

Asbestos contaminated elements (ACE) - Building elements such as ceilings, walls, lights, or ductwork that are contaminated with asbestos.

Asbestos-contaminated soil (ACS) – Soil found in the work area or in adjacent areas such as crawlspaces or pipe tunnels which is contaminated with asbestos-containing material debris and cannot be easily separated from the material.

Asbestos-containing waste (ACW) material - Asbestos-containing material or asbestos contaminated objects requiring disposal.

Asbestos Project Monitor – Some states require that any person conducting asbestos abatement air sampling, clearance inspections and clearance air sampling be licensed as an asbestos project monitor.

Asbestos waste decontamination facility - A system consisting of drum/bag washing facilities and a temporary storage area for cleaned containers of asbestos waste. Used as the exit for waste and equipment leaving the regulated area. In an emergency, it may be used to evacuate personnel.

Authorized person - Any person authorized by the VA, the Contractor, or government agency and required by work duties to be present in regulated areas.

Authorized visitor - Any person approved by the VA; the contractor; or any government agency representative having jurisdiction over the regulated area (e.g., OSHA, Federal and State EPA).

Barrier - Any surface that isolates the regulated area and inhibits fiber migration from the regulated area.

Containment Barrier - An airtight barrier consisting of walls, floors, and/or ceilings of sealed plastic sheeting which surrounds and seals the outer perimeter of the regulated area.

Critical Barrier - The barrier responsible for isolating the regulated area from adjacent spaces, typically constructed of 2-layers of 6-mil independently installed plastic sheeting (Polyethylene) secured in place at openings such as doors, windows, penetrations or any other opening into the regulated area.

Primary Barrier – Plastic barriers placed over critical barriers and exposed directly to abatement work or to secondary barrier.

Secondary Barrier - Any additional plastic barriers used to isolate and provide protection from debris during abatement work.

Breathing zone - The hemisphere forward of the shoulders with a radius of about 150 - 225 mm (6 - 9 inches) from the worker's nose.

Bridging encapsulant - An encapsulant that forms a layer on the surface of the ACM.

Building/facility owner - The legal entity, including a lessee, which exercises control over management and recordkeeping functions relating to a building and/or facility in which asbestos activities take place.

Bulk testing - The collection and analysis of suspect asbestos containing materials.

Certified Industrial Hygienist (CIH) - A person certified in the comprehensive practice of industrial hygiene by the American Board of Industrial Hygiene.

Class I asbestos work - Activities involving the removal of Thermal System Insulation (TSI) and surfacing ACM and Presumed Asbestos Containing Material (PACM).

Class II asbestos work - Activities involving the removal of ACM which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastic.

Clean room/Changing room - An uncontaminated room having facilities for the storage of employee's street clothing and uncontaminated materials and equipment.

Clearance sample - The final air sample taken after all asbestos work has been done and visually inspected. Performed by the VA's professional industrial hygiene consultant/Certified Industrial Hygienist (VPIH/CIH).

Closely resemble - The major workplace conditions which have contributed to the levels of historic asbestos exposure, are no more protective than conditions of the current workplace.

Competent person - In addition to the definition in 29 CFR 1926.32(f), one who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure, who has the authority to take prompt corrective measures to eliminate them, as specified in 29 CFR 1926.32(f); in addition, for Class I and II work who is specially trained in a training course which meets the criteria of EPA's Model Accreditation Plan (40 CFR 763) for supervisor.

Contractor's Professional Industrial Hygienist (CPIH/CIH) - The asbestos abatement contractor's industrial hygienist. The industrial hygienist must meet the qualification requirements of a PIH and may report to a certified industrial hygienist (CIH).

Count - Refers to the fiber count or the average number of fibers greater than five microns in length with a length-to-width (aspect) ratio of at least 3 to 1, per cubic centimeter of air.

Crawlspace – An area which can be found either in or adjacent to the work area. This area has limited access and egress and may contain asbestos materials and/or asbestos contaminated soil.

Decontamination area/unit - An enclosed area adjacent to and connected to the regulated area and consisting of an equipment room, shower room, and clean room, which is used for the decontamination of workers, materials, and equipment that are contaminated with asbestos.

Demolition - The wrecking or taking out of any load-supporting structural member and any related razing, removing, or stripping of asbestos products.

Disposal bag - Typically 6-mil thick sift-proof, dustproof, leak-tight container used to package and transport asbestos waste from regulated areas to the approved landfill. Each bag/container must be labeled/marked in accordance with EPA, OSHA and DOT requirements.

Disturbance – Asbestos Operations and Maintenance Activities (OSHA Class III) that disrupt the matrix of ACM or PACM, crumble or pulverize ACM or PACM, or generate visible debris from ACM or PACM. Disturbance includes cutting away small amounts of ACM or PACM, no greater than the amount that can be contained in one standard sized glove bag or waste bag in order to access a building component. In no event shall the amount of ACM or PACM so disturbed exceed that which can be contained in one glove bag or disposal bag, which shall not exceed 60 inches in length or width.

Drum - A rigid, impermeable container made of cardboard fiber, plastic, or metal which can be sealed in order to be sift-proof, dustproof, and leak-tight.

Employee exposure - The exposure to airborne asbestos that would occur if the employee were not wearing respiratory protection equipment.

Encapsulant - A material that surrounds or embeds asbestos fibers in an adhesive matrix and prevents the release of fibers.

Encapsulation - Treating ACM with an encapsulant.

Enclosure - The construction of an air tight, impermeable, permanent barrier around ACM to control the release of asbestos fibers from the material and also eliminate access to the material.

Equipment room - A contaminated room located within the decontamination area that is supplied with impermeable bags or containers for the disposal of contaminated protective clothing and equipment.

Fiber - A particulate form of asbestos, 5 microns or longer, with a length to width (aspect) ratio of at least 3 to 1.

Fibers per cubic centimeter (f/cc) - Abbreviation for fibers per cubic centimeter, used to describe the level of asbestos fibers in air.

Filter - Media used in respirators, vacuums, or other machines to remove particulate from air.

Firestopping - Material used to close the open parts of a structure in order to prevent a fire from spreading.

Friable asbestos containing material - Any material containing more than one (1) percent asbestos as determined using the method specified in 40 CFR 763, Polarized Light Microscopy, that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.

Glovebag - Not more than a 60 x 60 inch impervious plastic bag-like enclosure affixed around an asbestos-containing material, with glove-like appendages through which materials and tools may be handled.

High efficiency particulate air (HEPA) filter – An ASHRAE MERV 17 filter capable of trapping and retaining at least 99.97 percent of all mono-dispersed particles of 0.3 micrometers in diameter.

HEPA vacuum - Vacuum collection equipment equipped with a HEPA filter system capable of collecting and retaining asbestos fibers.

Homogeneous area - An area of surfacing, thermal system insulation or miscellaneous ACM that is uniform in color, texture and date of application.

HVAC - Heating, Ventilation and Air Conditioning

Industrial hygienist (IH) - A professional qualified by education, training, and experience to anticipate, recognize, evaluate and develop controls for occupational health hazards. Meets definition requirements of the American Industrial Hygiene Association (AIHA).

Industrial hygienist technician (IH Technician) - A person working under the direction of an IH or CIH who has special training, experience, certifications and licenses required for the industrial hygiene work assigned. Some states require that an industrial hygienist technician conducting asbestos abatement air sampling, clearance inspection and clearance air sampling be licensed as an asbestos project monitor.

Intact - The ACM has not crumbled, been pulverized, or otherwise deteriorated so that the asbestos is no longer likely to be bound with its matrix.

Lockdown - Applying encapsulant, after a final visual inspection, on all abated surfaces at the conclusion of ACM removal prior to removal of critical barriers.

National Emission Standards for Hazardous Air Pollutants (NESHAP) - EPA's rule to control emissions of asbestos to the environment (40 CFR part 61, Subpart M).

Negative initial exposure assessment - A demonstration by the employer which complies with the criteria in 29 CFR 1926.1101 (f)(2)(iii), that employee exposure during an operation is expected to be consistently below the PEL or Excursion Limit (EL).

Negative pressure - Air pressure which is lower than the surrounding area, created by exhausting air from a sealed regulated area through HEPA equipped filtration units. OSHA requires maintaining -0.02 inch water column gauge inside the negative pressure enclosure.

Negative pressure respirator - A respirator in which the air pressure inside the facepiece is negative during inhalation relative to the air pressure outside the respirator facepiece.

Non-friable ACM - Material that contains more than 1 percent asbestos but cannot be crumbled, pulverized, or reduced to powder by hand pressure.

Organic vapor cartridge - The type of cartridge used on air purifying respirators to remove organic vapor hazardous air contaminants.

Outside air - The air outside buildings and structures, including, but not limited to, the air under a bridge or in an open ferry dock.

Owner/operator - Any person who owns, leases, operates, controls, or supervises the facility being demolished or renovated or any person who owns, leases, operates, controls, or supervises the demolition or renovation operation, or both.

Penetrating encapsulant - Encapsulant that is absorbed into the ACM matrix without leaving a surface layer.

Permissible exposure limit (PEL) - The level of exposure OSHA allows for as an eight (8) hour time-weighted average (TWA). For asbestos fibers, the eight (8) hour time-weighted average PEL is 0.1 fibers per cubic centimeter (0.1 f/cc) of air and the 30-minute Excursion Limit (EL) is 1.0 fibers per cubic centimeter (1 f/cc).

Personal protective equipment (PPE) – equipment designed to protect user from injury and/or specific job hazard. Such equipment may include protective clothing, hard hats, safety glasses, fall protection, and respirators.

Personal sampling/monitoring - Representative air samples obtained in the breathing zone for one or more workers within the regulated area using a filter cassette and a calibrated air sampling pump to determine asbestos exposure.

Pipe tunnel – An area, typically located adjacent to mechanical spaces or boiler rooms in which the pipes servicing the heating system in the building are routed to allow the pipes to access heating elements. These areas may contain asbestos pipe insulation, asbestos fittings, debris or asbestos-contaminated soil.

Polarized light microscopy (PLM) - Light microscopy using dispersion staining techniques and refractive indices to identify and quantify the type of asbestos present in a bulk sample.

Polyethylene sheeting - Strong plastic barrier material 4 to 6-mils thick, semi-transparent, flame retardant per NFPA 241.

Positive/negative fit check - A method of verifying the seal of a facepiece respirator by temporarily occluding the filters and breathing in (inhaling) and then temporarily occluding the exhalation valve and breathing out (exhaling) while checking for inward or outward leakage of the respirator, respectively.

Presumed ACM (PACM) - Thermal system insulation, surfacing, and flooring material installed in buildings prior to 1981. If the building owner has actual knowledge, or should have known through the exercise of due diligence that other materials are ACM, they too must be treated as PACM. The designation of PACM may be rebutted pursuant to 29 CFR 1926.1101 (k)(5).

Professional IH - An IH who meets the definition requirements of AIHA; meets the definition requirements of OSHA as a "Competent Person" at 29 CFR 1926.1101 (b); has completed two specialized EPA approved courses on management and supervision of asbestos abatement projects; has formal training in respiratory protection and waste disposal; and has a minimum of four projects of similar complexity with this project of which at least three projects serving as the supervisory IH. The PIH may be either the VA's PIH (VPIH/CIH) or Contractor's PIH (CPIH/CIH).

Project designer - A person who has successfully completed the training requirements for an asbestos abatement project designer as required by 40 CFR 763 Subpart E, Appendix C, Part I; (B)(5).

Assigned protection factor - A value assigned by OSHA/NIOSH to indicate the expected protection provided by each respirator class, when the respirator is properly selected and worn correctly. The number indicates the reduction of exposure level from outside to inside the respirator facepiece.

Qualitative fit test (QLFT) - A fit test using a challenge material that can be sensed by the wearer if leakage in the respirator occurs.

Quantitative fit test (QNFT) - A fit test using a challenge material which is quantified outside and inside the respirator thus allowing the determination of the actual fit factor.

Regulated area - An area established by the employer to demarcate where Class I, II, III asbestos work is conducted, and any adjoining area where debris and waste from such asbestos work may accumulate; and a work area within which airborne concentrations of asbestos exceed, or there is a reasonable possibility they may exceed the PEL.

Regulated ACM (RACM) - Friable ACM; Category I non-friable ACM that has become friable; Category I non-friable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading or; Category II non-friable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of the demolition or renovation operation.

Removal - All operations where ACM, PACM and/or RACM is taken out or stripped from structures or substrates, including demolition operations.

Renovation - Altering a facility or one or more facility components in any way, including the stripping or removal of asbestos from a facility component which does not involve demolition activity.

Repair - Overhauling, rebuilding, reconstructing, or reconditioning of structures or substrates, including encapsulation or other repair of ACM or PACM attached to structures or substrates.

Shower room - The portion of the PDF where personnel shower before leaving the regulated area.

Supplied air respirator (SAR) - A respiratory protection system that supplies minimum Grade D respirable air per ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-2018.

Surfacing ACM - A material containing more than 1 percent asbestos that is sprayed, troweled on or otherwise applied to surfaces for acoustical, decorative, fireproofing and other purposes.

Surfactant - A chemical added to water to decrease water's surface tension thus making it more penetrating into ACM.

Thermal system ACM - A material containing more than 1 percent asbestos applied to pipes, fittings, boilers, breeching, tanks, ducts, or other structural components to prevent heat loss or gain.

Transmission electron microscopy (TEM) - A microscopy method that can identify and count asbestos fibers.

VA Professional Industrial Hygienist (VPIH/CIH) – The Department of Veterans Affairs Professional Industrial Hygienist must meet the qualifications of a PIH, and may report to a Certified Industrial Hygienist (CIH).

VA Representative - The VA official responsible for on-going project work.

VA Total – means a building or substantial part of the building is completely removed, torn or knocked down, bulldozed, flattened, or razed, including removal of building debris.

Visible emissions - Any emissions, which are visually detectable without the aid of instruments, coming from ACM/PACM/RACM/ACS or ACM waste material.

Waste/Equipment decontamination facility (W/EDF) – The area in which equipment is decontaminated before removal from the regulated area.

Waste generator - Any owner or operator whose act or process produces asbestos-containing waste material.

Waste shipment record - The shipping document, required to be originated and signed by the waste generator, used to track and substantiate the disposition of asbestos-containing waste material.

Wet cleaning - The process of thoroughly eliminating, by wet methods, any asbestos contamination from surfaces or objects.

B. Referenced Standards Organizations: See Section 01 42 19 REFERENCED STANDARDS.

1.4 APPLICABLE CODES AND REGULATIONS

. General Applicability of Codes, Regulations, and Standards:

1. All work under this contract shall be done in strict accordance with all applicable Federal, State, and Local regulations, standards and codes governing asbestos abatement, and any other trade work done in conjunction with the abatement. All applicable codes, regulations and standards are adopted into this specification and will have the same force and effect as this specification.
2. The most recent edition of any relevant regulation, standard, document or code shall be in effect. Where conflict among the requirements or with these specifications exists, the most stringent requirement(s) shall be utilized.
3. Copies of all standards, regulations, codes and other applicable documents, including this specification and those listed in Section 1.5 shall be available at the worksite in the clean change area of the worker decontamination system and/or the Contractor's on-site Field Office. These standards, regulations, codes and other applicable documents, including this specification and those listed in Section 1.5 may be made available electronically.

A. Asbestos Abatement Contractor Responsibility: The Asbestos Abatement Contractor (Contractor) shall assume full responsibility and liability for compliance with all applicable Federal, State and Local regulations related to any and all aspects of the asbestos abatement project. The Contractor is responsible for providing and maintaining training, accreditations, medical exams, medical records, personal protective equipment (PPE), respiratory protection, and respirator fit testing, as required by applicable Federal, State and Local regulations. The Contractor shall hold the VA and VPIH/CIH consultants harmless for any Contractor's failure to comply with any applicable work, packaging, transporting, disposal, safety, health, or environmental requirement on the part of himself, his employees, or his subcontractors. The Contractor will incur all costs of the CPIH/CIH, including all sampling/analytical costs to assure compliance with OSHA/EPA/State/Local requirements related to failure to comply with the regulations applicable to the work.

B. Federal Requirements:
1. Federal requirements which govern asbestos abatement include, but are not limited to, the following regulations:
   . Occupational Safety and Health Administration **(OSHA)**
      0) Title 29 CFR 1926.1101 - Construction Standard for Asbestos

1) Title 29 CFR 1926 Subpart E - Personal Protective Equipment and Life Saving Equipment
2) Title 29 CFR 1910.134 - Respiratory Protection
3) Title 29 CFR 1926 - Construction Industry Standards
4) Title 29 CFR 1926.33 - Access to Employee Exposure and Medical Records
5) Title 29 CFR 1926.59 same as 1910.1200 - Hazard Communication
6) Title 29 CFR 1926 Subpart C – General Safety and Health Provisions and Subpart D – Occupational Health and Environmental Controls

a. Environmental Protection Agency **(EPA)**:

0) 40 CFR 61 Subpart M - National Emission Standard for Hazardous Air Pollutants - Asbestos.
1) 40 CFR 763 - Asbestos Hazard Emergency Response Act (AHERA) and Asbestos Hazard Abatement Reauthorization Act (ASHARA)

b. Department of Transportation **(DOT)**

0) Title 49 CFR 171 - 180 – Transportation

C. State Requirements:

1. State requirements that apply to the asbestos abatement work, disposal, clearance, etc., include, but are not limited to, the following:

Wisconsin Dept. Health and Human Services
Lead and Asbestos Section
1 W Wilson St., Room 137
Madison, WI 53703-3445

Wisconsin Dept. of Natural Resources
P.O. Box 7921
Madison, WI 53707
Ch. NR 447 Wis. Admin. Code

D. Local Requirements:

1. If local requirements are more stringent than federal or state standards, the local standards are to be followed.

City of Milwaukee, WI (within city limits)

E. Standards:

1. Standards which govern asbestos abatement activities include, but are not limited to, the following:
   . American National Standards Institute (ANSI)/ASSP Z9.2-2018 - Fundamentals Governing the Design and Operation of Local Exhaust Systems and ANSI/ASSE Z88.2-2015 - Practices for Respiratory Protection.
   a. Underwriters Laboratories (UL) 586-2009 - UL Standard for Safety of HEPA Filter Units, 9th Edition; ANSI Approval 2017-12-19.
2. Standards which govern encapsulation work include, but are not limited to the following:
   . American Society for Testing and Materials International (ASTM)
3. Standards which govern the fire and safety concerns in abatement work include, but are not limited to, the following:
   . National Fire Protection Association (NFPA) 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations.
   a. NFPA 701 - Standard Methods for Fire Tests for Flame Resistant Textiles and Film.
   b. NFPA 101 - Life Safety Code

F. EPA Guidance Documents:
1. EPA guidance documents which discuss asbestos abatement work activities are listed below. These documents are made part of this section by reference.
2. Guidance for Controlling ACM in Buildings (Purple Book) EPA 560/5-85-024
3. Asbestos Waste Management Guidance EPA 530-SW-85-007
4. A Guide to Respiratory Protection for the Asbestos Abatement Industry EPA-560-OPTS-86-001
5. Guide to Managing Asbestos in Place (Green Book) TS 799 20T July 1990

G. Notices:
1. State and Local agencies: Send written notification as required by State and Local regulations prior to beginning any work on ACM as follows:
   Wisconsin Dept. Health and Human Services
   Lead and Asbestos Section
   1 W Wilson St., Room 137
   Madison, WI 53703-3445

Wisconsin Dept. of Natural Resources
P.O. Box 7921
Madison, WI 53707
Ch. NR 447 Wis. Admin. Code

City of Milwaukee (if applicable)

2. Copies of notifications shall be submitted to the VA for the facility's records in the same time frame notification are given to EPA, State, and Local authorities.

H. Permits/Licenses: The contractor shall apply for and have all required permits and licenses to perform asbestos abatement work as required by Federal, State, and Local regulations.

I. Posting and Filing of Regulations: Maintain two (2) copies of applicable Federal, State, and Local regulations. Post one copy of each in the clean room at the regulated area where workers will have daily access to the regulations and keep another hard copy or electronic copy in the Contractor's office.

J. VA Responsibilities prior to commencement of work:

1. Notify occupants adjacent to regulated areas of project dates and requirements for relocation, if needed. Arrangements must be made prior to starting work for relocation of desks, files, equipment, and personal possessions to avoid unauthorized access into the regulated area. **Note: Notification of adjacent personnel is required by OSHA in 29 CFR 1926.1101 (k) to prevent unnecessary or unauthorized access to the regulated area.**
2. Submit to the Contractor results of background air sampling; including location of samples, person who collected the samples, equipment utilized, calibration data and method of analysis. During abatement, submit to the Contractor, results of bulk material analysis and air sampling data collected during the course of the abatement. This information shall not release the Contractor from any responsibility for OSHA compliance.

K. Emergency Action Plan and Arrangements:

1. An Emergency Action Plan shall be developed prior to commencing abatement activities and shall be agreed to by the Contractor and the VA. The Plan shall meet the requirements of 29 CFR 1926, Subpart C, Standard 1926.35 Employee Emergency Action Plans.
2. Emergency procedures shall be in written form and prominently posted in the clean room and equipment room of the decontamination unit. Everyone, prior to entering the regulated area, must read and sign these procedures to acknowledge understanding of the regulated area layout, location of emergency exits and emergency procedures.
3. Emergency planning shall include written notification of police, fire, and emergency medical personnel of planned abatement activities; work schedule; layout of regulated area; and access to the regulated area, particularly barriers that may affect response capabilities.
4. Emergency planning shall include consideration of fire, explosion, hazardous atmospheres, electrical hazards, slips/trips and falls, confined spaces, and heat stress illness. Written procedures for response to emergency situations shall be developed and employee training in procedures shall be provided.
5. Employees shall be trained in regulated area/site evacuation procedures in the event of workplace emergencies.
   . For non-life-threatening situations - employees injured or otherwise incapacitated shall be decontaminated following normal procedures with assistance from fellow workers, if necessary, before exiting the regulated area to obtain proper medical treatment.
   a. For life-threatening injury or illness, worker decontamination shall take least priority after measures to stabilize the injured worker, medical personnel shall remove them from the regulated area if back or neck injury is present, and secure proper medical treatment.
6. Telephone numbers of any/all emergency response personnel shall be prominently posted in the clean room, along with the location of the nearest telephone.
7. The Contractor shall provide verification of first aid/CPR training for personnel responsible for providing first aid/CPR. OSHA requires medical assistance within 3-4 minutes of a life-threatening

injury/illness. Bloodborne Pathogen training shall also be verified for those personnel required to provide first aid/CPR.

8. The Emergency Action Plan shall provide for a Contingency Plan in the event that an incident occurs that may require the modification of the standard operating procedures during abatement. Such incidents include, but are not limited to, fire; accident; power failure; negative pressure failure; and supplied air system failure. The Contractor shall detail procedures to be followed in the event of an incident assuring that asbestos abatement work is stopped and wetting is continued until correction of the problem.

L. Pre-Construction Meeting:

1. Prior to commencing the work, the Contractor shall meet with the VA Certified Industrial Hygienist (VPIH/CIH) to present and review, as appropriate, the items following this paragraph. The Contractor's Competent Person(s) who will be on-site shall participate in the pre-start meeting. The pre-start meeting is to discuss and determine procedures to be used during the project. At this meeting, the Contractor shall provide:

. Proof of Contractor licensing.

a. Proof the Competent Person(s) is trained and accredited and approved for working in this State. Verification of the experience of the Competent Person(s) shall also be presented.

b. A list of all workers who will participate in the project, including experience and verification of training and accreditation.

c. A list of and verification of training for all personnel who have current first-aid/CPR training. A minimum of one person per shift must have adequate training.

d. Current medical written opinions for all personnel working on-site meeting the requirements of 29 CFR 1926.1101 (m).

e. Current fit-tests for all personnel wearing respirators on-site meeting the requirements of 29 CFR 1926.1101 (h) and Appendix C.

f. A copy of the Contractor's Asbestos Hazard Abatement Plan. In these procedures, the following information must be detailed, specific for this project.

0) Regulated area preparation procedures;

1) Notification requirements procedure of Contractor as required in 29 CFR 1926.1101 (d) Multi-Employer Worksites;
2) Decontamination area set-up/layout and decontamination procedures for employees;
3) Abatement methods/procedures and equipment to be used;
4) Personal protective equipment to be used.

g. At this meeting the Contractor shall provide all submittals as required.

h. Procedures for handling, packaging and disposal of asbestos waste.

i. Emergency Action Plan and Contingency Plan Procedures.

1.5 PROJECT COORDINATION

. The following are the minimum administrative and supervisory personnel necessary for coordination of the work.

1. Personnel:

. Administrative and supervisory personnel shall consist of a qualified Competent Person(s) as defined by OSHA in the Construction Standards and the Asbestos Construction Standard; Contractor Professional Industrial Hygienist and Industrial Hygiene Technicians. These employees are the Contractor's representatives responsible for compliance with these specifications and all other applicable requirements.

a. Non-supervisory personnel shall consist of an adequate number of qualified personnel to meet the schedule requirements of the project. Personnel shall meet required qualifications. Personnel utilized on-site shall be pre-approved by the VA representative. A request for approval shall be submitted for any person to be employed during the project giving the person's name; last four digits of social security number; qualifications; accreditation card with color picture, if required by state; Certificate of Worker's Acknowledgment; and Affidavit of Medical Surveillance and Respiratory Protection and current Respirator Fit Test.

b. Minimum qualifications for Contractor and assigned personnel are:

0) The Contractor has conducted within the last three (3) years, three (3) projects of similar complexity and dollar value as this project; has not been cited and penalized for serious violations of Federal (and State or Local as applicable) EPA and OSHA asbestos regulations in the past three (3) years;

has adequate liability/occurrence insurance for asbestos work as required by the state; is licensed in applicable state; has adequate and qualified personnel available to complete the work; has comprehensive standard operating procedures for asbestos work; has adequate materials, equipment and supplies to perform the work.

1) The Competent Person has four (4) years of abatement experience of which two (2) years were as the Competent Person on the project; meets the OSHA definition of a Competent Person; has been the Competent Person on two (2) projects of similar size and complexity as this project within the past three (3) years; has completed EPA AHERA/OSHA/State/Local training requirements/accreditation(s) and refreshers; and has all required OSHA documentation related to medical and respiratory protection.
2) The Contractor Professional Industrial Hygienist/CIH (CPIH/CIH) shall have five (5) years of monitoring experience and supervision of asbestos abatement projects; has participated as senior IH on five (5) abatement projects, three (3) of which are similar in size and complexity as this project; has specialized EPA AHERA/OSHA training in asbestos abatement management, respiratory protection, waste disposal and asbestos inspection; has completed the NIOSH 582 Course or equivalent, Contractor/Supervisor course; and has appropriate medical/respiratory protection records/documentation.
3) The Abatement Personnel shall have completed the EPA AHERA/OSHA abatement worker course; have training on the standard operating procedures of the Contractor; has one year of asbestos abatement experience within the past three (3) years of similar size and complexity; has applicable medical and respiratory protection documentation; has certificate of training/current refresher and State accreditation/license.

c. All personnel shall be in compliance with OSHA construction safety training as applicable and submit certification.

1.6 RESPIRATORY PROTECTION

. General - Respiratory Protection Program: The Contractor shall develop and implement a written Respiratory Protection Program (RPP) which is

in compliance with OSHA requirements found at 29 CFR 1926.1101 and 29 CFR 1910.134. ANSI Standard Z88.2-2015 provides excellent guidance for developing a respiratory protection program. All respirators used must be NIOSH approved for asbestos abatement activities. The written RPP shall, at a minimum, contain the basic requirements found at 29 CFR 1910.134 (c) - Respiratory Protection Program.

A. Respiratory Protection Program Coordinator: The Respiratory Protection Program Coordinator (RPPC) must be identified and shall have two (2) years of experience coordinating RPP of similar size and complexity. The RPPC must submit a signed statement attesting to the fact that the program meets the above requirements.

B. Selection and Use of Respirators: The procedure for the selection and use of respirators must be submitted to the VA as part of the Contractor's qualifications. The procedure must be written clearly enough for workers to understand. A copy of the Respiratory Protection Program must be available in the clean room of the decontamination unit or in the onsite Contractor’s office, for reference by employees or authorized visitors.

C. Minimum Respiratory Protection: Shall be a ½-mask negative pressure air purifying respirator equipped with P100 filters, provided personal air samples in the workplace remain at or below 0.1 f/cc, determined as an 8-hour TWA. Full face powered air purifying respirator equipped with P100 filters shall be required until Contractor demonstrates that personal air samples are at or below 0.1 f/cc, determined as an 8-hour TWA. A higher level of respiratory protection shall be required, if fiber levels exceed 1 f/cc as an 8-hour TWA, inside the regulated work area. Respirator selection shall meet the requirements of 29 CFR 1926.1101 (h) and 29 CFR 1910.134 (d)(3)(i)(A) Table 1, except as indicated in this paragraph. Abatement personnel must have a respirator for their exclusive use.

D. Medical Written Opinion: No employee shall be allowed to wear a respirator unless a physician or other licensed health care professional has provided a written determination they are medically qualified to wear the class of respirator to be used on the project while wearing whole body impermeable garments and subjected to heat or cold stress.

E. Respirator Fit Test: All personnel wearing respirators shall have a current qualitative/quantitative fit test which was conducted in

accordance with 29 CFR 1910.134 (f) and Appendix A. Quantitative fit tests shall be done for PAPRs which have been put into a motor/blower failure mode.

F. Respirator Fit Check: The Competent Person shall assure that the positive/negative pressure user seal check is done each time the respirator is donned by an employee. Head coverings must cover respirator head straps. Any situation that prevents an effective facepiece to face seal as evidenced by failure of a user seal check shall preclude that person from entering the regulated area until resolution of the problem.

G. Maintenance and Care of Respirators: The Respiratory Protection Program Coordinator shall submit evidence and documentation showing compliance with 29 CFR 1910.134 (h) Maintenance and Care of Respirators.

H. Supplied Air Systems: If a supplied air system is used, the system shall meet all requirements of 29 CFR 1910.134 and the ANSI/Compressed Gas Association (CGA) Commodity Specification for Air current requirements for Type 1 - Grade D breathing air. Low pressure systems are not allowed to be used on asbestos abatement projects. Supplied Air respirator use shall be in accordance with EPA/NIOSH publication EPA-560-OPTS-86-001 "A Guide to Respiratory Protection for the Asbestos Abatement Industry". The competent person on site will be responsible for the supplied air system to ensure the safety of the worker.

1.7 WORKER PROTECTION

. Training of Abatement Personnel: Prior to beginning any abatement activity, all personnel shall be trained in accordance with OSHA 29 CFR 1926.1101 (k)(9) and any additional State/Local requirements. Training must include, at a minimum, the elements listed at 29 CFR 1926.1101 (k)(9)(viii). Training shall have been conducted by a third party, EPA/State approved trainer meeting the requirements of EPA 40 CFR 763 Appendix C (AHERA MAP). Initial training certificates and current refresher and accreditation proof must be submitted for each person working at the site.

A. Medical Examinations: Medical examinations meeting the requirements of 29 CFR 1926.1101 (m) shall be provided for all personnel working in the regulated area, regardless of exposure levels. A current physician's written opinion as required by 29 CFR 1926.1101 (m)(4) shall be provided for each person and shall include in the medical opinion that the person has been evaluated for working in a heat and cold stress

environment while wearing personal protective equipment (PPE) and is able to perform the work without risk of material health impairment.

B. Regulated Area Entry Procedure: The Competent Person shall ensure that each time workers enter the regulated area; they remove ALL street clothes in the clean room of the decontamination unit and put on new disposable coveralls, head coverings, a clean respirator, and then proceed through the shower room to the equipment room where they put on non-disposable required personal protective equipment.

C. Decontamination Procedure: The Competent Person shall require all personnel to adhere to following decontamination procedures whenever they leave the regulated area.

1. When exiting the regulated area, remove disposable coveralls, and ALL other clothes, disposable head coverings, and foot coverings or boots in the equipment room.
2. Still wearing the respirator and completely naked, proceed to the shower. Showering is MANDATORY. Care must be taken to follow reasonable procedures in removing the respirator to avoid inhaling asbestos fibers while showering. The following procedure is required as a minimum:
   . Thoroughly wet body including hair and face. If using a PAPR hold blower above head to keep filters dry.
   a. With respirator still in place, thoroughly decontaminate body, hair, respirator face piece, and all other parts of the respirator except the blower and battery pack on a PAPR. Pay particular attention to cleaning the seal between the face and respirator facepiece and under the respirator straps.
   b. Take a deep breath, hold it and/or exhale slowly, completely wetting hair, face, and respirator. While still holding breath, remove the respirator and hold it away from the face before starting to breathe.
3. Carefully decontaminate the facepiece of the respirator inside and out. If using a PAPR, shut down using the following sequence: a) first cap inlets to filters; b) turn blower off to keep debris collected on the inlet side of the filter from dislodging and contaminating the outside of the unit; c) thoroughly decontaminate blower and hoses; d) carefully decontaminate battery pack with a wet rag being cautious of getting water in the battery pack thus

preventing destruction. **(THIS PROCEDURE IS NOT A SUBSTITUTE FOR RESPIRATOR CLEANING!)**

4. Shower and wash body completely with soap and water. Rinse thoroughly.
5. Rinse shower room walls and floor to drain prior to exiting.
6. Proceed from shower to clean room; dry off and change into street clothes or into new disposable work clothing.

D. Regulated Area Requirements: The Competent Person shall meet all requirements of 29 CFR 1926.1101 (o) and assure that all requirements for regulated areas at 29 CFR 1926.1101 (e) are met. All personnel in the regulated area shall not be allowed to eat, drink, smoke, chew tobacco or gum, apply cosmetics, or in any way interfere with the fit of their respirator.

1.8 DECONTAMINATION FACILITIES

. Description: Provide each regulated area with separate personnel decontamination facilities (PDF) and waste/equipment decontamination facilities (W/EDF). Ensure that the PDF are the only means of ingress and egress to the regulated area and that all equipment, bagged waste, and other material exit the regulated area only through the W/EDF.

A. General Requirements: All personnel entering or exiting a regulated area must go through the PDF and shall follow the requirements at 29 CFR 1926.1101 (j)(1) and these specifications. All waste, equipment and contaminated materials must exit the regulated area through the W/EDF and be decontaminated in accordance with these specifications. Walls and ceilings of the PDF and W/EDF must be constructed of a minimum of 3 layers of 6-mil opaque fire retardant polyethylene sheeting and be securely attached to existing building components and/or an adequate temporary framework. A minimum of 3 layers of 6-mil poly shall also be used to cover the floor under the PDF and W/EDF units. Construct doors so that they overlap and secure to adjacent surfaces. Weight inner doorway sheets with layers of duct tape or approved equivalent so that they close quickly after release. Put arrows on sheets so they show direction of travel and overlap. If the building adjacent area is occupied, construct a solid barrier on the occupied side(s) to protect the sheeting and reduce potential for non-authorized personnel entering the regulated area.

B. Temporary Facilities to the PDF and W/EDF: The Competent Person shall provide temporary water service connections to the PDF and W/EDF.

Backflow prevention must be provided at the point of connection to the VA system. Water supply must be of adequate pressure and meet requirements of 29 CFR 1910.141(d)(3). Provide adequate temporary overhead electric power with ground fault circuit interruption (GFCI) protection. Provide a sub-panel equipped with GFCI protection for all temporary power in the clean room. Provide adequate lighting to provide a minimum of 50 foot candles in the PDF and W/EDF. Provide temporary heat, if needed, to maintain 70 degrees F throughout the PDF and W/EDF.

C. Personnel Decontamination Facility (PDF): The Competent Person shall provide a PDF consisting of shower room which is contiguous to a clean room and equipment room which is connected to the regulated area. The PDF must be sized to accommodate the number of personnel scheduled for the project. The shower room, located in the center of the PDF, shall be fitted with as many portable showers as necessary to insure all employees can complete the entire decontamination procedure within 15 minutes. The PDF shall be constructed of opaque poly for privacy. The PDF shall be constructed to eliminate any parallel routes of egress without showering.

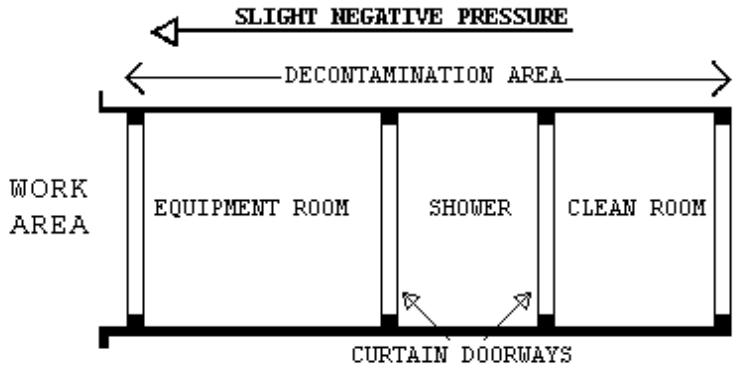
1. Clean Room: The clean room must be physically and visually separated from the rest of the building to protect the privacy of personnel changing clothes. The clean room shall be constructed of at least 3 layers of 6-mil opaque fire retardant poly to provide an air tight room. Provide a minimum of 2 - 900 mm (3 foot) wide 6-mil poly opaque fire retardant doorways. One doorway shall be the entry from outside the PDF and the second doorway shall be to the shower room of the PDF. The floor of the clean room shall be maintained in a clean, dry and sanitary condition. Shower overflow shall not be allowed into the clean room. Provide 1 storage locker per person. A portable fire extinguisher, minimum 10 pounds capacity, Type ABC, shall be provided in accordance with OSHA and NFPA Standard 10. All persons entering the regulated area shall remove all street clothing in the clean room and dress in disposable protective clothing and respiratory protection. Any person entering the clean room does so either from the outside with street clothing on or is coming from the shower room completely naked and thoroughly washed. Male/Females required to enter the regulated area shall be ensured of their privacy throughout the entry/exit process by posting guards at both

entry points to the PDF so no male/female can enter or exit the PDF during his/her stay in the PDF.

2. Shower Room: The Competent Person shall assure that the shower room is a completely water tight compartment to be used for the movement of all personnel from the clean room to the equipment room and for the showering of all personnel going from the equipment room to the clean room. Each shower shall be constructed so water runs down the walls of the shower and into a drip pan. Install a freely draining smooth floor on top of the shower pan. The shower room shall be separated from the rest of the building and from the clean room and equipment room using air tight walls made from at least 3 layers of 6-mil opaque fire retardant poly. The shower shall be equipped with a shower head and controls, hot and cold water, drainage, soap dish and continuous supply of soap, and shall be maintained in a sanitary condition throughout its use. The controls shall be arranged so an individual can shower without assistance. Provide a flexible hose shower head, hose bibs and all other items shown on Shower Schematic. Waste water will be pumped to a drain after being filtered through a minimum of a 100 micron sock in the shower drain; a 20 micron filter; and a final 5 micron filter. Filters will be changed a minimum of daily or more often as needed. Filter changes must be done in the shower to prevent loss of contaminated water. Hose down all shower surfaces after each shift and clean any debris from the shower pan. Residue is to be disposed of as asbestos waste.
3. Equipment Room: The Competent Person shall provide an equipment room which shall be an air tight compartment for the storage of work equipment/tools, reusable personal protective equipment, except for a respirator and for use as a gross decontamination area for personnel exiting the regulated area. The Competent Person shall ensure that most gross contamination is removed from the outside of PPE, suits and respirators in the regulated work area, prior to entering the Equipment Room. The equipment room shall be separated from the regulated area by a minimum 3 foot wide door made with 2 layers of 6-mil opaque fire retardant poly. The equipment room shall be separated from the regulated area, the shower room and the rest of the building by air tight walls and ceiling constructed of a minimum of 3 layers of 6-mil opaque fire retardant poly. Damp wipe all surfaces of the equipment room after each shift change. Provide

an additional loose layer of 6-mil fire retardant poly per shift change and remove this layer after each shift. If needed, provide a temporary electrical sub-panel equipped with GFCI in the equipment room to accommodate any equipment required in the regulated area.

4. The PDF shall be as follows: Clean room at the entrance followed by a shower room followed by an equipment room leading to the regulated area. Each doorway in the PDF shall be a minimum of 2 layers of 6-mil opaque fire retardant poly.



D. Waste/Equipment Decontamination Facility (W/EDF):

1. The Competent Person shall provide a W/EDF consisting of a wash room, holding room, and clean room for removal of waste, equipment and contaminated material from the regulated area. Personnel shall not enter or exit the W/EDF except in the event of an emergency. Clean debris and residue in the W/EDF daily. All surfaces in the W/EDF shall be wiped/hosed down after each shift and all debris shall be cleaned from the shower pan. The W/EDF shall consist of the following:

   . Wash Down Station: Provide an enclosed shower unit in the regulated area just outside the Wash Room as an equipment bag and container cleaning station.

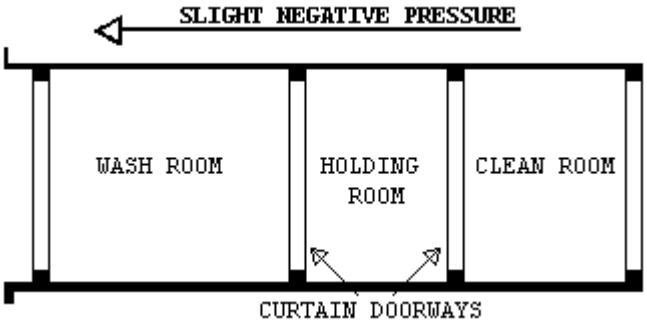
   a. Wash Room: Provide a wash room for cleaning of bagged or containerized asbestos containing waste materials passed from the regulated area. Construct the wash room using 50 x 100 mm (2 inches x 4 inches) wood framing or approved equivalent and 3 layers of 6-mil fire retardant poly. Locate the wash room so that packaged materials, after being wiped clean, can be passed to the

Holding Room. Doorways in the wash room shall be constructed of 2 layers of 6-mil fire retardant poly.

b. Holding Room: Provide a holding room as a drop location for bagged materials passed from the wash room. Construct the holding room using 50 x 100 mm (2 inches x 4 inches) wood framing or approved equivalent and 3 layers of 6-mil fire retardant poly. The holding room shall be located so that bagged material cannot be passed from the wash room to the clean room unless it goes through the holding room. Doorways in the holding room shall be constructed of 2 layers of 6-mil fire retardant poly.

c. Clean Room: Provide a clean room to isolate the holding room from the exterior of the regulated area. Construct the clean room using 2 inches x 4 inches wood framing or approved equivalent and 2 layers of 6-mil fire retardant poly. The clean room shall be located so as to provide access to the holding room from the building exterior. Doorways to the clean room shall be constructed of 2 layers of 6-mil fire retardant poly. When a negative pressure differential system is used, a rigid enclosure separation between the W/EDF clean room and the adjacent areas shall be provided.

d. The W/EDF shall be as follows: Wash Room leading to a Holding Room followed by a Clean Room leading to outside the regulated area. See diagram.



E. Waste/Equipment Decontamination Procedures: At the washdown station in the regulated area, thoroughly wet clean contaminated equipment and/or sealed polyethylene bags and pass into Wash Room after visual inspection. When passing anything into the Wash Room, close all doorways of the W/EDF, other than the doorway between the washdown

station and the Wash Room. Keep all outside personnel clear of the W/EDF. Once inside the Wash Room, wet clean the equipment and/or bags. After cleaning and inspection, pass items into the Holding Room. Close all doorways except the doorway between the Holding Room and the Clean Room. Workers from the Clean Room/Exterior shall enter the Holding Room and remove the decontaminated/cleaned equipment/bags for removal and disposal. At no time shall personnel from the clean side be allowed to enter the Wash Room.

PART 2 - PRODUCTS

2.0 MATERIALS AND EQUIPMENT

. General Requirements: Prior to the start of work, the contractor shall provide and maintain a sufficient quantity of materials and equipment to assure continuous and efficient work throughout the duration of the project. Work shall not start unless the following items have been delivered to the site and the CPIH/CIH has submitted verification to the VA's representative.

1. All materials shall be delivered in their original package, container or bundle bearing the name of the manufacturer and the brand name (where applicable).
2. Store all materials subject to damage off the ground, away from wet or damp surfaces and under cover sufficient enough to prevent damage or contamination. Flammable and combustible materials cannot be stored inside buildings. Replacement materials shall be stored outside of the regulated area until abatement is completed.
3. The Contractor shall not block or hinder use of buildings by patients, staff, and visitors to the VA in partially occupied buildings by placing materials/equipment in any unauthorized location.
4. The Competent Person shall inspect for damaged, deteriorating or previously used materials. Such materials shall not be used and shall be removed from the worksite and disposed of properly.
5. Polyethylene sheeting for walls in the regulated area shall be a minimum of 4-mils. For floors and all other uses, sheeting of at least 6-mil shall be used in widths selected to minimize the frequency of joints. Fire retardant poly shall be used throughout.
6. The method of attaching polyethylene sheeting shall be agreed upon in advance by the Contractor and the VA and selected to minimize damage to equipment and surfaces. Method of attachment may include

any combination of moisture resistant duct tape, poly tape, furring strips, spray glue, staples, nails, screws, lumber and plywood for enclosures or approved equivalent procedures capable of sealing polyethylene to dissimilar finished or unfinished surfaces under both wet and dry conditions.

7. Polyethylene sheeting utilized for the PDF shall be opaque white or black in color, 6-mil fire retardant poly.
8. Installation and plumbing hardware, showers, hoses, drain pans, sump pumps and waste water filtration system shall be provided by the Contractor.
9. An adequate number of HEPA vacuums, scrapers, sprayers, nylon brushes, brooms, disposable mops, rags, sponges, staple guns, shovels, ladders and scaffolding of suitable height and length as well as meeting OSHA requirements, fall protection devices, water hose to reach all areas in the regulated area, airless spray equipment, and any other tools, materials or equipment required to conduct the abatement project. All electrically operated hand tools, equipment, electric cords shall be connected to GFCI protection.
10. Special protection for objects in the regulated area shall be detailed (e.g., plywood over carpeting or hardwood floors to prevent damage from scaffolds, water and falling material).
11. Disposal bags – 2 layers of 6-mil poly for asbestos waste shall be pre-printed with labels, markings and address as required by OSHA, EPA and DOT regulations.
12. The VA shall be provided an advance copy of the Safety Data Sheets (SDS) as required for all hazardous chemicals under OSHA 29 CFR 1910.1200 - Hazard Communication in the pre-start meeting submittal. Chlorinated compounds shall not be used with any spray adhesive, mastic remover or other product. Appropriate encapsulant(s) shall be provided.
13. OSHA DANGER demarcation signs, as many and as required by OSHA 29 CFR 1926.1101(k)(7) shall be provided and placed by the Competent Person. All other posters and notices required by Federal and State regulations shall be posted in the Clean Room.
14. Adequate and appropriate PPE for the project and number of personnel/shifts shall be provided. All personal protective equipment issued must be based on a written hazard assessment conducted under 29 CFR 1910.132(d).

2.1 MONITORING, INSPECTION AND TESTING

. General:

1. Perform throughout abatement work monitoring, inspection and testing inside and around the regulated area in accordance with the OSHA requirements and these specifications. OSHA requires that the employee exposure to asbestos must not exceed 0.1 fiber per cubic centimeter (f/cc) of air, averaged over an 8-hour work shift. The CPIH/CIH is responsible for and shall inspect and oversee the performance of the Contractor IH Technician. The IH Technician shall continuously inspect and monitor conditions inside the regulated area to ensure compliance with these specifications. In addition, the CPIH/CIH shall personally manage air sample collection, analysis, and evaluation for personnel, regulated area, and adjacent area samples inside the building, but outside the regulated area. Inside the building, but outside the regulated area air samples shall be collected in the Clean Room of the PDF, at the approximate location of HEPA exhaust discharge, and at a minimum of three (3) locations in areas immediately outside the regulated work area to satisfy this specification. Additional inspection and testing requirements are also indicated in other parts of this specification.
2. The VA will employ an independent industrial hygienist (VPIH/CIH) consultant and/or use its own IH to perform various services on behalf of the VA. The VPIH/CIH will perform the necessary monitoring, inspection, testing, and other support services to ensure that VA patients, employees, and visitors will not be adversely affected by the abatement work, and that the abatement work proceeds in accordance with these specifications, that the abated areas or abated buildings have been successfully decontaminated. The work of the VPIH/CIH consultant in no way relieves the Contractor from their responsibility to perform the work in accordance with contract/specification requirements, to perform continuous inspection, monitoring and testing for the safety of their employees, and to perform other such services as specified. The cost of the VPIH/CIH and their services will be borne by the VA except for any repeat of final inspection and testing that may be required due to unsatisfactory initial results. Any repeated final

inspections and/or testing, if required, will be paid for by the Contractor.

3. If fibers counted by the VPIH/CIH during abatement work, either inside or outside the regulated area, utilizing the NIOSH 7400 air monitoring method, exceed the specified respective limits, the Contractor shall stop work. The Contractor may request confirmation of the results by analysis of the samples by TEM. Request must be in writing and submitted to the VA's representative. Cost for the confirmation of results will be borne by the Contractor for both the collection and analysis of samples and for the time delay that may/does result for this confirmation. Confirmation sampling and analysis will be the responsibility of the CPIH/CIH with review and approval of the VPIH/CIH. An agreement between the CPIH/CIH and the VPIH/CIH shall be reached on the exact details of the confirmation effort, in writing, including such things as the number of samples, location, collection, quality control on-site, analytical laboratory, interpretation of results and any follow-up actions. This written agreement shall be co-signed by the IH's and delivered to the VA's representative.

A. Scope of Services of the VPIH/CIH Consultant:

1. The purpose of the work of the VPIH/CIH is to: assure quality; adherence to the specification; resolve problems; prevent the spread of contamination beyond the regulated area; and assure clearance at the end of the project. In addition, their work includes performing the final inspection and testing to determine whether the regulated area or building has been adequately decontaminated. All air monitoring is to be done utilizing PCM/TEM. The VPIH/CIH will perform the following tasks:

. Task 1: Establish background levels before abatement begins by collecting background samples. Retain samples for possible TEM analysis.

a. Task 2: Perform representative air monitoring, inspection, and testing outside the regulated area during actual abatement work to detect any faults in the regulated area isolation and any adverse impact on the surroundings from regulated area activities.

b. Task 3: Perform unannounced visits to spot check overall compliance of work with contract/specifications. These visits may

include any inspection, monitoring, and testing inside and outside the regulated area and all aspects of the operation except personnel monitoring.

c. Task 4: Provide support to the VA representative such as evaluation of submittals from the Contractor, resolution of conflicts, interpret data, etc.

d. Task 5: Perform, in the presence of the VA representative, final inspection and testing of a decontaminated regulated area at the conclusion of the abatement to certify compliance with all regulations and VA requirements/specifications.

e. Task 6: Issue certificate of decontamination for each regulated area and project report.

2. All documentation, inspection results and testing results generated by the VPIH/CIH will be available to the Contractor for information and consideration. The Contractor shall cooperate with and support the VPIH/CIH for efficient and smooth performance of their work.

3. The monitoring and inspection results of the VPIH/CIH will be used by the VA to issue any Stop Removal orders to the Contractor during abatement work and to accept or reject a regulated area or building as decontaminated.

B. Monitoring, Inspection and Testing by Contractor CPIH/CIH: The Contractor’s CPIH/CIH is responsible for managing all monitoring, inspections, and testing required by these specifications, as well as any and all regulatory requirements adopted by these specifications. The CPIH/CIH is responsible for the continuous monitoring of all subsystems and procedures which could affect the health and safety of the Contractor’s personnel. Safety and health conditions and the provision of those conditions inside the regulated area for all persons entering the regulated area is the exclusive responsibility of the Contractor/Competent Person. The person performing the personnel and area air monitoring inside the regulated area shall be an IH Technician, who shall be trained and shall have specialized field experience in sampling and analysis. The IH Technician shall have successfully completed a NIOSH 582 Course or equivalent and provide documentation. The IH Technician shall participate in the AIHA Asbestos Analysis Registry or participate in the Proficiency Analytical Testing program of AIHA for fiber counting quality control assurance. The IH

Technician shall also be an accredited EPA AHERA/State Contractor/Supervisor and Building Inspector. The IH Technician shall have participated in five abatement projects collecting personal and area samples and have experience in substantially similar projects in size and scope. The analytical laboratory used by the Contractor to analyze the samples shall be AIHA accredited for asbestos PAT and approved by the VA prior to start of the project. A daily log shall be maintained by the CPIH/CIH or IH Technician, documenting all OSHA requirements for personal and area air monitoring for asbestos in 29 CFR 1926.1101(f), (g) and Appendix A. This log shall be made available to the VA representative and the VPIH/CIH upon request. The log will contain, at a minimum, information on personnel or area samples, other persons represented by the sample, the date of sample collection, start and stop times for sampling, sample volume, flow rate, and fibers/cc. The CPIH/CIH shall collect and analyze samples for each representative job being done in the regulated area, i.e., removal, wetting, clean-up, and load-out. No fewer than two (2) personal air samples or 25 percent of representative workforce per shift shall be collected, whichever is greater, in the regulated area; a minimum of three (3) area air samples at locations inside the building but immediately outside the regulated work area; one (1) area air sample shall be collected daily in the Clean Room of the PDF; and one (1) area air sample shall be collected daily at the approximate location of HEPA exhaust discharge. In addition to the continuous monitoring required, the CPIH/CIH will perform inspection and testing at the final stages of abatement for each regulated area as specified in the CPIH/CIH responsibilities. Additionally, the CPIH/CIH will monitor and record pressure readings within the containment daily with a minimum of two readings at the beginning and at the end of a shift, and submit the data in the daily report.

2.2 ASBESTOS HAZARD ABATEMENT PLAN

. The Contractor shall have an established an Asbestos Hazard Abatement Plan (AHAP) in printed form and loose leaf folder consisting of simplified text, diagrams, sketches, and pictures that establish and explain clearly the procedures to be followed during all phases of the work by the Contractor's personnel. The AHAP must be modified as needed to address specific requirements of this project and the specifications. The AHAP shall be submitted for review and approval to

the VA prior to the start of any abatement work. The minimum topics and areas to be covered by the AHAPs are:

1. Minimum Personnel Qualifications
2. Emergency Action Plan/Contingency Plans and Arrangements
3. Security and Safety Procedures
4. Respiratory Protection/Personal Protective Equipment Program and Training
5. Medical Surveillance Program and Recordkeeping
6. Regulated Area Requirements - Containment Barriers/Isolation of Regulated Area
7. Decontamination Facilities and Entry/Exit Procedures (PDF and W/EDF)
8. Negative Pressure Systems Requirements
9. Monitoring, Inspections, and Testing
10. Removal Procedures for ACM
11. Removal of Contaminated Soil (if applicable)
12. Encapsulation Procedures for ACM
13. Disposal of ACM waste/equipment
14. Regulated Area Decontamination/Clean-up
15. Regulated Area Visual and Air Clearance
16. Project Completion/Closeout

2.3 SUBMITTALS

. Pre-Start Meeting Submittals:

1. Submit to the VA a minimum of 14 days prior to the pre-start meeting the following for review and approval. Meeting this requirement is a prerequisite for the pre-start meeting for this project:
   . Submit a detailed work schedule for the entire project reflecting contract documents and the phasing/schedule requirements from the CPM chart.
   a. Submit a staff organization chart showing all personnel who will be working on the project and their capacity/function. Provide their qualifications, training, accreditations, and licenses, as appropriate. Provide a copy of the "Certificate of Worker's Acknowledgment" and the "Affidavit of Medical Surveillance and Respiratory Protection" for each person.
   b. Submit Asbestos Hazard Abatement Plan developed specifically for this project, incorporating the requirements of the specifications, prepared, signed and dated by the CPIH/CIH.

c. Submit the specifics of the materials and equipment to be used for this project with manufacturer names, model numbers, performance characteristics, pictures/diagrams, and number available for the following:
   0) Supplied air system, negative air machines, HEPA vacuums, air monitoring pumps, calibration devices, pressure differential monitoring device and emergency power generating system.
   1) Waste water filtration system, shower system, containment barriers.
   2) Encapsulants, surfactants, hand held sprayers, airless sprayers, glovebags, and fire extinguishers.
   3) Respirators, protective clothing, fall protection and other required personal protective equipment.
   4) Fire safety equipment to be used in the regulated area.
d. Submit the name, location, and phone number of the approved landfill; proof/verification the landfill is approved for ACM disposal; the landfill's requirements for ACM waste; the type of vehicle to be used for transportation; and name, address, and phone number of subcontractor, if used. Proof of asbestos training for transportation personnel shall be provided.
e. Submit required notifications and arrangements made with regulatory agencies having regulatory jurisdiction and the specific contingency/emergency arrangements made with local health, fire, ambulance, hospital authorities and any other notifications/arrangements.
f. Submit the name, location and verification of the laboratory and/or personnel to be used for analysis of air and/or bulk samples. Personal air monitoring must be done in accordance with OSHA 29 CFR 1926.1101(f) and Appendix A. Area or clearance air monitoring shall be conducted in accordance with EPA AHERA protocols.
g. Submit qualifications verification: Submit the following evidence of qualifications. Make sure that all references are current and verifiable by providing current phone numbers and documentation.
   0) Asbestos Abatement Company: Project experience within the past 3 years; listing projects first most similar to this project: Project Name; Type of Abatement; Duration; Cost; Reference Name/Phone Number; Final Clearance; Completion Date

1) List of project(s) halted by owner, A/E, IH, regulatory agency in the last 3 years: Project Name; Reason; Date; Reference Name/Number; Resolution
2) List asbestos regulatory citations (e.g., OSHA), notices of violations (e.g., Federal and state EPA), penalties, and legal actions taken against the company including the company's officers (including damages paid) in the last 3 years. Provide copies and all information needed for verification.

h. Submit information on personnel: Provide a resume; address each item completely; copies of certificates, accreditations, and licenses. Submit an affidavit signed by the CPIH/CIH stating that all personnel submitted below have medical records in accordance with OSHA 29 CFR 1926.1101(m) and that the company has implemented a medical surveillance program and written respiratory protection program, and maintains recordkeeping in accordance with the above regulation. Submit the phone number and doctor/clinic/hospital used for medical evaluations.

0) CPIH/CIH and IH Technician: Name; years of abatement experience; list of projects similar to this one; certificates, licenses, accreditations for proof of AHERA/OSHA specialized asbestos training; professional affiliations; medical opinion; and current respirator fit test.
1) Competent Person(s)/Supervisor(s): Number; names; last four digits of social security numbers; years of abatement experience as Competent Person/Supervisor; list of similar projects in size/complexity as Competent Person/Supervisor; as a worker; certificates, licenses, accreditations; proof of AHERA/OSHA specialized asbestos training; maximum number of personnel supervised on a project; medical opinion (asbestos surveillance and respirator use); and current respirator fit test.
2) Workers: Numbers; names; last four digits of social security numbers; years of abatement experience; certificates, licenses, accreditations; training courses in asbestos abatement and respiratory protection; medical opinion

(asbestos surveillance and respirator use); and current respirator fit test.

i. Submit copies of State license for asbestos abatement; copy of insurance policy, including exclusions with a letter from agent stating in plain language the coverage provided and the fact that asbestos abatement activities are covered by the policy; copy of AHAPs incorporating the requirements of this specification; information on who provides your training, how often; who provides medical surveillance, how often; who performs and how is personal air monitoring of abatement workers conducted; a list of references of independent laboratories/IH's familiar with your air monitoring and standard operating procedures; and copies of monitoring results of the five referenced projects listed and analytical methods used.

j. Rented equipment must be decontaminated prior to returning to the rental agency.

k. Submit, before the start of work, the manufacturer's technical data for all types of encapsulants, all SDS and application instructions.

A. Submittals During Abatement:

1. The Competent Person shall maintain and submit a daily log at the regulated area documenting the dates and times of the following: purpose, attendees and summary of meetings; all personnel entering/exiting the regulated area; document and discuss the resolution of unusual events such as barrier breeching, equipment failures, emergencies, and any cause for stopping work; and representative air monitoring and results/TWA's/EL's. Submit this information daily to the VA's representative.

2. The CPIH/CIH shall document and maintain the inspection and approval of the regulated area preparation prior to start of work and daily during work.

. Removal of any poly barriers.

a. Visual inspection/testing by the CPIH/CIH or IH Technician prior to application of lockdown encapsulant.

b. Packaging and removal of ACM waste from regulated area.

c. Disposal of ACM waste materials; copies of Waste Shipment Records/landfill receipts to the VA's representative on a weekly basis.

B. Submittals at Completion of Abatement: The CPIH/CIH shall submit a project report consisting of the daily log book requirements and documentation of events during the abatement project including Waste Shipment Records signed by the landfill's agent. It will also include information on the containment and transportation of waste from the containment with applicable Chain of Custody forms. The report shall include a certificate of completion, signed and dated by the CPIH/CIH, in accordance with Attachment #1. All clearance and perimeter area samples must be submitted. The VA representative will retain the abatement report after completion of the project and provide copies of the abatement report to VAMC Office of Engineer and the Safety Office.

2.4 ENCAPSULANTS

. Types of Encapsulants:

1. The following four types of encapsulants, if used, must comply with performance requirements as stated in paragraph 2.5.2:
   . Removal encapsulant - used as a wetting agent to remove ACM.
   a. Bridging encapsulant - provides a tough, durable coating on ACM.
   b. Penetrating encapsulant - penetrates/encapsulates ACM at least 13 mm (1/2 inches).
   c. Lockdown encapsulant - seals microscopic fibers on surfaces after ACM removal.

A. Performance Requirements:

1. Encapsulants shall meet the latest requirements of EPA; shall not contain toxic or hazardous substances; or solvents; and shall comply with the following performance requirements:
   . General Requirements for all Encapsulants:
      0) ASTM E84: Flame spread of 25; smoke emission of 50.
      1) University of Pittsburgh Protocol: Combustion Toxicity; zero mortality.
      2) ASTM C732: Accelerated Aging Test; Life Expectancy - 20 years.
      3) ASTM E96: Permeability - minimum of 0.4 perms.
   a. Bridging/Penetrating Encapsulants:
      0) ASTM E736: Cohesion/Adhesion Test - 24 kPa (50 pounds/square foot).
      1) ASTM E119: Fire Resistance - 3 hours (Classified by UL for use on fibrous/cementitious fireproofing).

2) ASTM D2794: Gardner Impact Test; Impact Resistance - minimum 11.5 kg-mm (43 in/lb).
3) ASTM D522: Mandrel Bend Test; Flexibility - no rupture or cracking.

b. Lockdown Encapsulants:
0) ASTM E119: Fire resistance - 3 hours (tested with fireproofing over encapsulant applied directly to steel member).
1) ASTM E736: Bond Strength - 48 kPa (100 pounds/square foot) (test compatibility with cementitious and fibrous fireproofing).
2) In certain situations, encapsulants may have to be applied to hot pipes/equipment. The encapsulant must be able to withstand high temperatures without cracking or creating any noxious gaseous or vapors during or after application.

B. Certificates of Compliance: The Contractor shall submit to the VA representative certification from the manufacturer indicating compliance with performance requirements for encapsulants when applied according to manufacturer recommendations.

PART 3 - EXECUTION

3.0 REGULATED AREA PREPARATIONS

. Site Security:
1. Regulated area access is to be restricted only to authorized, trained/accredited and protected personnel. These may include the Contractor's employees, employees of Subcontractors, VA employees and representatives, State and Local inspectors, and any other designated individuals. A list of authorized personnel shall be established prior to commencing the project and be posted in the clean room of the decontamination unit.
2. Entry into the regulated area by unauthorized individuals shall be reported immediately to the Competent Person by anyone observing the entry. The Competent Person shall immediately require any unauthorized person to leave the regulated area and then notify the VA Contracting Officer or VA Representative using the most expeditious means.
3. A log book shall be maintained in the clean room of the decontamination unit. Anyone who enters the regulated area must

record their name, affiliation, time in, and time out for each entry.

4. Access to the regulated area shall be through a single decontamination unit. All other access (doors, windows, hallways, etc.) shall be sealed and demarcated as an asbestos regulated work area to prevent entry to or exit from the regulated area unless in the event of an emergency. The only exceptions for this requirement are the waste/equipment load-out area which shall be sealed except during the removal of containerized asbestos waste from the regulated area, and emergency exits. Emergency exits shall not be locked from the inside; however, they shall be sealed with poly sheeting and taped until needed. In any situation where exposure to high temperatures which may result in a flame hazard, fire retardant poly sheeting must be used.
5. The Contractor's Competent Person shall control site security during abatement operations in order to isolate work in progress and protect adjacent personnel. A 24-hour security system shall be provided at the entrance to the regulated area to assure that all entrants are logged in/out and that only authorized personnel are allowed entrance.
6. The Contractor will have the VA's assistance in notifying adjacent personnel of the presence, location and quantity of ACM in the regulated area and enforcement of restricted access by the VA's employees.
7. The regulated area shall be locked during non-working hours and secured by VA Representative or Competent Person. The VA Police shall be informed of asbestos abatement regulated areas to provide security checks during facility rounds and emergency response.

A. Signage and Power Management:

1. Post OSHA DANGER signs meeting the specifications of OSHA 29 CFR 1926.1101 at any location and approaches to the regulated area. Signs shall be posted at a distance sufficiently far enough away from the regulated area to permit any personnel to read the sign and take the necessary measures to avoid exposure. Additional signs will be posted following construction of the regulated area enclosure.
2. Shut down and lock out/tag out electric power to the regulated area. Provide temporary power and lighting. Insure safe installation

including GFCI of temporary power sources and equipment by compliance with all applicable electrical code and OSHA requirements for temporary electrical systems. Electricity shall be provided by the VA.

3. Shut down and lock out/tag out heating, cooling, and air conditioning system (HVAC) components that are in, supply or pass through the regulated area. Investigate the regulated area and agree on pre-abatement condition with the VA's representative. Seal all intake and exhaust vents in the regulated area with duct tape and 2 layers of independently installed 6-mil poly. Also, seal any seams in system components that pass through the regulated area. Remove all contaminated HVAC system filters and place in labeled 6-mil polyethylene disposal bags for staging and eventual disposal as asbestos waste.

B. Negative Pressure Filtration System:

1. The Contractor shall provide enough HEPA negative air machines to effect $\geq$ - 0.02 inch WCG pressure differential inside the regulated work area. The Competent Person shall determine the number of units needed for the regulated area by dividing the cubic feet in the regulated area by 15 and then dividing that result by the cubic feet per minute (CFM) for each unit to determine the number of units needed to effect $\geq$ - 0.02 inch WCG pressure inside the regulated work area. Provide standby units in the event of machine failure and/or emergency in an adjacent area. HEPA equipped negative air machines shall be discharged outside of the building a minimum of 30 feet from building make-up air, doors, open windows, patients, visitors and staff.
2. NIOSH has done extensive studies and has determined that negative air machines typically operate at ~50 percent efficiency. The contractor shall consider this in their determination of number of units needed to provide $\geq$ - 0.02 inch WCG pressure differential inside the regulated work area. The contractor shall use double the number of machines, based on their calculations, or submit proof their machines operate at stated capacities, at a 2 inches pressure drop across the filters.
3. Design and Layout:

. Before start of work submit the design and layout of the regulated area and the negative air machines. The submittal shall indicate the number of, location of and size of negative air machines. The point(s) of exhaust, air flow within the regulated area, anticipated negative pressure differential, and supporting calculations for sizing shall be provided. In addition, submit the following:

0) Method of supplying power to the units and designation/location of the panels.
1) Description of testing method(s) for correct air volume and pressure differential.
2) If auxiliary power supply is to be provided for the negative air machines, provide a schematic diagram of the power supply and manufacturer's data on the generator and switch.

4. Negative Air Machines (Hepa Units):

. Negative Air Machine Cabinet: The cabinet shall be constructed of steel or other durable material capable of withstanding potential damage from rough handling and transportation. The width of the cabinet shall be less than 30 inches in order to fit in standard doorways. The cabinet must be factory sealed to prevent asbestos fibers from being released during use, transport, or maintenance. Any access to and replacement of filters shall be from the inlet end. The unit must be on casters or wheels.

a. Negative Air Machine Fan: The rating capacity of the fan must indicate the CFM under actual operating conditions. Manufacturer's typically use "free-air" (no resistance) conditions when rating fans. The fan must be a centrifugal type fan.

b. Negative Air Machine Final Filter: The final filter shall be a HEPA filter. The filter media must be completely sealed on all edges within a structurally rigid frame. The filter shall align with a continuous flexible gasket material in the negative air machine housing to form an air tight seal. Each HEPA filter shall be certified by the manufacturer to have an efficiency of not less than 99.97 percent. Testing shall have been done in accordance with Military Standard MIL-STD-282 and Army Instruction Manual 136-300-175A. Each filter must bear a UL586 label to indicate ability to perform under specified conditions.

Each filter shall be marked with the name of the manufacturer, serial number, air flow rating, efficiency and resistance, and the direction of test air flow.

c. Negative Air Machine Pre-filters: The pre-filters, which protect the final HEPA filter by removing larger particles, are required to prolong the operating life of the HEPA filter. Two stages of pre-filtration are required. A first stage pre-filter shall be a low efficiency type for particles 10 µm or larger. A second stage pre-filter shall have a medium efficiency effective for particles down to 5 µm or larger. Pre-filters shall be installed either on or in the intake opening of the NAM and the second stage filter must be held in place with a special housing or clamps.

d. Negative Air Machine Instrumentation: Each unit must be equipped with a gauge to measure the pressure drop across the filters and to indicate when filters have become loaded and need to be changed. A table indicating the cfm for various pressure readings on the gauge shall be affixed near the gauge for reference or the reading shall indicate at what point the filters shall be changed, noting cfm delivery. The unit must have an elapsed time meter to show total hours of operation.

e. Negative Air Machine Safety and Warning Devices: An electrical/ mechanical lockout must be provided to prevent the fan from being operated without a HEPA filter. Units must be equipped with an automatic shutdown device to stop the fan in the event of a rupture in the HEPA filter or blockage in the discharge of the fan. Warning lights are required to indicate normal operation; too high a pressure drop across filters; or too low of a pressure drop across filters.

f. Negative Air Machine Electrical: All electrical components shall be approved by the National Electrical Manufacturer's Association (NEMA) and Underwriters Laboratories (UL). Each unit must be provided with overload protection and the motor, fan, fan housing, and cabinet must be grounded.

g. It is essential that replacement HEPA filters be tested using an “in-line” testing method, to ensure the seal around the periphery was not damaged during replacement. Damage to the outer HEPA filter seal could allow contaminated air to bypass the HEPA filter and be discharged to an inappropriate location.

Contractor will provide written documentation of test results for negative air machine units with HEPA filters.

5. Pressure Differential: The fully operational negative air system within the regulated area shall continuously maintain a pressure differential $\geq$ - 0.02 inch WCG inside the regulated work area. Before any disturbance of any asbestos material, this shall be demonstrated to the VA by use of a pressure differential meter/manometer as required by OSHA 29 CFR 1926.1101(g)(5)(i). The Competent Person shall be responsible for providing, maintaining, and documenting the negative pressure and air changes as required by OSHA and this specification.
6. Monitoring: The pressure differential shall be continuously monitored and recorded between the regulated area and the area outside the regulated area with a monitoring device that incorporates a strip chart recorder. The strip chart recorder shall become part of the project log and shall indicate at least $\geq$ - 0.02 inch WCG pressure differential inside the regulated work area for the duration of the project.
7. Auxiliary Generator: If the building is occupied during abatement, provide an auxiliary gasoline/diesel generator located outside the building in an area protected from the weather. In the event of a power failure of the general power grid and the VAMC emergency power grid, the generator must automatically start and supply power to a minimum of 50 percent of the negative air machines in operation.
8. Supplemental Make-Up Air Inlets: Provide, as needed for proper air flow in the regulated area, in a location approved by the VA, openings in the plastic sheeting to allow outside air to flow into the regulated area. Auxiliary makeup air inlets must be located as far from the negative air machines as possible, off the floor near the ceiling, and away from the barriers that separate the regulated area from the occupied clean areas. Cover the inlets with weighted flaps which will seal in the event of failure of the negative pressure system.
9. Testing The System: The negative pressure system must be tested before any ACM is disturbed in any way. After the regulated area has been completely prepared, the decontamination units set up, and the negative air machines installed, start the units up one at a time. Demonstrate and document the operation and testing of the negative

pressure system to the VA using smoke tubes and a negative pressure gauge. Verification and documentation of adequate negative pressure differential across each barrier must be done at the start of each work shift.

10. Demonstration of the Negative Pressure Filtration System:
    . The demonstration of the operation of the negative pressure system to the VA shall include, but not be limited to, the following:
        0) Plastic barriers and sheeting move lightly in toward the regulated area.
        1) Curtains of the decontamination units move in toward regulated area.
        2) There is a noticeable movement of air through the decontamination units. Use the smoke tube to demonstrate air movement from the clean room to the shower room to the equipment room to the regulated area.
        3) Use smoke tubes to demonstrate air is moving across all areas in which work is to be done. Use a differential pressure gauge to indicate a negative pressure of at > - 0.02 inch across every barrier separating the regulated area from the rest of the building. Modify the system as necessary to meet the above requirements.
11. Use of the Negative Pressure Filtration System During Abatement Operations:
    . Start units before beginning any disturbance of ACM occurs. After work begins, the units shall run continuously, maintaining 4 actual air changes per hour at a negative pressure differential of > - 0.02 inch water column gauge, for the duration of the work until a final visual clearance and final air clearance has been successfully completed.
    a. No negative air units shall be shut down at any time unless authorized by the VA Contracting Officer, verbally and in writing.
    b. Pre-cleaning of ACM contaminated items shall be performed after the enclosure has been erected and negative pressure has been established in the work area. After items have been pre-cleaned and decontaminated, they may be removed from the work area for storage until the completion of abatement in the work area.

c. Abatement work shall begin at a location farthest from the units and proceed towards them. If an electric failure occurs, the Competent Person shall stop all abatement work and immediately begin wetting all exposed asbestos materials for the duration of the power outage. Abatement work shall not resume until power is restored and all units are operating properly again.

d. The negative air machines shall continue to run after all work is completed and until a final visual clearance and a final air clearance has been successfully completed for that regulated area.

12. Dismantling The System: After completion of the final visual and final air clearance has been obtained by the VPIH/CIH, the units may be shut down. The unit exterior surfaces shall have been completely decontaminated; pre-filters are not to be removed and the units inlet/outlet sealed with 2 layers of 6-mil poly immediately after shut down. No filter removal shall occur at the VA site following successful completion of site clearance. OSHA/EPA/DOT asbestos labels shall be attached to the units.

C. Containment Barriers and Coverings in the Regulated Area:

1. General: Seal off the perimeter to the regulated area to completely isolate the regulated area from adjacent spaces. All surfaces in the regulated area must be covered to prevent contamination and to facilitate clean-up. Should adjacent areas become contaminated as a result of the work, Contractor shall immediately stop work and clean up the contamination at no additional cost to the VA. Provide firestopping and identify all fire barrier penetrations due to abatement work as specified in Section 3.1.4.8; FIRESTOPPING.

2. Preparation Prior To Sealing: The Regulated Area: Place all tools, scaffolding, materials and equipment needed for working in the regulated area prior to erecting any plastic sheeting. All uncontaminated removable furniture, equipment and/or supplies shall be removed by the VA from the regulated area before commencing work. Any objects not scheduled for removal remaining in the regulated area shall be completely covered with 2 layers of 6-mil fire retardant poly sheeting and secured with duct tape. Lock out and tag out any HVAC/electrical systems in the regulated area.

3. Controlling Access to The Regulated Area: Access to the regulated area is allowed only through the personnel decontamination facility

(PDF). All other means of access shall be eliminated and OSHA DANGER demarcation signs posted as required by OSHA. If the regulated area is adjacent to, or within view of an occupied area, provide a visual barrier of 6-mil opaque fire retardant poly to prevent building occupant observation. If the adjacent area is accessible to the public, the barrier must be solid and capable of withstanding the negative pressure.

4. Critical Barriers: Completely separate any operations in the regulated area from adjacent areas using 2 layers of 6-mil fire retardant poly and duct tape. Individually seal with 2 layers of 6-mil poly and duct tape all HVAC openings into the regulated area. Individually seal all lighting fixtures, clocks, doors, windows, convectors, speakers, or any other objects/openings in the regulated area. Heat must be shut off any objects covered with poly.
5. Primary Barriers:
   . Cover the regulated area with two layers of 6-mil fire retardant poly on the floors and two layers of 4 mil, fire retardant poly on the walls, unless otherwise directed in writing by the VA representative. Floor layers must form a right angle with the wall and turn up the wall at least 300 mm (12 inches). Seams must overlap at least 1800 mm (6 feet) and must be spray glued and taped. Install sheeting so that layers can be removed independently from each other. Carpeting shall be covered with three layers of 6-mil poly. Corrugated cardboard sheets must be placed between the bottom and middle layers of poly. Mechanically support and seal with duct tape and glue all wall layers.
   a. If stairs and ramps are covered with 6-mil plastic, two layers must be used. Provide 19 mm (3/4 inch) exterior grade plywood treads held in place with duct tape/glue on the plastic. Do not cover rungs or rails with any isolation materials.
6. Secondary Barriers: A loose layer of 6-mil shall be used as a drop cloth to protect the primary layers from debris generated during the abatement. This layer shall be replaced as needed during the work.
7. Extension of the Regulated Area: If the enclosure of the regulated area is breached in any way that could allow contamination to occur, the affected area shall be included in the regulated area and constructed as per this section. Decontamination measures must be

started immediately and continue until air monitoring indicates background levels are met.

8. Firestopping:
   . Through penetrations caused by cables, cable trays, pipes, sleeves, conduits, etc. must be firestopped with a fire-rated firestop system providing an air tight seal.
   a. Firestop materials that are not equal to the wall or ceiling penetrated shall be brought to the attention of the VA Representative. The contractor shall list all areas of penetration, the type of sealant used, and whether or not the location is fire rated. Any discovery of penetrations during abatement shall be brought to the attention of the VA representative immediately. All walls, floors and ceilings are considered fire rated unless otherwise determined by the VA Representative or Fire Marshall.
   b. Any visible openings whether or not caused by a penetration shall be reported by the Contractor to the VA Representative for a sealant system determination. Firestops shall meet ASTM E814 and UL 1479 requirements for the opening size, penetrant, and fire rating needed.

D. Sanitary Facilities: The Contractor shall provide sanitary facilities for abatement personnel and maintain them in a clean and sanitary condition throughout the abatement project.

E. Personal Protective Equipment: Provide whole body clothing, head coverings, gloves and foot coverings and any other personal protective equipment as determined by conducting the hazard assessment required by OSHA at 29 CFR 1910.132 (d). The Competent Person shall ensure the integrity of personal protective equipment worn for the duration of the project. Duct tape shall be used to secure all suit sleeves to wrists and to secure foot coverings at the ankle.

F. Pre-Cleaning:
   1. The VA will provide water for abatement purposes. The Contractor shall connect to the existing VA system. The service to the shower(s) shall be supplied with backflow prevention.
   2. Pre-cleaning of ACM contaminated items shall be performed after the enclosure has been erected and negative pressure has been established in the work area. All workers performing pre-cleaning activities must don appropriate personal protective equipment (PPE),

as specified throughout this document and as approved in the Contractor's work plan. After items have been pre-cleaned and decontaminated, they may be removed from the work area for storage until the completion of abatement in the work area.

3. Pre-clean all movable objects within the regulated area using a HEPA filtered vacuum and/or wet cleaning methods as appropriate. After cleaning, these objects shall be removed from the regulated area and carefully stored in an uncontaminated location. Drapes, clothing, upholstered furniture and other fabric items shall be disposed of as asbestos contaminated waste. Cleaning these asbestos contaminated items utilizing HEPA vacuum techniques and off-premises steam cleaning is very difficult and cannot guarantee decontamination. Carpeting will be disposed of prior to abatement if in the regulated area. If ACM floor tile is attached to the carpet while the Contractor is removing the carpet that section of the carpet will be disposed of as asbestos waste.
4. Pre-clean all fixed objects in the regulated area using HEPA filtered vacuums and/or wet cleaning techniques as appropriate. Careful attention must be paid to machinery behind grills or gratings where access may be difficult but contamination may be significant. Also, pay particular attention to wall, floor and ceiling penetration behind fixed items. After pre-cleaning, enclose fixed objects with 2 layers of 6-mil poly and seal securely in place with duct tape. Objects (e.g., permanent fixtures, shelves, electronic equipment, laboratory tables, sprinklers, alarm systems, closed circuit TV equipment and computer cables) which must remain in the regulated area and that require special ventilation or enclosure requirements should be designated here along with specified means of protection. Contact the manufacturer for special protection requirements.
5. Pre-clean all surfaces in the regulated area using HEPA filtered vacuums and/or wet cleaning methods as appropriate. Do not use any methods that would raise dust such as dry sweeping or vacuuming with equipment not equipped with HEPA filters. Do not disturb asbestos-containing materials during this pre-cleaning phase.

G. Pre-Abatement Activities:

1. Pre-Abatement Meeting: The VA representative, upon receipt, review, and substantial approval of all pre-abatement submittals and

verification by the CPIH/CIH that all materials and equipment required for the project are on the site, will arrange for a pre-abatement meeting between the Contractor, the CPIH/CIH, Competent Person(s), the VA representative(s), and the VPIH/CIH. The purpose of the meeting is to discuss any aspect of the submittals needing clarification or amplification and to discuss any aspect of the project execution and the sequence of the operation. The Contractor shall be prepared to provide any supplemental information/documentation to the VA's representative regarding any submittals, documentation, materials or equipment. Upon satisfactory resolution of any outstanding issues, the VA's representative will issue a written order to proceed to the Contractor. No abatement work of any kind described in the following provisions shall be initiated prior to the VA written order to proceed.

2. Pre-Abatement Construction and Operations:
   . Perform all preparatory work for the first regulated area in accordance with the approved work schedule and with this specification.
   a. Upon completion of all preparatory work, the CPIH/CIH will inspect the work and systems and will notify the VA's representative when the work is completed in accordance with this specification. The VA's representative may inspect the regulated area and the systems with the VPIH/CIH and may require that upon satisfactory inspection, the Contractor's employees perform all major aspects of the approved AHAP(s), especially worker protection, respiratory systems, contingency plans, decontamination procedures, and monitoring to demonstrate satisfactory operation. The operational systems for respiratory protection and the negative pressure system shall be demonstrated for proper performance.
   b. The CPIH/CIH shall document the pre-abatement activities described above and deliver a copy to the VA's representative.
   c. Upon satisfactory inspection of the installation of and operation of systems, the VA's representative will notify the Contractor in writing to proceed with the asbestos abatement work in accordance with this specification and all applicable regulations.
3. Pre-Abatement Inspections and Preparations:

. Before any work begins on the construction of the regulated area, the Contractor will:

0) Conduct a space-by-space inspection with an authorized VA representative and prepare a written inventory of all existing damage in those spaces where asbestos abatement will occur. Still or video photography may be used to supplement the written damage inventory. Document will be signed and certified as accurate by both parties.

1) A NESHAP (destructive) ACM inspection shall be conducted on all building structures that will be demolished. Ensure the following areas are inspected on the project: lay-in ceilings concealing ACM; ACM behind walls/windows from previous renovations; inside utility chases/walls; transite piping/ductwork/sheets; behind radiators; lab fume hoods; transite lab countertops; roofing materials; below window sills; water/sewer lines; electrical conduit coverings; crawlspaces (previous abatement contamination); flooring/mastic covered by carpeting/new flooring; exterior insulated wall panels; on underground fuel tanks; and steam line trench coverings. Verify during NESHAP survey that no other suspect ACM is present.

2) Ensure that all furniture, machinery, equipment, curtains, drapes, blinds, and other movable objects required to be removed from the regulated area have been cleaned and removed or properly protected from contamination.

3) If present and required, remove and dispose of carpeting from floors in the regulated area.

4) Inspect existing firestopping in the regulated area. Correct as needed.

3.1 REMOVAL OF ACM

. Wetting ACM:

1. Use amended water for the wetting of ACM prior to removal. The Competent Person shall assure the wetting of ACM meets the definition of "adequately wet" in the EPA NESHAP regulation and OSHA’s “wet methods” for the duration of the project. A removal encapsulant may be used instead of amended water with written approval of the VA's representative.

2. Amended Water: Provide water to which a surfactant has been added to wet the ACM and reduce the potential for fiber release during disturbance of ACM. The mixture must be equal to or greater than the wetting provided by water amended by a surfactant consisting of one ounce of 50 percent polyoxyethylene ester and 50 percent polyoxyethylene ether mixed with 5 gallons (19L) of water.
3. Removal Encapsulant: When authorized by VA, provide a removal encapsulant designed specifically for the removal of ACM. The material must, when used, result in adequate wetting of the ACM and retard fiber release during removal.

A. Secondary Barrier and Walkways:
1. Install as a drop cloth a 6-mil poly sheet at the beginning of each work shift where removal is to be done during that shift. Completely cover floors and any walls within 10 feet (3 meters) of the area where work is to done. Secure the secondary barrier with duct tape to prevent it from moving or debris from getting behind it. Remove the secondary barrier at the end of the shift or as work in the area is completed. Keep residue on the secondary barrier wetted. When removing, fold inward to prevent spillage and place in a disposal bag.
2. Install walkways using 6-mil black poly between the regulated area and the decontamination facilities (PDF and W/EDF) to protect the primary layers from contamination and damage. Install the walkways at the beginning of each shift and remove at the end of each shift.

B. Wet Removal of ACM:
1. Adequately and thoroughly wet the ACM to be removed prior to removal with amended water or when authorized by VA, removal encapsulant to reduce/prevent fiber release to the air. Adequate time must be allowed for the amended water or removal encapsulant to saturate the ACM. Abatement personnel must not disturb dry ACM. Use a fine spray of amended water or removal encapsulant. Saturate the material sufficiently to wet to the substrate without causing excessive dripping. The material must be sprayed repeatedly/continuously during the removal process in order to maintain adequately wet conditions. Removal encapsulants must be applied in accordance with the manufacturer's written instructions. Perforate or carefully separate, using wet methods, an outer covering that is painted or jacketed in order to allow penetration and wetting of the material.

Where necessary, carefully remove covering while wetting to minimize fiber release. **In no event shall dry removal occur except when authorized in writing by the VPIH/CIH and VA when a greater safety hazard (e.g., electricity) is present.**

2. If ACM does not wet well with amended water due to composition, coating or jacketing, remove as follows:
   . Mist work area continuously with amended water whenever necessary to reduce airborne fiber levels.
   a. Remove saturated ACM in small sections. Do not allow material to dry out. As material is removed, bag material, while still wet into disposal bags. Twist the bag neck tightly, bend over (gooseneck) and seal with a minimum of three tight wraps of duct tape. Clean /decontaminate the outside of the bag of any residue and move to washdown station adjacent to W/EDF.
   b. Fireproofing or Architectural Finish on Scratch Coat: Spray with a fine mist of amended water or removal encapsulant. Allow time for saturation to the substrate. Do not over saturate causing excess dripping. Scrape material from substrate. Remove material in manageable quantities and control falling to staging or floor. If the falling distance is over 20 feet (6 meters), use a drop chute to contain material through descent. Remove residue remaining on the scratch coat after scraping is done using a stiff bristle hand brush. If a removal encapsulant is used, remove residue completely before the encapsulant dries. Periodically re-wet the substrate with amended water as needed to prevent drying of the material before the residue is removed from the substrate.
   c. Fireproofing or Architectural Finish on Wire Lath: Spray with a fine mist of amended water or removal encapsulant. Allow time to completely saturate the material. Do not over saturate causing excess dripping. If the surface has been painted or otherwise coated, cut small holes as needed and apply amended water or removal encapsulant from above. Cut saturated wire lath into 2 feet x 6 feet (50mm x 150mm) sections and cut hanger wires. Roll up complete with ACM, cover in burlap and hand place in disposal bag. Do not drop to floor. After removal of lath/ACM, remove any overspray on decking and structure using stiff bristle nylon

brushes. Depending on hardness of overspray, scrapers may be needed for removal.

d. Pipe/Tank/Vessel/Boiler Insulation: Remove the outer layer of wrap while spraying with amended water in order to saturate the ACM. Spray ACM with a fine mist of amended water or removal encapsulant. Allow time to saturate the material to the substrate. Cut bands holding pre-formed pipe insulation sections. Slit jacketing at the seams, remove and hand place in a disposal bag. Do not allow dropping to the floor. Remove molded fitting insulation/mud in large pieces and hand place in a disposal bag. Remove any residue on pipe or fitting with a stiff bristle nylon brush. In locations where pipe fitting insulation is removed from fibrous glass or other non-asbestos insulated straight runs of pipe, remove fibrous material at least 6 inches from the point it contacts the ACM.

C. Wet Removal of Amosite:

1. The following areas shown on drawings indicate locations of amosite ACM which will require local exhaust ventilation and collection as described below, in addition to wet removal. Provide specific description /locations/ drawings.
2. Provide local exhaust ventilation and collection systems to assure collection of amosite fibers at the point of generation. A 300 mm (12") flexible rigid non-collapsing duct shall be shall be located no more than 600 mm (2 feet) from any scraping/brushing activity. Primary filters must be replaced every 30 minutes on the negative air machines. Each scraping/brushing activity must have a negative air machine devoted to it. For pre-molded pipe insulation or cutting wire lathe attach a 1200 mm (4 feet) square flared end piece on the intake of the duct. Support the duct horizontally at a point 600 mm (2 feet) below the work to effect capture. One person in the crew shall be assigned to operate the duct collection system on a continual basis.
3. Amosite does not wet well with amended water. Submit full information/documentation on the wetting agent proposed prior to start for review and approval by the VPIH/CIH and VA Contracting Officer. Ensure that the material is worked on in small sections and is thoroughly and continuously wetted. Package as soon as possible while wet. Remove as required.

3.2 LOCKDOWN ENCAPSULATION

A. General: Lockdown encapsulation is an integral part of the ACM removal. At the conclusion of ACM removal and before removal of the primary barriers, the contractor shall encapsulate all surfaces with a bridging encapsulant.

B. Delivery and Storage: Deliver materials to the job site in original, new and unopened containers bearing the manufacturer's name and label as well as the following information: name of material, manufacturer's stock number, date of manufacture, thinning instructions, application instructions and the SDS for the material.

C. Worker Protection: Before beginning work with any material for which an SDS has been submitted, provide workers with any required personal protective equipment. The required personal protective equipment shall be used whenever exposure to the material might occur. In addition to OSHA/specification requirements for respiratory protection, a paint pre-filter and an organic vapor cartridge, at a minimum, shall be used in addition to the HEPA filter when an organic solvent based encapsulant or other solvent is used. The CPIH/CIH shall be responsible for provision of adequate respiratory protection. Note: Flammable and combustible encapsulants or solvents shall not be used, unless authorized in writing by the VA.

D. Encapsulation of Scratch Coat Plaster or Piping:

1. Apply two coats of lockdown encapsulant to the scratch coat plaster or piping after all ACM has been removed. Apply in strict accordance with the manufacturer's instructions. Any deviation from the instructions must be approved by the VA's representative in writing prior to commencing the work.

2. Apply the lockdown encapsulant with an airless sprayer at a pressure and using a nozzle orifice as recommended by the manufacturer. Apply the first coat while the scratch coat is still damp from the asbestos removal process, after passing the visual inspection. If the surface has been allowed to dry, wet wipe or HEPA vacuum prior to spraying with encapsulant. Apply a second coat over the first coat in strict conformance with the manufacturer's instructions. Color the lockdown encapsulant and contrast the color in the second coat so that visual confirmation of completeness and uniform coverage of each coat is possible. Adhere to the manufacturer's

instructions for coloring. At the completion of the encapsulation, the surface must be a uniform third color produced by the mixture.

E. Sealing Exposed Edges: Seal edges of ACM exposed by removal work which is inaccessible, such as a sleeve, wall penetration, etc., with two coats of bridging encapsulant. Prior to sealing, permit the exposed edges to dry completely to permit penetration of the bridging encapsulant. Apply in accordance with 3.3.4 (B).

3.3 DISPOSAL OF ACM WASTE MATERIALS

. General: Dispose of waste ACM and debris which is packaged in accordance with these specifications, in accordance with OSHA, EPA, State, Local and DOT requirements. The landfill requirements for packaging must also be met. Transport will be in compliance with 49 CFR 171-180 regulations. Disposal shall be done at an approved landfill. Disposal of non-friable ACM shall be done in accordance with applicable regulations.

A. Procedures:

1. The VA must be notified at least 24 hours in advance of any waste removed from the containment.
2. Asbestos waste shall be packaged and moved through the W/EDF into a covered transport container in accordance with procedures is this specification. Waste shall be double-bagged and wetted with amended water prior to disposal. Wetted waste can be very heavy. Bags shall not be overfilled. Bags shall be evacuated with HEPA vacuum and securely sealed to prevent accidental opening and/or leakage. The top shall be tightly twisted and goose necked prior to tightly sealing with at least three wraps of duct tape. Ensure that unauthorized persons do not have access to the waste material once it is outside the regulated area. All transport containers must be covered at all times when not in use. NESHAP signs must be on containers during loading and unloading. Material shall not be transported in open vehicles. If drums are used for packaging, the drums shall be labeled properly and shall not be re-used.
3. Waste Load Out: Waste load out shall be done in accordance with the procedures in W/EDF Decontamination Procedures. Sealed waste bags shall be decontaminated on exterior surfaces by wet cleaning and HEPA vacuuming before being placed in the second waste bag and sealed, which then must also be wet wiped and HEPA vacuumed.

4. Asbestos waste with sharp edged components, i.e., nails, screws, lath, strapping, tin sheeting, jacketing, metal mesh, etc., which might tear poly bags shall be wrapped securely in burlap before packaging and, if needed, use a poly lined fiber drum as the second container, prior to disposal.

3.4 PROJECT DECONTAMINATION

. General:

1. The entire work related to project decontamination shall be performed under the close supervision and monitoring of the CPIH/CIH.
2. If the asbestos abatement work is in an area which was contaminated prior to the start of abatement, the decontamination will be done by cleaning the primary barrier poly prior to its removal and cleanings of the surfaces of the regulated area after the primary barrier removal.
3. If the asbestos abatement work is in an area which was uncontaminated prior to the start of abatement, the decontamination will be done by cleaning the primary barrier poly prior to its removal, thus preventing contamination of the building when the regulated area critical barriers are removed.

A. Regulated Area Clearance: Clearance air testing and other requirements which must be met before release of the Contractor and re-occupancy of the regulated area space are specified in Final Testing Procedures.

B. Work Description: Decontamination includes the clearance air testing in the regulated area and the decontamination and removal of the enclosures/facilities installed prior to the abatement work including primary/critical barriers, PDF and W/EDF facilities, and negative pressure systems.

C. Pre-Decontamination Conditions:

1. Before decontamination starts, all ACM waste from the regulated area shall be collected and removed, and the loose 6-mil layer of poly removed while being adequately wetted with amended water and disposed of along with any gross debris generated by the work.
2. At the start of decontamination, the following shall be in place:
   . Primary barriers consisting of 2 layers of 6-mil poly on the floor and 4 mil poly on the walls.

a. Critical barriers consisting of 2 layers of 6-mil poly which is the sole barrier between the regulated area and openings to the rest of the building or outside.

b. Decontamination facilities for personnel and equipment in operating condition and the negative pressure system in operation.

D. First Cleaning: Carry out a first cleaning of all surfaces of the regulated area including items of remaining poly sheeting, tools, scaffolding, ladders/staging by wet methods and HEPA vacuuming. Do not use dry dusting/sweeping/air blowing methods. Use each surface of a wetted cleaning cloth one time only and then dispose of as contaminated waste. Continue this cleaning until there is no visible residue from abated surfaces or poly or other surfaces. Remove all filters in the air handling system and dispose of as ACM waste in accordance with these specifications. The negative pressure system shall remain in operation during this time. Additional cleaning(s) may be needed as determined by the CPIH/VPIH/CIH.

E. Pre-Clearance Inspection and Testing: The CPIH/CIH and VPIH/CIH will perform a thorough and detailed visual inspection at the end of the cleaning to determine whether there is any visible residue in the regulated area. If the visual inspection is acceptable, the CPIH/CIH will perform pre-clearance sampling using aggressive clearance as detailed in 40 CFR 763 Subpart E (AHERA) Appendix A (III)(B)(7)(d). If the sampling results show values below 0.01 f/cc, then the Contractor shall notify the VA's representative of the results with a brief report from the CPIH/CIH documenting the inspection and sampling results and a statement verifying that the regulated area is ready for lockdown encapsulation. The VA reserves the right to utilize their own VPIH/CIH to perform a pre-clearance inspection and testing for verification.

F. Lockdown Encapsulation of Abated Surfaces: With the express written permission of the VA's representative, perform lockdown encapsulation of all surfaces from which asbestos was abated in accordance with the procedures in this specification. Negative pressure shall be maintained in the regulated area during the lockdown application.

3.5 FINAL VISUAL INSPECTION AND AIR CLEARANCE TESTING

. General: Notify the VA representative 24 hours in advance for the performance of the final visual inspection and testing. The final

visual inspection and testing will be performed by the VPIH/CIH starting after the final cleaning.

A. Final Visual Inspection: Final visual inspection will include the entire regulated area, the PDF, all poly sheeting, seals over HVAC openings, doorways, windows, and any other openings. If any debris, residue, dust or any other suspect material is detected, the final cleaning shall be repeated at no additional cost to the VA. Dust/material samples may be collected and analyzed at no additional cost to the VA at the discretion of the VPIH/CIH to confirm visual findings. When the regulated area is visually clean the final testing can be done.

B. Final Air Clearance Testing:

1. After an acceptable final visual inspection by the VPIH/CIH and VA Representative, the VPIH/CIH will perform the final clearance testing. Air samples will be collected and analyzed in accordance with procedures for AHERA in this specification. If work is less than 260 lf/160 sf/35 cf, 5 PCM samples shall be collected for clearance and a minimum of two field blank. If work is equal to or more than 260 lf/160 sf/35 cf, AHERA TEM sampling shall be performed for clearance. TEM analysis shall be done in accordance with procedures for EPA AHERA presented in this specification. If the release criteria are not met, the Contractor shall repeat the final cleaning and continue decontamination procedures until clearance is achieved. **All Additional inspection and testing costs will be borne by the Contractor.**
2. If release criteria are met, proceed to perform the abatement closeout and to issue the certificate of completion in accordance with these specifications.

C. Final Air Clearance Procedures:

1. Contractor's Release Criteria: Work in a regulated area is complete when the regulated area is visually clean and airborne fiber levels have been reduced to or below 0.01 f/cc as measured by the AHERA PCM protocol and < 70 AHERA asbestos structures per square millimeter (s/mm2) by AHERA TEM. No averaging of results will be used for this project. All five (5) TEM samples inside the regulated area shall be at or below 70 asbestos s/mm2 to satisfy the project final clearance criteria.

2. Air Monitoring and Final Clearance Sampling: To determine if the elevated airborne fiber counts encountered during abatement operations have been reduced to the specified level, the VPIH/CIH will secure samples and analyze them according to the following procedures:
   . Fibers Counted: "Fibers" referred to in this section shall be either all fibers regardless of composition as counted in the NIOSH 7400 PCM method or asbestos fibers counted using the AHERA TEM method.
   a. Aggressive Sampling: All final air testing samples shall be collected using aggressive sampling techniques except where soil is not encapsulated or enclosed. Samples will be collected on 0.8µ MCE filters for PCM analysis and 0.45µ MCE for TEM. A minimum of 3850 Liters of air using calibrated sampling pumps shall be collected for PCM samples and a minimum of 1200 Liters of air using calibrated sampling pumps shall be collected for TEM clearance samples. Before pumps are started, initiate aggressive air mixing sampling as detailed in 40 CFR 763 Subpart E (AHERA) Appendix A (III)(B)(7)(d). Air samples will be collected in areas subject to normal air circulation away from corners, obstructed locations, and locations near windows, doors, or vents. After air sampling pumps have been shut off, circulating fans shall be shut off. The negative pressure system shall continue to operate.
   b. Final clearance for soil that is not encapsulated, samples will be collected on 0.8µ MCE filters for PCM analysis and 0.45µ MCE filters for TEM. A minimum of 3850 Liters of air using calibrated sampling pumps shall be collected for PCM samples and a minimum of 1200 Liters of air using calibrated sampling pumps shall be collected for TEM clearance samples. Air clearance of work areas where contaminated soil has been removed is in addition to the requirement for clearance by bulk sample analysis discussed within these specifications. There will be no aggressive air sampling for the clearance of soil due to the fact that aggressive air sampling may overload the cassettes.
   c. Random bulk samples shall be collected from areas of soil which have been abated to ensure that the soil has been properly decontaminated. The total number of samples to be collected from

the soil areas shall be; <1000 square feet of soil – 3 samples; >1000 to <5000 square feet of soil – 5 samples; and >5000 square feet of soil – 7 samples. The soil samples shall be collected in a statistically random manner and shall be analyzed by PLM method. The clearance level to determine the soil clean is <1 percent asbestos by weight as analyzed by PLM method. If this level is achieved, the soil areas shall be considered clear. If the levels are >1 percent asbestos, the areas shall be re-cleaned until the sample results are <1 percent.

D. Clearance Sampling Using PCM – Less than 260LF/160SF:
   1. The VPIH/CIH will perform clearance samples as indicated by the specification.
   2. The NIOSH 7400 PCM method will be used for clearance sampling with a minimum collection volume of 3850 Liters of air. A minimum of 5 PCM clearance samples shall be collected. All samples must be equal to or less than 0.01 f/cc to clear the regulated area.
   3. Random bulk samples shall be collected from areas of soil which have been abated to ensure that the soil has been properly decontaminated. The total number of samples to be collected from the soil areas shall be; <1000 square feet of soil – 3 samples; >1000 to <5000 square feet of soil – 5 samples; and >5000 square feet of soil – 7 samples. The soil samples shall be collected in a statistically random manner and shall be analyzed by PLM method. The clearance level to determine the soil clean is <1 percent asbestos by weight as analyzed by PLM method. If this level is achieved, the soil areas shall be considered clear. If the levels are >1 percent asbestos, the areas shall be re-cleaned until the sample results are <1 percent.

E. Clearance Sampling Using Tem – Equal to or more than 260LF/160SF: TEM
   1. Clearance requires 13 samples be collected; 5 inside the regulated area; 5 outside the regulated area; and 3 field blanks.
   2. The TEM method will be used for clearance sampling with a minimum collection volume of 1200 Liters of air. A minimum of 13 clearance samples shall be collected. All samples must be equal to or less than 70 AHERA structures per square millimeter (s/mm2) AHERA TEM, no averaging of results for this specific project.

F. Laboratory Testing of PCM Clearance Samples: The services of an AIHA accredited laboratory will be employed by the VA to perform analysis

for the PCM air samples. The accredited laboratory shall be successfully participating in the AIHA Proficiency Analytical Testing (PAT) program. Samples will be sent daily by the VPIH/CIH so that verbal/faxed reports can be received within 24-36 hours. A complete record, certified by the laboratory, of all air monitoring tests and results will be furnished to the VA’s representative and the Contractor.

G. Laboratory Testing of Tem Samples: Samples shall be sent by the VPIH/CIH to a NIST NVLAP accredited laboratory for analysis by TEM. The laboratory shall be successfully participating in the NIST Airborne Asbestos Analysis (TEM) program. Verbal/faxed results from the laboratory shall be available within 24-36 hours after receipt of the samples. A complete record, certified by the laboratory, of all TEM results shall be furnished to the VA's representative and the Contractor.

H. Laboratory Testing of Bulk Samples: Samples shall be sent by the VPIH/CIH or CPIH/CIH to a NIST NVLAP accredited laboratory for analysis by PLM. The laboratory shall successfully participate in the NIST NVLAP Bulk Asbestos Analysis (PLM) program. Verbal/faxed results from the laboratory shall be available within 24-36 hours after receipt of the samples. A complete record, certified by the laboratory, of all PLM and/or TEM results shall be furnished to the VA's representative and the Contractor.

3.6 ABATEMENT CLOSEOUT AND CERTIFICATE OF COMPLIANCE

. Completion of Abatement Work:

1. After thorough decontamination, seal negative air machines with 2 layers of 6-mil poly and duct tape to form a tight seal at the intake/outlet ends before removal from the regulated area. Complete asbestos abatement work upon meeting the regulated area visual and air clearance criteria and fulfilling the following:
   . Remove all equipment and materials from the project area.
   a. Dispose of all packaged ACM waste as required.
   b. Repair or replace all interior finishes damaged during the abatement work, as required.
   c. Fulfill other project closeout requirements as required in this specification.

A. Certificate of Completion By Contractor: The CPIH/CIH shall complete and sign the "Certificate of Completion" in accordance with Attachment

1 at the completion of the abatement and decontamination of the regulated area.

B. Work Shifts: All work shall generally be done during administrative hours (8:00 AM to 4:30 PM) Monday - Friday excluding Federal Holidays. Any change in the work schedule must be approved in writing by the VA Representative.

C. Re-Insulation: If required as part of the contract, replace all asbestos containing insulation/fire-proofing with suitable non-asbestos material. Provide SDS’s for all replacement materials in advance of installation for VA approval. Refer to Section 23 07 11, HVAC, PLUMBING, AND BOILER PLANT INSULATION.

ATTACHMENT #1
CERTIFICATE OF COMPLETION

DATE: _____ VA Project #:_____

PROJECT NAME:_____ Abatement Contractor:_____

VAMC/ADDRESS:_____

1. I certify that I have personally inspected, monitored and supervised the abatement work of (specify regulated area or Building):
   which took place from / / to / /
2. That throughout the work all applicable requirements/regulations and the VA's specifications were met.
3. That any person who entered the regulated area was protected with the appropriate personal protective equipment and respirator and that they followed the proper entry and exit procedures and the proper operating procedures for the duration of the work.
4. That all employees of the Abatement Contractor engaged in this work were trained in respiratory protection, were experienced with abatement work, had proper medical surveillance documentation, were fit-tested for their respirator, and were not exposed at any time during the work to asbestos without the benefit of appropriate respiratory protection.
5. That I performed and supervised all inspection and testing specified and required by applicable regulations and VA specifications.
6. That the conditions inside the regulated area were always maintained in a safe and healthy condition and the maximum fiber count never exceeded 0.5 f/cc, except as described below.
7. That all abatement work was done in accordance with OSHA requirements and the manufacturer’s recommendations.

CPIH/CIH Signature/Date:_____

CPIH/CIH Print Name:_____

Abatement Contractor Signature/Date:_____

Abatement Contractor Print Name:_____

ATTACHMENT #2

CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

PROJECT NAME:_____DATE:_____

PROJECT ADDRESS:_____

ABATEMENT CONTRACTOR'S NAME:_____

WORKING WITH ASBESTOS CAN BE HAZARDOUS TO YOUR HEALTH. INHALING ASBESTOS HAS BEEN LINKED WITH VARIOUS TYPES OF CANCERS. IF YOU SMOKE AND INHALE ASBESTOS FIBERS, YOUR CHANCES OF DEVELOPING LUNG CANCER IS GREATER THAN THAT OF THE NON-SMOKING PUBLIC.

Your employer's contract with the owner for the above project requires that: You must be supplied with the proper personal protective equipment including an adequate respirator and be trained in its use. You must be trained in safe and healthy work practices and in the use of the equipment found at an asbestos abatement project. You must receive/have a current medical examination for working with asbestos. These things shall be provided at no cost to you. By signing this certificate of worker’s acknowledgement you are indicating to the owner that your employer has met these obligations.

RESPIRATORY PROTECTION: I have been trained in the proper use of respirators and have been informed of the type of respirator to be used on the above indicated project. I have a copy of the written Respiratory Protection Program issued by my employer. I have been provided for my exclusive use, at no cost, with a respirator to be used on the above indicated project.

TRAINING COURSE: I have been trained by a third party, State/EPA accredited trainer in the requirements for an AHERA/OSHA Asbestos Abatement Worker training course, 32-hours minimum duration. I currently have a valid State accreditation certificate. The topics covered in the course include, as a minimum, the following:

- Physical Characteristics and Background Information on Asbestos
- Potential Health Effects Related to Exposure to Asbestos
- Employee Personal Protective Equipment
- Establishment of a Respiratory Protection Program
- State of the Art Work Practices
- Personal Hygiene
- Additional Safety Hazards
- Medical Monitoring
- Air Monitoring
- Relevant Federal, State and Local Regulatory Requirements, Procedures, and Standards
- Asbestos Waste Disposal

MEDICAL EXAMINATION: I have had a medical examination within the past 12 months which was paid for by my employer. This examination included: health history, occupational history, pulmonary function test, and may have included a chest x-ray evaluation. The physician issued a positive written opinion after the examination.

Signature:_____

Printed Name:_____

Social Security Number:_____

Witness:_____

ATTACHMENT #3
AFFIDAVIT OF MEDICAL SURVEILLANCE, RESPIRATORY PROTECTION AND TRAINING/ACCREDITATION

VA PROJECT NAME AND NUMBER:_____

VA MEDICAL FACILITY:_____

ABATEMENT CONTRACTOR'S NAME AND ADDRESS:_____

1. I verify that the following individual

Name:_____ Social Security Number:_____
who is proposed to be employed in asbestos abatement work associated with the above project by the named Abatement Contractor, is included in a medical surveillance program in accordance with 29 CFR 1926.1101(m), and that complete records of the medical surveillance program as required by 29 CFR 1926.1101(m)(n) and 29 CFR 1910.20 are kept at the offices of the Abatement Contractor at the following address.

Address:_____

2. I verify that this individual has been trained, fit-tested and instructed in the use of all appropriate respiratory protection systems and that the person is capable of working in safe and healthy manner as expected and required in the expected work environment of this project.

3. I verify that this individual has been trained as required by 29 CFR 1926.1101(k). This individual has also obtained a valid State accreditation certificate. Documentation will be kept on-site.

4. I verify that I meet the minimum qualifications criteria of the VA specifications for a CPIH.

Signature of CPIH/CIH:_____ Date:_____

Printed Name of CPIH/CIH:_____

Signature of Contractor:_____ Date:_____

Printed Name of Contractor:_____

ATTACHMENT #4
ABATEMENT CONTRACTOR/COMPETENT PERSON(S) REVIEW AND ACCEPTANCE OF THE VA'S ASBESTOS SPECIFICATIONS

VA Project Location:_____

VA Project #:_____

VA Project Description:_____

1. This form shall be signed by the Asbestos Abatement Contractor Owner and the Asbestos Abatement Contractor's Competent Person(s) prior to any start of work at the VA related to this Specification. If the Asbestos Abatement Contractor's/Competent Person(s) has not signed this form, they shall not be allowed to work on-site.

2 I, the undersigned, have read VA's Asbestos Specification regarding the asbestos abatement requirements. I understand the requirements of the VA's Asbestos Specification and agree to follow these requirements as well as all required rules and regulations of OSHA/EPA/DOT and State/Local requirements. I have been given ample opportunity to read the VA's Asbestos Specification and have been given an opportunity to ask any questions regarding the content and have received a response related to those questions. I do not have any further questions regarding the content, intent and requirements of the VA's Asbestos Specification.

3. At the conclusion of the asbestos abatement, I will certify that all asbestos abatement work was done in accordance with the VA's Asbestos Specification and all ACM was removed properly and no fibrous residue remains on any abated surfaces.

Abatement Contractor Owner's Signature_____Date_____

- - - E N D - - -

SECTION 02 82 13.13
GLOVEBAG ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 SUMMARY OF WORK

A. Contract Documents and Related Requirements: Drawings, general provisions of the contract, including general and supplementary conditions and other Division 01 specifications, shall apply to the work of this section. The contract documents show the work to be done under the contract and related requirements and conditions impacting the project. Related requirements and conditions include applicable codes and regulations, notices and permits, existing site conditions and restrictions on use of the site, requirements for partial owner occupancy during the work, coordination with other work and the phasing of the work. In the event the Asbestos Abatement Contractor discovers a conflict in the contract documents and/or requirements or codes, the conflict must be brought to the immediate attention of the Contracting Officer for resolution. Whenever there is a conflict or overlap in the requirements, the most stringent shall apply. Any actions taken by the Contractor without obtaining guidance from the Contracting Officer shall become the sole risk and responsibility of the Asbestos Abatement Contractor. All costs incurred due to such action are also the responsibility of the Asbestos Abatement Contractor.

B. Extent of Work: Below is a brief description of the estimated quantities of asbestos containing materials to be abated by the Glovebag method. These quantities are for informational purposes only and are based on the best information available at the time of the specification preparation. The Contractor shall satisfy himself as to the actual quantities to be abated. Nothing in this section may be interpreted as limiting the extent of work otherwise required by this contract and related documents.

1. Removal, clean-up and disposal of ACM piping and fittings and asbestos contaminated elements in an appropriate regulated area in the following approximate quantities:

Asbestos Containing Materials - AMI Hazardous Material Survey Dated July 26, 2021. Available to contractor upon request to COR.

1. Beige TSI Pipe Wrap 2”, 4” ASSUMED Bldg 70 Rm 38,39, E104HC 250 LF
2. Beige TSI Mudded Fittings 2”, 4” ASSUMED Bldg 70 Rm 38,39, E104HC 30 EA
3. Beige TSI Pipe Wrap 2” ASSUMED Bldg111 B0423,B0610,B0622 60 LF
4. Beige TSI Mudded Fittings 2” ASSUMED Bldg. 111 B0423,B0610,B0622 6 EA
5. TSI Inside Heater ASSUMED Bldg 6 Rms B103,D206,C303 3 EA
6. TSI Inside Heater ASSUMED Bldg 70 E104HC, C126, D125 3 EA
7. TSI Inside Heater ASSUMED Bldg 111 Rms 8409,9409,10409 3 EA

C. Related Work:
   1. Section 02 41 00, DEMOLITION
   2. Section 02 82 11, TRADITIONAL ASBESTOS ABATEMENT
   3. SECTION 02 82 13.19, ASBESTOS FLOOR TILE AND MASTIC ABATEMENT
   4. SECTION 02 82 13.31, ASBESTOS TRANSITE AND ABATEMENT
D. SECTION 02 83 33.13 LEAD BASED PAINT REMOVAL AND DISPOSALTASKS:
   1. The work tasks are summarized briefly as follows:
      a. Pre-abatement activities including pre-abatement meeting(s), inspection(s), notifications, permits, submittal approvals, work-site preparations, emergency procedures arrangements, and Asbestos Hazard Abatement Plans for Glovebag asbestos abatement work.
      b. Abatement activities including removal, clean-up and disposal of ACM waste, recordkeeping, security, monitoring, and inspections.
      c. Cleaning and decontamination activities including final visual inspection, air monitoring and certification of decontamination.
E. Abatement Contractor Use of Premises:
F. The Contractor and Contractor's personnel shall cooperate fully with the VA Representative consultant to facilitate efficient use of buildings and areas within buildings. The Contractor shall perform the work in accordance with the VA specifications, drawings, phasing plan and in compliance with any all applicable Federal, State and Local regulations and requirements.
G. The Contractor shall use the existing facilities in the building strictly within the limits indicated in contract documents as well as the approved VA Design and Construction Procedures. VA Design and Construction Procedures drawings of partially occupied buildings will

show the limits of regulated areas; the placement of decontamination facilities; the temporary location of bagged waste ACM; the path of transport to outside the building; and the temporary waste storage area for each building/regulated area. Any variation from the arrangements shown on drawings shall be secured in writing from the VA Representative through the pre-abatement plan of action. The following limitations of use shall apply to existing facilities shown on drawings.

1.2 VARIATIONS IN QUANTITY

A. The quantities and locations of ACM as indicated on the drawings and the extent of work included in this section are estimated, which are limited by the physical constraints imposed by occupancy of the buildings and accessibility to ACM. Accordingly, minor variations (+/- 10 percent) in quantities of ACM within the regulated area are considered as having no impact on contract price and time requirements of this contract. Where additional work is required beyond the above variation, the contractor shall provide unit prices for newly discovered ACM and those prices shall be used for additional work required under the contractor.

1.3 STOP ASBESTOS REMOVAL

A. If the Contracting Officer; their field representative; the facility Safety Officer/Manager or their designee, or the VA Professional Industrial Hygienist/Certified Industrial Hygienist (VPIH/CIH) presents a verbal Stop Asbestos Removal Order, the Contractor/Personnel shall immediately stop all asbestos removal and maintain HEPA filtered negative pressure air flow in the containment and adequately wet any exposed ACM. If a verbal Stop Asbestos Removal Order is issued, the VA shall follow-up with a written order to the Contractor as soon as it is practicable. The Contractor shall not resume any asbestos removal activity until authorized to do so in writing by the VA Contracting Officer. A stop asbestos removal order may be issued at any time the VA Contracting Officer determines abatement conditions/activities are not within VA specification, regulatory requirements or that an imminent hazard exists to human health or the environment. Work stoppage will continue until conditions have been corrected to the satisfaction of the VA. Standby time and costs for corrective actions will be borne by the Contractor, including the VPIH/CIH time. The occurrence of any of

the following events shall be reported immediately by the Contractor's competent person to the VA Contracting Office or field representative using the most expeditious means (e.g., verbal or telephonic), followed up with written notification to the Contracting Officer as soon as practical. The Contractor shall immediately stop asbestos removal/disturbance activities and initiate fiber reduction activities if:

1. Airborne PCM analysis results equal to or greater than 0.01 f/cc above background levels inside the building but outside the regulated area;
2. breach or break in regulated area containment barrier(s);
3. less than −0.02 inch WCG pressure in the regulated area;
4. serious injury/death at the site;
5. fire/safety emergency at the site;
6. respiratory protection system failure;
7. power failure or loss or inadequate use of wetting agent; or
8. any visible emissions observed outside the regulated area; or
9. failure to follow project specification requirements.

1.4 DEFINITIONS

A. General: Definitions and explanations here are neither complete nor exclusive of all terms used in the contract documents, but are general for the work to the extent they are not stated more explicitly in another element of the contract documents. Drawings must be recognized as diagrammatic in nature and not completely descriptive of the requirements indicated therein.

B. Glossary:

Abatement - Procedures to control fiber release from asbestos-containing materials. Includes removal, encapsulation, enclosure, demolition, and renovation activities related to asbestos containing materials (ACM).

Aerosol - Solid or liquid particulate suspended in air.

Adequately wet - Sufficiently mixed or penetrated with liquid to prevent the release of particulates. If visible emissions are observed coming from the ACM, then that material has not been adequately wetted.

Aggressive method - Removal or disturbance of building material by sanding, abrading, grinding, or other method that breaks, crumbles, or disintegrates intact ACM.

Aggressive air sampling - EPA AHERA defined clearance sampling method using air moving equipment such as fans and leaf blowers to aggressively disturb and maintain in the air residual fibers after abatement.

AHERA - Asbestos Hazard Emergency Response Act. Asbestos regulations for schools issued in 1987.

Aircell - Pipe or duct insulation made of corrugated cardboard which contains asbestos.

Air monitoring - The process of measuring the fiber content of a known volume of air collected over a specified period of time. The NIOSH 7400 Method, Issue 3, Fifth Edition is used to determine the fiber levels in air. For personal samples, area air samples and clearance air testing using Phase Contrast Microscopy (PCM) analysis, the NIOSH Method 7402 Issue 2, Fourth Edition) can be used when it is necessary to confirm fibers counted by PCM as being asbestos. The AHERA TEM analysis may be used for background, area samples and clearance samples when required by this specification, or at the discretion of the VPIH/CIH as appropriate.

Air sample filter - The filter used to collect fibers which are then counted. The filter is made of mixed cellulose ester membrane (MCE) for PCM (Phase Contrast Microscopy, 25 mm, 3-piece with 2 inches Static Extension Cowl, 0.8 micron pore size) and MCE for TEM (Transmission Electron Microscopy, 25 mm, 3-piece with 2 inches Static Extension Cowl, 0.45 micron pore size).

Amended water - Water to which a surfactant (wetting agent) has been added to increase the penetrating ability of the liquid.

Asbestos - Includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos, and any of these minerals that have been chemically treated or altered. Asbestos also includes PACM, as defined below.

Asbestos Hazard Abatement Plan (AHAP) - Asbestos work procedures required to be submitted by the contractor before work begins.

Asbestos-containing material (ACM) - Any material containing more than one percent of asbestos.

Asbestos contaminated elements (ACE) - Building elements such as ceilings, walls, lights, or ductwork that are contaminated with asbestos.

Asbestos-contaminated soil (ACS) – Soil found in the work area or in adjacent areas such as crawlspaces or pipe tunnels which is contaminated with asbestos-containing material debris and cannot be easily separated from the material.

Asbestos-containing waste (ACW) material - Asbestos-containing material or asbestos contaminated objects requiring disposal.

Asbestos Project Monitor – Some States require that any person conducting asbestos abatement air sampling, clearance inspections and clearance air sampling be licensed as an asbestos project monitor.

Asbestos waste decontamination facility - A system consisting of drum/bag washing facilities and a temporary storage area for cleaned containers of asbestos waste. Used as the exit for waste and equipment leaving the regulated area. In an emergency, it may be used to evacuate personnel.

Authorized person - Any person authorized by the VA, the Contractor, or government agency and required by work duties to be present in regulated areas.

Authorized visitor - Any person approved by the VA; the contractor; or any government agency representative having jurisdiction over the regulated area (e.g., OSHA, Federal and State EPA).

Barrier - Any surface that isolates the regulated area and inhibits fiber migration from the regulated area.

Containment Barrier - An airtight barrier consisting of walls, floors, and/or ceilings of sealed plastic sheeting which surrounds and seals the outer perimeter of the regulated area.

Critical Barrier - The barrier responsible for isolating the regulated area from adjacent spaces, typically constructed of 2-layers of 6-mil independently installed plastic sheeting (Polyethylene) secured in place at openings such as doors, windows, penetrations or any other opening into the regulated area.

Primary Barrier – Plastic barriers placed over critical barriers and exposed directly to abatement work or to secondary barrier.

Secondary Barrier - Any additional plastic barriers used to isolate and provide protection from debris during abatement work.

Breathing zone - The hemisphere forward of the shoulders with a radius of about 150 - 225 mm (6 - 9 inches) from the worker's nose.

Bridging encapsulant - An encapsulant that forms a layer on the surface of the ACM.

Building/facility owner - The legal entity, including a lessee, which exercises control over management and recordkeeping functions relating to a building and/or facility in which asbestos activities take place.

Bulk testing - The collection and analysis of suspect asbestos containing materials.

Certified Industrial Hygienist (CIH) - A person certified in the comprehensive practice of industrial hygiene by the American Board of Industrial Hygiene.

Class I asbestos work - Activities involving the removal of Thermal System Insulation (TSI) and surfacing ACM and Presumed Asbestos Containing Material (PACM).

Class II asbestos work - Activities involving the removal of ACM which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastic.

Clean room/Changing room - An uncontaminated room having facilities for the storage of employee's street clothing and uncontaminated materials and equipment.

Clearance sample - The final air sample taken after all asbestos work has been done and visually inspected. Performed by the VA's Professional Industrial Hygiene Consultant/Certified Industrial Hygienist (VPIH/CIH).

Closely resemble - The major workplace conditions which have contributed to the levels of historic asbestos exposure, are no more protective than conditions of the current workplace.

Competent person - In addition to the definition in 29 CFR 1926.32(f), one who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure, who has the authority to take prompt corrective measures to eliminate them, as specified in 29 CFR 1926.32(f); in addition, for Class I and II work who is specially trained in a training course which meets the criteria of EPA's Model Accreditation Plan (40 CFR 763) for supervisor.

Contractor's Professional Industrial Hygienist (CPIH/CIH) - The asbestos abatement contractor's industrial hygienist. The industrial hygienist must meet the qualification requirements of a PIH and may report to a certified industrial hygienist (CIH).

Count - Refers to the fiber count or the average number of fibers greater than five microns in length with a length-to-width (aspect) ratio of at least 3 to 1, per cubic centimeter of air.

Crawlspace – An area which can be found either in or adjacent to the work area. This area has limited access and egress and may contain asbestos materials and/or asbestos contaminated soil.

Decontamination area/unit - An enclosed area adjacent to and connected to the regulated area and consisting of an equipment room, shower room, and clean room, which is used for the decontamination of workers, materials, and equipment that are contaminated with asbestos.

Demolition - The wrecking or taking out of any load-supporting structural member and any related razing, removing, or stripping of asbestos products.

Disposal bag - Typically 6-mil thick sift-proof, dustproof, leak-tight container used to package and transport asbestos waste from regulated areas to the approved landfill. Each bag/container must be labeled/marked in accordance with EPA, OSHA and DOT requirements.

Disturbance - Asbestos Operations and Maintenance Activities (OSHA Class III) that disrupt the matrix of ACM or PACM, crumble or pulverize ACM or PACM, or generate visible debris from ACM or PACM. Disturbance includes cutting away small amounts of ACM or PACM, no greater than the amount that can be contained in one standard sized glove bag or waste bag, in order to access a building component. In no event shall the amount of ACM or PACM so disturbed exceed that which can be contained in one glove bag or disposal bag, which shall not exceed 60 inches in length or width.

Drum - A rigid, impermeable container made of cardboard fiber, plastic, or metal which can be sealed in order to be sift-proof, dustproof, and leak-tight.

Employee exposure – The exposure to airborne asbestos that would occur if the employee were not wearing respiratory protection equipment.

Encapsulant - A material that surrounds or embeds asbestos fibers in an adhesive matrix and prevents the release of fibers.

Encapsulation - Treating ACM with an encapsulant.

Enclosure - The construction of an air tight, impermeable, permanent barrier around ACM to control the release of asbestos fibers from the material and also eliminate access to the material.

Equipment room - A contaminated room located within the decontamination area that is supplied with impermeable bags or containers for the disposal of contaminated protective clothing and equipment.

Fiber - A particulate form of asbestos, 5 microns or longer, with a length to width (aspect) ratio of at least 3 to 1.

Fibers per cubic centimeter (f/cc) - Abbreviation for fibers per cubic centimeter, used to describe the level of asbestos fibers in air.

Filter - Media used in respirators, vacuums, or other machines to remove particulate from air.

Firestopping - Material used to close the open parts of a structure in order to prevent a fire from spreading.

Friable asbestos containing material - Any material containing more than one (1) percent asbestos as determined using the method specified 40 CFR 763, Polarized Light Microscopy, that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.

Glovebag - Not more than a 60 x 60 inch impervious plastic bag-like enclosure affixed around an asbestos-containing material, with glove-like appendages through which materials and tools may be handled.

High efficiency particulate air (HEPA) filter – An ASHRAE MERV 17 filter capable of trapping and retaining at least 99.97 percent of all mono-dispersed particles of 0.3 micrometers in diameter.

HEPA vacuum - Vacuum collection equipment equipped with a HEPA filter system capable of collecting and retaining asbestos fibers.

Homogeneous area - An area of surfacing, thermal system insulation or miscellaneous ACM that is uniform in color, texture and date of application.

HVAC - Heating, Ventilation and Air Conditioning

Industrial hygienist (IH) - A professional qualified by education, training, and experience to anticipate, recognize, evaluate and develop controls for occupational health hazards. Meets definition requirements of the American Industrial Hygiene Association (AIHA).

Industrial hygienist technician (IH Technician) - A person working under the direction of an IH or CIH who has special training,

experience, certifications and licenses required for the industrial hygiene work assigned. Some States require that an industrial hygienist technician conducting asbestos abatement air sampling, clearance inspection and clearance air sampling be licensed as an asbestos project monitor.

Intact - The ACM has not crumbled, been pulverized, or otherwise deteriorated so that the asbestos is no longer likely to be bound with its matrix.

Lockdown - Applying encapsulant, after a final visual inspection, on all abated surfaces at the conclusion of ACM removal prior to removal of critical barriers.

National Emission Standards for Hazardous Air Pollutants (NESHAP) - EPA's rule to control emissions of asbestos to the environment (40 CFR Part 61, Subpart M).

Negative initial exposure assessment - A demonstration by the employer which complies with the criteria in 29 CFR 1926.1101 (f)(2)(iii), that employee exposure during an operation is expected to be consistently below the PEL or Excursion Limit (EL).

Negative pressure - Air pressure which is lower than the surrounding area, created by exhausting air from a sealed regulated area through HEPA equipped filtration units. OSHA requires maintaining -0.02 inch water column gauge inside the negative pressure enclosure.

Negative pressure respirator - A respirator in which the air pressure inside the facepiece is negative during inhalation relative to the air pressure outside the respirator facepiece.

Non-friable ACM - Material that contains more than 1 percent asbestos but cannot be crumbled, pulverized, or reduced to powder by hand pressure.

Organic vapor cartridge - The type of cartridge used on air purifying respirators to remove organic vapor hazardous air contaminants.

Outside air - The air outside buildings and structures, including, but not limited to, the air under a bridge or in an open ferry dock.

Owner/operator - Any person who owns, leases, operates, controls, or supervises the facility being demolished or renovated or any person who owns, leases, operates, controls, or supervises the demolition or renovation operation, or both.

Penetrating encapsulant - Encapsulant that is absorbed into the ACM matrix without leaving a surface layer.

Permissible exposure limit (PEL) - The level of exposure OSHA allows for an 8-hour time weighted average. For asbestos fibers, the eight (8) hour time-weighted average PEL is 0.1 fibers per cubic centimeter (0.1 f/cc) of air and the 30-minute Excursion Limit (EL) is 1.0 fibers per cubic centimeter (1 f/cc).

Personal protective equipment (PPE) – equipment designed to protect user from injury and/or specific job hazard. Such equipment may include protective clothing, hard hats, safety glasses, fall protection, and respirators.

Personal sampling/monitoring - Representative air samples obtained in the breathing zone for one or more workers within the regulated area using a filter cassette and a calibrated air sampling pump to determine asbestos exposure.

Pipe tunnel – An area, typically located adjacent to mechanical spaces or boiler rooms in which the pipes servicing the heating system in the building are routed to allow the pipes to access heating elements. These areas may contain asbestos pipe insulation, asbestos fittings, debris or asbestos-contaminated soil.

Polarized light microscopy (PLM) - Light microscopy using dispersion staining techniques and refractive indices to identify and quantify the type of asbestos present in a bulk sample.

Polyethylene sheeting - Strong plastic barrier material 4 to 6-mils thick, semi-transparent, flame retardant per NFPA 241.

Positive/negative fit check - A method of verifying the seal of a facepiece respirator by temporarily occluding the filters and breathing in (inhaling) and then temporarily occluding the exhalation valve and breathing out (exhaling) while checking for inward or outward leakage of the respirator respectively.

Presumed ACM (PACM) - Thermal system insulation, surfacing, and flooring material installed in buildings prior to 1981. If the building owner has actual knowledge, or should have known through the exercise of due diligence that other materials are ACM, they too must be treated as PACM. The designation of PACM may be rebutted pursuant to 29 CFR 1926.1101 (k)(5).

Professional IH - An IH who meets the definition requirements of AIHA; meets the definition requirements of OSHA as a "Competent Person" at 29 CFR 1926.1101 (b); has completed two specialized EPA approved courses on management and supervision of asbestos abatement projects; has formal training in respiratory protection and waste disposal; and has a minimum of four projects of similar complexity with this project of which at least three projects serving as the supervisory IH. The PIH may be either the VA's PIH (VPIH/CIH) or Contractor's PIH (CPIH/CIH).

Project designer - A person who has successfully completed the training requirements for an asbestos abatement project designer as required by 40 CFR 763 Subpart E, Appendix C, Part I; (B)(5).

Assigned Protection factor - A value assigned by OSHA/NIOSH to indicate the expected protection provided by each respirator class, when the respirator is properly selected and worn correctly. The number indicates the reduction of exposure level from outside to inside the respirator facepiece.

Qualitative fit test (QLFT) - A fit test using a challenge material that can be sensed by the wearer if leakage in the respirator occurs.

Quantitative fit test (QNFT) - A fit test using a challenge material which is quantified outside and inside the respirator thus allowing the determination of the actual fit factor.

Regulated area - An area established by the employer to demarcate where Class I, II, III asbestos work is conducted, and any adjoining area where debris and waste from such asbestos work may accumulate; and a work area within which airborne concentrations of asbestos exceed, or there is a reasonable possibility they may exceed the PEL.

Regulated ACM (RACM) - Friable ACM; Category I non-friable ACM that has become friable; Category I non-friable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading or; Category II non-friable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of the demolition or renovation operation.

Removal - All operations where ACM, PACM and/or RACM is taken out or stripped from structures or substrates, including demolition operations.

Renovation - Altering a facility or one or more facility components in any way, including the stripping or removal of asbestos from a facility component which does not involve demolition activity.

Repair - Overhauling, rebuilding, reconstructing, or reconditioning of structures or substrates, including encapsulation or other repair of ACM or PACM attached to structures or substrates.

Shower room - The portion of the PDF where personnel shower before leaving the regulated area.

Supplied air respirator (SAR) - A respiratory protection system that supplies minimum Grade D respirable air per ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-2018.

Surfacing ACM - A material containing more than 1 percent asbestos that is sprayed, troweled on or otherwise applied to surfaces for acoustical, decorative, fireproofing and other purposes.

Surfactant - A chemical added to water to decrease water's surface tension thus making it more penetrating into ACM.

Thermal system ACM - A material containing more than 1 percent asbestos applied to pipes, fittings, boilers, breeching, tanks, ducts, or other structural components to prevent heat loss or gain.

Transmission electron microscopy (TEM) - A microscopy method that can identify and count asbestos fibers.

VA Professional Industrial Hygienist (VPIH/CIH) – The Department of Veterans Affairs Professional Industrial Hygienist must meet the qualifications of a PIH, and may report to a Certified Industrial Hygienist (CIH).

VA Representative - The VA official responsible for on-going project work.

VA Total – means a building or substantial part of the building is completely removed, torn or knocked down, bulldozed, flattened, or razed, including removal of building debris.

Visible emissions - Any emissions, which are visually detectable without the aid of instruments, coming from ACM/PACM/RACM/ACS or ACM waste material.

Waste/Equipment decontamination facility (W/EDF) – The area in which equipment is decontaminated before removal from the regulated area.

Waste generator - Any owner or operator whose act or process produces asbestos-containing waste material.

Waste shipment record - The shipping document, required to be originated and signed by the waste generator, used to track and substantiate the disposition of asbestos-containing waste material.

Wet cleaning - The process of thoroughly eliminating, by wet methods, any asbestos contamination from surfaces or objects.

C. Referenced Standards Organizations: See Section 01 42 19 REFERENCED STANDARDS.

1.5 APPLICABLE CODES AND REGULATIONS

A. General Applicability of Codes, Regulations, and Standards:

1. All work under this contract shall be done in strict accordance with all applicable Federal, State, and Local regulations, standards and codes governing asbestos abatement, and any other trade work done in conjunction with the abatement. All applicable codes, regulations and standards are adopted into this specification and will have the same force and effect as this specification.
2. The most recent edition of any relevant regulation, standard, document or code shall be in effect. Where conflict among the requirements or with these specification, exists, the most stringent requirement(s) shall be utilized.
3. Copies of all standards, regulations, codes and other applicable documents, including this specification and those listed in Section 1.5 shall be available at the worksite in the clean change area of the worker decontamination system and/or the Contractor’s on-site Field Office. These standards, regulations, codes and other applicable documents, including this specification and those listed in Section 1.5 may be made available electronically.

B. Asbestos Abatement Contractor Responsibility: The Asbestos Abatement Contractor (Contractor) shall assume full responsibility and liability for compliance with all applicable Federal, State and Local regulations related to any and all aspects of the asbestos abatement project. The Contractor is responsible for providing and maintaining training, accreditations, medical exams, medical records, personal protective equipment (PPE), respiratory protection, and respirator fit testing, as required by applicable Federal, State and Local regulations. The Contractor shall hold the VA and VPIH/CIH consultants harmless for any Contractor’s failure to comply with any applicable work, packaging, transporting, disposal, safety, health, or environmental requirement on

the part of himself, his employees, or his subcontractors. The Contractor will incur all costs of the CPIH/CIH, including all sampling/analytical costs to assure compliance with OSHA/EPA/State/Local requirements related to failure to comply with the regulations applicable to the work.

C. Federal Requirements: Federal requirements which govern some aspect of asbestos abatement include, but are not limited to, the following regulations.

1. Occupational Safety and Health Administration **(OSHA)**
   a. Title 29 CFR 1926.1101 - Construction Standard for Asbestos
   a. Title 29 CFR 1926 Subpart E - Personal Protective Equipment and Life Saving Equipment
   b. Title 29 CFR 1910.134 - Respiratory Protection
   c. Title 29 CFR 1926 - Construction Industry Standards
   d. Title 29 CFR 1926.33 - Access to Employee Exposure and Medical Records
   e. Title 29 CFR 1926.59 same as 1910.1200 - Hazard Communication
   f. Title 29 CFR 1926 Subpart C – General Safety and Health Provisions and Subpart D – Occupational Health and Environmental Controls
2. Environmental Protection Agency **(EPA)**
   a. 1.40 CFR 61 Subpart M - National Emission Standard for Hazardous Air Pollutants - Asbestos
   a. 2.40 CFR 763.80 - Asbestos Hazard Emergency Response Act (AHERA) and Asbestos Hazard Abatement Reauthorization Act (ASHARA)
3. Department of Transportation **(DOT)**
   a. Title 49 CFR 171 - 180 – Transportation

D. State Requirements:

1. State requirements that apply to the asbestos abatement work, disposal, clearance, etc., include, but are not limited to, the following:

   Wisconsin Dept. Health and Human Services
   Lead and Asbestos Section
   1 W Wilson St., Room 137
   Madison, WI 53703-3445

   Wisconsin Dept. of Natural Resources
   P.O. Box 7921
   Madison, WI 53707
   Ch. NR 447 Wis. Admin. Code

E. Local Requirements:
   1. If Local requirements are more stringent than Federal or State standards, the local standards are to be followed.

      City of Milwaukee, WI (within city limits)

F. Standards:
   1. Standards which govern asbestos abatement activities include, but are not limited to, the following:
      a. American National Standards Institute (ANSI/ASSP) Z9.2-2018 - Fundamentals Governing the Design and Operation of Local Exhaust Systems and ANSI/ASSE Z88.2-2015 - Practices for Respiratory Protection.
      b. Underwriters Laboratories (UL) 586-2009 - UL Standard for Safety of HEPA filter Units, 9th Edition; ANSI Approval 2017-12-19.
   2. Standards which govern encapsulation work include, but are not limited to, the following:
      a. American Society for Testing and Materials International (ASTM).
   3. Standards which govern the fire and safety concerns in abatement work include, but are not limited to, the following:
      a. National Fire Protection Association (NFPA) 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations.
      b. NFPA 701 - Standard Methods for Fire Tests for Flame Resistant Textiles and Film.
      c. NFPA 101 - Life Safety Code.

G. EPA Guidance Documents:
   1. EPA guidance documents which discuss asbestos abatement work activities are listed below. These documents are made part of this section by reference. Guidance for Controlling ACM in Buildings (Purple Book) EPA 560/5-85-024.
   2. Asbestos Waste Management Guidance EPA 530-SW-85-007.
   3. A Guide to Respiratory Protection for the Asbestos Abatement Industry EPA-560-OPTS-86-001.
   4. Guide to Managing Asbestos in Place (Green Book) TS 799 20T July 1990.

H. Notices:

1. State and Local agencies: Send written notification as required by state and local regulations including the local fire department prior to beginning any work on ACM as follows:

   Wisconsin Dept. Health and Human Services
   Lead and Asbestos Section
   1 W Wilson St., Room 137
   Madison, WI 53703-3445

   Wisconsin Dept. of Natural Resources
   P.O. Box 7921
   Madison, WI 53707
   Ch. NR 447 Wis. Admin. Code

   City of Milwaukee (if applicable)

2. Copies of notifications shall be submitted to the VA for the facility's records in the same time frame notification are given to EPA, State, and Local authorities.

I. Permits/Licenses: The contractor shall apply for and have all required permits and licenses to perform asbestos abatement work as required by Federal, State, and Local regulations prior to beginning any work on ACM as follows.

J. Posting and Filing of Regulations: Maintain two (2) copies of applicable Federal, State, and Local regulations. Post one copy of each at the regulated area where workers will have daily access to the regulations and keep another copy in the Contractor's office.

K. VA Responsibilities Prior to Commencement of Work:

1. Notify occupants adjacent to regulated areas of project dates and requirements for relocation, if needed. Arrangements must be made prior to starting work for relocation of desks, files, equipment, and personal possessions to avoid unauthorized access into the regulated area. Note: **Notification of adjacent personnel is required by OSHA in 29 CFR 1926.1101 (k) to prevent unnecessary or unauthorized access to the regulated area.**

2. Submit to the Contractor results of background air sampling; including location of samples, person who collected the samples, equipment utilized, calibration data and method of analysis. During abatement, submit to the Contractor, results of bulk material analysis and air sampling data collected during the course of the

abatement. This information shall not release the Contractor from any responsibility for OSHA compliance.

L. Emergency Action Plan and Arrangements:

1. An Emergency Action Plan shall be developed by prior to commencing abatement activities and shall be agreed to by the Contractor and the VA. The Plan shall meet the requirements of 29 CFR 1926, Subpart C, Standard 1926.35 Employee Emergency Action Plans.
2. Emergency procedures shall be in written form and prominently posted in the clean room and equipment room of the decontamination unit. Everyone, prior to entering the regulated area, must read and sign these procedures to acknowledge understanding of the regulated area layout, location of emergency exits and emergency procedures.
3. Emergency planning shall include written notification of police, fire, and emergency medical personnel of planned abatement activities; work schedule; layout of regulated area; and access to the regulated area, particularly barriers that may affect response capabilities.
4. Emergency planning shall include consideration of fire, explosion, hazardous atmospheres, electrical hazards, slips/trips and falls, confined spaces, and heat stress illness. Written procedures for response to emergency situations shall be developed and employee training in procedures shall be provided.
5. Employees shall be trained in regulated area/site evacuation procedures in the event of workplace emergencies.
   a. For non-life-threatening situations - employees injured or otherwise incapacitated shall be decontaminated following normal procedures with assistance from fellow workers, if necessary, before exiting the regulated area to obtain proper medical treatment.
   b. For life-threatening injury or illness, worker decontamination shall take least priority after measures to stabilize the injured worker, medical personnel shall remove them from the regulated area if back or neck injury is present, and secure proper medical treatment.
6. Telephone numbers of any/all emergency response personnel shall be prominently posted in the clean room, along with the location of the nearest telephone.

7. The Contractor shall provide verification of first aid/CPR training for personnel responsible for providing first aid/CPR. OSHA requires medical assistance within 3-4 minutes of a life-threatening injury/illness. Bloodborne Pathogen training shall also be verified for those personnel required to provide first aid/CPR.
8. The Emergency Action Plan shall provide for a Contingency Plan in the event that an incident occurs that may require the modification of the Asbestos Hazard Abatement Plans during abatement. Such incidents include, but are not limited to, fire; accident; power failure; negative pressure failure; and supplied air system failure. The Contractor shall detail procedures to be followed in the event of an incident assuring that asbestos abatement work is stopped and wetting is continued until correction of the problem.

M. Pre-Construction Meeting:

1. Prior to commencing the work, the Contractor shall meet with the VPIH/CIH to present and review, as appropriate, the items following this paragraph. The Contractor's Competent Person(s) who will be on-site shall participate in the pre-start meeting. The pre-start meeting is to discuss and determine procedures to be used during the project. At this meeting, the Contractor shall provide:
   a. Proof of Contractor licensing.
   b. Proof the Competent Person is trained and accredited and approved for working in this State. Verification of the experience of the Competent Person shall also be presented.
   c. A list of all workers who will participate in the project, including experience and verification of training and accreditation.
   d. A list of and verification of training for all personnel who have current first-aid/CPR training. A minimum of one person per shift must have adequate training.
   e. Current medical written opinions for all personnel working on-site meeting the requirements of 29 CFR 1926.1101 (m).
   f. Current fit-tests for all personnel wearing respirators on-site meeting the requirements of 29 CFR 1926.1101 (h) and Appendix C.
   g. A copy of the Contractor's Asbestos Hazard Abatement Plan. In these procedures, the following information must be detailed, specific for this project. A copy of the Contractor's Asbestos

Hazard Abatement Plan (AHAP) for Class I Glovebag Asbestos Abatement. In these procedures, the following information must be detailed, specific for this project.

1) Regulated area preparation procedures;
2) Notification requirements procedure of Contractor as required in 29 CFR 1926.1101 (d) Multi-Employer Worksites;
3) If required, decontamination area set-up/layout and decontamination procedures for employees;
4) Glovebag abatement methods/procedures and equipment to be used; and
5) Personal protective equipment to be used

2. At this meeting the Contractor shall provide all submittals as required.
3. Procedures for handling, packaging and disposal of asbestos waste.
4. Emergency Action Plan and Contingency Plan Procedures.

1.6 PROJECT COORDINATION

A. The following are the minimum administrative and supervisory personnel necessary for coordination of the work.

1. Personnel

a. Administrative and supervisory personnel shall consist of a qualified Competent Person(s) as defined by OSHA in the Construction Standards and the Asbestos Construction Standard; Contractor Professional Industrial Hygienist and Industrial Hygiene Technicians. These employees are the Contractor's representatives responsible for compliance with these specifications and all other applicable requirements.

b. Non-supervisory personnel shall consist of an adequate number of qualified personnel to meet the schedule requirements of the project. Personnel shall meet required qualifications. Personnel utilized on-site shall be pre-approved by the VA Representative. A request for approval shall be submitted for any person to be employed during the project giving the person's name; last four digits of social security number; qualifications; accreditation card with color picture if required by State; Certificate of Worker's Acknowledgment; and Affidavit of Medical Surveillance and Respiratory Protection and current Respirator Fit Test.

c. Minimum qualifications for Contractor and assigned personnel are:

1) The Contractor has conducted within the last three (3) years, three (3) projects of similar complexity and dollar value as this project; has not been cited and penalized for serious violations of Federal (and State or Local as applicable) EPA and OSHA asbestos regulations in the past three (3) years; has adequate liability/occurrence insurance for asbestos work as required by the State; is licensed in applicable State; has adequate and qualified personnel available to complete the work; has comprehensive Asbestos Hazard Abatement Plans (AHAPs) for asbestos work; and has adequate materials, equipment and supplies to perform the work.
2) The Competent Person has four (4) years of abatement experience of which two (2) years were as the Competent Person on the project; meets the OSHA definition of a Competent Person; has been the Competent Person on two (2) projects of similar size and complexity as this project within the past three (3) years; has completed EPA AHERA/OSHA/State/Local training requirements/accreditation(s) and refreshers; and has all required OSHA documentation related to medical and respiratory protection.
3) The Contractor Professional Industrial Hygienist/CIH (CPIH/CIH) shall have five (5) years of monitoring experience and supervision of asbestos abatement projects; has participated as senior IH on five (5) abatement projects, three (3) of which are similar in size and complexity as this project; has specialized EPA AHERA/OSHA training in asbestos abatement management, respiratory protection, waste disposal and asbestos inspection; has completed the NIOSH 582 Course or equivalent, Contractor/Supervisor course; and has appropriate medical/respiratory protection records/documentation.
4) The Abatement Personnel shall have completed the EPA AHERA/OSHA abatement worker course; have training on the Asbestos Hazard Abatement Plans of the Contractor; has one year of asbestos abatement experience within the past three (3) years of similar size and complexity; has applicable medical and respiratory protection documentation; has

certificate of training/current refresher and State accreditation/license.

2. All personnel shall be in compliance with OSHA construction safety training as applicable and submit certification.

1.7 RESPIRATORY PROTECTION

A. General - Respiratory Protection Program: The Contractor shall develop and implement a written Respiratory Protection Program (RPP) which is in compliance with OSHA requirements found at 29 CFR 1926.1101 and 29 CFR 1910.134. ANSI Standard Z88.2-2015 provides excellent guidance for developing a respiratory protection program. All respirators used must be NIOSH approved for asbestos abatement activities. The written RPP shall, at a minimum, contain the basic requirements found at 29 CFR 1910.134 (c) - Respiratory Protection Program. Respiratory Protection Program Coordinator: The Respiratory Protection Program Coordinator (RPPC) must be identified and shall have two (2) years of experience coordinating RPP of similar size and complexity. The RPPC must submit a signed statement attesting to the fact that the program meets the above requirements.

B. Selection and Use of Respirators: The procedure for the selection and use of respirators must be submitted to the VA as part of the Contractor's qualifications. The procedure must be written clearly enough for workers to understand. A copy of the Respiratory Protection Program must be available in the clean room of the decontamination unit or in the onsite Contractor’s office, for reference by employees or authorized visitors.

C. Minimum Respiratory Protection: Minimum respiratory protection shall be a ½-mask negative pressure air purifying respirator equipped with P100 filters, provided personal air samples in the workplace remain at or below 0.1 f/cc, determined as an 8-hour TWA. Full face powered air purifying respirator equipped with P100 filters shall be required until Contractor demonstrates that personal air samples are at or below 0.1 f/cc, determined as an 8-hour TWA. A higher level of respiratory protection shall be required, if fiber levels exceed 1 f/cc as an 8-hour TWA, inside the regulated work area. Respirator selection shall meet the requirements of 29 CFR 1926.1101 (h) and 29 CFR 1910.134 (d)(3)(i)(A) Table 1, except as indicated in this paragraph. Abatement personnel must have a respirator for their exclusive use.

D. Medical Written Opinion: No employee shall be allowed to wear a respirator unless a physician or other licensed health care professional has provided a written determination they are medically qualified to wear the class of respirator to be used on the project while wearing whole body impermeable garments and subjected to heat or cold stress.

E. Respirator Fit Test: All personnel wearing respirators shall have a current quantitative fit test which was conducted in accordance with 29 CFR 1910.134 (f) and Appendix A. Fit tests shall be done for PAPR's which have been put into a failure mode.

F. Respirator Fit Check: The Competent Person shall assure that the positive/negative pressure user seal check is done each time the respirator is donned by an employee. Head coverings must cover respirator head straps. Any situation that prevents an effective facepiece to face seal as evidenced by failure of a user seal check shall preclude that person from entering the regulated area until resolution of the problem.

G. Maintenance and Care of Respirators: The Respiratory Protection Program Coordinator shall submit evidence and documentation showing compliance with 29 CFR 1910.134 (h) maintenance and care of respirators.

1.8 WORKER PROTECTION

A. Training of Abatement Personnel: Prior to beginning any abatement activity, all personnel shall be trained in accordance with OSHA 29 CFR 1926.1101 (k)(9) and any additional State/Local requirements. Training must include, at a minimum, the elements listed at 29 CFR 1926.1101 (k)(9)(viii). Training shall have been conducted by a third party, EPA/State approved trainer meeting the requirements of EPA 40 CFR 763 Appendix C (AHERA MAP). Initial training certificates and current refresher and accreditation proof must be submitted for each person working at the site.

B. Medical Examinations: Medical examinations meeting the requirements of 29 CFR 1926.1101 (m) shall be provided for all personnel working in the regulated area, regardless of exposure levels. A current physician's written opinion as required by 29 CFR 1926.1101 (m)(4) shall be provided for each person and shall include in the medical opinion that the person has been evaluated for working in a heat and cold stress

environment while wearing personal protective equipment (PPE) and is able to perform the work without risk of material health impairment.

C. Personal Protective Equipment: Provide whole body clothing, head coverings, foot coverings and any other personal protective equipment as determined by conducting the hazard assessment required by OSHA at 29 CFR 1910.132 (d). The Competent Person shall ensure the integrity of personal protective equipment worn for the duration of the project. Duct tape shall be used to secure all suit sleeves to wrists and to secure foot coverings at the ankle.

D. Regulated Area Entry Procedure: The Competent Person shall ensure that each time workers enter the regulated area; they remove ALL street clothes in the clean room of the decontamination unit and put on new disposable coveralls, head coverings, a clean respirator, and then proceed through the shower room to the equipment room where they put on non-disposable required personal protective equipment

E. Decontamination Procedure: The Competent Person shall require all personnel to adhere to following decontamination procedures whenever they leave the regulated area.

1. When exiting the regulated area, remove disposable coveralls, and ALL other clothes, disposable head coverings, and foot coverings or boots in the equipment room.
2. Still wearing the respirator and completely naked, proceed to the shower. Showering is MANDATORY. Care must be taken to follow reasonable procedures in removing the respirator to avoid inhaling asbestos fibers while showering. The following procedure is required as a minimum:
   a. Thoroughly wet body including hair and face. If using a PAPR hold blower above head to keep filters dry.
   b. With respirator still in place, thoroughly decontaminate body, hair, respirator face piece, and all other parts of the respirator except the blower and battery pack on a PAPR. Pay particular attention to cleaning the seal between the face and respirator facepiece and under the respirator straps.
   c. Take a deep breath, hold it and/or exhale slowly, completely wetting hair, face, and respirator. While still holding breath, remove the respirator and hold it away from the face before starting to breathe.

3. Carefully decontaminate the facepiece of the respirator inside and out. If using a PAPR, shut down using the following sequence: a) first cap inlets to filters; b) turn blower off to keep debris collected on the inlet side of the filter from dislodging and contaminating the outside of the unit; c) thoroughly decontaminate blower and hoses; d) carefully decontaminate battery pack with a wet rag being cautious of getting water in the battery pack thus preventing destruction. **(THIS PROCEDURE IS NOT A SUBSTITUTE FOR RESPIRATOR CLEANING!)**
4. Shower and wash body completely with soap and water. Rinse thoroughly.
5. Rinse shower room walls and floor to drain prior to exiting.
6. Proceed from shower to clean room; dry off and change into street clothes or into new disposable work clothing.

F. Regulated Area Requirements: The Competent Person shall meet all requirements of 29 CFR 1926.1101 (o) and assure that all requirements for Class I Glovebag regulated areas at 29 CFR 1926.1101 (e), 29 CFR 1926.1101 (g)(1)(i)(ii)(iii), 29 CFR 1926.1101 (g)(5)(ii)(iii)(iv) are met. All personnel in the regulated area shall not be allowed to eat, drink, smoke, chew tobacco or gum, apply cosmetics, or in any way interfere with the fit of their respirator.

1.9 DECONTAMINATION FACILITIES

A. Description: Provide each regulated area with separate personnel decontamination facilities (PDF) and waste/equipment decontamination facilities (W/EDF). Ensure that the PDF are the only means of ingress and egress to the regulated area and that all equipment, bagged waste, and other material exit the regulated area only through the W/EDF.

B. General Requirements: All personnel entering or exiting a regulated area must go through the PDF and shall follow the requirements at 29 CFR 1926.1101 (j)(1) and these specifications. All waste, equipment and contaminated materials must exit the regulated area through the W/EDF and be decontaminated in accordance with these specifications. Walls and ceilings of the PDF and W/EDF must be constructed of a minimum of 3-layers of 6-mil opaque fire retardant polyethylene sheeting and be securely attached to existing building components and/or an adequate temporary framework. A minimum of 3-layers of 6-mil poly shall also be used to cover the floor under the PDF and W/EDF units. Construct doors

so that they overlap and secure to adjacent surfaces. Weight inner doorway sheets with layers of duct tape so that they close quickly after release. Put arrows on sheets so they show direction of travel and overlap. If the building adjacent area is occupied, construct a solid barrier on the occupied side(s) to protect the sheeting and reduce potential for non-authorized personnel entering the regulated area.

C. Temporary Facilities to the PDF and W/EDF: The Competent Person shall provide temporary water service connections to the PDF and W/EDF. Backflow prevention must be provided at the point of connection to the VA system. Water supply must be of adequate pressure and meet requirements of 29 CFR 1910.141(d)(3). Provide adequate temporary overhead electric power with ground fault circuit interruption (GFCI) protection. Provide a sub-panel equipped with GFCI protection for all temporary power in the clean room. Provide adequate lighting to provide a minimum of 50 foot candles in the PDF and W/EDF. Provide temporary heat, if needed, to maintain 70˚F throughout the PDF and W/EDF.

D. Personnel Decontamination Facility (PDF): The Competent Person shall provide a PDF consisting of shower room which is contiguous to a clean room and equipment room. The PDF must be sized to accommodate the number of personnel scheduled for the project. The shower room, located in the center of the PDF, shall be fitted with as many portable showers as necessary to insure all employees can complete the entire decontamination procedure within 15 minutes. The PDF shall be constructed of opaque poly for privacy. The PDF shall be constructed to eliminate any parallel routes of egress without showering.

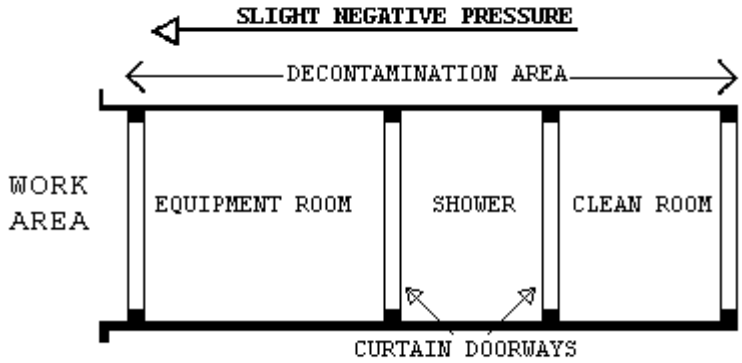
1. Clean Room: The clean room must be physically and visually separated from the rest of the building to protect the privacy of personnel changing clothes. The clean room shall be constructed of at least 3—layers of 6-mil opaque fire retardant poly to provide an air tight room. Provide a minimum of 2 - 900 mm (3 foot) wide 6-mil poly opaque fire retardant doorways. One doorway shall be the entry from outside the PDF and the second doorway shall be to the shower room of the PDF. The floor of the clean room shall be maintained in a clean, dry and sanitary condition. Shower overflow shall not be allowed into the clean room. Provide 1 storage locker per person. A portable fire extinguisher, minimum 10 pounds capacity, Type ABC,

shall be provided in accordance with OSHA and NFPA Standard 10. All persons entering the regulated area shall remove all street clothing in the clean room and dress in disposable protective clothing and respiratory protection. Any person entering the clean room does so either from the outside with street clothing on or is coming from the shower room completely naked and thoroughly washed. Any person entering the regulated area to perform Glovebag removal work, in which a negative exposure assessment has been performed, shall don a double outer protective suit and respirator. Male/Females required to enter the regulated area shall be ensured of their privacy throughout the entry/exit process by posting guards at both entry points to the PDF so no male/female can enter or exit the PDF during his/her stay in the PDF.

2. Shower Room: The Competent Person shall assure that the shower room is a completely water tight compartment to be used for the movement of all personnel from the clean room to the equipment room and for the showering of all personnel going from the equipment room to the clean room. Each shower shall be constructed so water runs down the walls of the shower and into a drip pan. Install a freely draining smooth floor on top of the shower pan. The shower room shall be separated from the rest of the building and from the clean room and equipment room using air tight walls made from at least 3-layers of 6-mil opaque fire retardant poly. The shower shall be equipped with a shower head and controls, hot and cold water, drainage, soap dish and continuous supply of soap, and shall be maintained in a sanitary condition throughout its use. The controls shall be arranged so an individual can shower without assistance. Provide a flexible hose shower head, hose bibs and all other items shown on Shower Schematic. Waste water will be pumped to a drain after being filtered through a minimum of a 100 micron sock in the shower drain; a 20 micron filter; and a final 5 micron filter. Filters will be changed a minimum of once per day or more often as needed. Filter changes must be done in the shower to prevent loss of contaminated water. Hose down all shower surfaces after each shift and clean any debris from the shower pan. Residue is to be disposed of as asbestos waste. The Competent Person shall provide a decontamination area at the outer perimeter of the regulated work area where the employees

will decontaminate the outer protective suit and respirator by wet wiping and HEPA vacuuming.

3. Equipment Room: The Competent Person shall provide an equipment room which shall be an air tight compartment for the storage of work equipment/tools, reusable personal protective equipment, except for a respirator and for use as a gross decontamination area for personnel exiting the regulated area. The equipment room shall be separated from the regulated area by a minimum 3 foot wide door made with 2-layers of 6-mil opaque fire retardant poly. The equipment room shall be separated from the regulated area, the shower room and the rest of the building by air tight walls and ceiling constructed of a minimum of 3-layers of 6-mil opaque fire retardant poly. Damp wipe all surfaces of the equipment room after each shift change. Provide an additional loose layer of 6-mil fire retardant poly per shift change and remove this layer after each shift. If needed, provide a temporary electrical sub-panel equipped with GFCI in the equipment room to accommodate any equipment required in the regulated area. The Competent Person shall provide a decontamination area at the outer perimeter of the regulated work area where the employees will decontaminate the outer protective suit and respirator by wet wiping and HEPA vacuuming.
4. The PDF shall be as follows: Clean room at the entrance followed by a shower room followed by an equipment room leading to the regulated area. Each doorway in the PDF shall be a minimum of 2-layers of 6-mil opaque fire retardant poly.

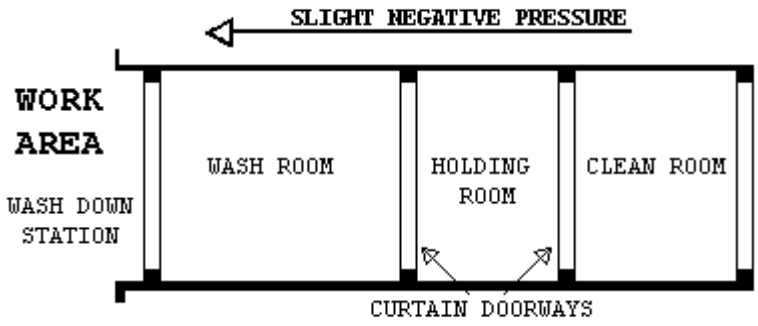


a.

E. . Waste/Equipment Decontamination Facility (W/EDF)

1. The Competent Person shall provide a W/EDF consisting of a wash room, holding room, and clean room for removal of waste, equipment and contaminated material from the regulated area. Personnel shall not enter or exit the W/EDF except in the event of an emergency. Clean debris and residue in the W/EDF daily. All surfaces in the W/EDF shall be wiped/hosed down after each shift and all debris shall be cleaned from the shower pan. The W/EDF shall consist of the following:
   a. Wash Down Station: Provide an enclosed shower unit in the regulated area just outside the Wash Room as an equipment bag and container cleaning station.
   b. Wash Room: Provide a wash room for cleaning of bagged or containerized asbestos containing waste materials passed from the regulated area. Construct the wash room using 50 x 100 mm (2 inches x 4 inches) wood framing and 3-layers of 6-mil fire retardant poly. Locate the wash room so that packaged materials, after being wiped clean, can be passed to the Holding Room. Doorways in the wash room shall be constructed of 2-layers of 6-mil fire retardant poly.
   c. Holding Room: Provide a holding room as a drop location for bagged materials passed from the wash room. Construct the holding room using 50 x 100 mm (2 inches x 4 inches) wood framing or approved equivalent and 3-layers of 6-mil fire retardant poly. The holding room shall be located so that bagged material cannot be passed from the wash room to the clean room unless it goes through the holding room. Doorways in the holding room shall be constructed of 2-layers of 6-mil fire retardant poly.
   d. Clean Room: Provide a clean room to isolate the holding room from the exterior of the regulated area. Construct the clean room using 2 inches x 4 inches wood framing or approved equivalent and 2-layers of 6-mil fire retardant poly. The clean room shall be located so as to provide access to the holding room from the building exterior. Doorways to the clean room shall be constructed of 2-layers of 6-mil fire retardant poly. When a negative pressure differential system is used, a rigid enclosure separation between the W/EDF clean room and the adjacent areas shall be provided.

e. The W/EDF shall be as follows: Wash Room leading to a Holding Room followed by a Clean Room leading to outside the regulated area. See diagram.



F. Waste/Equipment Decontamination Procedures: At the washdown station in the regulated area, thoroughly wet wipe/clean contaminated equipment and/or sealed polyethylene bags and pass into Wash Room after visual inspection. When passing anything into the Wash Room, close all doorways of the W/EDF, other than the doorway between the washdown station and the Wash Room. Keep all outside personnel clear of the W/EDF. Once inside the Wash Room, wet clean the equipment and/or bags. After cleaning and inspection, pass items into the Holding Room. Close all doorways except the doorway between the Holding Room and the Clean Room. Workers from the Clean Room/Exterior shall enter the Holding Room and remove the decontaminated/cleaned equipment/bags for removal and disposal. At no time shall personnel from the clean side be allowed to enter the Wash Room.

PART 2 - PRODUCTS, MATERIALS AND EQUIPMENT

2.1 MATERIALS AND EQUIPMENT

A. General Requirements (all abatement projects): Prior to the start of work, the contractor shall provide and maintain a sufficient quantity of materials and equipment to assure continuous and efficient work throughout the duration of the project. Work shall not start unless the following items have been delivered to the site and the CPIH/CIH has submitted verification to the VA's Representative.

1. All materials shall be delivered in their original package, container or bundle bearing the name of the manufacturer and the brand name (where applicable).
2. Store all materials subject to damage off the ground, away from wet or damp surfaces and under cover sufficient enough to prevent damage or contamination. Flammable and combustible materials cannot be stored inside buildings. Replacement materials shall be stored outside of the regulated area until abatement is completed.
3. The Contractor shall not block or hinder use of buildings by patients, staff, and visitors to the VA in partially occupied buildings by placing materials/equipment in any unauthorized location.
4. The Competent Person shall inspect for damaged, deteriorating or previously used materials. Such materials shall not be used and shall be removed from the worksite and disposed of properly.
5. Polyethylene sheeting for walls in the regulated area shall be a minimum of 4-mils. For floors and all other uses, sheeting of at least 6-mils shall be used in widths selected to minimize the frequency of joints. Fire retardant poly shall be used throughout.
6. The method of attaching polyethylene sheeting shall be agreed upon in advance by the Contractor and the VA and selected to minimize damage to equipment and surfaces. Method of attachment may include any combination of moisture resistant duct tape, poly tape, furring strips, spray glue, staples, nails, screws, lumber and plywood for enclosures or approved equivalent procedures capable of sealing polyethylene to dissimilar finished or unfinished surfaces under both wet and dry conditions.
7. Polyethylene sheeting utilized for the PDF shall be opaque white or black in color, 6-mil fire retardant poly.
8. Installation and plumbing hardware, showers, hoses, drain pans, sump pumps and waste water filtration system shall be provided by the Contractor.
9. An adequate number of HEPA vacuums, scrapers, sprayers, nylon brushes, brooms, disposable mops, rags, sponges, staple guns, shovels, ladders and scaffolding of suitable height and length as well as meeting OSHA requirements, fall protection devices, water hose to reach all areas in the regulated area, airless spray

equipment, and any other tools, materials or equipment required to conduct the abatement project. All electrically operated hand tools, equipment, electric cords shall be connected to GFCI protection.

10. Special protection for objects in the regulated area shall be detailed (e.g., plywood over carpeting or hardwood floors to prevent damage from scaffolds, water and falling material).
11. Disposal bags – 2-layers of 6-mil poly for asbestos waste shall be pre-printed with labels, markings and address as required by OSHA, EPA and DOT regulations.
12. The VA shall be provided an advance copy of the Safety Data Sheets (SDS) as required for all hazardous chemicals under OSHA 29 CFR 1910.1200 - Hazard Communication in the pre-project submittal. Chlorinated compounds shall not be used with any spray adhesive, mastic remover or other product. Appropriate encapsulant(s) shall be provided.
13. OSHA DANGER demarcation signs, as many and as required by OSHA 29 CFR 1926.1101(k)(7) shall be provided and placed by the Competent Person. All other posters and notices required by Federal, State and Local regulations shall be posted in the Clean Room.
14. Adequate and appropriate PPE for the project and number of personnel/shifts shall be provided. All personal protective equipment issued must be based on a written hazard assessment conducted under 29 CFR 1910.132(d)

2.2 CONTAINMENT BARRIERS AND COVERINGS IN THE REGULATED AREA

A. General: Using critical barriers, seal off the perimeter to the regulated area to completely isolate the regulated area from adjacent spaces. All horizontal surfaces in the regulated area must be covered with 2-layers of 6-mil fire retardant poly to prevent contamination and to facilitate clean-up. Should adjacent areas become contaminated, immediately stop work and clean up the contamination at no additional cost to the Government. Provide firestopping and identify all fire barrier penetrations due to abatement work as specified in Section 2.2.7; FIRESTOPPING.

B. Preparation Prior to Sealing the Regulated Area: Place all tools, scaffolding, materials and equipment needed for working in the regulated area prior to erecting any plastic sheeting. Remove all uncontaminated removable furniture, equipment and/or supplies from the

regulated area before commencing work, or completely cover with 2-layers of 6-mil fire retardant poly sheeting and secure with duct tape. Lock out and tag out any HVAC systems in the regulated area.

C. Controlling Access to the Regulated Area: Access to the regulated area is allowed only through the personnel decontamination facility (PDF), if required. All other means of access shall be eliminated and OSHA Danger demarcation signs posted as required by OSHA. If the regulated area is adjacent to or within view of an occupied area, provide a visual barrier of 6-mil opaque fire retardant poly sheeting to prevent building occupant observation. If the adjacent area is accessible to the public, the barrier must be solid.

D. Critical Barriers: Completely separate any openings into the regulated area from adjacent areas using fire retardant poly at least 6-mils thick and duct tape. Individually seal with 2-layers of independently installed 6-mil poly and duct tape all HVAC openings into the regulated area. Individually seal all lighting fixtures, clocks, doors, windows, convectors, speakers, or any other objects in the regulated area. Heat must be shut off any objects covered with poly.

E. Secondary Barriers: A loose layer of 6-mil fire retardant poly shall be used as a drop cloth to protect the floor/horizontal surfaces from debris generated during the Glovebag abatement. This layer shall be replaced as needed during the work.

F. Extension of the Regulated Area: If the enclosure of the regulated area is breached in any way that could allow contamination to occur, the affected area shall be included in the regulated area and constructed as per this section. If the affected area cannot be added to the regulated area, decontamination measures must be started immediately and continue until air monitoring indicates background levels are met.

G. Firestopping:

1. Through penetrations caused by cables, cable trays, pipes, sleeves must be firestopped with a fire-rated firestop system providing an air tight seal.
2. Firestop materials that are not equal to the wall or ceiling penetrated shall be brought to the attention of the VA Representative. The Contractor shall list all areas of penetration, the type of sealant used, and whether or not the location is fire rated. Any discovery of penetrations during abatement shall be

brought to the attention of the VA Representative immediately. All walls, floors and ceilings are considered fire rated unless otherwise determined by the VA Representative or Fire Marshall.

3. Any visible openings whether or not caused by a penetration shall be reported by the Contractor to the VA Representative for a sealant system determination. Firestops shall meet ASTM E814 and UL 1479 requirements for the opening size, penetrant, and fire rating needed

2.3 MONITORING, INSPECTION AND TESTING

A. General:

1. Perform throughout abatement work monitoring, inspection and testing inside and around the regulated area in accordance with the OSHA requirements and these specifications. OSHA requires that the employee exposure to asbestos must not exceed 0.1 fibers per cubic centimeter (f/cc) of air, averaged over an 8-hour work shift. The CPIH/CIH is responsible for and shall inspect and oversee the performance of the Contractor IH Technician. The IH Technician shall continuously inspect and monitor conditions inside the regulated area to ensure compliance with these specifications. In addition, the CPIH/CIH shall personally manage air sample collection, analysis, and evaluation for personnel, regulated area, and adjacent area samples inside the building, but outside the regulated area. Inside the building, but outside the regulated area air samples shall be collected at the boundary of the regulated area and/or Clean Room of the PDF, at the approximate location of HEPA exhaust discharge (if used), and at a minimum of three (3) locations in areas immediately outside the regulated work area to satisfy this specification. Additional inspection and testing requirements are also indicated in other parts of this specification.
2. The VA will employ an independent industrial hygienist (VPIH/CIH) consultant and/or use its own IH to perform various services on behalf of the VA. The VPIH/CIH will perform the necessary monitoring, inspection, testing, and other support services to ensure that VA patients, employees, and visitors will not be adversely affected by the abatement work, and that the abatement work proceeds in accordance with these specifications, that the abated areas or abated buildings have been successfully decontaminated. The work of the VPIH/CIH consultant in no way

relieves the Contractor from their responsibility to perform the work in accordance with contract/specification requirements, to perform continuous inspection, monitoring and testing for the safety of their employees, and to perform other such services as specified. The cost of the VPIH/CIH and their services will be borne by the VA except for any repeat of final inspection and testing that may be required due to unsatisfactory initial results. Any repeated final inspections and/or testing, if required, will be paid for by the Contractor.

3. If fibers counted by the VPIH/CIH during abatement work, either inside or outside the regulated area, utilizing the NIOSH 7400 air monitoring method, exceed the specified respective limits, the Contractor shall stop work. The Contractor may request confirmation of the results by analysis of the samples by TEM. Request must be in writing and submitted to the VA's Representative. Cost for the confirmation of results will be borne by the Contractor for both the collection and analysis of samples and for the time delay that may/does result for this confirmation. Confirmation sampling and analysis will be the responsibility of the CPIH/CIH with review and approval of the VPIH/CIH. An agreement between the CPIH/CIH and the VPIH/CIH shall be reached on the exact details of the confirmation effort, in writing, including such things as the number of samples, location, collection, quality control on-site, analytical laboratory, interpretation of results and any follow-up actions. This written agreement shall be co-signed by the IH's and delivered to the VA's Representative.

B. Scope of Services of the VPIH/CIH Consultant:

1. The purpose of the work of the VPIH/CIH is to: Assure quality; resolve problems; and prevent the spread of contamination beyond the regulated area. In addition, their work includes performing the final inspection and testing to determine whether the regulated area or building has been adequately decontaminated. All air monitoring is to be done utilizing PCM/TEM. The VPIH/CIH will perform the following tasks:

   a. Task 1: Establish background levels before abatement begins by collecting background samples. Retain samples for possible TEM analysis.

b. Task 2: Perform representative air monitoring, inspection, and testing outside the regulated area during actual abatement work to detect any faults in the regulated area isolation and any adverse impact on the surroundings from regulated area activities.
c. Task 3: Perform unannounced visits to spot check overall compliance of work with contract/specifications. These visits may include any inspection, monitoring, and testing inside and outside the regulated area and all aspects of the operation except personnel monitoring.
d. Task 4: Provide support to the VA Representative such as evaluation of submittals from the Contractor, resolution of unforeseen developments, etc.
e. Task 5: Perform, in the presence of the VA Representative, final inspection and testing of a decontaminated regulated area or building at the conclusion of the abatement and clean-up work to certify compliance with all regulations and the VA requirements/specifications.
f. Task 6: Issue certificate of decontamination for each regulated area or building and project report.

2. All data, inspection results and testing results generated by the VPIH/CIH will be available to the Contractor for information and consideration. The Contractor shall cooperate with and support the VPIH/CIH for efficient and smooth performance of their work.
3. The monitoring and inspection results of the VPIH/CIH will be used by the VA to issue any Stop Removal orders to the Contractor during abatement work and to accept or reject a regulated area or building as decontaminated.
4. Monitoring, Inspection and Testing by Abatement Contractor CPIH/CIH: The Contractor’s CPIH/CIH is responsible for managing all monitoring, inspections, and testing required by these specifications, as well as any and all regulatory requirements adopted by these specifications. The CPIH/CIH is responsible for the continuous monitoring of all subsystems and procedures which could affect the health and safety of the Contractor’s personnel. Safety and health conditions and the provision of those conditions inside the regulated area for all persons entering the regulated

area is the exclusive responsibility of the Contractor/Competent Person. The person performing the personnel and area air monitoring inside the regulated area shall be an IH Technician, who shall be trained and shall have specialized field experience in sampling and analysis. The IH Technician shall have successfully completed a NIOSH 582 Course or equivalent and provide documentation. The IH Technician shall participate in the AIHA Asbestos Analysis Registry or participate in the Proficiency Analytical Testing program of AIHA for fiber counting quality control assurance. The IH Technician shall also be an accredited EPA AHERA/State Contractor/Supervisor and Building Inspector. The IH Technician shall have participated in five abatement projects collecting personal and area samples and have experience in substantially similar projects in size and scope. The analytical laboratory used by the Contractor to analyze the samples shall be AIHA accredited for asbestos PAT and approved by the VA prior to start of the project. A daily log shall be maintained by the CPIH/CIH or IH Technician, documenting all OSHA requirements for personal and area air monitoring for asbestos in 29 CFR 1926.1101(f), (g) and Appendix A. This log shall be made available to the VA Representative and the VPIH/CIH upon request. The log will contain, at a minimum, information on personnel or area samples, other persons represented by the sample, the date of sample collection, start and stop times for sampling, sample volume, flow rate, and fibers/cc. The CPIH/CIH shall collect and analyze samples for each representative job being done in the regulated area, i.e., removal, wetting, clean-up, and load-out. No fewer than two (2) personal air samples or 25% of representative workforce per shift shall be collected, whichever is greater, in the regulated area; a minimum of three (3) area air samples at locations inside the building but immediately outside the regulated work area; one (1) area air sample shall be collected daily at the boundary of the regulated area and/or Clean Room of the PDF; and one (1) area air sample shall be collected daily at the approximate location of HEPA exhaust discharge, if used. In addition to the continuous monitoring required, the CPIH/CIH will perform inspection and testing at the final stages of abatement for each regulated area as specified in the CPIH/CIH responsibilities. Additionally, the CPIH/CIH will

monitor and record pressure readings within the containment daily with a minimum of two readings at the beginning and at the end of a shift, and submit the data in the daily report. Pressure readings with the containment may be omitted if negative pressure Glovebag procedures are used.

2.4 ASBESTOS HAZARD ABATEMENT PLAN

A. The Contractor shall have established Asbestos Hazard Abatement Plan (AHAP) in printed form and loose leaf folder consisting of simplified text, diagrams, sketches, and pictures that establish and explain clearly the ways and procedures to be followed during all phases of the work by the Contractor's personnel. The AHAP must be modified as needed to address specific requirements of the project. The AHAP shall be submitted for review and approval prior to the start of any abatement work. The minimum topics and areas to be covered by the AHAP(s) are:

1. Minimum Personnel Qualifications
2. Contingency Plans and Arrangements
3. Security and Safety Procedures
4. Respiratory Protection/Personal Protective Equipment Program and Training
5. Medical Surveillance Program and Recordkeeping
6. Regulated Area Requirements for Glovebag Abatement
7. Decontamination Facilities and Entry/Exit Procedures (PDF and W/EDF) or approved equivalent.
8. Monitoring, Inspections, and Testing
9. Removal Procedures for Piping ACM Using the Glovebag Method
10. Disposal of ACM waste
11. Regulated Area Decontamination/Clean-up
12. Regulated Area Visual and Air Clearance
13. Project Completion/Closeout

2.5 SUBMITTALS

A. Pre-Start Meeting Submittals:

1. Submit to the VA a minimum of 14 days prior to the pre-start meeting the following for review and approval. Meeting this requirement is a prerequisite for the pre-start meeting for this project:
   a. Submit a detailed work schedule for the entire project reflecting contract documents and the phasing/schedule requirements from the CPM chart.

b. Submit a staff organization chart showing all personnel who will be working on the project and their capacity/function. Provide their qualifications, training, accreditations, and licenses, as appropriate. Provide a copy of the "Certificate of Worker's Acknowledgment" and the "Affidavit of Medical Surveillance and Respiratory Protection" for each person.
c. Submit Asbestos Hazard Abatement Plan developed specifically for this project, incorporating the requirements of the specifications, prepared, signed and dated by the CPIH/CIH.
d. Submit the specifics of the materials and equipment to be used for this project with manufacturer names, model numbers, performance characteristics, pictures/diagrams, and number available for the following:
   1) Supplied air system, negative air machines, HEPA vacuums, air monitoring pumps, calibration devices, pressure differential monitoring device and emergency power generating system.
   2) Waste water filtration system, shower system, containment barriers.
   3) Encapsulantys, surfactants, hand held sprayers, airless sprayers, Glovebas, and fire extinguishers.
   4) Respirators, water filtration system, shower system, containment barriers equipment.
   5) Fire safety equipment to be used in the regulated area.
e. Submit the name, location, and phone number of the approved landfill; proof/verification the landfill is approved for ACM disposal; the landfill's requirements for ACM waste; the type of vehicle to be used for transportation; and name, address, and phone number of subcontractor, if used. Proof of asbestos training for transportation personnel shall be provided.
f. Submit required notifications and arrangements made with regulatory agencies having regulatory jurisdiction and the specific contingency/emergency arrangements made with local health, fire, ambulance, hospital authorities and any other notifications/arrangements.
g. Submit the name, location and verification of the laboratory and/or personnel to be used for analysis of air and/or bulk samples. Personal air monitoring must be done in accordance with

OSHA 29 CFR 1926.1101(f) and Appendix A. Area or clearance air monitoring shall be conducted in accordance with EPA AHERA protocols.

h. Submit qualifications verification: Submit the following evidence of qualifications. Make sure that all references are current and verifiable by providing current phone numbers and documentation.
   1) Asbestos Abatement Company: Project experience within the past 3 years; listing projects first most similar to this project; Project Name; Type of Abatement; Duration; Cost; Reference Name/Phone Number; Final Clearance; and Completion Date.
   2) List of project(s) halted by owner, A/E, IH, regulatory agency in the last 3 years: Project Name; Reason; Date; Reference Name/Number; and Resolution.
   3) List asbestos regulatory citations (e.g., OSHA), notices of violations (e.g., Federal, State, Local NESHAP), penalties, and legal actions taken against the company including the company’s officers (including damages paid) in the last 3 years. Provide copies and all information needed for verification.

i. Submit information on personnel: Provide a resume; address each item completely; copies of certificates, accreditations, and licenses. Submit an affidavit signed by the CPIH/CIH stating that all personnel submitted below have medical records in accordance with OSHA 29 CFR 1926.1101(m) and that the company has implemented a medical surveillance program and written respiratory protection program, and maintains recordkeeping in accordance with the above regulations. Submit the phone number and doctor/clinic/hospital used for medical evaluations.
   1) CPIH/CIH and IH Technician: Name; years of abatement experience; list of projects similar to this one; certificates, licenses, accreditations for proof of AHERA/OSHA specialized asbestos training; professional affiliations; medical opinion; and current respirator fit test.
   2) Competent Person(s)/Supervisor(s): Number; names; last four digits of social security numbers; years of abatement experience as Competent Person/Supervisor; list of similar projects in size/complexity as Competent Person/Supervisor; as

a worker; certificates, licenses, accreditations; proof of AHERA/OSHA specialized asbestos training; maximum number of personnel supervised on a project; medical opinion (asbestos surveillance and respirator use); and current respirator fit test.

3) Workers: Numbers; names; last four digits of social security numbers; years of abatement experience; certificates, licenses, accreditations; training courses in asbestos abatement and respiratory protection; medical opinion (asbestos surveillance and respirator use); and current respirator fit test.

j. Submit copies of State license for asbestos abatement; copy of insurance policy, including exclusions with a letter from agent stating in plain language the coverage provided and the fact that asbestos abatement activities are covered by the policy; copy of AHAP(s) incorporating the requirements of this specification; information on who provides your training, how often; who provides medical surveillance, how often; who performs and how is personal air monitoring of abatement workers conducted; a list of references of independent laboratories/IH's familiar with your air monitoring and Asbestos Hazard Abatement Plans; copies of monitoring results of the five referenced projects listed and analytical method(s) used.

k. Rented equipment must be decontaminated prior to returning to the rental agency.

l. Submit, before the start of work, the manufacturer's technical data for all types of encapsulants, all SDS, and application instructions.

B. Submittals During Abatement:

1. The Competent Person shall maintain and submit a daily log at the regulated area documenting the dates and times of the following: purpose, attendees and summary of meetings; all personnel entering/exiting the regulated area; document and discuss the resolution of unusual events such as barrier breeching, equipment failures, emergencies, and any cause for stopping work; representative air monitoring and results/TWAs/ELs. Submit this information daily to the VA's Representative.

2. The CPIH/CIH shall document and maintain the inspection and approval of the regulated area preparation prior to start of work and daily during work.
   a. Removal of any poly barriers and/or failure of negative pressure Glovebags.
   b. Visual inspection/testing by the CPIH/CIH or IH Technician prior to application of lockdown encapsulant.
   c. Packaging and removal of ACM waste from regulated area.
   d. Disposal of ACM waste materials; copies of Waste Shipment Records/landfill receipts to the VA's Representative on a weekly basis.

C. Submittals at Completion of Abatement: The CPIH/CIH shall submit a project report consisting of the daily log book requirements and documentation of events during the abatement project including Waste Shipment Records signed by the landfill's agent. It will also include information on the containment and transportation of waste from the containment with applicable Chain of Custody forms. The report shall include a certificate of completion, signed and dated by the CPIH/CIH, in accordance with Attachment #1. All clearance and perimeter area samples must be submitted. The VA Representative will retain the abatement report after completion of the project and provide copies of the abatement report to VAMC Office of Engineer and the Safety Office.

2.6 ENCAPSULANTS

A. Types of Encapsulants:
   1. The following four types of encapsulants must comply with performance requirements as stated in paragraph 2.6.2:
      a. Removal encapsulant - used as a wetting agent to remove ACM.
      b. Bridging encapsulant - provides a tough, durable coating on ACM.
      c. Penetrating encapsulant - penetrates/encapsulates ACM at least 13 mm (1/2 inch).
      d. Lockdown encapsulant - seals microscopic fibers on surfaces after ACM removal.

B. Performance Requirements:
   1. Encapsulants shall meet the latest requirements of EPA; shall not contain toxic or hazardous substances; or solvents; and shall comply with the following performance requirements:
      a. General Requirements for all Encapsulants:

1) ASTM E84: Flame spread of 25; smoke emission of 50.
2) University of Pittsburgh Protocol: Combustion Toxicity; zero mortality.
3) ASTM C732: Accelerated Aging Test; Life Expectancy - 20 years.
4) ASTM E96: Permeability - minimum of 0.4 perms.

b. Bridging/Penetrating Encapsulants:
1) ASTM E736: Cohesion/Adhesion Test - 24 kPa (50 pounds/square foot).
2) ASTM E119: Fire Resistance - 3 hours (Classified by UL for use on fibrous/cementitious fireproofing).
3) ASTM D2794: Gardner Impact Test; Impact Resistance - minimum 11.5 kg-mm (43 in/lb).
4) ASTM D522: Mandrel Bend Test; Flexibility - no rupture or cracking

c. Lockdown Encapsulants:
1) ASTM E119: Fire resistance - 3 hours (tested with fireproofing over encapsulant applied directly to steel member).
2) ASTM E736: Bond Strength - 48 kPa (100 pounds/square foot) (test compatibility with cementitious and fibrous fireproofing).
3) In certain situations, encapsulants may have to be applied to hot pipes/equipment. The encapsulant must be able to withstand high temperatures without cracking or creating any noxious gaseous or vapors during or after application.

2.7 CERTIFICATES OF COMPLIANCE

A. The Contractor shall submit to the VA Representative certification from the manufacturer indicating compliance with performance requirements for encapsulants when applied according to manufacturer recommendations.

B. Recyclable Protective Clothing: If recyclable clothing is provided, all requirements of EPA, DOT and OSHA shall be met.

PART 3 - EXECUTION

3.1 REGULATED AREA PREPARATIONS

A. Site Security:
1. Regulated area access is to be restricted only to authorized, trained/accredited and protected personnel. These may include the Contractor's employees, employees of Subcontractors, VA employees

and representatives, State and Local inspectors, and any other designated individuals. A list of authorized personnel shall be established prior to commencing the project and shall be posted in the clean room of the decontamination unit or in a designated area located immediately outside of the regulated area established for Glovebag removal activities.

2. Entry into the regulated area by unauthorized individuals shall be reported immediately to the Competent Person by anyone observing the entry. The Competent Person shall immediately require any unauthorized person to leave the regulated area and then notify the VA Contracting Officer or VA Representative using the most expeditious means.
3. A log book shall be maintained in the clean room of the decontamination unit or in a designated area located immediately outside of the regulated area established for Glovebag removal activities. Anyone who enters the regulated area must record their name, affiliation, time in, and time out for each entry.
4. Access to the regulated area shall be through a single decontamination unit or in an area designated by the Competent Person for Glovebag removal activities. All other access (doors, windows, hallways, etc.) shall be sealed or locked to prevent entry to or exit from the regulated area. The only exceptions for this requirement are the waste/equipment load-out area which shall be sealed except during the removal of containerized asbestos waste from the regulated area, and emergency exits. Emergency exits shall not be locked from the inside; however, they shall be sealed with poly sheeting and taped until needed. In any situation where exposure to high temperatures which may result in a flame hazard, fire retardant poly sheeting must be used.
5. The Contractor's Competent Person shall control site security during abatement operations in order to isolate work in progress and protect adjacent personnel. A 24 hour security system shall be provided at the entrance to the regulated area to assure that all entrants are logged in/out and that only authorized personnel are allowed entrance.
6. The Contractor will have the VA's assistance in notifying adjacent personnel of the presence, location and quantity of ACM in the

regulated area and enforcement of restricted access by the VA's employees.

7. The regulated area shall be locked during non-working hours and secured by VA Representative or Competent Person. The VA Police shall be informed of asbestos abatement regulated areas to provide security checks during facility rounds and emergency response.

B. OSHA Danger Signs: Post OSHA DANGER signs meeting the specifications of OSHA 29 CFR 1926.1101 at any location and approaches to the regulated area where airborne concentrations of asbestos may exceed ambient background levels. Signs shall be posted at a distance sufficiently far enough away from the regulated area to permit any personnel to read the sign and take the necessary measures to avoid exposure. Additional signs will be posted following construction of the regulated area enclosure.

C. Shut Down - Lock Out Electrical: Shut down and lock out/tag out electric power to the regulated area. Provide temporary power and lighting. Insure safe installation including GFCI of temporary power sources and equipment by compliance with all applicable electrical code requirements and OSHA requirements for temporary electrical systems. Electricity shall be provided by the VA.

D. Shut Down - Lock Out HVAC: Shut down and lock out/tag out heating, cooling, and air conditioning system (HVAC) components that are in, supply or pass through the regulated area. Investigate the regulated area and agree on pre-abatement condition with the VA's Representative. Seal all intake and exhaust vents in the regulated area with duct tape and 2-ayers of independently installed 6-mil poly. Also, seal any seams in system components that pass through the regulated area. Remove all contaminated HVAC system filters and place in labeled 6-mil poly disposal bags for disposal as asbestos waste.

E. Containment Barriers and Coverings for the Regulated Area:

1. General: Seal off any openings at the perimeter of the regulated area with critical barriers to completely isolate the regulated area and to contain all airborne asbestos contamination created by the abatement activities. Should the adjacent area past the regulated area become contaminated due to improper work activities, the Contractor shall suspend work inside the regulated area, continue wetting, and clean the adjacent areas in accordance with procedures

described in these specifications. Any and all costs associated with the adjacent area cleanup shall not be borne by the VA.

2. Preparation Prior to Sealing Off: Place all materials, equipment and supplies necessary to isolate the regulated area inside the regulated area. Remove all movable material/equipment as described above and secure all unmovable material/equipment as described above. Properly secured material/ equipment shall be considered to be outside the regulated area.
3. Controlling Access to the Regulated Area: Access to the regulated area is allowed only through the personnel decontamination facility (PDF) or in an area designated by the Competent Person for Glovebag removal activities. All other means of access shall be eliminated and OSHA DANGER demarcation signs posted as required by OSHA. If the regulated area is adjacent to, or within view of an occupied area, provide a visual barrier of 6-mil opaque fire retardant poly to prevent building occupant observation. If the adjacent area is accessible to the public, the barrier must be solid and capable of withstanding the negative pressure.

4. Critical Barriers: The regulated area must be completely separated from the adjacent area(s) and the outside by at least 2-layers of independently installed 6-mil fire retardant poly and duct tape/spray adhesive. Individually seal all supply and exhaust ventilation openings, lighting fixtures, clocks, doorways, windows, convectors, speakers, and other openings into the regulated area with 2-layers of 6-mil fire retardant poly, and taped securely in place with duct tape/spray adhesive. Critical barriers must remain in place until all work and clearances have been completed. Light fixtures shall not be operational during abatement. Auxiliary lighting shall be provided. If needed, provide plywood squares 6 inches x 6 inches x 3/8 inch (150mm x 150mm x 18mm) or approved equivalent, held in place with 6d smooth masonry/galvanized nail or approved equivalent driven through the center of the plywood square and duct tape on the poly so as to clamp the poly to the wall/surface. Locate plywood squares at each end, corner, and 4 feet (1200mm) maximum on centers
5. Extension of the Regulated Area: If the regulated area barrier is breached in any manner that could allow the passage of asbestos

fibers or debris, the Competent Person shall immediately stop work, continue wetting, and proceed to extend the regulated area to enclose the affected area as per procedures described in this specification. If the affected area cannot be enclosed, decontamination measures and cleanup shall start immediately. All personnel shall be isolated from the affected area until decontamination/cleanup is completed as verified by visual inspection and air monitoring. Air monitoring at completion must indicate background levels.

6. Floor Barriers: All floors within 10 feet of Glovebag work shall be covered with 2-layers of 6-mil fire retardant poly. If no breach occurs during the Glovebag abatement operation, these layers of 6—mil fire retardant poly may be reused

F. Sanitary Facilities: The Contractor shall provide sanitary facilities for abatement personnel and maintain them in a clean and sanitary condition throughout the abatement project.

G. Pre-Cleaning:

1. Pre-Cleaning Movable Objects:

a. The VA will provide water for abatement purposes. The Contractor shall connect to the existing VA system. The service to the shower(s), if used, shall be supplied with backflow prevention.

b. Pre-cleaning of ACM contaminated items shall be performed after the enclosure has been erected and negative pressure has been established in the work area. PPE must be donned by all workers performing pre-cleaning activities. After items have been pre-cleaned and decontaminated, they may be removed from the work area for storage until the completion of abatement in the work area.

c. Pre-clean all movable objects within the regulated area using a HEPA filtered vacuum and/or wet cleaning methods as appropriate. After cleaning, these objects shall be removed from the regulated area and carefully stored in an uncontaminated location.

2. Pre-Cleaning Fixed Objects:

a. Pre-cleaning of ACM contaminated items shall be performed after the enclosure has been erected and negative pressure has been established in the work area.

b. Pre-clean all fixed objects in the regulated area using HEPA filtered vacuums and wet cleaning techniques as appropriate. Careful attention must be paid to machinery behind grills or gratings where access may be difficult but contamination may be significant. Also, pay particular attention to wall, floor and ceiling penetration behind fixed items. After pre-cleaning, enclose fixed objects with 2-layers of 6-mil poly and seal securely in place with duct tape. Objects (e.g., permanent fixtures, shelves, electronic equipment, laboratory tables, sprinklers, alarm systems, closed circuit TV equipment and computer cables) which must remain in the regulated area and that require special ventilation or enclosure requirements should be designated here along with specified means of protection. Contact the manufacturer for special protection requirements.

3. Pre-Cleaning Surfaces in the Regulated Area:
   a. Pre-cleaning of ACM contaminated items shall be performed after the enclosure has been erected and negative pressure has been established in the work area.

   b. Pre-clean all surfaces in the regulated area using HEPA filtered vacuums and wet cleaning methods as appropriate. Do not use any methods that would raise dust such as dry sweeping or vacuuming with equipment not equipped with HEPA filters. Do not disturb asbestos-containing materials during this pre-cleaning phase.

H. Pre-Abatement Activities:
1. Pre-Abatement Meeting: The VA Representative, upon receipt, review, and substantial approval of all pre-abatement submittals and verification by the CPIH/CIH that all materials and equipment required for the project are on the site, will arrange for a pre-abatement meeting between the Contractor, the CPIH/CIH, Competent Person, the VA Representatives, and the VPIH/CIH. The purpose of the meeting is to discuss any aspect of the submittals needing clarification or amplification and to discuss any aspect of the project execution and the sequence of the operation. The Contractor shall be prepared to provide any supplemental information or documentation to the VA's Representative regarding any submittals, materials or equipment. Upon satisfactory resolution of any

outstanding issues, the VA's representative will issue a written order to proceed to the Contractor. No abatement work of any kind described in the following provisions shall be initiated prior to the VA written order to proceed.

2. Pre-Abatement Inspections and Preparations:
   a. Before any work begins on the construction of the regulated area, the Contractor will:
      1) Conduct a space-by-space inspection with an authorized VA Representative and prepare a written inventory of all existing damage in those spaces where asbestos abatement will occur. Still or video photography may be used to supplement the written damage inventory. Document will be signed and certified as accurate by both parties.
      2) The VA Representative, the Contractor, and the VPIH/CIH must be aware of AEQA 10-95 indicating the failure to identify asbestos in the areas listed as well as common issues when preparing specifications and contract documents. This is especially critical when demolition is planned, because AHERA surveys are non-destructive, and ACM may remain undetected. A NESHAP (destructive) ACM inspection should be conducted on all building structures that will be demolished. Ensure the following areas are inspected on the project: Lay-in ceilings concealing ACM; ACM behind walls/windows from previous renovations; inside utility chases/walls; transite piping/ductwork/sheets; behind radiators; lab fume hoods; transite lab countertops; roofing materials; below window sills; water/sewer lines; electrical conduit coverings; crawl spaces(previous abatement contamination); flooring/mastic covered by carpeting/new flooring; exterior insulated wall panels; on underground fuel tanks; and steam line trench coverings.
      3) Ensure that all furniture, machinery, equipment, curtains, drapes, blinds, and other movable objects required to be removed from the regulated area have been cleaned and removed or properly protected from contamination.
      4) Inspect existing firestopping in the regulated area. Correct as needed.

3. Pre-Abatement Construction and Operations:
   a. Perform all preparatory work for the first regulated area in accordance with the approved work schedule and with this specification.
   b. Upon completion of all preparatory work, the CPIH/CIH will inspect the work and systems and will notify the VA's Representative when the work is completed in accordance with this specification. The VA's Representative may inspect the regulated area and the systems with the VPIH/CIH and may require that upon satisfactory inspection, the Contractor's employees perform all major aspects of the approved AHAP(s), especially worker protection, respiratory systems, contingency plans, decontamination procedures, and monitoring to demonstrate satisfactory operation.
   c. The CPIH/CIH shall document the pre-abatement activities described above and deliver a copy to the VA's Representative.
   d. Upon satisfactory inspection of the installation of and operation of systems the VA's Representative will notify the Contractor in writing to proceed with the asbestos abatement work in accordance with this specification.

3.2 REMOVAL OF PIPING ACM

A. Wetting Materials:
   1. Use amended water for the wetting of ACM prior to removal. The Competent Person shall assure that the wetting of ACM meets the definition of "adequately wet" in the EPA NESHAP regulation and OSHA’s “wet methods” for the duration of the project. A removal encapsulant may be used instead of amended water with written approval of the VA's Representative.
   2. Amended Water: Provide water to which a surfactant has been added to wet the ACM and reduce the potential for fiber release during disturbance of ACM. The mixture must be equal to or greater than the wetting provided by water amended by a surfactant consisting of one ounce of 50 percent polyoxyethylene ester and 50 percent polyoxyethylene ether mixed with 5 gallons (19L) of water.
   3. Removal Encapsulant: Provide a penetrating encapsulant designed specifically for the removal of ACM. The material must, when used, result in adequate wetting of the ACM and retard fiber release

during disturbance equal to or greater than the amended water described above in B.

B. Secondary Barrier and Walkways: Install as a drop cloth a 6-mil poly sheet at the beginning of each work shift where removal is to be done during that shift. Secure the drop cloth (6-mil poly sheet) with duct tape or approved equivalent to prevent it from moving or debris from getting behind it. Remove the drop cloth (6-mil poly sheet) at the end of the shift or as work in the area is completed. Keep residue on the drop cloth (6-mil poly sheet) wetted. When removing, fold inward to prevent spillage and place in a disposal bag.

C. Wet Removal of ACM: Using acceptable Glovebag procedures, adequately and thoroughly wet the ACM to be removed prior to removal with amended water or when authorized by VA, removal encapsulant to reduce/prevent fiber release to the air. Adequate time must be allowed for the amended water or removal encapsulant to saturate the ACM. Abatement personnel must not disturb dry ACM. Use a fine spray of amended water or removal encapsulant. Saturate the material sufficiently to wet to the substrate without causing excessive dripping. The material must be sprayed repeatedly/continuously during the removal process in order to maintain adequately wet conditions. Removal encapsulants must be applied in accordance with the manufacturer's written instructions. Perforate or carefully separate, using wet methods, an outer covering that is painted or jacketed in order to allow penetration and wetting of the material. Where necessary, carefully remove covering while wetting to minimize fiber release.

3.3 GLOVEBAG REMOVAL PROCEDURES

A. General: All applicable OSHA requirements and Glovebag manufacturer’s recommendations shall be met during Glovebag removal operations. In cases where live steam lines are present, the lines must be shut down prior to any work being performed on the system. No abatement work shall be conducted on live, pressurized steam lines. The Contractor may choose to use a High Temperature Glovebag in which a temperature rating ranges from 300˚F to 700˚F on steam lines that have recently been shut down and remain at high temperature for some time. In the case where a Glovebag is not feasible, the Contractor will need to build a full negative pressure containment of sufficient size or work within a negative pressure mini-enclosure and follow all regulations as it

pertains to removal. The Contractor shall provide enough HEPA negative air machines to continuously maintain a negative pressure differential of -0.02 inch water column gauge (WCG) inside the regulated work area relative to adjacent non-work building areas. OSHA 29 CFR 1926.1101 (g)(5)(i)(A)(2) also requires at least four (4) air changes per hour. Contractor shall increase air changes per hour as necessary to maintain volatile organic compounds below the applicable OSHA PEL. Contractor shall protect pipe insulation from being disturbed on either side of the Glovebag removal operations with a “candy stripe” layer of 6-mil poly sheet and duct tape, if Glove bag removal activities cause the piping to dislodge ACM during performance of their work.

1. Mix the surfactant with water in the garden sprayer, following the manufacturer's directions.
2. Have each employee put on a HEPA filtered respirator approved for asbestos and check the fit using the positive/negative fit check.
3. Have each employee put on a disposable full-body suit. Remember, the hood goes over the respirator straps.
4. Check closely the integrity of the glove bag to be used. Check all seams, gloves, sleeves, and glove openings. OSHA requires the bottom of the bag to be seamless.
5. Check the pipe where the work will be performed. If it is damaged (broken lagging, hanging, etc.), wrap the entire length of the pipe in poly sheeting and "candy stripe" it with duct tape.
6. Attach Glovebag with required tools per manufacturer’s instructions.
7. Using the smoke tube and aspirator bulb, test 10 percent of Glovebags by placing the tube into the water porthole (two-inch opening to glove bag), and fill the bag with smoke and squeeze it. If leaks are found, they shall be taped closed using duct tape and the bag shall be retested with smoke.
8. Insert the wand from the water sprayer through the water porthole.
9. Insert the hose end from a HEPA vacuum into the upper portion of the glove bag.
10. Wet and remove the pipe insulation.
11. If the section of pipe is covered with an aluminum jacket, remove it first using the wire cutters to cut any bands and then use tin snips to remove the aluminum. It is important to fold the sharp edges in to prevent cutting the bag when placing it in the bottom.

12. When the work is complete, spray the upper portion of the bag and move all residue into the bottom of the bag with the other waste material. Be very thorough. Use adequate water.
13. Put all tools, after washing them off in the bag, in one of the sleeves of glove bag and turn it inside out, drawing it outside of the bag. Twist the sleeve tightly several times to seal it and tape it several tight turns with duct tape. Cut through the middle of the duct tape and remove the sleeve. Put the sleeve in the next glove bag or put it in a bucket of water to decontaminate the tools after cutting the sleeve open.
14. Turn on the HEPA vacuum and collapse the bag completely. Remove the vacuum nozzle, seal the hole with duct tape, twist the bag tightly several times in the middle, and tape it to keep the material in the bottom during removal of the glove bag from the pipe.
15. Slip a disposal bag over the glove bag (still attached to the pipe). Remove the tape securing the ends, and slit open the top of the glove bag and carefully fold it down into the disposal bag. Double bag and gooseneck waste materials.

B. Negative Pressure Glovebag Procedure:
   1. In addition to the above requirements, the HEPA vacuum shall be run continuously during the Glovebag procedure until completion at which time the Glovebag will be collapsed by the HEPA vacuum prior to removal from the pipe/component.
   2. The HEPA vacuum shall be attached and operated as needed to prevent collapse of the Glovebag during the removal process.

3.4 LOCKDOWN ENCAPSULATION

A. General: Lockdown encapsulation is an integral part of the ACM removal. At the conclusion of ACM removal and before removal of the primary barriers, all piping surfaces shall be encapsulated with a bridging encapsulant.

B. Sealing Exposed Edges: Seal edges of ACM exposed by removal work with two coats of encapsulant. Prior to sealing, permit the exposed edges to dry completely to permit penetration of the encapsulant.

3.5 DISPOSAL OF ACM WASTE MATERIALS

A. General: Dispose of waste ACM and debris which is packaged in accordance with these specifications, OSHA, EPA and DOT. The landfill requirements for packaging must also be met. Transport will be in

compliance with 49 CFR 171 - 180 regulations. Disposal shall be done at an approved landfill. Disposal of non-friable ACM shall be done in accordance with applicable regulations.

B. Procedures:

1. The VA must be notified at least 24 hours in advance of any waste removed from the containment
2. Asbestos waste shall be packaged and moved through the W/EDF into a covered transport container in accordance with procedures in this specification. Waste shall be double-bagged and wetted with amended water prior to disposal. Wetted waste can be very heavy. Bags shall not be overfilled. Bags shall be securely sealed to prevent accidental opening and/or leakage. The top shall be tightly twisted and goose necked prior to tightly sealing with at least three wraps of duct tape. Ensure that unauthorized persons do not have access to the waste material once it is outside the regulated area. All transport containers must be covered at all times when not in use. OSHA Danger signs must be displayed during loading and unloading. Material shall not be transported in open vehicles. If drums are used for packaging, the drums shall be labeled properly and shall not be re-used.
3. Waste Load Out: Waste load out shall be done in accordance with the procedures in W/EDF Decontamination Procedures. Sealed waste bags shall be decontaminated on exterior surfaces by wet cleaning and HEPA vacuuming before being placed in the second waste bag and sealed, which then must also be wet wiped and HEPA vacuumed.
4. Asbestos waste with sharp edged components, i.e., nails, screws, lath, strapping, tin sheeting, jacketing, metal mesh, etc., which might tear poly bags shall be wrapped securely in burlap before packaging and, if needed, use a poly lined fiber drum as the second container, prior to disposal.

3.6 PROJECT DECONTAMINATION

A. General:

1. The entire work related to project decontamination shall be performed under the close supervision and monitoring of the CPIH/CIH.
2. If the asbestos abatement work is in an area which was contaminated prior to the start of abatement, the decontamination will be done by

cleaning the primary poly barrier prior to its removal and cleanings of the surfaces of the regulated area after the primary barrier removal.

3. If the asbestos abatement work is in an area which was uncontaminated prior to the start of abatement, the decontamination will be done by cleaning the primary poly barrier prior to its removal, thus preventing contamination of the building when the regulated area critical barriers are removed.

B. Regulated Area Clearance: Air testing and other requirements which must be met before release of the Contractor and re-occupancy of the regulated area space are specified in Final Testing Procedures.

C. Work Description: Decontamination includes the clearance air testing in the regulated area and the decontamination and removal of the enclosures/facilities installed prior to the abatement work including primary/critical barriers, PDF and W/EDF facilities, and negative pressure systems.

D. Pre-Decontamination Conditions:

1. Before decontamination starts, all ACM waste from the regulated area shall be removed, all waste collected and removed, and the secondary barrier of poly removed and disposed of along with any gross debris generated by the work.
2. At the start of decontamination, the following shall be in place.
   a. Critical barriers over all openings consisting of two layers of 6-mil poly which is the sole barrier between the regulated area and the rest of the building or outside.
   b. Decontamination facilities, if required for personnel and equipment in operating condition.

E. First Cleaning: Carry out a first cleaning of all surfaces of the regulated area including items of remaining poly sheeting, tools, scaffolding, ladders/staging by wet methods and HEPA vacuuming. Do not use dry dusting/sweeping/air blowing methods. Use each surface of a wetted cleaning cloth one time only and then dispose of as contaminated waste. Continue this cleaning until there is no visible residue from abated surfaces or poly or other surfaces. Remove all filters in the air handling system and dispose of as ACM waste in accordance with these specifications. The negative pressure system shall remain in

operation during this time, if used. Additional cleaning may be needed as determined by the CPIH/VPIH/CIH.

F. Pre-Clearance Inspection and Testing: The CPIH/CIH and VPIH/CIH will perform a thorough and detailed visual inspection at the end of the cleaning to determine whether there is any visible residue in the regulated area. If the visual inspection is acceptable, the CPIH/CIH will perform pre-clearance sampling using aggressive clearance as detailed in 40 CFR 763 Subpart E (AHERA) Appendix A (III)(B)(7)(d). If the sampling results show values below 0.01 f/cc, then the Contractor shall notify the VA's Representative of the results with a brief report from the CPIH/CIH documenting the inspection and sampling results and a statement verifying that the regulated area is ready for lockdown encapsulation. The VA reserves the right to utilize their own VPIH/CIH to perform a pre-clearance inspection and testing for verification.

G. Lockdown Encapsulation of Abated Surfaces: With the express written permission of the VA's Representative, perform lockdown encapsulation of all surfaces from which asbestos was abated in accordance with the procedures in this specification.

3.7 FINAL VISUAL INSPECTIONS AND AIR CLEARANCE TESTING

A. General: Notify the VA Representative 24 hours in advance for the performance of the final visual inspection and testing. The final visual inspection and testing will be performed by the VPIH/CIH after the final cleaning.

B. Final Visual Inspection: Final visual inspection will include the entire regulated area, the PDF, all poly sheeting, seals over HVAC openings, doorways, windows, and any other openings. If any debris, residue, dust or any other suspect material is detected, the final cleaning shall be repeated at no additional cost to the VA. Dust/material samples may be collected and analyzed at no additional cost to the VA at the discretion of the VPIH/CIH to confirm visual findings. When the regulated area is visually clean the final testing can be done.

C. Final Air Clearance Testing:

1. After an acceptable final visual inspection by the VPIH/CIH and VA Representative, the VPIH/CIH will perform the final clearance testing. Air samples will be collected and analyzed in accordance with procedures for AHERA in this specification. If work is less

than 260 lf/160 sf/35 cf, 5 PCM samples shall be collected for clearance and a minimum of two field blank. If work is equal to or more than 260 lf/160 sf/35 cf, AHERA TEM sampling shall be performed for clearance. TEM analysis shall be done in accordance with procedures for EPA AHERA presented in this specification. If the release criteria are not met, the Contractor shall repeat the final cleaning and continue decontamination procedures until clearance is achieved. All additional inspection and testing costs will be borne by the Contractor.

2. If release criteria are met, proceed to perform the abatement closeout and to issue the certificate of completion in accordance with these specifications.

D. Final Air Clearance Procedures:

1. Contractor's Release Criteria: Work in a regulated area is complete when the regulated area is visually clean and airborne fiber levels have been reduced to or below 0.01 f/cc as measured by the AHERA PCM protocol, and < 70 AHERA asbestos structures per square millimeter (s/mm2) by AHERA TEM. No averaging of results will be used for this project. All five (5) TEM samples inside the regulated area shall be at or below 70 asbestos s/mm2 to satisfy the project final clearance criteria.

2. Air Monitoring and Final Clearance Sampling: To determine if the elevated airborne fiber counts encountered during abatement operations have been reduced to the specified level, the VPIH/CIH will secure samples and analyze them according to the following procedures:

   a. Fibers Counted: “Fibers” referred to in this section shall be either all fibers regardless of composition as counted in the NIOSH 7400 PCM method or asbestos fibers counted using the AHERA TEM method.

   b. Aggressive Sampling: All final air testing samples shall be collected using aggressive sampling techniques except where soil is not encapsulated or enclosed. Samples will be collected on 0.8µ MCE filters for PCM analysis and 0.45µ MCE for TEM. A minimum of 3850 Liters of air using calibrated sampling pumps shall be collected for PCM samples and a minimum of 1200 Liters of air using calibrated sampling pumps shall be collected for TEM

clearance samples. Before pumps are started, initiate aggressive air mixing sampling as detailed in 40 CFR 763 Subpart E (AHERA) Appendix A (III)(B)(7)(d). Air samples will be collected in areas subject to normal air circulation away from corners, obstructed locations, and locations near windows, doors, or vents. After air sampling pumps have been shut off, circulating fans shall be shut off. The negative pressure system shall continue to operate.

E. Clearance Sampling Using PCM:
   1. The VPIH/CIH will perform clearance samples as indicated by the specification.
   2. The NIOSH 7400 PCM method will be used for clearance sampling with a minimum collection volume of 3850 Liters of air. A minimum of 5 PCM clearance samples shall be collected. All samples must be equal to or less than 0.01 f/cc to clear the regulated area.

F. Clearance Sampling Using TEM:
   1. Clearance requires 13 samples be collected; 5 inside the regulated area; 5 outside the regulated area; and 3 field blanks.
   2. The TEM method will be used for clearance sampling with a minimum collection volume of 1200 Liters of air. A minimum of 13 clearance samples shall be collected. All samples must be equal to or less than 70 AHERA structures per square millimeter (s/mm2) AHERA TEM, no averaging of results for this specific project.

G. Laboratory Testing of PCM Samples: The services of an AIHA accredited laboratory will be employed by the VA to perform analysis for the PCM air samples. The accredited laboratory shall be successfully participating in the AIHA Proficiency Analytical Testing (PAT) program. Samples will be sent daily by the VPIH/CIH so that verbal/faxed reports can be received within 24-36 hours. A complete record, certified by the laboratory, of all air monitoring tests and results will be furnished to the VA’s Representative and the Contractor.

H. Laboratory Testing of Tem Samples: Samples shall be sent by the VPIH/CIH to a NIST NVLAP accredited laboratory for analysis by TEM. The laboratory shall be successfully participating in the NIST NVLAP Airborne Asbestos Analysis (TEM) program. Verbal/faxed results from the laboratory shall be available within 24-36 hours after receipt of the samples. A complete record, certified by the laboratory, of all TEM

results shall be furnished to the VA's Representative and the Contractor.

3.8 ABATEMENT CLOSEOUT AND CERTIFICATE OF COMPLIANCE

A. Completion of Abatement Work: After thorough decontamination, seal negative air machines with 2-layers of 6-mil poly and duct tape to form a tight seal at the intake/outlet ends before removal from the regulated area. Complete asbestos abatement work upon meeting the regulated area visual and air clearance criteria and fulfilling the following:

1. Remove all equipment, materials, and debris from the project area.
2. Package and dispose of all asbestos waste as required. Dispose of waste ACM and debris which is packaged in accordance with these specifications, OSHA, EPA and DOT. The landfill requirements for packaging must also be met. Transport will be in compliance with 49 CFR 171 - 180 regulations.
3. Repair or replace all interior finishes damaged during the abatement work.
4. The VA will be notified of any waste removed from the containment prior to 24 hours.
5. Fulfill other project closeout requirements as specified elsewhere in this specification.

B. Certificate of Completion by Contractor: The CPIH/CIH shall complete and sign the "Certificate of Completion" in accordance with Attachment 1 at the completion of the abatement and decontamination of the regulated area.

C. Work Shifts: All work shall generally be done during administrative hours (8:00 AM to 4:30 PM) Monday - Friday excluding Federal Holidays. Any change in the work schedule must be approved in writing by the VA Representative.

D. Re-Insulation: If required as part of the contract, replace all asbestos containing insulation with suitable non-asbestos material. Provide SDS for all replacement materials. Refer to Section 23 07 11, HVAC, PLUMBING, AND BOILER PLANT INSULATION.

ATTACHMENT #1
CERTIFICATE OF COMPLETION

DATE: _____ VA Project #:_____

PROJECT NAME:_____ Abatement Contractor:_____

VAMC/ADDRESS:_____

1. I certify that I have personally inspected, monitored and supervised the abatement work of (specify regulated area or Building):
   which took place from / / to / /
2. That throughout the work all applicable requirements/regulations and the VA's specifications were met.
3. That any person who entered the regulated area was protected with the appropriate personal protective equipment and respirator and that they followed the proper entry and exit procedures and the proper operating procedures for the duration of the work.
4. That all employees of the Abatement Contractor engaged in this work were trained in respiratory protection, were experienced with abatement work, had proper medical surveillance documentation, were fit-tested for their respirator, and were not exposed at any time during the work to asbestos without the benefit of appropriate respiratory protection.
5. That I performed and supervised all inspection and testing specified and required by applicable regulations and VA specifications.
6. That the conditions inside the regulated area were always maintained in a safe and healthy condition and the maximum fiber count never exceeded 0.5 f/cc, except as described below.
7. That all abatement work was done in accordance with OSHA requirements and the manufacturer’s recommendations.

CPIH/CIH Signature/Date:_____

CPIH/CIH Print Name:_____

Abatement Contractor Signature/Date:_____

Abatement Contractor Print Name:_____

ATTACHMENT #2
CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

PROJECT NAME:_____DATE:_____

PROJECT ADDRESS:_____

ABATEMENT CONTRACTOR'S NAME:_____

WORKING WITH ASBESTOS CAN BE HAZARDOUS TO YOUR HEALTH. INHALING ASBESTOS HAS BEEN LINKED WITH VARIOUS TYPES OF CANCERS. IF YOU SMOKE AND INHALE ASBESTOS FIBERS, YOUR CHANCES OF DEVELOPING LUNG CANCER IS GREATER THAN THAT OF THE NON-SMOKING PUBLIC.

Your employer's contract with the owner for the above project requires that: You must be supplied with the proper personal protective equipment including an adequate respirator and be trained in its use. You must be trained in safe and healthy work practices and in the use of the equipment found at an asbestos abatement project. You must receive/have a current medical examination for working with asbestos. These things shall be provided at no cost to you. By signing this certificate of worker’s acknowledgement you are indicating to the owner that your employer has met these obligations.

RESPIRATORY PROTECTION: I have been trained in the proper use of respirators and have been informed of the type of respirator to be used on the above indicated project. I have a copy of the written Respiratory Protection Program issued by my employer. I have been provided for my exclusive use, at no cost, with a respirator to be used on the above indicated project.

TRAINING COURSE: I have been trained by a third party, State/EPA accredited trainer in the requirements for an AHERA/OSHA Asbestos Abatement Worker training course, 32-hours minimum duration. I currently have a valid State accreditation certificate. The topics covered in the course include, as a minimum, the following:

- Physical Characteristics and Background Information on Asbestos
- Potential Health Effects Related to Exposure to Asbestos
- Employee Personal Protective Equipment
- Establishment of a Respiratory Protection Program
- State of the Art Work Practices
- Personal Hygiene
- Additional Safety Hazards
- Medical Monitoring
- Air Monitoring
- Relevant Federal, State and Local Regulatory Requirements, Procedures, and Standards
- Asbestos Waste Disposal

MEDICAL EXAMINATION: I have had a medical examination within the past 12 months which was paid for by my employer. This examination included: health history, occupational history, pulmonary function test, and may have included a chest x-ray evaluation. The physician issued a positive written opinion after the examination.

Signature:_____
Printed Name:_____
Social Security Number:_____

Witness:_____

ATTACHMENT #3
AFFIDAVIT OF MEDICAL SURVEILLANCE, RESPIRATORY PROTECTION AND TRAINING/ACCREDITATION

VA PROJECT NAME AND NUMBER:_____

VA MEDICAL FACILITY:_____

ABATEMENT CONTRACTOR'S NAME AND ADDRESS:_____

1. I verify that the following individual
   Name:_____ Social Security Number:_____
   who is proposed to be employed in asbestos abatement work associated with the above project by the named Abatement Contractor, is included in a medical surveillance program in accordance with 29 CFR 1926.1101(m), and that complete records of the medical surveillance program as required by 29 CFR 1926.1101(m)(n) and 29 CFR 1910.20 are kept at the offices of the Abatement Contractor at the following address.
   Address:_____
2. I verify that this individual has been trained, fit-tested and instructed in the use of all appropriate respiratory protection systems and that the person is capable of working in safe and healthy manner as expected and required in the expected work environment of this project.

3. I verify that this individual has been trained as required by 29 CFR 1926.1101(k). This individual has also obtained a valid State accreditation certificate. Documentation will be kept on-site.

4. I verify that I meet the minimum qualifications criteria of the VA specifications for a CPIH.

Signature of CPIH/CIH:_____ Date:_____

Printed Name of CPIH/CIH:_____

Signature of Contractor:_____ Date:_____

Printed Name of Contractor:_____

ATTACHMENT #4
ABATEMENT CONTRACTOR/COMPETENT PERSON(S) REVIEW AND ACCEPTANCE OF THE VA'S ASBESTOS SPECIFICATIONS

VA Project Location:_____

VA Project #:_____

VA Project Description:_____

This form shall be signed by the Asbestos Abatement Contractor Owner and the Asbestos Abatement Contractor's Competent Person(s) prior to any start of work at the VA related to this Specification. If the Asbestos Abatement Contractor's/Competent Person(s) has not signed this form, they shall not be allowed to work on-site.

I, the undersigned, have read VA's Asbestos Specification regarding the asbestos abatement requirements. I understand the requirements of the VA's Asbestos Specification and agree to follow these requirements as well as all required rules and regulations of OSHA/EPA/DOT and State/Local requirements. I have been given ample opportunity to read the VA's Asbestos Specification and have been given an opportunity to ask any questions regarding the content and have received a response related to those questions. I do not have any further questions regarding the content, intent and requirements of the VA's Asbestos Specification.

At the conclusion of the asbestos abatement, I will certify that all asbestos abatement work was done in accordance with the VA's Asbestos Specification and all ACM was removed properly and no fibrous residue remains on any abated surfaces.

Abatement Contractor Owner's Signature_____Date_____

- - - END - - -

SECTION 02 82 13.19
ASBESTOS FLOOR TITLE AND MASTIC ABATEMENT

PART 1 - GENERAL

1.1 SUMMARY OF THE WORK

A. Contract Documents and Related Requirements: Drawings, general provisions of the contract, including general and supplementary conditions and other Division 01 specifications, shall apply to the work of this section. The contract documents show the work to be done under the contract and related requirements and conditions impacting the project. Related requirements and conditions include applicable codes and regulations, notices and permits, existing site conditions and restrictions on use of the site, requirements for partial owner occupancy during the work, coordination with other work and the phasing of the work. In the event the Asbestos Abatement Contractor discovers a conflict in the contract documents and/or requirements or codes, the conflict must be brought to the immediate attention of the Contracting Officer for resolution. Whenever there is a conflict or overlap in the requirements, the most stringent shall apply. Any actions taken by the Contractor without obtaining guidance from the Contracting Officer shall become the sole risk and responsibility of the Asbestos Abatement Contractor. All costs incurred due to such action are also the responsibility of the Asbestos Abatement Contractor.

B. Extent of Work:

1. Below is a brief description of the estimated quantities of asbestos flooring materials to be abated. These quantities are for informational purposes only and are based on the best information available at the time of the specification preparation. The Contractor shall satisfy himself as to the actual quantities to be abated. Nothing in this section may be interpreted as limiting the extent of work otherwise required by this contract and related documents.

C.

1. Removal, clean-up and disposal of asbestos containing materials (ACM) and asbestos/waste contaminated elements or debris in an appropriate regulated area for the following approximate quantities;

1. Brown 12” x 12” VFT 2% Chrysotile Bldg 5 Rm 117 80 Square Feet (SF)
2. Black Mastic 2% Chrysotile Throughout Building 6 775 SF
3. Brown 9” x 9” VFT 3% Chrysotile Bldg70 Rm B39 250 SF
4. Brown 9” x 9” Wall Tile 2% Chrysotile Bldg 70 Rm D125 30 SF
5. (wall tile painted white)
6. Tan/Brn/Wht12”x12” VFT 2% Chrysotile Bldg 111 Rm B610 160 SF
7. Black Mastic (below VFT) 2% Chrysotile Bldg 111 Rm B610 160 SF
8. Blue/White 9”x9” VFT 2% Chrysotile Bldg 111 Rm B5311 260 SF
9. Black Mastic (below VFT) 2% Chrysotile Bldg 111 Rm B5311 260 SF
10. Gray 12”x12” VFT 2% Chrysotile Bldg 111 Rm B2557 200 SF
11. Black Mastic 2% Chrysotile Bldg 111 Rm B2557 200 SF
12. Black Mastic 2% Chrysotile Bldg 43 Rm A201,A202, A203, A303 215 SF
13. Window Caulking/Glazing ASSUMED Bldg. 70 B38, E104HC, B159,C126, D125 5 EA
14. Window Caulking/Glazing ASSUMED Bldg. 6 Rms B103, D206, C30 7 EA
15. Window Caulking/Glazing ASSUMED Bldg111Rms8409,9409,10409 3 EA
16. Window Caulking/Glazing ASSUMED Bldg 5 Rm 204 1 EA
17. Window Caulking/Glazing ASSUMED Bldg 112 Room 108 1 EA
18. Window Caulking/Glazing ASSUMED Bldg. 3 1st Floor Storage 1 EA

D. Related Work:

1. Section 02 41 00, DEMOLITION
2. Section 02 82 13.13, GLOVEBAG ASBESTOS ABATEMENT
3. SECTION 02 82 13.19, ASBESTOS FLOOR TILE AND MASTIC ABATEMENT

4. SECTION 02 82 13.31, ASBESTOS TRANSITE AND ABATEMENT
5. SECTION 02 83 33.13 LEAD BASED PAINT REMOVAL AND DISPOSAL

E. Tasks:
1. The work tasks are summarized briefly as follows:
   a. Pre-abatement activities including pre-abatement meeting(s), inspection(s), notifications, permits, submittal approvals, regulated area preparations, emergency procedures arrangements, and Asbestos Hazard Abatement Plans for asbestos work.
   b. Abatement activities including removal, clean-up and disposal of ACM waste, recordkeeping, security, monitoring, and inspections.
   c. Cleaning and decontamination activities including final visual inspection, air monitoring and certification of decontamination.

F. Abatement Contractors Use of Premises:
1. The Contractor and Contractor's personnel shall cooperate fully with the VA representative/consultant to facilitate efficient use of buildings and areas within buildings. The Contractor shall perform the work in accordance with the VA specifications, drawings, phasing plan and in compliance with any/all applicable Federal, State and Local regulations and requirements.
2. The Contractor shall use the existing facilities in the building strictly within the limits indicated in contract documents as well as the approved VA Design and Construction Procedures. VA Design Construction Procedure drawings of partially occupied buildings will show the limits of regulated areas; the placement of decontamination facilities; the temporary location of bagged waste ACM; the path of transport to outside the building; and the temporary waste storage area for each building/regulated area. Any variation from the arrangements shown on drawings shall be secured in writing from the VA Representative through the pre-abatement plan of action. The following limitations of use shall apply to existing facilities shown on drawings.

1.2 VARIATIONS IN QUANTITY

. The quantities and locations of ACM as indicated on the drawings and the extent of work included in this section are estimated which are limited by the physical constraints imposed by occupancy of the buildings and accessibility to ACM. Accordingly, minor variations (+/-

10 percent) in quantities of ACM within the regulated area are considered as having no impact on contract price and time requirements of this contract. Where additional work is required beyond the above variation, the contractor shall provide unit prices for newly discovered ACM and those prices shall be used for additional work required under the contractor.

1.3 STOP ASBESTOS REMOVAL

. If the Contracting Officer; their field representative; the facility Safety Officer/Manager or their designee, or the VA Professional Industrial Hygienist/Certified Industrial Hygienist (VPIH/CIH) presents a verbal **Stop Asbestos Removal Order**, the Contractor/Personnel shall immediately stop all asbestos removal and maintain HEPA filtered negative pressure air flow in the containment and adequately wet any exposed ACM. If a verbal Stop Asbestos Removal Order is issued, the VA shall follow-up with a written order to the Contractor as soon as it is practicable. The Contractor shall not resume any asbestos removal activity until authorized to do so in writing by the VA Contracting Officer. A stop asbestos removal order may be issued at any time the VA Contracting Officer determines abatement conditions/activities are not within VA specification, regulatory requirements or that an imminent hazard exists to human health or the environment. Work stoppage will continue until conditions have been corrected to the satisfaction of the VA. Standby time and costs for corrective actions will be borne by the Contractor, including the VPIH/CIH time. The occurrence of any of the following events shall be reported immediately by the Contractor’s competent person to the VA Contracting Office or field representative using the most expeditious means (e.g., verbal or telephonic), followed up with written notification to the Contracting Officer as soon as practical. The Contractor shall immediately stop asbestos removal/disturbance activities and initiate fiber reduction activities if:

1. Airborne PCM analysis results equal to or greater than 0.01 f/cc above background levels inside the building but outside the regulated area;
2. breach or break in regulated area containment barrier(s);
3. less than −0.02 inch WCG pressure in the regulated area;

4. serious injury/death at the site;
5. fire/safety emergency at the site;
6. respiratory protection system failure;
7. power failure or loss or inadequate use of wetting agent;
8. any visible emissions observed outside the regulated area; or
9. failure to follow project specification requirements.

1.4 DEFINITIONS

. General: Definitions and explanations here are neither complete nor exclusive of all terms used in the contract documents, but are general for the work to the extent they are not stated more explicitly in another element of the contract documents. Drawings must be recognized as diagrammatic in nature and not completely descriptive of the requirements indicated therein.

A. Glossary:

Abatement - Procedures to control fiber release from asbestos-containing materials. Includes removal, encapsulation, enclosure, demolition, and renovation activities related to asbestos containing materials (ACM).

Adequately wet - Sufficiently mixed or penetrated with liquid to prevent the release of particulates. If visible emissions are observed coming from the ACM, then that material has not been adequately wetted.

Aerosol - Solid or liquid particulate suspended in air.

Aggressive method - Removal or disturbance of building material by sanding, abrading, grinding, or other method that breaks, crumbles, or disintegrates intact ACM.

Aggressive air sampling - EPA AHERA defined clearance sampling method using air moving equipment such as fans and leaf blowers to aggressively disturb and maintain in the air residual fibers after abatement.

AHERA - Asbestos Hazard Emergency Response Act. Asbestos regulations for schools issued in 1987.

Aircell - Pipe or duct insulation made of corrugated cardboard which contains asbestos.

Air monitoring - The process of measuring the fiber content of a known volume of air collected over a specified period of time. The NIOSH 7400 Method, Issue 3, Fifth Edition is used to determine the fiber levels in air. For personal samples, area air samples and clearance air testing

using Phase Contrast Microscopy (PCM) analysis, the NIOSH Method 7402 (Issue 2, Fourth Edition) can be used when it is necessary to confirm fibers counted by PCM as being asbestos. The AHERA TEM analysis may be used for background, area samples and clearance samples when required by this specification, or at the discretion of the VPIH/CIH as appropriate.

Air sample filter - The filter used to collect fibers which are then counted. The filter is made of mixed cellulose ester (MCE) membrane for PCM (Phase Contrast Microscopy, 25 mm, 3-piece with 2 inches Static Extension Cowl, 0.8 micron pore size) and MCE for TEM (Transmission Electron Microscopy, 25 mm, 3-piece with 2 inches Static Extension Cowl, 0.45 micron pore size).

Amended water - Water to which a surfactant (wetting agent) has been added to increase the penetrating ability of the liquid.

Asbestos - Includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos, and any of these minerals that have been chemically treated or altered. Asbestos also includes PACM, as defined below.

Asbestos Hazard Abatement Plan (AHAP) - Asbestos work procedures required to be submitted by the contractor before work begins.

Asbestos-containing material (ACM) - Any material containing more than one percent of asbestos.

Asbestos contaminated elements (ACE) - Building elements such as ceilings, walls, lights, or ductwork that are contaminated with asbestos.

Asbestos-contaminated soil (ACS) – Soil found in the work area or in adjacent areas such as crawlspaces or pipe tunnels which is contaminated with asbestos-containing material debris and cannot be easily separated from the material.

Asbestos-containing waste (ACW) material - Asbestos-containing material or asbestos contaminated objects requiring disposal.

Asbestos Project Monitor – Some states require that any person conducting asbestos abatement air sampling, clearance inspections and clearance air sampling be licensed as an asbestos project monitor.

Asbestos waste decontamination facility - A system consisting of drum/bag washing facilities and a temporary storage area for cleaned containers of asbestos waste. Used as the exit for waste and equipment

leaving the regulated area. In an emergency, it may be used to evacuate personnel.

Authorized person - Any person authorized by the VA, the Contractor, or government agency and required by work duties to be present in regulated areas.

Authorized visitor - Any person approved by the VA; the contractor; or any government agency representative having jurisdiction over the regulated area (e.g., OSHA, Federal and State EPA).

Barrier - Any surface that isolates the regulated area and inhibits fiber migration from the regulated area.

Containment Barrier - An airtight barrier consisting of walls, floors, and/or ceilings of sealed plastic sheeting which surrounds and seals the outer perimeter of the regulated area.

Critical Barrier - The barrier responsible for isolating the regulated area from adjacent spaces, typically constructed of 2-layers of 6-mil independently installed plastic sheeting (Polyethylene) secured in place at openings such as doors, windows, penetrations or any other opening into the regulated area.

Primary Barrier – Plastic barriers placed over critical barriers and exposed directly to abatement work or to secondary barrier.

Secondary Barrier - Any additional plastic barriers used to isolate and provide protection from debris during abatement work.

Breathing zone - The hemisphere forward of the shoulders with a radius of about 150 - 225 mm (6 - 9 inches) from the worker's nose.

Bridging encapsulant - An encapsulant that forms a layer on the surface of the ACM.

Building/facility owner - The legal entity, including a lessee, which exercises control over management and recordkeeping functions relating to a building and/or facility in which asbestos activities take place.

Bulk testing - The collection and analysis of suspect asbestos containing materials.

Certified Industrial Hygienist (CIH) - A person certified in the comprehensive practice of industrial hygiene by the American Board of Industrial Hygiene.

Class I asbestos work - Activities involving the removal of Thermal System Insulation (TSI) and surfacing ACM and Presumed Asbestos Containing Material (PACM).

Class II asbestos work - Activities involving the removal of ACM which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastic.

Clean room/Changing room - An uncontaminated room having facilities for the storage of employee's street clothing and uncontaminated materials and equipment.

Clearance sample - The final air sample taken after all asbestos work has been done and visually inspected. Performed by the VA's Professional Industrial Hygiene consultant/Certified Industrial Hygienist (VPIH/CIH).

Closely resemble - The major workplace conditions which have contributed to the levels of historic asbestos exposure, are no more protective than conditions of the current workplace.

Competent person - In addition to the definition in 29 CFR 1926.32(f), one who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure, who has the authority to take prompt corrective measures to eliminate them, as specified in 29 CFR 1926.32(f); in addition, for Class I and II work who is specially trained in a training course which meets the criteria of EPA's Model Accreditation Plan (40 CFR 763) for supervisor.

Contractor's Professional Industrial Hygienist (CPIH/CIH) - The asbestos abatement contractor's industrial hygienist. The industrial hygienist must meet the qualification requirements of a PIH and may report to a certified industrial hygienist (CIH).

Count - Refers to the fiber count or the average number of fibers greater than five microns in length with a length-to-width (aspect) ratio of at least 3 to 1, per cubic centimeter of air.

Crawlspace – An area which can be found either in or adjacent to the work area. This area has limited access and egress and may contain asbestos materials and/or asbestos contaminated soil.

Decontamination area/unit - An enclosed area adjacent to and connected to the regulated area and consisting of an equipment room, shower room, and clean room, which is used for the decontamination of workers, materials, and equipment that are contaminated with asbestos.

Demolition - The wrecking or taking out of any load-supporting structural member and any related razing, removing, or stripping of asbestos products.

Disposal bag - Typically 6-mil thick sift-proof, dustproof, leak-tight container used to package and transport asbestos waste from regulated areas to the approved landfill. Each bag/container must be labeled/marked in accordance with EPA, OSHA and DOT requirements.

Disturbance – Asbestos Operations and Maintenance Activities (OSHA Class III) that disrupt the matrix of ACM or PACM, crumble or pulverize ACM or PACM, or generate visible debris from ACM or PACM. Disturbance includes cutting away small amounts of ACM or PACM, no greater than the amount that can be contained in one standard sized glove bag or waste bag in order to access a building component. In no event shall the amount of ACM or PACM so disturbed exceed that which can be contained in one glove bag or disposal bag, which shall not exceed 60 inches in length or width.

Drum - A rigid, impermeable container made of cardboard fiber, plastic, or metal which can be sealed in order to be sift-proof, dustproof, and leak-tight.

Employee exposure - The exposure to airborne asbestos that would occur if the employee were not wearing respiratory protection equipment.

Encapsulant - A material that surrounds or embeds asbestos fibers in an adhesive matrix and prevents the release of fibers.

Encapsulation - Treating ACM with an encapsulant.

Enclosure - The construction of an air tight, impermeable, permanent barrier around ACM to control the release of asbestos fibers from the material and also eliminate access to the material.

Equipment room - A contaminated room located within the decontamination area that is supplied with impermeable bags or containers for the disposal of contaminated protective clothing and equipment.

Fiber - A particulate form of asbestos, 5 microns or longer, with a length to width (aspect) ratio of at least 3 to 1.

Fibers per cubic centimeter (f/cc) - Abbreviation for fibers per cubic centimeter, used to describe the level of asbestos fibers in air.

Filter - Media used in respirators, vacuums, or other machines to remove particulate from air.

Firestopping - Material used to close the open parts of a structure in order to prevent a fire from spreading.

Friable asbestos containing material - Any material containing more than one (1) percent asbestos as determined using the method specified in 40 CFR 763, Polarized Light Microscopy, that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.

Glovebag - Not more than a 60 x 60 inch impervious plastic bag-like enclosure affixed around an asbestos-containing material, with glove-like appendages through which materials and tools may be handled.

High efficiency particulate air (HEPA) filter – An ASHRAE MERV 17 filter capable of trapping and retaining at least 99.97 percent of all mono-dispersed particles of 0.3 micrometers in diameter.

HEPA vacuum - Vacuum collection equipment equipped with a HEPA filter system capable of collecting and retaining asbestos fibers.

Homogeneous area - An area of surfacing, thermal system insulation or miscellaneous ACM that is uniform in color, texture and date of application.

HVAC - Heating, Ventilation and Air Conditioning

Industrial hygienist (IH) - A professional qualified by education, training, and experience to anticipate, recognize, evaluate and develop controls for occupational health hazards. Meets definition requirements of the American Industrial Hygiene Association (AIHA).

Industrial hygienist technician (IH Technician) - A person working under the direction of an IH or CIH who has special training, experience, certifications and licenses required for the industrial hygiene work assigned. Some states require that an industrial hygienist technician conducting asbestos abatement air sampling, clearance inspection and clearance air sampling be licensed as an asbestos project monitor.

Intact - The ACM has not crumbled, been pulverized, or otherwise deteriorated so that the asbestos is no longer likely to be bound with its matrix.

Lockdown - Applying encapsulant, after a final visual inspection, on all abated surfaces at the conclusion of ACM removal prior to removal of critical barriers.

National Emission Standards for Hazardous Air Pollutants (NESHAP) – EPA's rule to control emissions of asbestos to the environment (40 CFR part 61, Subpart M).

Negative initial exposure assessment – A demonstration by the employer which complies with the criteria in 29 CFR 1926.1101 (f)(2)(iii), that employee exposure during an operation is expected to be consistently below the PEL or Excursion Limit (EL).

Negative pressure – Air pressure which is lower than the surrounding area, created by exhausting air from a sealed regulated area through HEPA equipped filtration units. OSHA requires maintaining -0.02 inch water column gauge inside the negative pressure enclosure.

Negative pressure respirator – A respirator in which the air pressure inside the facepiece is negative during inhalation relative to the air pressure outside the respirator facepiece.

Non-friable ACM – Material that contains more than 1 percent asbestos but cannot be crumbled, pulverized, or reduced to powder by hand pressure.

Organic vapor cartridge – The type of cartridge used on air purifying respirators to remove organic vapor hazardous air contaminants.

Outside air – The air outside buildings and structures, including, but not limited to, the air under a bridge or in an open ferry dock.

Owner/operator – Any person who owns, leases, operates, controls, or supervises the facility being demolished or renovated or any person who owns, leases, operates, controls, or supervises the demolition or renovation operation, or both.

Penetrating encapsulant – Encapsulant that is absorbed into the ACM matrix without leaving a surface layer.

Permissible exposure limit (PEL) – The level of exposure OSHA allows for as an eight (8) hour time-weighted average (TWA). For asbestos fibers, the eight (8) hour time-weighted average PEL is 0.1 fibers per cubic centimeter (0.1 f/cc) of air and the 30-minute Excursion Limit (EL) is 1.0 fibers per cubic centimeter (1 f/cc).

Personal protective equipment (PPE) – equipment designed to protect user from injury and/or specific job hazard. Such equipment may include protective clothing, hard hats, safety glasses, fall protection, and respirators.

Personal sampling/monitoring - Representative air samples obtained in the breathing zone for one or more workers within the regulated area using a filter cassette and a calibrated air sampling pump to determine asbestos exposure.

Pipe tunnel – An area, typically located adjacent to mechanical spaces or boiler rooms in which the pipes servicing the heating system in the building are routed to allow the pipes to access heating elements. These areas may contain asbestos pipe insulation, asbestos fittings, debris or asbestos-contaminated soil.

Polarized light microscopy (PLM) - Light microscopy using dispersion staining techniques and refractive indices to identify and quantify the type of asbestos present in a bulk sample.

Polyethylene sheeting - Strong plastic barrier material 4 to 6-mils thick, semi-transparent, flame retardant per NFPA 241.

Positive/negative fit check - A method of verifying the seal of a facepiece respirator by temporarily occluding the filters and breathing in (inhaling) and then temporarily occluding the exhalation valve and breathing out (exhaling) while checking for inward or outward leakage of the respirator, respectively.

Presumed ACM (PACM) - Thermal system insulation, surfacing, and flooring material installed in buildings prior to 1981. If the building owner has actual knowledge, or should have known through the exercise of due diligence that other materials are ACM, they too must be treated as PACM. The designation of PACM may be rebutted pursuant to 29 CFR 1926.1101 (k)(5).

Professional IH - An IH who meets the definition requirements of AIHA; meets the definition requirements of OSHA as a "Competent Person" at 29 CFR 1926.1101 (b); has completed two specialized EPA approved courses on management and supervision of asbestos abatement projects; has formal training in respiratory protection and waste disposal; and has a minimum of four projects of similar complexity with this project of which at least three projects serving as the supervisory IH. The PIH may be either the VA’s PIH (VPIH/CIH) or Contractor’s PIH (CPIH/CIH).

Project designer - A person who has successfully completed the training requirements for an asbestos abatement project designer as required by 40 CFR 763 Subpart E, Appendix C, Part I; (B)(5).

Assigned protection factor - A value assigned by OSHA/NIOSH to indicate the expected protection provided by each respirator class, when the respirator is properly selected and worn correctly. The number indicates the reduction of exposure level from outside to inside the respirator facepiece.

Qualitative fit test (QLFT) - A fit test using a challenge material that can be sensed by the wearer if leakage in the respirator occurs.

Quantitative fit test (QNFT) - A fit test using a challenge material which is quantified outside and inside the respirator thus allowing the determination of the actual fit factor.

Regulated area - An area established by the employer to demarcate where Class I, II, III asbestos work is conducted, and any adjoining area where debris and waste from such asbestos work may accumulate; and a work area within which airborne concentrations of asbestos exceed, or there is a reasonable possibility they may exceed the PEL.

Regulated ACM (RACM) - Friable ACM; Category I non-friable ACM that has become friable; Category I non-friable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading or; Category II non-friable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of the demolition or renovation operation.

Removal - All operations where ACM, PACM and/or RACM is taken out or stripped from structures or substrates, including demolition operations.

Renovation - Altering a facility or one or more facility components in any way, including the stripping or removal of asbestos from a facility component which does not involve demolition activity.

Repair - Overhauling, rebuilding, reconstructing, or reconditioning of structures or substrates, including encapsulation or other repair of ACM or PACM attached to structures or substrates.

Shower room - The portion of the PDF where personnel shower before leaving the regulated area.

Supplied air respirator (SAR) - A respiratory protection system that supplies minimum Grade D respirable air per ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-2018.

Surfacing ACM - A material containing more than 1 percent asbestos that is sprayed, troweled on or otherwise applied to surfaces for acoustical, decorative, fireproofing and other purposes.

Surfactant - A chemical added to water to decrease water's surface tension thus making it more penetrating into ACM.

Thermal system ACM - A material containing more than 1 percent asbestos applied to pipes, fittings, boilers, breeching, tanks, ducts, or other structural components to prevent heat loss or gain.

Transmission electron microscopy (TEM) - A microscopy method that can identify and count asbestos fibers.

VA Professional Industrial Hygienist (VPIH/CIH) – The Department of Veterans Affairs Professional Industrial Hygienist must meet the qualifications of a PIH, and may report to a Certified Industrial Hygienist (CIH).

VA Representative - The VA official responsible for on-going project work.

VA Total – means a building or substantial part of the building is completely removed, torn or knocked down, bulldozed, flattened, or razed, including removal of building debris.

Visible emissions - Any emissions, which are visually detectable without the aid of instruments, coming from ACM/PACM/RACM/ACS or ACM waste material.

Waste/Equipment decontamination facility (W/EDF) – The area in which equipment is decontaminated before removal from the regulated area.

Waste generator - Any owner or operator whose act or process produces asbestos-containing waste material.

Waste shipment record - The shipping document, required to be originated and signed by the waste generator, used to track and substantiate the disposition of asbestos-containing waste material.

Wet cleaning - The process of thoroughly eliminating, by wet methods, any asbestos contamination from surfaces or objects.

B. Referenced Standards Organizations: See Section 01 42 19 REFERENCED STANDARDS.

1.5 APPLICABLE CODES AND REGULATIONS

. General Applicability of Codes, Regulations, and Standards:

1. All work under this contract shall be done in strict accordance with all applicable Federal, State, and Local regulations, standards and

codes governing asbestos abatement, and any other trade work done in conjunction with the abatement. All applicable codes, regulations and standards are adopted into this specification and will have the same force and effect as this specification.

2. The most recent edition of any relevant regulation, standard, document or code shall be in effect. Where conflict among the requirements or with these specifications exists, the most stringent requirement(s) shall be utilized.
3. Copies of all standards, regulations, codes and other applicable documents, including this specification and those listed in Section 1.5 shall be available at the worksite in the clean change area of the worker decontamination system and/or the Contractor's on-site Field Office. These standards, regulations, codes and other applicable documents, including this specification and those listed in Section 1.5 may be made available electronically.

A. Contractor Responsibility: The Asbestos Abatement Contractor (Contractor) shall assume full responsibility and liability for compliance with all applicable Federal, State and Local regulations related to any and all aspects of the asbestos abatement project. The Contractor is responsible for providing and maintaining training, accreditations, medical exams, medical records, personal protective equipment (PPE), including respiratory protection and respirator fit testing, as required by applicable Federal, State and Local regulations. The Contractor shall hold the VA and VPIH/CIH consultants harmless for any Contractor's failure to comply with any applicable work, packaging, transporting, disposal, safety, health, or environmental requirement on the part of himself, his employees, or his subcontractors. The Contractor will incur all costs of the CPIH/CIH, including all sampling/analytical costs to assure compliance with OSHA/EPA/State/Local requirements related to failure to comply with the regulations applicable to the work.

B. Federal Requirements:
   1. Federal requirements which govern asbestos abatement include, but are not limited to, the following regulations:
      a. Occupational Safety and Health Administration **(OSHA)**
         1) Title 29 CFR 1926.1101 - Construction Standard for Asbestos

2) Title 29 CFR 1926 Subpart E - Personal Protective Equipment and Life Saving Equipment
3) Title 29 CFR 1910.134 - Respiratory Protection
4) Title 29 CFR 1926 - Construction Industry Standards
5) Title 29 CFR 1926.33 - Access to Employee Exposure and Medical Records
6) Title 29 CFR 1926.59 same as 1910.1200 - Hazard Communication
7) Title 29 CFR 1926 Subpart C – General Safety and Health Provisions and Subpart D – Occupational Health and Environmental Controls

b. Environmental Protection Agency **(EPA)**:
1) 40 CFR 61 Subpart M - National Emission Standard for Hazardous Air Pollutants - Asbestos.
2) 40 CFR 763 - Asbestos Hazard Emergency Response Act (AHERA) and Asbestos Hazard Abatement Reauthorization Act (ASHARA)

c. Department of Transportation **(DOT)**
1) Title 49 CFR 171 - 180 – Transportation

C. State Requirements:
1. State requirements that apply to the asbestos abatement work, disposal, clearance, etc., include, but are not limited to, the following:

Wisconsin Dept. Health and Human Services
Lead and Asbestos Section
1 W Wilson St., Room 137
Madison, WI 53703-3445

Wisconsin Dept. of Natural Resources
P.O. Box 7921
Madison, WI 53707
Ch. NR 447 Wis. Admin. Code

D. Local Requirements:
1. If local requirements are more stringent than federal or state standards, the local standards are to be followed.

City of Milwaukee (if within city limits)

E. Standards:

1. Standards which govern asbestos abatement activities include, but are not limited to, the following:
   a. American National Standards Institute (ANSI)/ASSP Z9.2-2018 - Fundamentals Governing the Design and Operation of Local Exhaust Systems and ANSI/ASSE Z88.2-2015 - Practices for Respiratory Protection.
   b. Underwriters Laboratories (UL) 586-2009 - UL Standard for Safety of HEPA Filter Units, 9th Edition; ANSI Approval 2017-12-19.
2. Standards which govern encapsulation work include, but are not limited to the following:
   a. American Society for Testing and Materials International (ASTM)
3. Standards which govern the fire and safety concerns in abatement work include, but are not limited to, the following:
   a. National Fire Protection Association (NFPA) 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations.
   b. NFPA 701 - Standard Methods for Fire Tests for Flame Resistant Textiles and Film.
   c. NFPA 101 - Life Safety Code

F. EPA Guidance Documents:
1. EPA guidance documents which discuss asbestos abatement work activities are listed below. These documents are made part of this section by reference.
2. Guidance for Controlling ACM in Buildings (Purple Book) EPA 560/5-85-024
3. Asbestos Waste Management Guidance EPA 530-SW-85-007
4. A Guide to Respiratory Protection for the Asbestos Abatement Industry EPA-560-OPTS-86-001
5. Guide to Managing Asbestos in Place (Green Book) TS 799 20T July 1990

G. Notices:
1. State and Local agencies: Send written notification as required by State and Local regulations prior to beginning any work on ACM as follows:

Wisconsin Dept. Health and Human Services
Lead and Asbestos Section
1 W Wilson St., Room 137
Madison, WI 53703-3445

Wisconsin Dept. of Natural Resources
P.O. Box 7921
Madison, WI 53707
Ch. NR 447 Wis. Admin. Code

City of Milwaukee (if applicable)

2. Copies of notifications shall be submitted to the VA for the facility's records in the same time frame notification are given to EPA, State, and Local regulations prior to beginning any work on ACM as follows.

H. Permits/Licenses: The contractor shall apply for and have all required permits and licenses to perform asbestos abatement work as required by Federal, State, and Local regulations.

I. Posting and Filing of Regulations: Maintain two (2) copies of applicable Federal, State, and Local regulations. Post one copy of each at the regulated area where workers will have daily access to the regulations and keep another hard copy or electronic copy in the Contractor's office.

J. VA Responsibilities prior to commencement of work:

1. Notify occupants adjacent to regulated areas of project dates and requirements for relocation, if needed. Arrangements must be made prior to starting work for relocation of desks, files, equipment, and personal possessions to avoid unauthorized access into the regulated area. **Note: Notification of adjacent personnel is required by OSHA in 29 CFR 1926.1101 (k) to prevent unnecessary or unauthorized access to the regulated area**.
2. Submit to the Contractor results of background air sampling; including location of samples, person who collected the samples, equipment utilized, calibration data and method of analysis. During abatement, submit to the Contractor, results of bulk material analysis and air sampling data collected during the course of the abatement. This information shall not release the Contractor from any responsibility for OSHA compliance.

K. Site Security:

1. Regulated area access is to be restricted only to authorized, trained/accredited and protected personnel. These may include the Contractor's employees, employees of Subcontractors, VA employees

and Representatives, State and Local inspectors, and any other designated individuals. A list of authorized personnel shall be established prior to commencing the project and shall be posted in the clean room of the decontamination unit.

2. Entry into the regulated area by unauthorized individuals shall be reported immediately to the Competent Person by anyone observing the entry. The Competent person shall immediately notify the VA Representative.
3. A log book shall be maintained in the clean room of the decontamination unit. Anyone who enters the regulated area must record their name, affiliation, time in, and time out for each entry.
4. Access to the regulated area shall be through a critical barrier doorway. All other access (doors, windows, hallways, etc.) shall be sealed or locked to prevent entry to or exit from the regulated area. The only exceptions for this requirement are the waste/equipment load-out area which shall be sealed except during the removal of containerized asbestos waste from the regulated area, and emergency exits. Emergency exits shall not be locked from the inside; however, they shall be sealed with poly sheeting and taped until needed.
5. The Contractor's Competent Person shall control site security during abatement operations in order to isolate work in progress and protect adjacent personnel. A 24-hour security system shall be provided at the entrance to the regulated area to assure that all entrants are logged in/out and that only authorized personnel are allowed entrance.
6. The regulated area shall be locked during non-working hours and secured by VA security guards.

L. Emergency Action Plan and Arrangements:

1. An Emergency Action Plan shall be developed prior to commencing abatement activities and shall be agreed to by the Contractor and the VA. The Plan shall meet the requirements of 29 CFR 1926, Subpart C, Standard 1926.35 Employee Emergency Action Plans.
2. Emergency procedures shall be in written form and prominently posted in the clean room and equipment room of the decontamination unit. Everyone, prior to entering the regulated area, must read and sign

these procedures to acknowledge understanding of the regulated area layout, location of emergency exits and emergency procedures.

3. Emergency planning shall include written notification of police, fire, and emergency medical personnel of planned abatement activities; work schedule; layout of regulated area; and access to the regulated area, particularly barriers that may affect response capabilities.
4. Emergency planning shall include consideration of fire, explosion, hazardous atmospheres, electrical hazards, slips/trips and falls, confined spaces, and heat stress illness. Written procedures for response to emergency situations shall be developed and employee training in procedures shall be provided.
5. Employees shall be trained in regulated area/site evacuation procedures in the event of workplace emergencies.
   a. For non-life-threatening situations - employees injured or otherwise incapacitated shall be decontaminated following normal procedures with assistance from fellow workers, if necessary, before exiting the regulated area to obtain proper medical treatment.
   b. For life-threatening injury or illness, worker decontamination shall take least priority after measures to stabilize the injured worker, medical personnel shall remove them from the regulated area if back or neck injury is present, and secure proper medical treatment.
6. Telephone numbers of any/all emergency response personnel shall be prominently posted in the clean room, along with the location of the nearest telephone.
7. The Contractor shall provide verification of first aid/CPR training for personnel responsible for providing first aid/CPR. OSHA requires medical assistance within 3-4 minutes of a life-threatening injury/illness. Bloodborne Pathogen training shall also be verified for those personnel required to provide first aid/CPR.
8. The Emergency Action Plan shall provide for a Contingency Plan in the event that an incident occurs that may require the modification of the Asbestos Hazard Abatement Plans during abatement. Such incidents include, but are not limited to, fire; accident; power failure; negative pressure failure; and supplied air system failure.

The Contractor shall detail procedures to be followed in the event of an incident assuring that asbestos abatement work is stopped and wetting is continued until correction of the problem.

M. Pre-Construction Meeting:

1. Prior to commencing the work, the Contractor shall meet with the VA Certified Industrial Hygienist (VPIH/CIH) to present and review, as appropriate, the items following this paragraph. The Contractor's Competent Person(s) who will be on-site shall participate in the pre-start meeting. The pre-start meeting is to discuss and determine procedures to be used during the project. At this meeting, the Contractor shall provide:

   a. Proof of Contractor licensing.
   b. Proof the Competent Person(s) is trained and accredited and approved for working in this State. Verification of the experience of the Competent Person(s) shall also be presented.
   c. A list of all workers who will participate in the project, including experience and verification of training and accreditation.
   d. A list of and verification of training for all personnel who have current first-aid/CPR training. A minimum of one person per shift must have adequate training.
   e. Current medical written opinions for all personnel working on-site meeting the requirements of 29 CFR 1926.1101 (m).
   f. Current fit-tests for all personnel wearing respirators on-site meeting the requirements of 29 CFR 1926.1101 (h) and Appendix C.
   g. A copy of the Contractor's Asbestos Hazard Abatement Plan. In these procedures, the following information must be detailed, specific for this project.
      1) Regulated area preparation procedures;
      2) Notification requirements procedure of Contractor as required in 29 CFR 1926.1101 (d) Multi-Employer Worksites;
      3) Decontamination area set-up/layout and decontamination procedures for employees;
      4) Abatement methods/procedures and equipment to be used;
      5) Personal protective equipment to be used.

h. At this meeting the Contractor shall provide all submittals as required.

i. Procedures for handling, packaging and disposal of asbestos waste.

j. Emergency Action Plan and Contingency Plan Procedures.

1.6 PROJECT COORDINATION

. The following are the minimum administrative and supervisory personnel necessary for coordination of the work.

1. Personnel:

a. Administrative and supervisory personnel shall consist of a qualified Competent Person(s) as defined by OSHA in the Construction Standards and the Asbestos Construction Standard; Contractor Professional Industrial Hygienist and Industrial Hygiene Technicians. These employees are the Contractor's representatives responsible for compliance with these specifications and all other applicable requirements.

b. Non-supervisory personnel shall consist of an adequate number of qualified personnel to meet the schedule requirements of the project. Personnel shall meet required qualifications. Personnel utilized on-site shall be pre-approved by the VA representative. A request for approval shall be submitted for any person to be employed during the project giving the person's name; last four digits of social security number; qualifications; accreditation card with color picture, if required by state; Certificate of Worker's Acknowledgment; and Affidavit of Medical Surveillance and Respiratory Protection and current Respirator Fit Test.

c. Minimum qualifications for Contractor and assigned personnel are:

1) The Contractor has conducted within the last three (3) years, three (3) projects of similar complexity and dollar value as this project; has not been cited and penalized for serious violations of Federal (and State or Local as applicable) EPA and OSHA asbestos regulations in the past three (3) years; has adequate liability/occurrence insurance for asbestos work as required by the state; is licensed in applicable state; has adequate and qualified personnel available to complete the work; has comprehensive Abatement Hazard Abatement Plans

for asbestos work; has adequate materials, equipment and supplies to perform the work.

2) The Competent Person has four (4) years of abatement experience of which two (2) years were as the Competent Person on the project; meets the OSHA definition of a Competent Person; has been the Competent Person on two (2) projects of similar size and complexity as this project within the past three (3) years; has completed EPA AHERA/OSHA/State/Local training requirements/accreditation(s) and refreshers; and has all required OSHA documentation related to medical and respiratory protection.

3) The Contractor Professional Industrial Hygienist/CIH (CPIH/CIH) shall have five (5) years of monitoring experience and supervision of asbestos abatement projects; has participated as senior IH on five (5) abatement projects, three (3) of which are similar in size and complexity as this project; has specialized EPA AHERA/OSHA training in asbestos abatement management, respiratory protection, waste disposal and asbestos inspection; has completed the NIOSH 582 Course or equivalent, Contractor/Supervisor course; and has appropriate medical/respiratory protection records/documentation.

4) The Abatement Personnel shall have completed the EPA AHERA/OSHA abatement worker course; have training on the Asbestos Hazard Abatement Plans of the Contractor; has one year of asbestos abatement experience within the past three (3) years of similar size and complexity; has applicable medical and respiratory protection documentation; and has certificate of training/current refresher and State accreditation/license.

d. All personnel shall be in compliance with OSHA construction safety training as applicable and submit certification.

1.7 RESPIRATORY PROTECTION

. General - Respiratory Protection Program: The Contractor shall develop and implement a written Respiratory Protection Program (RPP) which is in compliance with OSHA requirements found at 29 CFR 1926.1101 and 29 CFR 1910.134. ANSI Standard Z88.2-2015 provides excellent guidance for

developing a respiratory protection program. All respirators used must be NIOSH approved for asbestos abatement activities. The written RPP shall, at a minimum, contain the basic requirements found at 29 CFR 1910.134 (c) - Respiratory Protection Program.

A. Respiratory Protection Program Coordinator: The Respiratory Protection Program Coordinator (RPPC) must be identified and shall have two (2) years of experience coordinating RPP of similar size and complexity. The RPPC must submit a signed statement attesting to the fact that the program meets the above requirements.

B. Selection and Use of Respirators: The procedure for the selection and use of respirators must be submitted to the VA as part of the Contractor's qualifications. The procedure must be written clearly enough for workers to understand. A copy of the Respiratory Protection Program must be available in the clean room of the decontamination unit or in the onsite Contractor’s office, for reference by employees or authorized visitors.

C. Minimum Respiratory Protection: Shall be a ½-mask negative pressure air purifying respirator equipped with Combination P100 filters and Organic Vapor Cartridge, provided personal air samples in the workplace remain at or below 0.1 f/cc, and the applicable PEL for solvents, both determined as an 8-hour TWA. Full face powered air purifying respirator equipped with P100 filters and Organic Vapor Cartridge shall be required until Contractor demonstrates that personal air samples are at or below 0.1 f/cc, and the applicable PEL for solvents, both determined as an 8-hour TWA. A higher level of respiratory protection shall be required, if fiber levels exceed 1 f/cc as an 8-hour TWA, inside the regulated work area. Respirator selection shall meet the requirements of 29 CFR 1926.1101 (h) and 29 CFR 1910.134 (d)(3)(i)(A) Table 1, except as indicated in this paragraph. Abatement personnel must have a respirator for their exclusive use.

D. Medical Written Opinion: No employee shall be allowed to wear a respirator unless a physician or other licensed health care professional has provided a written determination they are medically qualified to wear the class of respirator to be used on the project while wearing whole body impermeable garments and subjected to heat or cold stress.

E. Respirator Fit Test: All personnel wearing respirators shall have a current qualitative/quantitative fit test which was conducted in accordance with 29 CFR 1910.134 (f) and Appendix A. Quantitative fit tests shall be done for PAPRs which have been put into a motor/blower failure mode.

F. Respirator Fit Check: The Competent Person shall assure that the positive/negative pressure user seal check is done each time the respirator is donned by an employee. Head coverings must cover respirator head straps. Any situation that prevents an effective facepiece to face seal as evidenced by failure of a user seal check shall preclude that person from entering the regulated area until resolution of the problem.

G. Maintenance and Care of Respirators: The Respiratory Protection Program Coordinator shall submit evidence and documentation showing compliance with 29 CFR 1910.134 (h) Maintenance and Care of Respirators.

H. Supplied Air Systems: If a supplied air system is used, the system shall meet all requirements of 29 CFR 1910.134 and the ANSI/Compressed Gas Association (CGA) Commodity Specification for Air current requirements for Type 1 - Grade D breathing air. Low pressure systems are not allowed to be used on asbestos abatement projects. Supplied Air respirator use shall be in accordance with EPA/NIOSH publication EPA-560-OPTS-86-001 "A Guide to Respiratory Protection for the Asbestos Abatement Industry". The competent person on site will be responsible for the supplied air system to ensure the safety of the worker.

1.8 WORKER PROTECTION

. Training of Abatement Personnel: Prior to beginning any abatement activity, all personnel shall be trained in accordance with OSHA 29 CFR 1926.1101 (k)(9) and any additional State/Local requirements. Training must include, at a minimum, the elements listed at 29 CFR 1926.1101 (k)(9)(viii). Training shall have been conducted by a third party, EPA/State approved trainer meeting the requirements of EPA 40 CFR 763 Appendix C (AHERA MAP). Initial training certificates and current refresher and accreditation proof must be submitted for each person working at the site.

A. Medical Examinations: Medical examinations meeting the requirements of 29 CFR 1926.1101 (m) shall be provided for all personnel working in the regulated area, regardless of exposure levels. A current physician's

written opinion as required by 29 CFR 1926.1101 (m)(4) shall be provided for each person and shall include in the medical opinion that the person has been evaluated for working in a heat and cold stress environment while wearing personal protective equipment (PPE) and is able to perform the work without risk of material health impairment.

B. Personal Protective Equipment: Provide whole body clothing, head coverings, foot coverings and any other personal protective equipment as determined by conducting the hazard assessment required by OSHA at 29 CFR 1910.132 (d). The Competent Person shall ensure the integrity of personal protective equipment worn for the duration of the project. Duct tape shall be used to secure all suit sleeves to wrists and to secure foot coverings at the ankle.

C. Regulated Area Entry Procedure: The Competent Person shall ensure that each time workers enter the regulated area they remove ALL street clothes in the clean room of the decontamination unit and put on new disposable coveralls, head coverings, a clean respirator, and then proceed through the shower room to the equipment room where they put on non-disposable required personal protective equipment.

D. Decontamination Procedure: The Competent Person shall require all personnel to adhere to following decontamination procedures whenever they leave the regulated area.

1. When exiting the regulated area, remove all disposable PPE and dispose of in a disposable bag provided in the regulated area.
2. Carefully decontaminate and clean the respirator. Put in a clean container/bag.

E. Regulated Area Requirements: The Competent Person shall meet all requirements of 29 CFR 1926.1101 (o) and assure that all requirements for Class II regulated areas at 29 CFR 1926.1101 (e) are met applicable to Class II work and this specification. All personnel in the regulated area shall not be allowed to eat, drink, smoke, chew tobacco or gum, apply cosmetics, or in any way interfere with the fit of their respirator.

1.9 DECONTAMINATION FACILITIES

. Description: Provide each regulated area with separate personnel decontamination facilities (PDF) and waste/equipment decontamination facilities (W/EDF). Ensure that the PDF are the only means of ingress

and egress to the regulated area and that all equipment, bagged waste, and other material exit the regulated area only through the W/EDF.

A. General Requirements: All personnel entering or exiting a regulated area must go through the PDF and shall follow the requirements at 29 CFR 1926.1101 (j)(1) and these specifications. All waste, equipment and contaminated materials must exit the regulated area through the W/EDF and be decontaminated in accordance with these specifications. Walls and ceilings of the PDF and W/EDF must be constructed of a minimum of 3-layers of 6-mil opaque fire retardant polyethylene sheeting and be securely attached to existing building components and/or an adequate temporary framework. A minimum of 3-layers of 6-mil poly shall also be used to cover the floor under the PDF and W/EDF units. Construct doors so that they overlap and secure to adjacent surfaces. Weight inner doorway sheets with layers of duct tape so that they close quickly after release. Put arrows on sheets so they show direction of travel and overlap. If the building adjacent area is occupied, construct a solid barrier on the occupied side(s) to protect the sheeting and reduce potential for non-authorized personnel entering the regulated area.

B. Temporary Facilities to the PDF and W/EDF: The Competent Person shall provide temporary water service connections to the PDF and W/EDF. Backflow prevention must be provided at the point of connection to the VA system. Water supply must be of adequate pressure and meet requirements of 29 CFR 1910.141 (d)(3). Provide adequate temporary overhead electric power with ground fault circuit interruption (GFCI) protection. Provide a sub-panel equipped with GFCI protection for all temporary power in the clean room. Provide adequate lighting to provide a minimum of 50 foot candles in the PDF and W/EDF. Provide temporary heat, if needed, to maintain 70°F throughout the PDF and W/EDF.

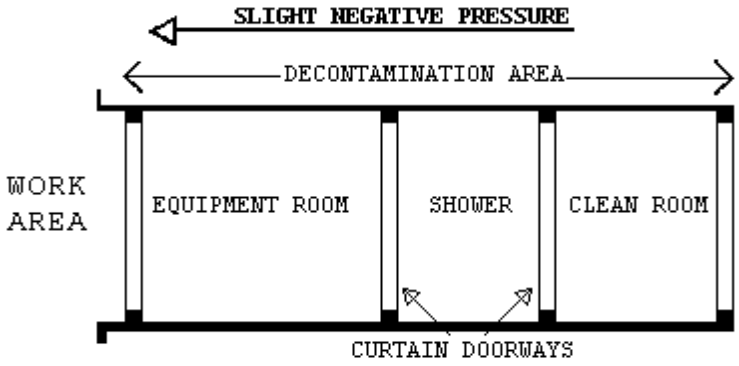
C. Personnel Decontamination Facility (PDF):

1. Clean Room: The clean room must be physically and visually separated from the rest of the building to protect the privacy of personnel changing clothes. The clean room shall be constructed of at least 3-layers of 6-mil opaque fire retardant poly to provide an air tight room. Provide a minimum of 2 - 900 mm (3 foot) wide 6-mil poly opaque fire retardant doorways. One doorway shall be the entry from outside the PDF and the second doorway shall be to the shower room

of the PDF. The floor of the clean room shall be maintained in a clean, dry and sanitary condition. Shower overflow shall not be allowed into the clean room. Provide 1 storage locker per person. A portable fire extinguisher, minimum 10 pounds capacity, Type ABC, shall be provided in accordance with OSHA and NFPA Standard 10. All persons entering the regulated area shall remove all street clothing in the clean room and dress in disposable protective clothing and respiratory protection. Any person entering the clean room does so either from the outside with street clothing on or is coming from the shower room completely naked and thoroughly washed. Male/Females required to enter the regulated area shall be ensured of their privacy throughout the entry/exit process by posting guards at both entry points to the PDF so no male/female can enter or exit the PDF during his/her stay in the PDF.

2. Shower Room: The Competent Person shall assure that the shower room is a completely water tight compartment to be used for the movement of all personnel from the clean room to the equipment room and for the showering of all personnel going from the equipment room to the clean room. Each shower shall be constructed so water runs down the walls of the shower and into a drip pan. Install a freely draining smooth floor on top of the shower pan. The shower room shall be separated from the rest of the building and from the clean room and equipment room using air tight walls made from at least 3-layers of 6-mil opaque fire retardant poly. The shower shall be equipped with a shower head and controls, hot and cold water, drainage, soap dish and continuous supply of soap, and shall be maintained in a sanitary condition throughout its use. The controls shall be arranged so an individual can shower without assistance. Provide a flexible hose shower head, hose bibs and all other items shown on Shower Schematic. Waste water will be pumped to a drain after being filtered through a minimum of a 100 micron sock in the shower drain; a 20 micron filter; and a final 5 micron filter. Filters will be changed a minimum of daily or more often as needed. Filter changes must be done in the shower to prevent loss of contaminated water. Hose down all shower surfaces after each shift and clean any debris from the shower pan. Residue is to be disposed of as asbestos waste.

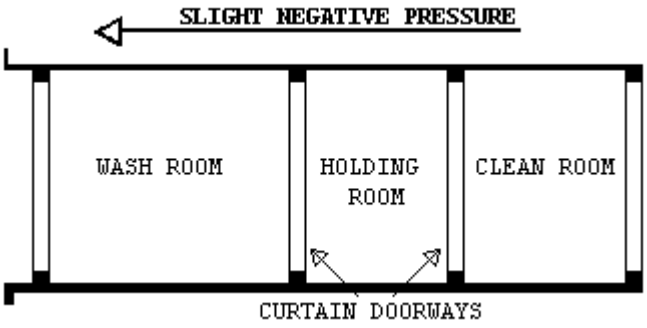
3. Equipment Room: The Competent Person shall provide an equipment room which shall be an air tight compartment for the storage of work equipment/tools, reusable personal protective equipment, except for a respirator and for use as a gross decontamination area for personnel exiting the regulated area. The equipment room shall be separated from the regulated area by a minimum 3 foot wide door made with 2-layers of 6-mil opaque fire retardant poly. The equipment room shall be separated from the regulated area, the shower room and the rest of the building by air tight walls and ceiling constructed of a minimum of 3-layers of 6-mil opaque fire retardant poly. Damp wipe all surfaces of the equipment room after each shift change. Provide an additional loose layer of 6-mil fire retardant poly per shift change and remove this layer after each shift. If needed, provide a temporary electrical sub-panel equipped with GFCI in the equipment room to accommodate any equipment required in the regulated area.
4. The PDF shall be as follows: Clean room at the entrance followed by a shower room followed by an equipment room leading to the regulated area. Each doorway in the PDF shall be a minimum of 2 layers of 6-mil opaque fire retardant poly.



D. Waste/Equipment Decontamination Facility (W/EDF):
1. The Competent Person shall provide an W/EDF consisting of a wash room, holding room, and clean room for removal of waste, equipment and contaminated material from the regulated area. Personnel shall not enter or exit the W/EDF except in the event of an emergency. Clean debris and residue in the W/EDF daily. All surfaces in the W/EDF shall be wiped/hosed down after each shift and all debris

shall be cleaned from the shower pan. The W/EDF shall consist of the following:

a. Wash Down Station: Provide an enclosed shower unit in the regulated area just outside the Wash Room as an equipment bag and container cleaning station.
b. Wash Room: Provide a wash room for cleaning of bagged or containerized asbestos containing waste materials passed from the regulated area. Construct the wash room using 50 x 100 mm (2 inches x 4 inches) wood framing or approved equivalent and 3-layers of 6-mil fire retardant poly. Locate the wash room so that packaged materials, after being wiped clean, can be passed to the Holding Room. Doorways in the wash room shall be constructed of 2-layers of 6-mil fire retardant poly.
c. Holding Room: Provide a holding room as a drop location for bagged materials passed from the wash room. Construct the holding room using 50 x 100 mm (2 inches x 4 inches) wood framing or approved equivalent and 3-layers of 6-mil fire retardant poly. The holding room shall be located so that bagged material cannot be passed from the wash room to the clean room unless it goes through the holding room. Doorways in the holding room shall be constructed of 2 layers of 6-mil fire retardant poly.
d. Clean Room: Provide a clean room to isolate the holding room from the exterior of the regulated area. Construct the clean room using 2 inches x 4 inches wood framing or approved equivalent and 2-layers of 6-mil fire retardant poly. The clean room shall be located so as to provide access to the holding room from the building exterior. Doorways to the clean room shall be constructed of 2-layers of 6-mil fire retardant poly. When a negative pressure differential system is used, a rigid enclosure separation between the W/EDF clean room and the adjacent areas shall be provided.
e. The W/EDF shall be as follows: Wash Room leading to a Holding Room followed by a Clean Room leading to outside the regulated area. See diagram.



E. Waste/Equipment Decontamination Procedures: At the washdown station, in the regulated area, thoroughly wet clean contaminated equipment and/or sealed polyethylene bags and pass into Wash Room after visual inspection. When passing anything into the Wash Room, close all doorways of the W/EDF, other than the doorway between the washdown station and the Wash Room. Keep all outside personnel clear of the W/EDF. Once inside the Wash Room, wet clean the equipment and/or bags. After cleaning and inspection, pass items into the Holding Room. Close all doorways except the doorway between the Holding Room and the Clean Room. Workers from the Clean Room/Exterior shall enter the Holding Room and remove the decontaminated/cleaned equipment/bags for removal and disposal. At no time shall personnel from the clean side be allowed to enter the Wash Room.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

. General Requirements (All Abatement Project): Prior to the start of work, the contractor shall provide and maintain a sufficient quantity of materials and equipment to assure continuous and efficient work throughout the duration of the project. Work shall not start unless the following items have been delivered to the site and the CPIH/CIH has submitted verification to the VA's Representative.

1. All materials shall be delivered in their original package, container or bundle bearing the name of the manufacturer and the brand name (where applicable).
2. Store all materials subject to damage off the ground, away from wet or damp surfaces and under cover sufficient enough to prevent damage or contamination. Flammable and combustible materials cannot be

stored inside buildings. Replacement materials shall be stored outside of the regulated area until abatement is completed.

3. The Contractor shall not block or hinder use of buildings by patients, staff, and visitors to the VA in partially occupied buildings by placing materials/equipment in any unauthorized location.
4. The Competent Person shall inspect for damaged, deteriorating or previously used materials. Such materials shall not be used and shall be removed from the worksite and disposed of properly.
5. Polyethylene sheeting for walls in the regulated area shall be a minimum of 4-mils. For floors and all other uses, sheeting of at least 6-mil shall be used in widths selected to minimize the frequency of joints. Fire retardant poly shall be used throughout.
6. The method of attaching polyethylene sheeting shall be agreed upon in advance by the Contractor and the VA and selected to minimize damage to equipment and surfaces. Method of attachment may include any combination of moisture resistant duct tape, poly tape, furring strips, spray glue, staples, nails, screws, lumber and plywood for enclosures or other approved equivalent procedures capable of sealing polyethylene to dissimilar finished or unfinished surfaces under both wet and dry conditions.
7. Polyethylene sheeting utilized for the PDF shall be opaque white or black in color, 6-mil fire retardant poly.
8. Installation and plumbing hardware, showers, hoses, drain pans, sump pumps and waste water filtration system shall be provided by the Contractor.
9. An adequate number of HEPA vacuums, scrapers, sprayers, nylon brushes, brooms, disposable mops, rags, sponges, staple guns, shovels, ladders and scaffolding of suitable height and length as well as meeting OSHA requirements, fall protection devices, water hose to reach all areas in the regulated area, airless spray equipment, and any other tools, materials or equipment required to conduct the abatement project. All electrically operated hand tools, equipment, electric cords shall be connected to GFCI protection.
10. Special protection for objects in the regulated area shall be detailed (e.g., plywood over carpeting or hardwood floors to prevent damage from scaffolds, water and falling material).

11. Disposal bags – 2 layers of 6-mil poly for asbestos waste shall be pre-printed with labels, markings and address as required by OSHA, EPA and DOT regulations.
12. The VA shall be provided an advance copy of the Safety Data Sheets (SDS) as required for all hazardous chemicals under OSHA 29 CFR 1910.1200 - Hazard Communication in the pre-project submittal. Chlorinated compounds shall not be used with any spray adhesive, mastic remover or other product. Appropriate encapsulant(s) shall be provided.
13. OSHA DANGER demarcation signs, as many and as required by OSHA 29 CFR 1926.1101(k)(7) shall be provided and placed by the Competent Person. All other posters and notices required by Federal and State regulations shall be posted in the Clean Room.
14. Adequate and appropriate PPE for the project and number of personnel/shifts shall be provided. All personal protective equipment issued must be based on a written hazard assessment conducted under 29 CFR 1910.132(d).

A. Negative Pressure Filtration System:

0. The Contractor shall provide enough HEPA negative air machines to continuously maintain a negative pressure differential of -0.02 inches water column gauge (WCG) inside the regulated work area relative to adjacent non-work building areas. OSHA 29 CFR 1926.1101 (g)(5)(i)(A)(2) also requires at least four (4) air changes per hour. Contractor shall increase air changes per hour as necessary to maintain volatile organic compounds below the applicable OSHA PEL. The Competent Person shall determine the number of units needed for the regulated area by dividing the cubic feet in the regulated area by 15 and then dividing that result by the cubic feet per minute (CFM) for each unit to determine the number of units needed to continuously maintain a negative pressure differential of -0.02 inches WCG. Provide a standby unit in the event of machine failure and/or emergency in an adjacent area. HEPA equipped negative air machines shall be discharged outside of the building a minimum of 3 feet from building make-up air, doors, open windows, patients, visitors and staff.
1. NIOSH has done extensive studies and has determined that negative air machines typically operate at ~50 percent efficiency. The

contractor shall consider this in their determination of number of units needed to continuously maintain a pressure differential of -0.02 inches WCG. The contractor shall use 8 air changes per hour or double the number of machines, based on their calculations, or submit proof their machines operate at stated capacities, at a 2 inches pressure drop across the filters.

B. Design and Layout:

1. Before start of work submit the design and layout of the regulated area and the negative air machines. The submittal shall indicate the number of, location of and size of negative air machines. The point(s) of exhaust, air flow within the regulated area, anticipated negative pressure differential, and supporting calculations for sizing shall be provided. In addition, submit the following:
   a. Method of supplying power to the units and designation/location of the panels.
   b. Description of testing method(s) for correct air volume and pressure differential.
   c. If auxiliary power supply is to be provided for the negative air machines, provide a schematic diagram of the power supply and manufacturer's data on the generator and switch.

C. Negative Air Machines (HEPA Units)

1. Negative Air Machine Cabinet: The cabinet shall be constructed of steel or other durable material capable of withstanding potential damage from rough handling and transportation. The width of the cabinet shall be less than 30 inches in order to fit in standard doorways. The cabinet must be factory sealed to prevent asbestos fibers from being released during use, transport, or maintenance. Any access to and replacement of filters shall be from the inlet end. The unit must be on casters or wheels.
2. Negative Air Machine Fan: The rating capacity of the fan must indicate the CFM under actual operating conditions. Manufacturer's typically use "free-air" (no resistance) conditions when rating fans. The fan must be a centrifugal type fan.
3. Negative Air Machine Final Filter: The final filter shall be a HEPA filter. The filter media must be completely sealed on all edges within a structurally rigid frame. The filter shall align with a continuous flexible gasket material in the negative air machine

housing to form an air tight seal. Each HEPA filter shall be certified by the manufacturer to have an efficiency of not less than 99.97 percent. Testing shall have been done in accordance with Military Standard MIL-STD-282 and Army Instruction Manual 136-300-175A. Each filter must bear a UL586 label to indicate ability to perform under specified conditions. Each filter shall be marked with the name of the manufacturer, serial number, air flow rating, efficiency and resistance, and the direction of test air flow.

4. Negative Air Machine Pre-filters: The pre-filters, which protect the final HEPA filter by removing larger particles, are required to prolong the operating life of the HEPA filter. Two stages of pre-filtration are required. A first stage pre-filter shall be a low efficiency type for particles 10 micron or larger. A second stage pre-filter shall have a medium efficiency effective for particles down to 5 micron or larger. Pre-filters shall be installed either on or in the intake opening of the NAM and the second stage filter must be held in place with a special housing or clamps.
5. Negative Air Machine Instrumentation: Each unit must be equipped with a gauge to measure the pressure drop across the filters and to indicate when filters have become loaded and need to be changed. A table indicating the cfm for various pressure readings on the gauge shall be affixed near the gauge for reference or the reading shall indicate at what point the filters shall be changed, noting cfm delivery. The unit must have an elapsed time meter to show total hours of operation.
6. Negative Air Machine Safety and Warning Devices: An electrical/ mechanical lockout must be provided to prevent the fan from being operated without a HEPA filter. Units must be equipped with an automatic shutdown device to stop the fan in the event of a rupture in the HEPA filter or blockage in the discharge of the fan. Warning lights are required to indicate normal operation; too high a pressure drop across filters; or too low of a pressure drop across filters.
7. Negative Air Machine Electrical: All electrical components shall be approved by the National Electrical Manufacturer's Association (NEMA) and Underwriters Laboratories (UL). Each unit must be

provided with overload protection and the motor, fan, fan housing, and cabinet must be grounded.

8. It is essential that replacement HEPA filters be tested using an "in-line" testing method, to ensure the seal around the periphery was not damaged during replacement. Damage to the outer HEPA filter seal could allow contaminated air to bypass the HEPA filter and be discharged to an inappropriate location. Contractor will provide written documentation of test results for negative air machine units with HEPA filters.
9. Pressure Differential: The fully operational negative air system within the regulated area shall continuously maintain a pressure differential $\geq$ -0.02 inches WCG inside the regulated work area. Before any disturbance of any asbestos material, this shall be demonstrated to the VA by use of a pressure differential meter/manometer as required by OSHA 29 CFR 1926.1101(g)(5)(i). The Competent Person shall be responsible for providing, maintaining, and documenting the negative pressure and air changes as required by OSHA and this specification.

2.2 CONTAINMENT BARRIERS AND COVERINGS IN THE REGULATED AREA

. General:

1. Using critical barriers, seal off the perimeter to the regulated area to completely isolate the regulated area from adjacent spaces. All surfaces in the regulated area must be covered to prevent contamination and to facilitate clean-up. Should adjacent areas become contaminated as a result of the work, Contractor shall immediately stop work and clean up the contamination at no additional cost to the VA. Provide firestopping and identify all fire barrier penetrations due to abatement work as specified in Specification Section 07 84 00; FIRESTOPPING and Section 2.2.6.
2. Place all tools, scaffolding, materials and equipment needed for working in the regulated area prior to erecting any plastic sheeting. All uncontaminated removable furniture, equipment and/or supplies shall be removed by the VA from the regulated area before commencing work. Any objects remaining in the regulated area shall be completely covered with 2-layers of 6-mil fire retardant poly sheeting and secured with duct tape. Lock out and tag out any HVAC/electrical systems in the regulated area

A. Controlling Access to the Regulated Area: Access to the regulated area is allowed only through the personnel decontamination facility (PDF). All other means of access shall be eliminated and OSHA DANGER demarcation signs posted as required by OSHA. If the regulated area is adjacent to, or within view of an occupied area, provide a visual barrier of 6-mil opaque fire retardant poly to prevent building occupant observation. If the adjacent area is accessible to the public, the barrier must be solid and capable of withstanding the negative pressure.

B. Critical Barriers: Completely separate any operations in the regulated area from adjacent areas using 2-layers of 6-mil fire retardant poly and duct tape. Individually seal with 2-layers of 6-mil poly and duct tape all HVAC openings into the regulated area. Individually seal all lighting fixtures, clocks, doors, windows, convectors, speakers, or any other objects/openings in the regulated area. Heat must be shut off any objects covered with poly.

C. Secondary Barriers: A loose layer of 6-mil poly shall be used as a drop cloth to protect the primary layers from debris generated during the abatement. This layer shall be replaced as needed during the work and at a minimum once per work day.

D. Extension of the Regulated Area: If the enclosure of the regulated area is breached in any way that could allow contamination to occur, the affected area shall be included in the regulated area and constructed as per this section. Decontamination measures must be started immediately and continue until air monitoring indicates background levels are met.

E. Firestopping:
   1. Through penetrations caused by cables, cable trays, pipes, sleeves, conduits, etc. must be firestopped with a fire-rated firestop system providing an air tight seal.
   2. Firestop materials that are not equal to the wall or ceiling penetrated shall be brought to the attention of the VA Representative. The contractor shall list all areas of penetration, the type of sealant used, and whether or not the location is fire rated. Any discovery of penetrations during abatement shall be brought to the attention of the VA Representative immediately. All

walls, floors and ceilings are considered fire rated unless otherwise determined by the VA Representative or Fire Marshall.

3. Any visible openings whether or not caused by a penetration shall be reported by the Contractor to the VA Representative for a sealant system determination. Firestops shall meet ASTM E814 and UL 1479 requirements for the opening size, penetrant, and fire rating needed

2.3 MONITORING, INSPECTION AND TESTING

A. General:

1. Perform throughout abatement work monitoring, inspection and testing inside and around the regulated area in accordance with the OSHA requirements and these specifications. OSHA requires that the Employee exposure to asbestos must not exceed 0.1 fibers per cubic centimeter (f/cc) of air, averaged over an 8-hour work shift. The CPIH/CIH is responsible for and shall inspect and oversee the performance of the Contractor IH Technician. The IH Technician shall continuously inspect and monitor conditions inside the regulated area to ensure compliance with these specifications. In addition, the CPIH/CIH shall personally manage air sample collection, analysis, and evaluation for personnel, regulated area, and adjacent area samples inside the building, but outside the regulated area. Inside the building, but outside the regulated area air samples shall be collected in the Clean Room of the PDF, at the approximate location of HEPA exhaust discharge, and at a minimum of three (3) locations in areas immediately outside the regulated work area to satisfy this specification. Additional inspection and testing requirements are also indicated in other parts of this specification.
2. The VA will employ an independent industrial hygienist (VPIH/CIH) consultant and/or use its own IH to perform various services on behalf of the VA. The VPIH/CIH will perform the necessary monitoring, inspection, testing, and other support services to ensure that VA patients, employees, and visitors will not be adversely affected by the abatement work, and that the abatement work proceeds in accordance with these specifications, that the abated areas or abated buildings have been successfully decontaminated. The work of the VPIH/CIH consultant in no way relieves the Contractor from their responsibility to perform the

work in accordance with contract/specification requirements, to perform continuous inspection, monitoring and testing for the safety of their employees, and to perform other such services as specified. The cost of the VPIH/CIH and their services will be borne by the VA except for any repeat of final inspection and testing that may be required due to unsatisfactory initial results. Any repeated final inspections and/or testing, if required, will be paid for by the Contractor.

3. If fibers counted by the VPIH/CIH during abatement work, either inside or outside the regulated area, utilizing the NIOSH 7400 air monitoring method, exceed the specified respective limits, the Contractor shall stop work. The Contractor may request confirmation of the results by analysis of the samples by TEM. Request must be in writing and submitted to the VA's Representative. Cost for the confirmation of results will be borne by the Contractor for both the collection and analysis of samples and for the time delay that may/does result for this confirmation. Confirmation sampling and analysis will be the responsibility of the CPIH/CIH with review and approval of the VPIH/CIH. An agreement between the CPIH/CIH and the VPIH/CIH shall be reached on the exact details of the confirmation effort, in writing, including such things as the number of samples, location, collection, quality control on-site, analytical laboratory, interpretation of results and any follow-up actions. This written agreement shall be co-signed by the IH's and delivered to the VA's Representative

B. Scope of Services of the VPIS/CIH Consultant:

1. The purpose of the work of the VPIH/CIH is to: assure quality; adherence to the specification; resolve problems; prevent the spread of contamination beyond the regulated area; and assure clearance at the end of the project. In addition, their work includes performing the final inspection and testing to determine whether the regulated area or building has been adequately decontaminated. All air monitoring is to be done utilizing PCM/TEM. The VPIH/CIH will perform the following tasks:

   a. Task 1: Establish background levels before abatement begins by collecting background samples. Retain samples for possible TEM analysis.

b. Task 2: Perform Representative air monitoring, inspection, and testing outside the regulated area during actual abatement work to detect any faults in the regulated area isolation and any adverse impact on the surroundings from regulated area activities.
c. Task 3: Perform unannounced visits to spot check overall compliance of work with contract/specifications. These visits may include any inspection, monitoring, and testing inside and outside the regulated area and all aspects of the operation except personnel monitoring.
d. Task 4: Provide support to the VA Representative such as evaluation of submittals from the Contractor, resolution of conflicts, interpret data, etc.
e. Task 5: Perform, in the presence of the VA Representative, final inspection and testing of a decontaminated regulated area at the conclusion of the abatement to certify compliance with all regulations and VA requirements/specifications.
f. Task 6: Issue certificate of decontamination for each regulated area and project report.

2. All documentation, inspection results and testing results generated by the VPIH/CIH will be available to the Contractor for information and consideration. The Contractor shall cooperate with and support the VPIH/CIH for efficient and smooth performance of their work.
3. The monitoring and inspection results of the VPIH/CIH will be used by the VA to issue any Stop Removal orders to the Contractor during abatement work and to accept or reject a regulated area or building as decontaminated.

C. Monitoring, Inspection and Testing by Contractor CPIH/CIH: The Contractor’s CPIH/CIH is responsible for managing all monitoring, inspections, and testing required by these specifications, as well as any and all regulatory requirements adopted by these specifications. The CPIH/CIH is responsible for the continuous monitoring of all subsystems and procedures which could affect the health and safety of the Contractor’s personnel. Safety and health conditions and the provision of those conditions inside the regulated area for all persons entering the regulated area is the exclusive responsibility of the

Contractor/Competent Person. The person performing the personnel and area air monitoring inside the regulated area shall be an IH Technician, who shall be trained and shall have specialized field experience in sampling and analysis. The IH Technician shall have successfully completed a NIOSH 582 Course or equivalent and provide documentation. The IH Technician shall participate in the AIHA Asbestos Analysis Registry or participate in the Proficiency Analytical Testing program of AIHA for fiber counting quality control assurance. The IH Technician shall also be an accredited EPA AHERA/State Contractor/Supervisor and Building Inspector. The IH Technician shall have participated in five abatement projects collecting personal and area samples and have experience in substantially similar projects in size and scope. The analytical laboratory used by the Contractor to analyze the samples shall be AIHA accredited for asbestos PAT and approved by the VA prior to start of the project. A daily log shall be maintained by the CPIH/CIH or IH Technician, documenting all OSHA requirements for personal and area air monitoring for asbestos in 29 CFR 1926.1101 (f), (g) and Appendix A. This log shall be made available to the VA Representative and the VPIH/CIH upon request. The log will contain, at a minimum, information on personnel or area samples, other persons represented by the sample, the date of sample collection, start and stop times for sampling, sample volume, flow rate, and fibers/cc. The CPIH/CIH shall collect and analyze samples for each Representative job being done in the regulated area, i.e., removal, wetting, clean-up, and load-out. No fewer than two (2) personal air samples or 25 percent of Representative workforce per shift shall be collected, whichever is greater, in the regulated area; a minimum of three (3) area air samples at locations inside the building but immediately outside the regulated work area; one (1) area air sample shall be collected daily in the Clean Room of the PDF; and one (1) area air sample shall be collected daily at the approximate location of HEPA exhaust discharge. In addition to the continuous monitoring required, the CPIH/CIH will perform inspection and testing at the final stages of abatement for each regulated area as specified in the CPIH/CIH responsibilities. Additionally, the CPIH/CIH will monitor and record pressure readings within the containment daily with a minimum of two readings at the

beginning and at the end of a shift, and submit the data in the daily report.

2.4 ASBESTOS HAZARD ABATEMENT PLAN

. The Contractor shall have an established Asbestos Hazard Abatement Plan (AHAP) in printed form and loose leaf folder consisting of simplified text, diagrams, sketches, and pictures that establish and explain clearly the procedures to be followed during all phases of the work by the Contractor's personnel. The AHAP must be modified as needed to address specific requirements of this project and the specifications. The AHAP(s) shall be submitted for review and approval to the VA prior to the start of any abatement work. The minimum topics and areas to be covered by the AHAP(s) are:

1. Minimum Personnel Qualifications
2. Emergency Action Plan/Contingency Plans and Arrangements
3. Security and Safety Procedures
4. Respiratory Protection/Personal Protective Equipment Program and Training
5. Medical Surveillance Program and Recordkeeping
6. Regulated Area Requirements - Containment Barriers/Isolation of Regulated Area
7. Decontamination Facilities and Entry/Exit Procedures (PDF and W/EDF)
8. Negative Pressure Systems Requirements
9. Monitoring, Inspections, and Testing
10. Removal Procedures for ACM
11. Removal of Contaminated Soil (if applicable)
12. Encapsulation Procedures for ACM
13. Disposal of ACM waste/equipment
14. Regulated Area Decontamination/Clean-up
15. Regulated Area Visual and Air Clearance
16. Project Completion/Closeout

2.5 SUBMITTALS

. Pre-Start Meeting Submittals:

1. Submit to the VA a minimum of 14 days prior to the pre-start meeting the following for review and approval. Meeting this requirement is a prerequisite for the pre-start meeting for this project:

a. Submit a detailed work schedule for the entire project reflecting contract documents and the phasing/schedule requirements from the CPM chart.
b. Submit a staff organization chart showing all personnel who will be working on the project and their capacity/function. Provide their qualifications, training, accreditations, and licenses, as appropriate. Provide a copy of the "Certificate of Worker's Acknowledgment" and the "Affidavit of Medical Surveillance and Respiratory Protection" for each person.
c. Submit Asbestos Hazard Abatement Plan developed specifically for this project, incorporating the requirements of the specifications, prepared, signed and dated by the CPIH/CIH.
d. Submit the specifics of the materials and equipment to be used for this project with manufacturer names, model numbers, performance characteristics, pictures/diagrams, and number available for the following:
    1) Supplied air system, negative air machines, HEPA vacuums, air monitoring pumps, calibration devices, pressure differential monitoring device and emergency power generating system.
    2) Waste water filtration system, shower system, containment barriers.
    3) Encapsulants, surfactants, hand held sprayers, airless sprayers, glovebags, and fire extinguishers.
    4) Respirators, protective clothing, fall protection and other required personal protective equipment.
    5) Fire safety equipment to be used in the regulated area.
e. Submit the name, location, and phone number of the approved landfill; proof/verification the landfill is approved for ACM disposal; the landfill's requirements for ACM waste; the type of vehicle to be used for transportation; and name, address, and phone number of subcontractor, if used. Proof of asbestos training for transportation personnel shall be provided.
f. Submit required notifications and arrangements made with regulatory agencies having regulatory jurisdiction and the specific contingency/emergency arrangements made with local health, fire, ambulance, hospital authorities and any other notifications/arrangements.

g. Submit the name, location and verification of the laboratory and/or personnel to be used for analysis of air and/or bulk samples. Personal air monitoring must be done in accordance with OSHA 29 CFR 1926.1101(f) and Appendix A. Area or clearance air monitoring shall be conducted in accordance with EPA AHERA protocols.

h. Submit qualifications verification: Submit the following evidence of qualifications. Make sure that all references are current and verifiable by providing current phone numbers and documentation.

   1) Asbestos Abatement Company: Project experience within the past 3 years; listing projects first most similar to this project: Project Name; Type of Abatement; Duration; Cost; Reference Name/Phone Number; Final Clearance; Completion Date

   2) List of project(s) halted by owner, A/E, IH, regulatory agency in the last 3 years: Project Name; Reason; Date; Reference Name/Number; Resolution

   3) List asbestos regulatory citations (e.g., OSHA), notices of violations (e.g., Federal and state EPA), penalties, and legal actions taken against the company including the company’s officers (including damages paid) in the last 3 years. Provide copies and all information needed for verification.

i. Submit information on personnel: Provide a resume; address each item completely; copies of certificates, accreditations, and licenses. Submit an affidavit signed by the CPIH/CIH stating that all personnel submitted below have medical records in accordance with OSHA 29 CFR 1926.1101(m) and that the company has implemented a medical surveillance program and written respiratory protection program, and maintains recordkeeping in accordance with the above regulations. Submit the phone number and doctor/clinic/hospital used for medical evaluations.

   1) CPIH/CIH and IH Technician: Name; years of abatement experience; list of projects similar to this one; certificates, licenses, accreditations for proof of AHERA/OSHA specialized asbestos training; professional affiliations; medical opinion; and current respirator fit test.

2) Competent Person(s)/Supervisor(s): Number; names; last four digits of social security numbers; years of abatement experience as Competent Person/Supervisor; list of similar projects in size/complexity as Competent Person/Supervisor; as a worker; certificates, licenses, accreditations; proof of AHERA/OSHA specialized asbestos training; maximum number of personnel supervised on a project; medical opinion (asbestos surveillance and respirator use); and current respirator fit test.
3) Workers: Numbers; names; last four digits of social security numbers; years of abatement experience; certificates, licenses, accreditations; training courses in asbestos abatement and respiratory protection; medical opinion (asbestos surveillance and respirator use); and current respirator fit test.

j. Submit copies of State license for asbestos abatement; copy of insurance policy, including exclusions with a letter from agent stating in plain language the coverage provided and the fact that asbestos abatement activities are covered by the policy; copy of the AHAP incorporating the requirements of this specification; information on who provides your training, how often; who provides medical surveillance, how often; who performs and how is personal air monitoring of abatement workers conducted; a list of references of independent laboratories/IH's familiar with your air monitoring and Asbestos Hazard Abatement Plans; copies of monitoring results of the five referenced projects listed and analytical methods used.

k. Rented equipment must be decontaminated prior to returning to the rental agency.

l. Submit, before the start of work, the manufacturer's technical data for all types of encapsulants, all SDS, and application instructions.

A. Submittals During Abatement:

1. The Competent Person shall maintain and submit a daily log at the regulated area documenting the dates and times of the following: purpose, attendees and summary of meetings; all personnel entering/exiting the regulated area; document and discuss the

resolution of unusual events such as barrier breeching, equipment failures, emergencies, and any cause for stopping work; Representative air monitoring and results/TWAs/ELs. Submit this information daily to the VA's Representative.

2. The CPIH/CIH shall document and maintain the inspection and approval of the regulated area preparation prior to start of work and daily during work.
   a. Removal of any poly barriers.
   b. Visual inspection/testing by the CPIH/CIH or IH Technician prior to application of lockdown encapsulant.
   c. Packaging and removal of ACM waste from regulated area.
   d. Disposal of ACM waste materials; copies of Waste Shipment Records/landfill receipts to the VA's Representative on a weekly basis.

B. Submittals at Completion of Abatement: The CPIH/CIH shall submit a project report consisting of the daily log book requirements and documentation of events during the abatement project including Waste Shipment Records signed by the landfill's agent. It will also include information on the containment and transportation of waste from the containment with applicable Chain of Custody forms. The report shall include a certificate of completion, signed and dated by the CPIH/CIH, in accordance with Attachment #1. All clearance and perimeter area samples must be submitted. The VA Representative will retain the abatement report after completion of the project and provide copies of the abatement report to VAMC Office of Engineer and the Safety Office.

PART 3 - EXECUTION

3.1 PRE-ABATEMENT ACTIVITIES

A. Pre-Abatement Meeting: The VA Representative, upon receipt, review, and substantial approval of all pre-abatement submittals and verification by the CPIH/CIH that all materials and equipment required for the project are on the site, will arrange for a pre-abatement meeting between the Contractor, the CPIH/CIH, Competent Person, the VA Representative(s), and the VPIH/CIH. The purpose of the meeting is to discuss any aspect of the submittals needing clarification or amplification and to discuss any aspect of the project execution and the sequence of the operation. The Contractor shall be prepared to provide any supplemental information/documentation to the VA's

Representative regarding any submittals, documentation, materials or equipment. Upon satisfactory resolution of any outstanding issues, the VA's Representative will issue a written order to proceed to the Contractor. No abatement work of any kind described in the following provisions shall be initiated prior to the VA written order to proceed.

B. Pre-Abatement Inspections and Preparations:

1. Before any work begins on the construction of the regulated area, the Contractor will:

   a. Conduct a space-by-space inspection with an authorized VA Representative and prepare a written inventory of all existing damage in those spaces where asbestos abatement will occur. Still or video photography may be used to supplement the written damage inventory. Document will be signed and certified as accurate by both parties.

   b. The VA Representative, the Contractor, and the VPIH/CIH must be aware of AEQA 10-95 indicating the failure to identify asbestos in the areas listed as well as common issues when preparing specifications and contract documents. This is especially critical when demolition is planned, because AHERA surveys are non-destructive, and ACM may remain undetected. A NESHAP (destructive) ACM inspection should be conducted on all building structures that will be demolished. Ensure the following areas are inspected on the project: Lay-in ceilings concealing ACM; ACM behind walls/windows from previous renovations; inside utility chases/walls; transite piping/ductwork/sheets; behind radiators; lab fume hoods; transite lab countertops; roofing materials; below window sills; water/sewer lines; electrical conduit coverings; crawl spaces(previous abatement contamination); flooring/mastic covered by carpeting/new flooring; exterior insulated wall panels; on underground fuel tanks; and steam line trench coverings.

   c. Ensure that all furniture, machinery, equipment, curtains, drapes, blinds, and other movable objects required to be removed from the regulated area have been cleaned and removed or properly protected from contamination.

d. If present and required, remove and dispose of carpeting from floors in the regulated area. If carpet comes up without disturbing ACM flooring material, the carpet can be disposed of as C&D waste. If ACM floor tile is attached to the carpet while the Contractor is removing the carpet, that section of the carpet will be disposed of as asbestos waste.

e. Inspect existing firestopping in the regulated area. Correct as needed.

C. Pre-Abatement Construction and Operations:

1. Perform all preparatory work for the first regulated area in accordance with the approved work schedule and with this specification.

2. Upon completion of all preparatory work, the CPIH/CIH will inspect the work and systems and will notify the VA's Representative when the work is completed in accordance with this specification. The VA's Representative may inspect the regulated area and the systems with the VPIH/CIH and may require that upon satisfactory inspection, the Contractor's employees perform all major aspects of the approved AHAP, especially worker protection, respiratory systems, contingency plans, decontamination procedures, and monitoring to demonstrate satisfactory operation. The operational systems for respiratory protection and the negative pressure system shall be demonstrated for proper performance.

3. The CPIH/CIH shall document the pre-abatement activities described above and deliver a copy to the VA's Representative.

4. Upon satisfactory inspection of the installation of and operation of systems the VA's Representative will notify the Contractor in writing to proceed with the asbestos abatement work in accordance with this specification and all applicable regulations

3.2 REGULATED AREA PREPARATIONS

. OSHA DANGER Signs: Post OSHA DANGER signs meeting the specifications of OSHA 29 CFR 1926.1101 at any location and approaches to the regulated area. Signs shall be posted at a distance sufficiently far enough away from the regulated area to permit any personnel to read the sign and take the necessary measures to avoid exposure. Additional signs will be posted following construction of the regulated area enclosure.

A. Controlling Access to the Regulated Area: Access to the regulated area is allowed only through the personnel decontamination facility (PDF), if required. All other means of access shall be eliminated and OSHA Danger demarcation signs posted as required by OSHA. If the regulated area is adjacent to or within view of an occupied area, provide a visual barrier of 6-mil opaque fire retardant poly sheeting to prevent building occupant observation. If the adjacent area is accessible to the public, the barrier must be solid.

B. Shut Down - Lock Out Electrical: Shut down and lock out/tag out electric power to the regulated area. Provide temporary power and lighting. Insure safe installation including GFCI of temporary power sources and equipment by compliance with all applicable electrical code and OSHA requirements for temporary electrical systems. Electricity shall be provided by the VA.

C. Shut Down - Lock Out HVAC: Shut down and lock out/tag out heating, cooling, and air conditioning system (HVAC) components that are in, supply or pass through the regulated area. Investigate the regulated area and agree on pre-abatement condition with the VA's Representative. Seal all intake and exhaust vents in the regulated area with duct tape and 2 layers of independently installed 6-mil poly. Also, seal any seams in system components that pass through the regulated area. Remove all contaminated HVAC system filters and place in labeled 6-mil polyethylene disposal bags for staging and eventual disposal as asbestos waste.

D. Sanitary Facilities: The Contractor shall provide sanitary facilities for abatement personnel and maintain them in a clean and sanitary condition throughout the abatement project.

E. Water for Abatement: The VA will provide water for abatement purposes. The Contractor shall connect to the existing VA system. The service to the shower(s) shall be supplied with backflow prevention.

F. Preparation Prior to Sealing Off: Place all tools, materials and equipment needed for working in the regulated area prior to erecting any plastic sheeting. Remove all uncontaminated removable furniture, equipment and/or supplies from the regulated area before commencing work, or completely cover with 2-layers of 6-mil fire retardant poly sheeting and secure with duct tape.

G. Critical Barriers: Completely separate any openings into the regulated area from adjacent areas using fire retardant poly at least 6-mils thick and duct tape. Individually seal with 2-layers of independently installed 6-mil poly and duct tape all HVAC openings into the regulated area. Individually seal all lighting fixtures, clocks, doors, windows, convectors, speakers, or any other objects in the regulated area. Heat must be shut off any objects covered with poly.

H. Floor Barriers: If floor removal is not being done, all floors in the regulated area shall be covered with 2-layers of 6-mil fire retardant poly and brought up the wall 24 inches.

I. Pre-Cleaning Movable Objects:

0. Pre-cleaning of ACM contaminated items shall be performed after the enclosure has been erected and negative pressure has been established in the work area. After items have been pre-cleaned and decontaminated, they may be removed from the work area for storage until the completion of abatement in the work area. Pre-cleaning may not be required if flooring materials is in good condition and are the only ACM present.

1. Pre-clean all movable objects within the regulated area using a HEPA filtered vacuum and/or wet cleaning methods as appropriate. After cleaning, these objects shall be removed from the regulated area and carefully stored in an uncontaminated location. Pre-cleaning may not be required if flooring materials is in good condition and are the only ACM present.

J. Pre-Cleaning Fixed Objects:

0. Pre-cleaning of ACM contaminated items shall be performed after the enclosure has been erected and negative pressure has been established in the work area. Pre-cleaning may not be required if flooring materials is in good condition and are the only ACM present.

1. Pre-clean all fixed objects in the regulated area using HEPA filtered vacuums and/or wet cleaning techniques as appropriate. Careful attention must be paid to machinery behind grills or gratings where access may be difficult, but contamination may be significant. Also, pay particular attention to wall, floor, and ceiling penetration behind fixed items. After pre-cleaning, enclose fixed objects with 2-layers of 6-mil poly and seal securely in place

with duct tape. Objects (e.g., permanent fixtures, shelves, electronic equipment, laboratory tables, sprinklers, alarm systems, closed circuit TV equipment and computer cables) which must remain in the regulated area and that require special ventilation or enclosure requirements should be designated here along with specified means of protection. Contact the manufacturer for special protection requirements.

K. Pre-Cleaning Surfaces in the Regulated Area:
   0. Pre-cleaning of ACM contaminated items shall be performed after the enclosure has been erected and negative pressure has been established in the work area.
   1. Pre-clean all surfaces in the regulated area using HEPA filtered vacuums and wet cleaning methods as appropriate. Do not use any methods that would raise dust such as dry sweeping or vacuuming with equipment not equipped with HEPA filters. Do not disturb asbestos-containing materials during this pre-cleaning phase.

L. Extension of the Regulated Area: If the regulated area barrier is breached in any manner that could allow the passage of asbestos fibers or debris, the Competent Person shall immediately stop work, continue wetting, and proceed to extend the regulated area to enclose the affected area as per procedures described in this specification. If the affected area cannot be enclosed, decontamination measures and cleanup shall start immediately. All personnel shall be isolated from the affected area until decontamination/cleanup is completed as verified by visual inspection and air monitoring. Air monitoring at completion must indicate background levels.

3.3 REMOVABLE OF CLASS II FLOORING AND MASTIC, MATERIALS

A. General: All applicable requirements of OSHA, EPA, and DOT shall be followed during Class II work. Keep materials intact to the extent feasible; wet while working with it; wrap as soon as possible with 2-layers of 6-mil plastic for disposal.

B. Removal of Flooring Materials:
   1. All requirements of OSHA Flooring agreement provisions shall be followed:
      a. The Contractor shall provide enough HEPA negative air machines to effect > -0.02 inches WCG pressure. Provide a standby unit in the

event of machine failure and/or emergency in an adjacent area. The contractor shall use double the number of machines, based on their calculations, or submit proof their machines operate at stated capacities, at a 2-inch pressure drops across the filters.

b. Flooring shall be removed intact, as much as feasible. Do not rip or tear flooring.

c. Mechanical chipping or sanding is not allowed.

d. Flooring may be removed with an infra-red heating unit operated by trained personnel following the manufacturer's instructions.

e. Wet clean and HEPA vacuum the floor before and after removal of flooring.

f. Place a 6-mil poly layer 4 feet by 10 feet adjacent to the regulated area for use as a decontamination area if a PDF is not specified. All waste must be contained in the regulated area.

g. Package all waste in 6-mil poly lined fiberboard drums or double bag in 6-mil polyethylene bags.

C. REMOVAL OF MASTIC

1. All chemical mastic removers must be low in volatile organic compound (VOC) content, have a flash point greater than 200 degrees Fahrenheit, contain no chlorinated solvents, and comply with California Air Resources Board (CARB) thresholds for VOCs (effective January 1, 2010).

2. Negative air machine as required under flooring removal shall be provided and operated in accordance with this project specification.

3. Follow all manufacturers' instructions in the use of the mastic removal material. Verify that there are no ignition sources in the work area and minimize the amount of mastic removal material used at any given time to eliminate fire hazards and objectionable odors.

4. Package all waste in 6-mil poly lined fiberboard drums or double bag in 6-mil polyethylene bags.

3.4 DISPOSAL OF CLASS II WASTE MATERIAL

A. General: Dispose of waste ACM and debris which is packaged in accordance with these specifications, OSHA, EPA and DOT. The landfill requirements for packaging must also be met. Transport will be in compliance with 49 CFR 171-180 regulations. Disposal shall be done at an approved landfill. Disposal of non-friable ACM shall be done in accordance with applicable State and Local regulations.

3.5 PROJECT DECONTAMINATION

A. General:
   1. The VA must be notified at least 24 hours in advance of any waste removed from the containment.
   2. The entire work related to project decontamination shall be performed under the close supervision and monitoring of the CPIH/CIH.
   3. If the asbestos abatement work is in an area which was contaminated prior to the start of abatement, the decontamination will be done by cleaning the primary barrier poly prior to its removal and cleanings of the surfaces of the regulated area after the primary barrier removal.
   4. If the asbestos abatement work is in an area which was uncontaminated prior to the start of abatement, the decontamination will be done by cleaning the primary barrier poly prior to its removal, thus preventing contamination of the building when the regulated area critical barriers are removed.

B. Regulated Area Clearance: Air testing and other requirements which must be met before release of the Contractor and re-occupancy of the regulated area space are specified in Final Testing Procedures

C. Work Description: Decontamination includes the clearance air testing in the regulated area and the decontamination and removal of the enclosures/facilities installed prior to the abatement work including primary/critical barriers, PDF and W/EDF facilities, and negative pressure systems.

D. Pre-Decontamination Conditions:
   1. Before decontamination starts, all ACM waste from the regulated area shall be removed, all waste collected and removed, and the secondary barrier of poly removed and disposed of along with any gross debris generated by the work.
   2. At the start of decontamination, the following shall be in place:
      a. Critical barriers over all openings consisting of two layers of 6-mil poly which is the sole barrier between the regulated area and the rest of the building or outside.
      b. Decontamination facilities, if required for personnel and equipment in operating condition.

E. Cleaning: Carry out a first cleaning of all surfaces of the regulated area including items of remaining poly sheeting, tools, scaffolding, ladders/staging by wet methods and HEPA vacuuming. Do not use dry dusting/sweeping/air blowing methods. Use each surface of a wetted cleaning cloth one time only and then dispose of as contaminated waste. Continue this cleaning until there is no visible residue from abated surfaces or poly or other surfaces. Remove all filters in the air handling system and dispose of as ACM waste in accordance with these specifications. The negative pressure system shall remain in operation during this time. Additional cleaning(s) may be needed as determined by the CPIH/VPIH/CIH.

3.6 VISUAL INSPECTION AND AIR CLEARANCE TESTING

A. General: Notify the VA Representative 24 hours in advance for the performance of the final visual inspection and testing. The final visual inspection and testing will be performed by the VPIH/CIH after the final cleaning.

B. Visual Inspection: Final visual inspection will include the entire regulated area, the PDF, all poly sheeting, seals over HVAC openings, doorways, windows, and any other openings. If any debris, residue, dust or any other suspect material is detected, the final cleaning shall be repeated at no additional cost to the VA. Dust/material samples may be collected and analyzed at no additional cost to the VA at the discretion of the VPIH/CIH to confirm visual findings. When the regulated area is visually clean the final testing can be done

C. Air Clearance Testing:

1. After an acceptable final visual inspection by the VPIH/CIH and VA Representative, the VPIH/CIH will perform the final clearance testing. Air samples will be collected and analyzed in accordance with procedures for AHERA in this specification. If work is less than 260 lf/160 sf/35 cf, 5 PCM samples shall be collected for clearance and a minimum of two field blank. If work is equal to or more than 260 lf/160 sf/35 cf, AHERA TEM sampling shall be performed for clearance. TEM analysis shall be done in accordance with procedures for EPA AHERA presented in this specification. If the release criteria are not met, the Contractor shall repeat the final cleaning and continue decontamination procedures until clearance is

achieved. **All Additional inspection and testing costs will be borne by the Contractor.**

2. If release criteria are met, proceed to perform the abatement closeout and to issue the certificate of completion in accordance with these specifications.

D. FinaL Air Clearance Procedures:

1. Contractor's Release Criteria: Work in a regulated area is complete when the regulated area is visually clean and airborne fiber levels have been reduced to or below 0.01 f/cc as measured by the AHERA PCM protocol and $\leq$ 70 AHERA asbestos structures per square millimeter (s/mm^2) by AHERA TEM. No averaging of results will be used for this project. All five (5) TEM samples inside the regulated area shall be at or below 70 asbestos s/mm^2 to satisfy the project final clearance criteria.
2. Air Monitoring and Final Clearance Sampling: To determine if the elevated airborne fiber counts encountered during abatement operations have been reduced to the specified level, the VPIH/CIH will secure samples and analyze them according to the following procedures.
   a. Fibers Counted: “Fibers” referred to in this section shall be either all fibers regardless of composition as counted in the NIOSH 7400 PCM method or asbestos fibers counted using the AHERA TEM method.
   b. Aggressive Sampling: All final air testing samples shall be collected using aggressive sampling techniques. Samples will be collected on 0.8µ MCE filters for PCM analysis and 0.45µ MCE for TEM. A minimum of 3850 Liters of air using calibrated sampling pumps shall be collected for PCM samples and a minimum of 1200 Liters of air using calibrated sampling pumps shall be collected for TEM clearance samples. Before pumps are started, initiate aggressive air mixing sampling as detailed in 40 CFR 763 Subpart E (AHERA) Appendix A (III)(B)(7)(d). Air samples will be collected in areas subject to normal air circulation away from corners, obstructed locations, and locations near windows, doors, or vents. After air sampling pumps have been shut off, circulating fans shall be shut off. The negative pressure system shall continue to operate.

3.7 ABATEMENT CLOSEOUT AND CERTIFICATE OF COMPLIANCE

A. Completion of Abatement Work:

1. After thorough decontamination, complete asbestos abatement work upon meeting the regulated area clearance criteria and fulfilling the following:

   a. Remove all equipment, materials, and debris from the project area.

   b. Package and dispose of all asbestos waste as required.

   c. Repair or replace all interior finishes damaged during the abatement work.

   d. Fulfill other project closeout requirements as specified elsewhere in this specification

B. Certificate of Completion by Contractor: The CPIH shall complete and sign the "Certificate of Completion" in accordance with Attachment 1 at the completion of the abatement and decontamination of the regulated area.

C. Work Shifts: All work shall generally be done during administrative hours (8:00 AM to 4:30 PM) Monday - Friday excluding Federal Holidays. Any change in the work schedule must be approved in writing by the VA Representative.

ATTACHMENT #1
CERTIFICATE OF COMPLETION

DATE: _____ VA Project #:_____

PROJECT NAME:_____ Abatement Contractor:_____

VAMC/ADDRESS:_____

1. I certify that I have personally inspected, monitored and supervised the abatement work of (specify regulated area or Building):
   which took place from / / to / /
2. That throughout the work all applicable requirements/regulations and the VA's specifications were met.
3. That any person who entered the regulated area was protected with the appropriate personal protective equipment and respirator and that they followed the proper entry and exit procedures and the proper operating procedures for the duration of the work.
4. That all employees of the Abatement Contractor engaged in this work were trained in respiratory protection, were experienced with abatement work, had proper medical surveillance documentation, were fit-tested for their respirator, and were not exposed at any time during the work to asbestos without the benefit of appropriate respiratory protection.
5. That I performed and supervised all inspection and testing specified and required by applicable regulations and VA specifications.
6. That the conditions inside the regulated area were always maintained in a safe and healthy condition and the maximum fiber count never exceeded 0.5 f/cc, except as described below.
7. That all abatement work was done in accordance with OSHA requirements and the manufacturer’s recommendations.

CPIH/CIH Signature/Date:_____

CPIH/CIH Print Name:_____

Abatement Contractor Signature/Date:_____

Abatement Contractor Print Name:_____

ATTACHMENT #2
CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

PROJECT NAME:_____DATE:_____

PROJECT ADDRESS:_____

ABATEMENT CONTRACTOR'S NAME:_____

WORKING WITH ASBESTOS CAN BE HAZARDOUS TO YOUR HEALTH. INHALING ASBESTOS HAS BEEN LINKED WITH VARIOUS TYPES OF CANCERS. IF YOU SMOKE AND INHALE ASBESTOS FIBERS, YOUR CHANCES OF DEVELOPING LUNG CANCER IS GREATER THAN THAT OF THE NON-SMOKING PUBLIC.

Your employer's contract with the owner for the above project requires that: You must be supplied with the proper personal protective equipment including an adequate respirator and be trained in its use. You must be trained in safe and healthy work practices and in the use of the equipment found at an asbestos abatement project. You must receive/have a current medical examination for working with asbestos. These things shall be provided at no cost to you. By signing this certificate of worker’s acknowledgement you are indicating to the owner that your employer has met these obligations.

RESPIRATORY PROTECTION: I have been trained in the proper use of respirators and have been informed of the type of respirator to be used on the above indicated project. I have a copy of the written Respiratory Protection Program issued by my employer. I have been provided for my exclusive use, at no cost, with a respirator to be used on the above indicated project.

TRAINING COURSE: I have been trained by a third party, State/EPA accredited trainer in the requirements for an AHERA/OSHA Asbestos Abatement Worker training course, 32-hours minimum duration. I currently have a valid State accreditation certificate. The topics covered in the course include, as a minimum, the following:

- Physical Characteristics and Background Information on Asbestos
- Potential Health Effects Related to Exposure to Asbestos
- Employee Personal Protective Equipment
- Establishment of a Respiratory Protection Program
- State of the Art Work Practices
- Personal Hygiene
- Additional Safety Hazards
- Medical Monitoring
- Air Monitoring
- Relevant Federal, State and Local Regulatory Requirements, Procedures, and Standards
- Asbestos Waste Disposal

MEDICAL EXAMINATION: I have had a medical examination within the past 12 months which was paid for by my employer. This examination included: health history, occupational history, pulmonary function test, and may have included a chest x-ray evaluation. The physician issued a positive written opinion after the examination.

Signature:_____

Printed Name:_____

Social Security Number:_____

Witness:_____

ATTACHMENT #3
AFFIDAVIT OF MEDICAL SURVEILLANCE, RESPIRATORY PROTECTION AND TRAINING/ACCREDITATION

VA PROJECT NAME AND NUMBER:_____

VA MEDICAL FACILITY:_____

ABATEMENT CONTRACTOR'S NAME AND ADDRESS:_____

1. I verify that the following individual

Name:_____ Social Security Number: _____who is proposed to be employed in asbestos abatement work associated with the above project by the named Abatement Contractor, is included in a medical surveillance program in accordance with 29 CFR 1926.1101(m), and that complete records of the medical surveillance program as required by 29 CFR 1926.1101(m)(n) and 29 CFR 1910.20 are kept at the offices of the Abatement Contractor at the following address.

Address:_____

2. I verify that this individual has been trained, fit-tested and instructed in the use of all appropriate respiratory protection systems and that the person is capable of working in safe and healthy manner as expected and required in the expected work environment of this project.

3. I verify that this individual has been trained as required by 29 CFR 1926.1101(k). This individual has also obtained a valid State accreditation certificate. Documentation will be kept on-site.

4. I verify that I meet the minimum qualifications criteria of the VA specifications for a CPIH.

Signature of CPIH/CIH:_____ Date:_____

Printed Name of CPIH/CIH:_____

Signature of Contractor:_____ Date:_____

Printed Name of Contractor:_____

ATTACHMENT #4
ABATEMENT CONTRACTOR/COMPETENT PERSON(S) REVIEW AND ACCEPTANCE OF THE VA'S ASBESTOS SPECIFICATIONS

VA Project Location:_____

VA Project #:_____

VA Project Description:_____

1. This form shall be signed by the Asbestos Abatement Contractor Owner and the Asbestos Abatement Contractor's Competent Person(s) prior to any start of work at the VA related to this Specification. If the Asbestos Abatement Contractor's/Competent Person(s) has not signed this form, they shall not be allowed to work on-site.

2 I, the undersigned, have read VA's Asbestos Specification regarding the asbestos abatement requirements. I understand the requirements of the VA's Asbestos Specification and agree to follow these requirements as well as all required rules and regulations of OSHA/EPA/DOT and State/Local requirements. I have been given ample opportunity to read the VA's Asbestos Specification and have been given an opportunity to ask any questions regarding the content and have received a response related to those questions. I do not have any further questions regarding the content, intent and requirements of the VA's Asbestos Specification.

3. At the conclusion of the asbestos abatement, I will certify that all asbestos abatement work was done in accordance with the VA's Asbestos Specification and all ACM was removed properly and no fibrous residue remains on any abated surfaces.

Abatement Contractor Owner's Signature_____Date_____

- - - E N D - - -

SECTION 02 82 13.31
ASBESTOS TRANSITE-TYPE ABATEMENT

PART 1 - GENERAL

1.1 SUMMARY OF THE WORK

A. Drawings, general provisions of the contract, including general and supplementary conditions and other Division 01 specifications, shall apply to the work of this section. The contract documents show the work to be done under the contract and related requirements and conditions impacting the project. Related requirements and conditions include applicable codes and regulations, notices and permits, existing site conditions and restrictions on use of the site, requirements for partial owner occupancy during the work, coordination with other work and the phasing of the work. In the event the Asbestos Abatement Contractor discovers a conflict in the contract documents and/or requirements or codes, the conflict must be brought to the immediate attention of the Contracting Officer for resolution. Whenever there is a conflict or overlap in the requirements, the most stringent shall apply. Any actions taken by the Contractor without obtaining guidance from the Contracting Officer shall become the sole risk and responsibility of the Asbestos Abatement Contractor. All costs incurred due to such action are also the responsibility of the Asbestos Abatement Contractor.

B. Extent of Work:

1. Below is a brief description of the estimated quantities of asbestos Transite-type materials to be abated. These quantities are for informational purposes only and are based on the best information available at the time of the specification preparation. The Contractor shall satisfy himself as the actual quantities to be abated. Nothing in this section may be interpreted as limiting the extent of work otherwise required by this contract and related documents.
2. Removal, clean-up and disposal of ACM Transite-type in an appropriate regulated area in the following approximate quantities;

- Gray Transite Window Panel ASSUMED Bldg 70 Rms E104HC/C126
  2 EA

C. Related Work:

1. Section 02 41 00, DEMOLITION
2. Section 02 82 11, TRADITIONAL ASBESTOS ABATEMENT
3. Section 02 82 13.13, GLOVEBAG ASBESTOS ABATEMENT
4. SECTION 02 82 13.19, ASBESTOS FLOOR TILE AND MASTIC ABATEMENT
5. SECTION 02 83 33.13 LEAD BASED PAINT REMOVAL AND DISPOSAL

D. Tasks:

1. The work tasks are summarized briefly as follows:
   a. Pre-abatement activities including pre-abatement meeting(s), inspection(s), notifications, permits, submittal approvals, regulated area preparations, emergency procedures arrangements, and standard operating procedures for asbestos abatement work.
   b. Abatement activities including removal, clean-up and disposal of ACM waste, recordkeeping, security, monitoring, and inspections.
   c. Cleaning and decontamination activities including final visual inspection, air monitoring and certification of decontamination.

E. Abatement Contractors Use of Premises:

1. The Contractor and Contractor's personnel shall cooperate fully with the VA Representative/consultant to facilitate efficient use of buildings and areas within buildings. The Contractor shall perform the work in accordance with the VA specifications, drawings, phasing plan and in compliance with any/all applicable Federal, State and Local regulations and requirements.
2. The Contractor shall use the existing facilities in the building strictly within the limits indicated in contract documents as well as the approved VA Design and Construction Procedure. VA Design and Construction Procedure drawings of partially occupied buildings will show the limits of regulated areas; the placement of decontamination facilities; the temporary location of bagged waste ACM; the path of transport to outside the building; and the temporary waste storage area for each building/regulated area. Any variation from the arrangements shown on drawings shall be secured in writing from the VA Representative through the pre-abatement plan of action. The following limitations of use shall apply to existing facilities shown on drawings:

1.2 VARIATIONS IN QUANTITY

A. The quantities and locations of ACM as indicated on the drawings and the extent of work included in this section are estimated which are limited by the physical constraints imposed by occupancy of the buildings and accessibility to ACM. Accordingly, minor variations (+/- 10 percent) in quantities of ACM within the regulated area are considered as having no impact on contract price and time requirements of this contract. Where additional work is required beyond the above variation, the contractor shall provide unit prices for newly discovered ACM and those prices shall be used for additional work required under the contract.

1.3 STOP ASBESTOS REMOVAL

A. If the Contracting Officer; their field Representative; the facility Safety Officer/Manager or their designee, or the VA Professional Industrial Hygienist/Certified Industrial Hygienist (VPIH/CIH) presents a verbal Stop Asbestos Removal Order, the Contractor/Personnel shall immediately stop all asbestos removal and maintain HEPA filtered negative pressure air flow in the containment and adequately wet any exposed ACM. If a verbal Stop Asbestos Removal Order is issued, the VA shall follow-up with a written order to the Contractor as soon as practicable. The Contractor shall not resume any asbestos removal activity until authorized to do so in writing by the VA Contracting Officer. A stop asbestos removal order may be issued at any time the VA Contracting Officer determines abatement conditions/activities are not within VA specification, regulatory requirements or that an imminent hazard exists to human health or the environment. Work stoppage will continue until conditions have been corrected to the satisfaction of the VA. Standby time and costs for corrective actions will be borne by the Contractor, including the VPIH/CIH time. The occurrence of any of the following events shall be reported immediately by the Contractor’s competent person to the VA Contracting Officer or field Representative using the most expeditious means (e.g., verbal or telephonic), followed up with written notification to the Contracting Officer as soon as it is practical. The Contractor shall immediately stop asbestos removal/disturbance activities and initiate fiber reduction activities:

1. Airborne PCM analysis results equal to or greater than 0.01 f/cc above background levels inside the building but outside the regulated area;
2. breach or break in regulated area containment barrier(s);
3. less than −0.02 inch WCG pressure in the regulated area;
4. serious injury/death at the site;
5. fire/safety emergency at the site;
6. respiratory protection system failure;
7. power failure or loss of wetting agent; or
8. any visible emissions observed outside the regulated area; or
9. failure to follow project specification requirements.

1.4 DEFINITIONS

A. General: Definitions and explanations here are neither complete nor exclusive of all terms used in the contract documents, but are general for the work to the extent they are not stated more explicitly in another element of the contract documents. Drawings must be recognized as diagrammatic in nature and not completely descriptive of the requirements indicated therein.

B. Glossary:

Abatement - Procedures to control fiber release from asbestos-containing materials. Includes removal, encapsulation, enclosure, demolition, and renovation activities related to asbestos containing materials (ACM).

Adequately wet - Sufficiently mixed or penetrated with liquid to prevent the release of particulates. If visible emissions are observed coming from the ACM, then that material has not been adequately wetted.

Aerosol - Solid or liquid particulate suspended in air.

Aggressive method - Removal or disturbance of building material by sanding, abrading, grinding, or other method that breaks, crumbles, or disintegrates intact ACM.

Aggressive air sampling - EPA AHERA defined clearance sampling method using air moving equipment such as fans and leaf blowers to aggressively disturb and maintain in the air residual fibers after abatement.

AHERA - Asbestos Hazard Emergency Response Act. Asbestos regulations for schools issued in 1987.

Aircell - Pipe or duct insulation made of corrugated cardboard which contains asbestos.

Air monitoring - The process of measuring the fiber content of a known volume of air collected over a specified period of time. The NIOSH 7400 Method, Issue 3, Fifth Edition is used to determine the fiber levels in air. For personal samples, area air samples and clearance air testing using Phase Contrast Microscopy (PCM) analysis, the NIOSH Method 7402 (Issue 2, Fourth Edition) can be used when it is necessary to confirm fibers counted by PCM as being asbestos. The AHERA TEM analysis may be used for background, area samples and clearance samples when required by this specification, or at the discretion of the VPIH/CIH as appropriate.

Air sample filter - The filter used to collect fibers which are then counted. The filter is made of mixed cellulose ester (MCE) membrane for PCM (Phase Contrast Microscopy, 25 mm, 3-piece with 2 inches Static Extension Cowl, 0.8 micron pore size) and MCE for TEM (Transmission Electron Microscopy, 25 mm, 3-piece with 2 inches Static Extension Cowl, 0.45 micron pore size).

Amended water - Water to which a surfactant (wetting agent) has been added to increase the penetrating ability of the liquid.

Asbestos - Includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos, and any of these minerals that have been chemically treated or altered. Asbestos also includes PACM, as defined below.

Asbestos Hazard Abatement Plan (AHAP) - Asbestos work procedures required to be submitted by the contractor before work begins.

Asbestos-containing material (ACM) - Any material containing more than one percent of asbestos.

Asbestos contaminated elements (ACE) - Building elements such as ceilings, walls, lights, or ductwork that are contaminated with asbestos.

Asbestos-contaminated soil (ACS) - Soil found in the work area or in adjacent areas such as crawlspaces or pipe tunnels which is contaminated with asbestos-containing material debris and cannot be easily separated from the material.

Asbestos-containing waste (ACW) material - Asbestos-containing material or asbestos contaminated objects requiring disposal.

Asbestos Project Monitor - Some states require that any person conducting asbestos abatement air sampling, clearance inspections and clearance air sampling be licensed as an asbestos project monitor.

Asbestos waste decontamination facility - A system consisting of drum/bag washing facilities and a temporary storage area for cleaned containers of asbestos waste. Used as the exit for waste and equipment leaving the regulated area. In an emergency, it may be used to evacuate personnel.

Authorized person - Any person authorized by the VA, the Contractor, or government agency and required by work duties to be present in regulated areas.

Authorized visitor - Any person approved by the VA; the contractor; or any government agency representative having jurisdiction over the regulated area (e.g., OSHA, Federal and State EPA).

Barrier - Any surface that isolates the regulated area and inhibits fiber migration from the regulated area.

Containment Barrier - An airtight barrier consisting of walls, floors, and/or ceilings of sealed plastic sheeting which surrounds and seals the outer perimeter of the regulated area.

Critical Barrier - The barrier responsible for isolating the regulated area from adjacent spaces, typically constructed of 2-layers of 6-mil independently installed plastic sheeting (Polyethylene) secured in place at openings such as doors, windows, penetrations or any other opening into the regulated area.

Primary Barrier – Plastic barriers placed over critical barriers and exposed directly to abatement work or to secondary barrier.

Secondary Barrier - Any additional plastic barriers used to isolate and provide protection from debris during abatement work.

Breathing zone - The hemisphere forward of the shoulders with a radius of about 150 - 225 mm (6 - 9 inches) from the worker's nose.

Bridging encapsulant - An encapsulant that forms a layer on the surface of the ACM.

Building/facility owner - The legal entity, including a lessee, which exercises control over management and recordkeeping functions relating to a building and/or facility in which asbestos activities take place.

Bulk testing - The collection and analysis of suspect asbestos containing materials.

Certified Industrial Hygienist (CIH) - A person certified in the comprehensive practice of industrial hygiene by the American Board of Industrial Hygiene.

Class I asbestos work - Activities involving the removal of Thermal System Insulation (TSI) and surfacing ACM and Presumed Asbestos Containing Material (PACM).

Class II asbestos work - Activities involving the removal of ACM which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastic.

Clean room/Changing room - An uncontaminated room having facilities for the storage of employee's street clothing and uncontaminated materials and equipment.

Clearance sample - The final air sample taken after all asbestos work has been done and visually inspected. Performed by the VA's Professional Industrial Hygiene consultant/Certified Industrial Hygienist (VPIH/CIH).

Closely resemble - The major workplace conditions which have contributed to the levels of historic asbestos exposure, are no more protective than conditions of the current workplace.

Competent person - In addition to the definition in 29 CFR 1926.32(f), one who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure, who has the authority to take prompt corrective measures to eliminate them, as specified in 29 CFR 1926.32(f); in addition, for Class I and II work who is specially trained in a training course which meets the criteria of EPA's Model Accreditation Plan (40 CFR 763) for supervisor.

Contractor's Professional Industrial Hygienist (CPIH/CIH) - The asbestos abatement contractor's industrial hygienist. The industrial hygienist must meet the qualification requirements of a PIH and may report to a certified industrial hygienist (CIH).

Count - Refers to the fiber count or the average number of fibers greater than five microns in length with a length-to-width (aspect) ratio of at least 3 to 1, per cubic centimeter of air.

Crawlspace – An area which can be found either in or adjacent to the work area. This area has limited access and egress and may contain asbestos materials and/or asbestos contaminated soil.

Decontamination area/unit - An enclosed area adjacent to and connected to the regulated area and consisting of an equipment room, shower room,

and clean room, which is used for the decontamination of workers, materials, and equipment that are contaminated with asbestos.

Demolition - The wrecking or taking out of any load-supporting structural member and any related razing, removing, or stripping of asbestos products.

Disposal bag - Typically 6-mil thick sift-proof, dustproof, leak-tight container used to package and transport asbestos waste from regulated areas to the approved landfill. Each bag/container must be labeled/marked in accordance with EPA, OSHA and DOT requirements.

Disturbance – Asbestos Operations and Maintenance Activities (OSHA Class III) that disrupt the matrix of ACM or PACM, crumble or pulverize ACM or PACM, or generate visible debris from ACM or PACM. Disturbance includes cutting away small amounts of ACM or PACM, no greater than the amount that can be contained in one standard sized glove bag or waste bag in order to access a building component. In no event shall the amount of ACM or PACM so disturbed exceed that which can be contained in one glove bag or disposal bag, which shall not exceed 60 inches in length or width.

Drum - A rigid, impermeable container made of cardboard fiber, plastic, or metal which can be sealed in order to be sift-proof, dustproof, and leak-tight.

Employee exposure - The exposure to airborne asbestos that would occur if the employee were not wearing respiratory protection equipment.

Encapsulant - A material that surrounds or embeds asbestos fibers in an adhesive matrix and prevents the release of fibers.

Encapsulation - Treating ACM with an encapsulant.

Enclosure - The construction of an air tight, impermeable, permanent barrier around ACM to control the release of asbestos fibers from the material and also eliminate access to the material.

Equipment room - A contaminated room located within the decontamination area that is supplied with impermeable bags or containers for the disposal of contaminated protective clothing and equipment.

Fiber - A particulate form of asbestos, 5 microns or longer, with a length to width (aspect) ratio of at least 3 to 1.

Fibers per cubic centimeter (f/cc) - Abbreviation for fibers per cubic centimeter, used to describe the level of asbestos fibers in air.

Filter - Media used in respirators, vacuums, or other machines to remove particulate from air.

Firestopping - Material used to close the open parts of a structure in order to prevent a fire from spreading.

Friable asbestos containing material - Any material containing more than one (1) percent asbestos as determined using the method specified in 40 CFR 763, Polarized Light Microscopy, that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.

Glovebag - Not more than a 60 x 60 inch impervious plastic bag-like enclosure affixed around an asbestos-containing material, with glove-like appendages through which materials and tools may be handled.

High efficiency particulate air (HEPA) filter – An ASHRAE MERV 17 filter capable of trapping and retaining at least 99.97 percent of all mono-dispersed particles of 0.3 micrometers in diameter.

HEPA vacuum - Vacuum collection equipment equipped with a HEPA filter system capable of collecting and retaining asbestos fibers.

Homogeneous area - An area of surfacing, thermal system insulation or miscellaneous ACM that is uniform in color, texture and date of application.

HVAC - Heating, Ventilation and Air Conditioning

Industrial hygienist (IH) - A professional qualified by education, training, and experience to anticipate, recognize, evaluate and develop controls for occupational health hazards. Meets definition requirements of the American Industrial Hygiene Association (AIHA).

Industrial hygienist technician (IH Technician) - A person working under the direction of an IH or CIH who has special training, experience, certifications and licenses required for the industrial hygiene work assigned. Some states require that an industrial hygienist technician conducting asbestos abatement air sampling, clearance inspection and clearance air sampling be licensed as an asbestos project monitor.

Intact - The ACM has not crumbled, been pulverized, or otherwise deteriorated so that the asbestos is no longer likely to be bound with its matrix.

Lockdown - Applying encapsulant, after a final visual inspection, on all abated surfaces at the conclusion of ACM removal prior to removal of critical barriers.

National Emission Standards for Hazardous Air Pollutants (NESHAP) - EPA's rule to control emissions of asbestos to the environment (40 CFR part 61, Subpart M).

Negative initial exposure assessment – A demonstration by the employer which complies with the criteria in 29 CFR 1926.1101 (f)(2)(iii), that employee exposure during an operation is expected to be consistently below the PEL or Excursion Limit (EL).

Negative pressure – Air pressure which is lower than the surrounding area, created by exhausting air from a sealed regulated area through HEPA equipped filtration units. OSHA requires maintaining -0.02 inch water column gauge inside the negative pressure enclosure.

Negative pressure respirator – A respirator in which the air pressure inside the facepiece is negative during inhalation relative to the air pressure outside the respirator facepiece.

Non-friable ACM – Material that contains more than 1 percent asbestos but cannot be crumbled, pulverized, or reduced to powder by hand pressure.

Organic vapor cartridge – The type of cartridge used on air purifying respirators to remove organic vapor hazardous air contaminants.

Outside air – The air outside buildings and structures, including, but not limited to, the air under a bridge or in an open ferry dock.

Owner/operator – Any person who owns, leases, operates, controls, or supervises the facility being demolished or renovated or any person who owns, leases, operates, controls, or supervises the demolition or renovation operation, or both.

Penetrating encapsulant – Encapsulant that is absorbed into the ACM matrix without leaving a surface layer.

Permissible exposure limit (PEL) – The level of exposure OSHA allows for as an eight (8) hour time-weighted average (TWA). For asbestos fibers, the eight (8) hour time-weighted average PEL is 0.1 fibers per cubic centimeter (0.1 f/cc) of air and the 30-minute Excursion Limit (EL) is 1.0 fibers per cubic centimeter (1 f/cc).

Personal protective equipment (PPE) – equipment designed to protect user from injury and/or specific job hazard. Such equipment may include protective clothing, hard hats, safety glasses, fall protection, and respirators.

Personal sampling/monitoring – Representative air samples obtained in the breathing zone for one or more workers within the regulated area using a filter cassette and a calibrated air sampling pump to determine asbestos exposure.

Pipe tunnel – An area, typically located adjacent to mechanical spaces or boiler rooms in which the pipes servicing the heating system in the building are routed to allow the pipes to access heating elements. These areas may contain asbestos pipe insulation, asbestos fittings, debris or asbestos-contaminated soil.

Polarized light microscopy (PLM) - Light microscopy using dispersion staining techniques and refractive indices to identify and quantify the type of asbestos present in a bulk sample.

Polyethylene sheeting - Strong plastic barrier material 4 to 6-mils thick, semi-transparent, flame retardant per NFPA 241.

Positive/negative fit check - A method of verifying the seal of a facepiece respirator by temporarily occluding the filters and breathing in (inhaling) and then temporarily occluding the exhalation valve and breathing out (exhaling) while checking for inward or outward leakage of the respirator, respectively.

Presumed ACM (PACM) - Thermal system insulation, surfacing, and flooring material installed in buildings prior to 1981. If the building owner has actual knowledge, or should have known through the exercise of due diligence that other materials are ACM, they too must be treated as PACM. The designation of PACM may be rebutted pursuant to 29 CFR 1926.1101 (k)(5).

Professional IH - An IH who meets the definition requirements of AIHA; meets the definition requirements of OSHA as a "Competent Person" at 29 CFR 1926.1101 (b); has completed two specialized EPA approved courses on management and supervision of asbestos abatement projects; has formal training in respiratory protection and waste disposal; and has a minimum of four projects of similar complexity with this project of which at least three projects serving as the supervisory IH. The PIH may be either the VA’s PIH (VPIH/CIH) or Contractor’s PIH (CPIH/CIH).

Project designer - A person who has successfully completed the training requirements for an asbestos abatement project designer as required by 40 CFR 763 Subpart E, Appendix C, Part I; (B)(5).

Assigned protection factor - A value assigned by OSHA/NIOSH to indicate the expected protection provided by each respirator class, when the respirator is properly selected and worn correctly. The number indicates the reduction of exposure level from outside to inside the respirator facepiece.

Qualitative fit test (QLFT) - A fit test using a challenge material that can be sensed by the wearer if leakage in the respirator occurs.

Quantitative fit test (QNFT) - A fit test using a challenge material which is quantified outside and inside the respirator thus allowing the determination of the actual fit factor.

Regulated area - An area established by the employer to demarcate where Class I, II, III asbestos work is conducted, and any adjoining area where debris and waste from such asbestos work may accumulate; and a work area within which airborne concentrations of asbestos exceed, or there is a reasonable possibility they may exceed the PEL.

Regulated ACM (RACM) - Friable ACM; Category I non-friable ACM that has become friable; Category I non-friable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading or; Category II non-friable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of the demolition or renovation operation.

Removal - All operations where ACM, PACM and/or RACM is taken out or stripped from structures or substrates, including demolition operations.

Renovation - Altering a facility or one or more facility components in any way, including the stripping or removal of asbestos from a facility component which does not involve demolition activity.

Repair - Overhauling, rebuilding, reconstructing, or reconditioning of structures or substrates, including encapsulation or other repair of ACM or PACM attached to structures or substrates.

Shower room - The portion of the PDF where personnel shower before leaving the regulated area.

Supplied air respirator (SAR) - A respiratory protection system that supplies minimum Grade D respirable air per ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-2018.

Surfacing ACM - A material containing more than 1 percent asbestos that is sprayed, troweled on or otherwise applied to surfaces for acoustical, decorative, fireproofing and other purposes.

Surfactant - A chemical added to water to decrease water's surface tension thus making it more penetrating into ACM.

Thermal system ACM - A material containing more than 1 percent asbestos applied to pipes, fittings, boilers, breeching, tanks, ducts, or other structural components to prevent heat loss or gain.

Transmission electron microscopy (TEM) - A microscopy method that can identify and count asbestos fibers.

VA Professional Industrial Hygienist (VPIH/CIH) – The Department of Veterans Affairs Professional Industrial Hygienist must meet the qualifications of a PIH, and may report to a Certified Industrial Hygienist (CIH).

VA Representative - The VA official responsible for on-going project work.

VA Total – means a building or substantial part of the building is completely removed, torn or knocked down, bulldozed, flattened, or razed, including removal of building debris.

Visible emissions - Any emissions, which are visually detectable without the aid of instruments, coming from ACM/PACM/RACM/ACS or ACM waste material.

Waste/Equipment decontamination facility (W/EDF) – The area in which equipment is decontaminated before removal from the regulated area.

Waste generator - Any owner or operator whose act or process produces asbestos-containing waste material.

Waste shipment record - The shipping document, required to be originated and signed by the waste generator, used to track and substantiate the disposition of asbestos-containing waste material.

Wet cleaning - The process of thoroughly eliminating, by wet methods, any asbestos contamination from surfaces or objects.

C. Referenced Standards Organizations: See Section 01 42 19 REFERENCED STANDARDS.

1.5 APPLICABLE CODES AND REGULATIONS

A. General Applicability of Codes, Regulations, and Standards:

1. All work under this contract shall be done in strict accordance with all applicable Federal, State, and Local regulations, standards and codes governing asbestos abatement, and any other trade work done in conjunction with the abatement. All applicable codes, regulations and standards are adopted into this specification and will have the same force and effect as this specification.
2. The most recent edition of any relevant regulation, standard, document or code shall be in effect. Where conflict among the

requirements or with these specifications exists, the most stringent requirement(s) shall be utilized.

3. Copies of all standards, regulations, codes and other applicable documents, including this specification and those listed in Section 1.5 shall be available at the worksite in the clean change area of the worker decontamination system and/or the Contractor's on-site Field Office. These standards, regulations, codes and other applicable documents, including this specification and those listed in Section 1.5 may be made available electronically.

B. Contractor Responsibility: The Asbestos Abatement Contractor (Contractor) shall assume full responsibility and liability for compliance with all applicable Federal, State and Local regulations related to any and all aspects of the asbestos abatement project. The Contractor is responsible for providing and maintaining training, accreditations, medical exams, medical records, personal protective equipment (PPE) including respiratory protection, and respirator fit testing, as required by applicable Federal, State and Local regulations. The Contractor shall hold the VA and VPIH/CIH consultants harmless for any Contractor's failure to comply with any applicable work, packaging, transporting, disposal, safety, health, or environmental requirement on the part of himself, his employees, or his subcontractors. The Contractor will incur all costs of the CPIH/CIH, including all sampling/analytical costs to assure compliance with OSHA/EPA/State/Local requirements related to failure to comply with the regulations applicable to the work.

C. Federal Requirements:

1. Federal requirements which govern asbestos abatement include, but are not limited to, the following regulations:

   a. Occupational Safety and Health Administration **(OSHA)**

      1) Title 29 CFR 1926.1101 - Construction Standard for Asbestos
      2) Title 29 CFR 1926 Subpart E - Personal Protective Equipment and Life Saving Equipment
      3) Title 29 CFR 1910.134 - Respiratory Protection
      4) Title 29 CFR 1926 - Construction Industry Standards
      5) Title 29 CFR 1926.33 - Access to Employee Exposure and Medical Records
      6) Title 29 CFR 1926.59 same as 1910.1200 - Hazard Communication

7) Title 29 CFR 1926 Subpart C – General Safety and Health Provisions and Subpart D – Occupational Health and Environmental Controls

b. Environmental Protection Agency **(EPA)**:

1) 40 CFR 61 Subpart M - National Emission Standard for Hazardous Air Pollutants - Asbestos.

2) 40 CFR 763 - Asbestos Hazard Emergency Response Act (AHERA) and Asbestos Hazard Abatement Reauthorization Act (ASHARA)

c. Department of Transportation **(DOT)**

1) Title 49 CFR 171 - 180 – Transportation

D. State Requirements:

1. State requirements that apply to the asbestos abatement work, disposal, clearance, etc., include, but are not limited to, the following:

Wisconsin Dept. Health and Human Services
Lead and Asbestos Section
1 W Wilson St., Room 137
Madison, WI 53703-3445

Wisconsin Dept. of Natural Resources
P.O. Box 7921
Madison, WI 53707
Ch. NR 447 Wis. Admin. Code

E. Local Requirements:

1. If local requirements are more stringent than federal or state standards, the local standards are to be followed.

City of Milwaukee (within City Limits)

F. Standards:

1. Standards which govern asbestos abatement activities include, but are not limited to, the following:

a. American National Standards Institute (ANSI)/ASSP Z9.2-2018 - Fundamentals Governing the Design and Operation of Local Exhaust Systems and ANSI/ASSE Z88.2-2015 - Practices for Respiratory Protection.

b. Underwriters Laboratories (UL) 586-2009 - UL Standard for Safety of HEPA Filter Units, 9th Edition; ANSI Approval 2017-12-19.

2. Standards which govern encapsulation work include, but are not limited to the following:
   a. American Society for Testing and Materials International(ASTM)
3. Standards which govern the fire and safety concerns in abatement work include, but are not limited to, the following:
   a. National Fire Protection Association (NFPA) 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations.
   b. NFPA 701 - Standard Methods for Fire Tests for Flame Resistant Textiles and Film.
   c. NFPA 101 - Life Safety Code

G. EPA Guidance Documents:
1. EPA guidance documents which discuss asbestos abatement work activities are listed below. These documents are made part of this section by reference.
2. Guidance for Controlling ACM in Buildings (Purple Book) EPA 560/5-85-024
3. Asbestos Waste Management Guidance EPA 530-SW-85-007
4. A Guide to Respiratory Protection for the Asbestos Abatement Industry EPA-560-OPTS-86-001
5. Guide to Managing Asbestos in Place (Green Book) TS 799 20T July 1990

H. Notices:
1. State and Local agencies: Send written notification as required by State and Local regulations including the Local fire department prior to beginning any work on ACM as follows:

Wisconsin Dept. Health and Human Services
Lead and Asbestos Section
1 W Wilson St., Room 137
Madison, WI 53703-3445

Wisconsin Dept. of Natural Resources
P.O. Box 7921
Madison, WI 53707
Ch. NR 447 Wis. Admin. Code

City of Milwaukee (if applicable)

2. Copies of notifications shall be submitted to the VA for the facility's records in the same time frame notification are given to EPA, State, and Local authorities.

I. Permits/Licenses: The contractor shall apply for and have all required permits and licenses to perform asbestos abatement work as required by Federal, State, and Local regulations.

J. Posting and Filing of Regulations: Maintain two (2) copies of applicable Federal, State, and Local regulations. Post one copy of each at the regulated area where workers will have daily access to the regulations and keep another copy in the Contractor's office.

K. VA Responsibilities prior to commencement of work:

1. Notify occupants adjacent to regulated areas of project dates and requirements for relocation, if needed. Arrangements must be made prior to starting work for relocation of desks, files, equipment and personal possessions to avoid unauthorized access into the regulated area. **Note: Notification of adjacent personnel is required by OSHA in 29 CFR 1926.1101 (k) to prevent unnecessary or unauthorized access to the regulated area.**
2. Submit to the Contractor results of background air sampling; including location of samples, person who collected the samples, equipment utilized, calibration data and method of analysis. During abatement, submit to the Contractor, results of bulk material analysis and air sampling data collected during the course of the abatement. This information shall not release the Contractor from any responsibility for OSHA compliance.

L. Emergency Action Plan and Arrangements:

1. An Emergency Action Plan shall be developed prior to commencing abatement activities and shall be agreed to by the Contractor and the VA. The Plan shall meet the requirements of 29 CFR 1926, Subpart C, Standard 1926.35 Employee Emergency Action Plans.
2. Emergency procedures shall be in written form and prominently posted in the clean room and equipment room of the decontamination unit. Everyone, prior to entering the regulated area, must read and sign these procedures to acknowledge understanding of the regulated area layout, location of emergency exits and emergency procedures.
3. Emergency planning shall include written notification of police, fire, and emergency medical personnel of planned abatement activities; work schedule; layout of regulated area; and access to the regulated area, particularly barriers that may affect response capabilities.

4. Emergency planning shall include consideration of fire, explosion, hazardous atmospheres, electrical hazards, slips/trips and falls, confined spaces, and heat stress illness. Written procedures for response to emergency situations shall be developed and employee training in procedures shall be provided.
5. Employees shall be trained in regulated area/site evacuation procedures in the event of workplace emergencies.
   a. For non-life-threatening situations - employees injured or otherwise incapacitated shall be decontaminated following normal procedures with assistance from fellow workers, if necessary, before exiting the regulated area to obtain proper medical treatment.
   b. For life-threatening injury or illness, worker decontamination shall take least priority after measures to stabilize the injured worker, medical personnel shall remove them from the regulated area if back or neck injury is present, and secure proper medical treatment.
6. Telephone numbers of any/all emergency response personnel shall be prominently posted in the clean room, along with the location of the nearest telephone.
7. The Contractor shall provide verification of first aid/CPR training for personnel responsible for providing first aid/CPR. OSHA requires medical assistance within 3-4 minutes of a life-threatening injury/illness. Bloodborne Pathogen training shall also be verified for those personnel required to provide first aid/CPR.
8. The Emergency Action Plan shall provide for a Contingency Plan in the event that an incident occurs that may require the modification of the standard operating procedures during abatement. Such incidents include, but are not limited to, fire; accident; power failure; negative pressure failure; and supplied air system failure. The Contractor shall detail procedures to be followed in the event of an incident assuring that asbestos abatement work is stopped and wetting is continued until correction of the problem.

M. Pre-Construction Meeting:
1. Prior to commencing the work, the Contractor shall meet with the VA Certified Industrial Hygienist (VPIH/CIH) to present and review, as appropriate, the items following this paragraph. The Contractor's Competent Person(s) who will be on-site shall participate in the

pre-start meeting. The pre-start meeting is to discuss and determine procedures to be used during the project. At this meeting, the Contractor shall provide:

a. Proof of Contractor licensing.
b. Proof the Competent Person(s) is trained and accredited and approved for working in this State. Verification of the experience of the Competent Person(s) shall also be presented.
c. A list of all workers who will participate in the project, including experience and verification of training and accreditation.
d. A list of and verification of training for all personnel who have current first-aid/CPR training. A minimum of one person per shift must have adequate training.
e. Current medical written opinions for all personnel working on—site meeting the requirements of 29 CFR 1926.1101 (m).
f. Current fit-tests for all personnel wearing respirators on-site meeting the requirements of 29 CFR 1926.1101 (h) and Appendix C.
g. A copy of the Contractor's Asbestos Hazard Abatement Plan. In these procedures, the following information must be detailed, specific for this project.
   1) Regulated area preparation procedures;
   2) Notification requirements procedure of Contractor as required in 29 CFR 1926.1101 (d) Multi-Employer Worksites;
   3) Decontamination area set-up/layout and decontamination procedures for employees;
   4) Abatement methods/procedures and equipment to be used; and
   5) Personal protective equipment to be used.
h. At this meeting the Contractor shall provide all submittals as required.
i. Procedures for handling, packaging and disposal of asbestos waste.
j. Emergency Action Plan and Contingency Plan Procedures.

1.6 PROJECT COORDINATION

A. The following are the minimum administrative and supervisory personnel necessary for coordination of the work.
   1. Personnel:

a. Administrative and supervisory personnel shall consist of a qualified Competent Person(s) as defined by OSHA in the Construction Standards and the Asbestos Construction Standard; Contractor Professional Industrial Hygienist and Industrial Hygiene Technicians. These employees are the Contractor's Representatives responsible for compliance with these specifications and all other applicable requirements.

b. Non-supervisory personnel shall consist of an adequate number of qualified personnel to meet the schedule requirements of the project. Personnel shall meet required qualifications. Personnel utilized on-site shall be pre-approved by the VA Representative. A request for approval shall be submitted for any person to be employed during the project giving the person's name; last four digits of social security number; qualifications; accreditation card with color picture if required by State; Certificate of Worker's Acknowledgment; and Affidavit of Medical Surveillance and Respiratory Protection and current Respirator Fit Test.

c. Minimum qualifications for Contractor and assigned personnel are:

1) The Contractor has conducted within the last three (3) years, three (3) projects of similar complexity and dollar value as this project; has not been cited and penalized for serious violations of Federal (and State or Local as applicable) EPA and OSHA asbestos regulations in the past three (3) years; has adequate liability/occurrence insurance for asbestos work as required by the State; is licensed in applicable State; has adequate and qualified personnel available to complete the work; has comprehensive standard operating procedures for asbestos work; has adequate materials, equipment and supplies to perform the work.

2) The Competent Person has four (4) years of abatement experience of which two (2) years were as the Competent Person on the project; meets the OSHA definition of a Competent Person; has been the Competent Person on two (2) projects of similar size and complexity as this project within the past three (3) years; has completed EPA AHERA/OSHA/State/Local training requirements/accreditation(s) and refreshers; and has all required OSHA documentation related to medical and respiratory protection.

3) The Contractor Professional Industrial Hygienist/CIH (CPIH/CIH) shall have five (5) years of monitoring experience and supervision of asbestos abatement projects; has participated as senior IH on five (5) abatement projects, three (3) of which are similar in size and complexity as this project; has specialized EPA AHERA/OSHA training in asbestos abatement management, respiratory protection, waste disposal and asbestos inspection; has completed the NIOSH 582 Course or equivalent, Contractor/Supervisor course; and has appropriate medical/respiratory protection records/documentation.

4) The Abatement Personnel shall have completed the EPA AHERA/OSHA abatement worker course; have training on the standard operating procedures of the Contractor; has one year of asbestos abatement experience within the past three (3) years of similar size and complexity; has applicable medical and respiratory protection documentation; has certificate of training/current refresher and State accreditation/license.

d. All personnel shall be in compliance with OSHA construction safety training as applicable and submit certification.

1.7 RESPIRATORY PROTECTION

A. General - Respiratory Protection Program: The Contractor shall develop and implement a written Respiratory Protection Program (RPP) which is in compliance with OSHA requirements found at 29 CFR 1926.1101 and 29 CFR 1910.134. ANSI Standard Z88.2-2015 provides excellent guidance for developing a respiratory protection program. All respirators used must be NIOSH approved for asbestos abatement activities. The written RPP shall, at a minimum, contain the basic requirements found at 29 CFR 1910.134 (c) - Respiratory Protection Program.

B. Respiratory Protection Program Coordinator: The Respiratory Protection Program Coordinator (RPPC) must be identified and shall have two (2) years of experience coordinating RPP of similar size and complexity. The RPPC must submit a signed statement attesting to the fact that the program meets the above requirements.

C. Selection and Use of Respirators: The procedure for the selection and use of respirators must be submitted to the VA as part of the Contractor's qualifications. The procedure must be written clearly enough for workers to understand. A copy of the Respiratory Protection Program must be available in the clean room of the decontamination unit

or in the onsite Contractor's office, for reference by employees or authorized visitors.

D. Minimum Respiratory Protection: Minimum respiratory protection shall be a ½-mask negative pressure air purifying respirator equipped with P100 filters, provided personal air samples in the workplace remain at or below 0.1 f/cc, determined as an 8-hour TWA. Full face powered air purifying respirator equipped with P100 filters shall be required until Contractor demonstrates that personal air samples are at or below 0.1 f/cc, determined as an 8-hour TWA. A higher level of respiratory protection shall be required, if fiber levels exceed 1 f/cc as an 8-hour TWA, inside the regulated work area. Respirator selection shall meet the requirements of 29 CFR 1926.1101 (h) and 29 CFR 1910.134 (d)(3)(i)(A) Table 1, except as indicated in this paragraph. Abatement personnel must have a respirator for their exclusive use.

E. Medical Written Opinion: No employee shall be allowed to wear a respirator unless a physician or other licensed health care professional has provided a written determination they are medically qualified to wear the class of respirator to be used on the project while wearing whole body impermeable garments and subjected to heat or cold stress.

F. Respirator Fit Test: All personnel wearing respirators shall have a current qualitative/quantitative fit test which was conducted in accordance with 29 CFR 1910.134 (f) and Appendix A. Quantitative fit tests shall be done for PAPRs which have been put into a motor/blower failure mode.

G. Respirator Fit Check: The Competent Person shall assure that the positive/negative pressure user seal check is done each time the respirator is donned by an employee. Head coverings must cover respirator head straps. Any situation that prevents an effective facepiece to face seal as evidenced by failure of a user seal check shall preclude that person from entering the regulated area until resolution of the problem.

H. Maintenance and Care of Respirators: The Respiratory Protection Program Coordinator shall submit evidence and documentation showing compliance with 29 CFR 1910.134 (h) Maintenance and care of respirators.

1.8 WORKER PROTECTION

A. Training of Abatement Personnel: Prior to beginning any abatement activity, all personnel shall be trained in accordance with OSHA 29 CFR

1926.1101 (k)(9) and any additional State/Local requirements. Training must include, at a minimum, the elements listed at 29 CFR 1926.1101 (k)(9)(viii). Training shall have been conducted by a third party, EPA/State approved trainer meeting the requirements of EPA 40 CFR 763 Appendix C (AHERA MAP). Initial training certificates and current refresher and accreditation proof must be submitted for each person working at the site.

B. Medical Examinations: Medical examinations meeting the requirements of 29 CFR 1926.1101 (m) shall be provided for all personnel working in the regulated area, regardless of exposure levels. A current physician's written opinion as required by 29 CFR 1926.1101 (m)(4) shall be provided for each person and shall include in the medical opinion that the person has been evaluated for working in a heat and cold stress environment while wearing personal protective equipment (PPE) and is able to perform the work without risk of material health impairment.

C. Personal Protective Equipment: Provide whole body clothing, head coverings, foot coverings and any other personal protective equipment as determined by conducting the hazard assessment required by OSHA at 29 CFR 1910.132 (d). The Competent Person shall ensure the integrity of personal protective equipment worn for the duration of the project. Duct tape shall be used to secure all suit sleeves to wrists and to secure foot coverings at the ankle.

D. Regulated Area Entry Procedure: The Competent Person shall ensure that each time workers enter the regulated area, they remove ALL street clothes in the clean room of the decontamination unit and put on new disposable coveralls, head coverings, a clean respirator, and then proceed through the shower room to the equipment room where they put on non-disposable required personal protective equipment.

E. Decontamination Procedure: The Competent Person shall require all personnel to adhere to following decontamination procedures whenever they leave the regulated area.

1. When exiting the regulated area, remove all disposable PPE and dispose of in a disposal bag provided in the regulated area.
2. Carefully decontaminate and clean the respirator. Put in a clean container/bag.

F. Regulated Area Requirements: The Competent Person shall meet all requirements of 29 CFR 1926.1101 (o) and assure that all requirements for Class II regulated areas at 29 CFR 1926.1101 (e) are met applicable

to Class II work and this specification. All personnel in the regulated area shall not be allowed to eat, drink, smoke, chew tobacco or gum, apply cosmetics, or in any way interfere with the fit of their respirator.

1.9 DECONTAMINATION FACILITIES

A. Description: Provide each regulated area with a fiber drum with a disposal bag in it for personnel waste materials. The Competent Person shall provide a specific area at the outer boundary of the regulated area and designate it specifically for the decontamination of personnel and respirators.

B. Waste/Equipment Decontamination Area (W/EDA): The Competent Person shall provide a specific area in the regulated area designated for removal of all waste, equipment and contaminated material from the regulated area

C. Waste/Equipment Decontamination Procedures: Contain all waste in 6-mil poly bags or approved equivalent. Clean/decontaminate bags and pass through a double 6-mil flap doorway into another bag or fiber drum. Remove to disposal dumpster/gondola/enclosed vehicle

PART 2 - PRODUCTS, MATERIALS AND EQUIPMENT

2.1 MATERIALS AND EQUIPMENT

A. General Requirements: Prior to the start of work, the contractor shall provide and maintain a sufficient quantity of materials and equipment to assure continuous and efficient work throughout the duration of the project. Work shall not start unless the following items have been delivered to the site and the CPIH/CIH has submitted verification to the VA's Representative.

1. All materials shall be delivered in their original package, container or bundle bearing the name of the manufacturer and the brand name (where applicable).
2. Store all materials subject to damage off the ground, away from wet or damp surfaces and under cover sufficient enough to prevent damage or contamination. Flammable and combustible materials cannot be stored inside buildings. Replacement materials shall be stored outside of the regulated area until abatement is completed.
3. The Contractor shall not block or hinder use of buildings by patients, staff, and visitors to the VA in partially occupied

buildings by placing materials/equipment in any unauthorized location.

4. The Competent Person shall inspect for damaged, deteriorating or previously used materials. Such materials shall not be used and shall be removed from the worksite and disposed of properly.
5. Critical penetration points into the building shall be sealed with 2-layers of 6-mil independently installed plastic sheeting (Polyethylene) secured in place at openings such as ducts, pipes, windows, louvers, penetrations or any other opening into the regulated area. A drop cloth of 1-layer of 6-mil plastic sheeting will be placed under the work area to capture falling debris and to facilitate clean-up. Fire retardant poly shall be used throughout.
6. The method of attaching polyethylene sheeting shall be agreed upon in advance by the Contractor and the VA and selected to minimize damage to equipment and surfaces. Method of attachment may include any combination of moisture resistant duct tape, poly tape, furring strips, spray glue, staples, nails, screws, lumber and plywood for enclosures or other effective procedures capable of sealing polyethylene to dissimilar finished or unfinished surfaces under both wet and dry conditions.
7. Polyethylene sheeting utilized for the PDF, if used, shall be opaque white or black in color, 6-mil fire retardant poly.
8. Installation and plumbing hardware, showers, hoses, drain pans, sump pumps and waste water filtration system shall be provided by the Contractor.
9. An adequate number of HEPA vacuums, scrapers, sprayers, nylon brushes, brooms, disposable mops, rags, sponges, staple guns, shovels, ladders and scaffolding of suitable height and length as well as meeting OSHA requirements, fall protection devices, water hose to reach all areas in the regulated area, airless spray equipment, and any other tools, materials or equipment required to conduct the abatement project. All electrically operated hand tools, equipment, electric cords shall be connected to GFCI protection.
10. Special protection for objects in the regulated area shall be detailed (e.g., plywood over carpeting or hardwood floors to prevent damage from scaffolds, water and falling material).
11. Disposal bags – Materials shall be wrapped in 2-layers of 6-mil poly for Transite-type waste and shall be pre-printed with labels,

markings and address as required by OSHA, EPA and DOT regulations. If necessary, materials may be boxed or otherwise packaged to prevent damage to Transite-type waste materials during transport. If boxed or otherwise packaged, appropriate labels shall be affixed to the outer layer of the final container.

12. The VA shall be provided an advance copy of the Safety Data Sheets (SDS) as required for all hazardous chemicals under OSHA 29 CFR 1910.1200 - Hazard Communication in the pre-project submittal. Chlorinated compounds shall not be used with any spray adhesive, mastic remover or other product. Appropriate encapsulant(s) shall be provided.
13. OSHA DANGER demarcation signs, as many and as required by OSHA 29 CFR 1926.1101(k)(7) shall be provided and placed by the Competent Person. All other posters and notices required by Federal and State and Local regulations shall be posted at the outer boundary of the regulated area or approved equivalent.
14. Adequate and appropriate PPE for the project and number of personnel/shifts shall be provided. All personal protective equipment issued must be based on a written hazard assessment conducted under 29 CFR 1910.132(d).

2.2 CONTAINMENT BARRIERS AND COVERINGS IN THE REGULATED AREA

A. General:

1. Using critical barriers, seal off the regulated area to completely isolate the regulated area from adjacent spaces. All penetrations to the regulated area must be covered with 2-layers of 6-mil fire retardant poly to prevent contamination and to facilitate clean-up. Should adjacent areas become contaminated, immediately stop work and clean up the contamination at no additional cost to the Government. Provide firestopping and identify all fire barrier penetrations due to abatement work as specified in Section 2.2.7; FIRESTOPPING.
2. Place all tools, scaffolding, materials and equipment needed for working in the regulated area prior to erecting any plastic sheeting. All uncontaminated removable furniture, equipment and/or supplies shall be removed by the VA from the regulated area before commencing work. Any objects remaining in the regulated area shall be completely covered with 2-layers of 6-mil fire retardant poly sheeting and secured with duct tape. Lock out and tag out any HVAC/electrical systems in the regulated area.

B. Controlling Access to the Regulated Area: Access to the regulated area is allowed only through the personnel decontamination facility (PDF), if required. All other means of access shall be eliminated and OSHA DANGER demarcation signs posted as required by OSHA. If the regulated area is adjacent to or within view of an occupied area, provide a visual barrier of 6-mil opaque fire retardant poly sheeting to prevent building occupant observation. If the adjacent area is accessible to the public, the barrier must be solid.

C. Critical Barriers: Completely separate any operations in the regulated area from adjacent areas using 2-layers of 6-mil fire retardant poly and duct tape. Individually seal with 2-layers of 6-mil poly and duct tape all HVAC openings into the regulated area. Individually seal all lighting fixtures, clocks, doors, windows, convectors, speakers, or any other objects/openings in the regulated area. Heat must be shut off any objects covered with poly.

D. Secondary Barriers: A loose layer of 6-mil poly shall be used as a drop cloth to protect the primary layers from debris generated during the abatement. This layer shall be replaced as needed during the work.

E. Extension of the Regulated Area: If the enclosure of the regulated area is breached in any way that could allow contamination to occur, the affected area shall be included in the regulated area and constructed as per this section. Decontamination measures must be started immediately and continue until air monitoring indicates background levels are met.

F. Firestopping:

1. Through penetrations caused by cables, cable trays, pipes, ducts, sleeves, conduits, etc. must be firestopped with a fire-rated firestop system providing an air tight seal.
2. Firestop materials that are not equal to the wall or ceiling penetrated shall be brought to the attention of the VA Representative. The contractor shall list all areas of penetration, the type of sealant used, and whether or not the location is fire rated. Any discovery of penetrations during abatement shall be brought to the attention of the VA Representative immediately. All walls, floors and ceilings are considered fire rated unless otherwise determined by the VA Representative or Fire Marshall.
3. Any visible openings whether or not caused by a penetration shall be reported by the Contractor to the VA Representative for a sealant

system determination. Firestops shall meet ASTM E814 and UL 1479 requirements for the opening size, penetrant, and fire rating needed.

2.3 MONITORING, INSPECTION AND TESTING

A. General:

1. Perform throughout abatement work monitoring, inspection and testing inside and around the regulated area in accordance with the OSHA requirements and these specifications. OSHA requires that the employee exposure to asbestos must not exceed 0.1 fibers per cubic centimeter (f/cc) of air, averaged over an 8-hour work shift. The CPIH/CIH is responsible for and shall inspect and oversee the performance of the Contractor IH Technician. The IH Technician shall continuously inspect and monitor conditions inside the regulated area to ensure compliance with these specifications. In addition, the CPIH/CIH shall personally manage air sample collection, analysis, and evaluation for personnel, regulated area, and insert number of samples, if any daily area air samples inside the building, but outside the regulated area. At a minimum three (3) perimeter area air samples shall be collected daily inside the building but outside the regulated work area. Additional inspection and testing requirements are also indicated in other parts of this specification.
2. The VA will employ an independent industrial hygienist (VPIH/CIH) consultant and/or use its own IH to perform various services on behalf of the VA. The VPIH/CIH will perform the necessary monitoring, inspection, testing, and other support services to ensure that VA patients, employees, and visitors will not be adversely affected by the abatement work, and that the abatement work proceeds in accordance with these specifications, that the abated areas or abated buildings have been successfully decontaminated. The work of the VPIH/CIH consultant in no way relieves the Contractor from their responsibility to perform the work in accordance with contract/specification requirements, to perform continuous inspection, monitoring and testing for the safety of their employees, and to perform other such services as specified. The cost of the VPIH/CIH and their services will be borne by the VA except for any repeat of final inspection and testing that may be required due to unsatisfactory initial results. Any repeated final

inspections and/or testing, if required, will be paid for by the Contractor.

3. If fibers counted by the VPIH/CIH during abatement work, either inside or outside the regulated area, utilizing the NIOSH 7400 air monitoring method, exceed the specified respective limits, the Contractor shall stop work. The Contractor may request confirmation of the results by analysis of the samples by TEM. Request must be in writing and submitted to the VA's Representative. Cost for the confirmation of results will be borne by the Contractor for both the collection and analysis of samples and for the time delay that may/does result for this confirmation. Confirmation sampling and analysis will be the responsibility of the CPIH/CIH with review and approval of the VPIH/CIH. An agreement between the CPIH/CIH and the VPIH/CIH shall be reached on the exact details of the confirmation effort, in writing, including such things as the number of samples, location, collection, quality control on-site, analytical laboratory, interpretation of results and any follow-up actions. This written agreement shall be co-signed by the IH's and delivered to the VA's Representative.

B. Scope of Services of the VPIH/CIH Consultant:

1. The purpose of the work of the VPIH/CIH is to: assure quality; adherence to the specification; resolve problems; prevent the spread of contamination beyond the regulated area; and assure clearance at the end of the project. In addition, their work includes performing the final inspection and testing to determine whether the regulated area or building has been adequately decontaminated. All air monitoring is to be done utilizing PCM/TEM. The VPIH/CIH will perform the following tasks:

   a. Task 1: Establish background levels before abatement begins by collecting background samples. Retain samples for possible TEM analysis.

   b. Task 2: Perform representative air monitoring, inspection, and testing outside the regulated area during actual abatement work to detect any faults in the regulated area isolation and any adverse impact on the surroundings from regulated area activities.

   c. Task 3: Perform unannounced visits to spot check overall compliance of work with contract/specifications. These visits may

include any inspection, monitoring, and testing inside and outside the regulated area and all aspects of the operation except personnel monitoring.

d. Task 4: Provide support to the VA Representative such as evaluation of submittals from the Contractor, resolution of conflicts, interpret data, etc.

e. Task 5: Perform, in the presence of the VA Representative, final inspection and testing of a decontaminated regulated area at the conclusion of the abatement to certify compliance with all regulations and VA requirements/specifications.

f. Task 6: Issue certificate of decontamination for each regulated area and project report.

2. All documentation, inspection results and testing results generated by the VPIH/CIH will be available to the Contractor for information and consideration. The Contractor shall cooperate with and support the VPIH/CIH for efficient and smooth performance of their work.
3. The monitoring and inspection results of the VPIH/CIH will be used by the VA to issue any Stop Removal orders to the Contractor during abatement work and to accept or reject a regulated area or building as decontaminated.

C. Monitoring, Inspection and Testing by Contractor CPIH/CIH: The Contractor’s CPIH/CIH is responsible for managing all monitoring, inspections, and testing required by these specifications, as well as any and all regulatory requirements adopted by these specifications. The CPIH/CIH is responsible for the continuous monitoring of all subsystems and procedures which could affect the health and safety of the Contractor’s personnel. Safety and health conditions and the provision of those conditions inside the regulated area for all persons entering the regulated area is the exclusive responsibility of the Contractor/Competent Person. The person performing the personnel and area air monitoring inside the regulated area shall be an IH Technician, who shall be trained and shall have specialized field experience in sampling and analysis. The IH Technician shall have successfully completed a NIOSH 582 Course or equivalent and provide documentation. The IH Technician shall participate in the AIHA Asbestos Analysis Registry or participate in the Proficiency Analytical Testing program of AIHA for fiber counting quality control assurance. The IH

Technician shall also be an accredited EPA AHERA/State Contractor/Supervisor and Building Inspector. The IH Technician shall have participated in five abatement projects collecting personal and area samples and have experience in substantially similar projects in size and scope. The analytical laboratory used by the Contractor to analyze the samples shall be AIHA accredited for asbestos PAT and approved by the VA prior to start of the project. A daily log shall be maintained by the CPIH/CIH or IH Technician, documenting all OSHA requirements for personal and area air monitoring for asbestos in 29 CFR 1926.1101 (f), (g) and Appendix A. This log shall be made available to the VA Representative and the VPIH/CIH upon request. The log will contain, at a minimum, information on personnel or area samples, other persons represented by the sample, the date of sample collection, start and stop times for sampling, sample volume, flow rate, and fibers/cc. The CPIH/CIH shall collect and analyze samples for each Representative job being done in the regulated area, i.e., removal, wetting, clean-up, and load-out. The CPIH/CIH shall personally manage air sample collection, analysis, and evaluation for personnel, and regulated areaAt a minimum three (3) perimeter area air samples shall be collected daily inside the building but outside the regulated work area. In addition to the continuous monitoring required, the CPIH/CIH will perform inspection and testing at the final stages of abatement for each regulated area as specified in the CPIH/CIH responsibilities.

2.4 ASBESTOS HAZARD ABATEMENT PLAN

A. The Contractor shall have an established Asbestos Hazard Abatement Plan (AHAP) in printed form and loose leaf folder consisting of simplified text, diagrams, sketches, and pictures that establish and explain clearly the ways and procedures to be followed during all phases of the work by the contractor's personnel. The AHAP(s) must be modified as needed to address specific requirements of the project. The AHAP shall be submitted for review and approval prior to the start of any abatement work. The minimum topics and areas to be covered by the AHAP(s) are:

1. Minimum Personnel Qualifications
2. Emergency Action Plan and Arrangements
3. Security and Safety Procedures
4. Respiratory Protection/Personal Protective Equipment Program and Training

5. Medical Surveillance Program and Recordkeeping
6. Regulated Area Requirements for Class II work
7. Decontamination Facilities and Entry/Exit Procedures (PDF and W/EDF)
8. Monitoring, Inspections, and Testing
9. Removal Procedures for Class II Materials
10. Disposal of ACM Waste
11. Regulated Area Decontamination/Clean-up
12. Regulated Area Visual and Air Clearance
13. Project Completion/Closeout

2.5 SUBMITTALS

A. Pre-Start Meeting Submittals:

1. Submit to the VA a minimum of 14 days prior to the pre-start meeting the following for review and approval. Meeting this requirement is a prerequisite for the pre-start meeting for this project:
   a. Submit a detailed work schedule for the entire project reflecting contract documents and the phasing/schedule requirements from the CPM chart.
   b. Submit a staff organization chart showing all personnel who will be working on the project and their capacity/function. Provide their qualifications, training, accreditations, and licenses, as appropriate. Provide a copy of the "Certificate of Worker's Acknowledgment" and the "Affidavit of Medical Surveillance and Respiratory Protection" for each person.
   c. Submit Asbestos Hazard Abatement Plan developed specifically for this project, incorporating the requirements of the specifications, prepared, signed and dated by the CPIH/CIH.
   d. Submit the specifics of the materials and equipment to be used for this project with manufacturer names, model numbers, performance characteristics, pictures/diagrams, and number available for the following:
      1) Negative air machines, HEPA vacuums, air monitoring pumps, calibration devices, pressure differential monitoring device and emergency power generating system.
      2) Waste water filtration system, shower system, and containment barriers.
      3) Encapsulants, surfactants, hand held sprayers, airless sprayers, and fire extinguishers.

4) Respirators, protective clothing, fall protection and other required personal protective equipment.
5) Fire safety equipment to be used in the regulated area.

e. Submit the name, location, and phone number of the approved landfill; proof/verification the landfill is approved for ACM disposal; the landfill's requirements for ACM waste; the type of vehicle to be used for transportation; and name, address, and phone number of subcontractor, if used. Proof of asbestos training for transportation personnel shall be provided.

f. Submit required notifications and arrangements made with regulatory agencies having regulatory jurisdiction and the specific contingency/emergency arrangements made with local health, fire, ambulance, hospital authorities and any other notifications/arrangements.

g. Submit the name, location and verification of the laboratory and/or personnel to be used for analysis of air and/or bulk samples. Personal air monitoring must be done in accordance with OSHA 29 CFR 1926.1101(f) and Appendix A. Area or clearance air monitoring shall be conducted in accordance with EPA AHERA protocols.

h. Submit qualifications verification: Submit the following evidence of qualifications. Make sure that all references are current and verifiable by providing current phone numbers and documentation.
1) Asbestos Abatement Company: Project experience within the past 3 years; listing projects first most similar to this project: Project Name; Type of Abatement; Duration; Cost; Reference Name/Phone Number; Final Clearance; and Completion Date
2) List of project(s) halted by owner, A/E, IH, regulatory agency in the last 3 years: Project Name; Reason; Date; Reference Name/Number; Resolution
3) List asbestos regulatory citations (e.g., OSHA), notices of violations (e.g., Federal and State and Local EPA), penalties, and legal actions taken against the company including and of the company’s officers (including damages paid) in the last 3 years. Provide copies and all information needed for verification.

i. Submit information on personnel: Provide a resume; address each item completely; copies of certificates, accreditations, and

licenses. Submit an affidavit signed by the CPIH/CIH stating that all personnel submitted below have medical records in accordance with OSHA 29 CFR 1926.1101(m) and that the company has implemented a medical surveillance program and written respiratory protection program, and maintains recordkeeping in accordance with the above regulations. Submit the phone number and doctor/clinic/hospital used for medical evaluations.

1) CPIH/CIH and IH Technician: Name; years of abatement experience; list of projects similar to this one; certificates, licenses, accreditations for proof of AHERA/OSHA specialized asbestos training; professional affiliations; medical opinion; and current respirator fit test.
2) Competent Person(s)/Supervisor(s): Number; names; last four digits of social security numbers; years of abatement experience as Competent Person/Supervisor; list of similar projects in size/complexity as Competent Person/Supervisor; as a worker; certificates, licenses, accreditations; proof of AHERA/OSHA specialized asbestos training; maximum number of personnel supervised on a project; medical opinion (asbestos surveillance and respirator use); and current respirator fit test.
3) Workers: Numbers; names; last four digits of social security numbers; years of abatement experience; certificates, licenses, accreditations; training courses in asbestos abatement and respiratory protection; medical opinion (asbestos surveillance and respirator use); and current respirator fit test.

j. Submit copies of State license for asbestos abatement; copy of insurance policy, including exclusions with a letter from agent stating in plain language the coverage provided and the fact that asbestos abatement activities are covered by the policy; copy of SOP's incorporating the requirements of this specification; information on who provides your training, how often; who provides medical surveillance, how often; who performs and how is personal air monitoring of abatement workers conducted; a list of references of independent laboratories/IH's familiar with your air monitoring and standard operating procedures; copies of

monitoring results of the five referenced projects listed and analytical methods used.

k. Rented equipment must be decontaminated prior to returning to the rental agency.

l. Submit, before the start of work, the manufacturer's technical data for all types of encapsulants, all SDS and application instructions.

B. Submittals During Abatement:

1. The Competent Person shall maintain and submit a daily log at the regulated area documenting the dates and times of the following: purpose, attendees and summary of meetings; all personnel entering/exiting the regulated area; document and discuss the resolution of unusual events such as barrier breeching, equipment failures, emergencies, and any cause for stopping work; Representative air monitoring and results/TWAs/ELs. Submit this information daily to the VA’s Representative.

2. The CPIH/CIH shall document and maintain the inspection and approval of the regulated area preparation prior to start of work and daily during work.

a. Removal of any poly barriers.

b. Visual inspection/testing by the CPIH/CIH or IH Technician prior to application of lockdown encapsulant, if used.

c. Packaging and removal of ACM waste from regulated area.

d. Disposal of ACM waste materials; copies of Waste Shipment Records/landfill receipts to the VA's Representative on a weekly basis.

C. Submittals at Completion of Abatement: The CPIH/CIH shall submit a project report consisting of the daily log book requirements and documentation of events during the abatement project including Waste Shipment Records signed by the landfill's agent. It will also include information on the containment and transportation of waste from the containment with applicable Chain of Custody forms. The report shall include a certificate of completion, signed and dated by the CPIH/CIH, in accordance with Attachment #1. All clearance and perimeter area samples must be submitted. The VA Representative will retain the abatement report after completion of the project and provide copies of the abatement report to VAMC Office of Engineer and the Safety Office.

PART 3 - EXECUTION

3.1 REGULATED AREA PREPARATIONS

A. Site Security:

1. Regulated area access is to be restricted only to authorized, trained/accredited and protected personnel. These may include the Contractor's employees, employees of Subcontractors, VA employees and Representatives, State and Local inspectors, and any other designated individuals. A list of authorized personnel shall be established prior to commencing the project and be posted in the clean room of the decontamination unit.
2. Entry into the regulated area by unauthorized individuals shall be reported immediately to the Competent Person by anyone observing the entry. The Competent person shall immediately notify the VA Representative.
3. A log book shall be maintained in the clean room of the decontamination unit. Anyone who enters the regulated area must record their name, affiliation, time in, and time out for each entry.
4. Access to the regulated area shall be through the PDF or approved equivalent. All other access (doors, windows, hallways, etc.) shall be sealed or locked to prevent entry to or exit from the regulated area. The only exceptions for this requirement are the waste/equipment load-out area which shall be sealed except during the removal of containerized asbestos waste from the regulated area, and emergency exits. Emergency exits shall <u>not</u> be locked from the inside or outside; however, they shall be sealed with poly sheeting and taped until needed.
5. The Contractor's Competent Person shall control site security during abatement operations in order to isolate work in progress and protect adjacent personnel. A 24-hour security system shall be provided at the entrance to the regulated area to assure that all entrants are logged in/out and that only authorized personnel are allowed entrance.
6. The Contractor will have the VA's assistance in notifying adjacent personnel of the presence, location and quantity of ACM in the regulated area and enforcement of restricted access by the VA's employees.

7. The regulated area shall be locked during non-working hours and secured by VA Representative or Competent Person. The VA Police shall be informed of asbestos abatement regulated areas to provide security checks during facility rounds and emergency response.

B. OSHA Danger Signs: Post OSHA DANGER signs meeting the specifications of OSHA 29 CFR 1926.1101 at any location and approaches to the regulated area where airborne concentrations of asbestos may exceed the PEL. Signs shall be posted at a distance sufficiently far enough away from the regulated area to permit any personnel to read the sign and take the necessary measures to avoid exposure. Additional signs will be posted following construction of the regulated area enclosure.

C. Shut down - Lock Out Electric: Shut down and lock out/tag out electric power to the regulated area. Provide temporary power and lighting. Insure safe installation including GFCI of temporary power sources and equipment by compliance with all applicable electrical code requirements and OSHA requirements for temporary electrical systems. Electricity shall be provided by the VA.

D. Shut Down and Lock Out HVAC:

1. Shut down and lock out/tag out heating, cooling, and air conditioning system **(HVAC)** components that are in, supply or pass through the regulated area.
2. Investigate the regulated area and agree on pre-abatement condition with the VA's Representative. Seal all intake and exhaust vents in the regulated area with duct tape and 2-layers of independently installed 6-mil poly. Also, seal any seams in system components that pass through the regulated area. Remove all contaminated HVAC system filters and place in labeled 6-mil poly disposal bags for disposal as asbestos waste.

E. Negative Pressure Filtration System:

1. The Contractor shall provide enough HEPA negative air machines to continuously maintain a negative pressure differential of -0.02 inch water column gauge (WCG) inside the regulated work area relative to adjacent non-work building areas. OSHA 29 CFR 1926.1101 (g)(5)(i)(A)(2) also requires at least four (4) air changes per hour. The Competent Person shall determine the number of units needed for the regulated area by dividing the cubic feet in the regulated area by 15 and then dividing that result by the cubic feet per minute (CFM) for each unit to determine the number of units

needed to continuously maintain a negative pressure differential of -0.02 inch WCG. Provide standby units in the event of machine failure and/or emergency in an adjacent area. HEPA equipped negative air machines shall be discharged outside of the building a minimum of 30 feet from building make-up air, doors, open windows, patients, visitors and staff.

2. NIOSH has done extensive studies and has determined that negative air machines typically operate at ~50 percent efficiency. The contractor shall consider this in their determination of number of units needed to provide -0.02 inch WCG. The contractor shall use 8 air changes per hour or double the number of machines, based on their calculations, or submit proof their machines operate at stated capacities, at a 2 inches pressure drop across the filters.

F. Containment Barriers and Coverings in the Regulated Area:

1. General: Using critical barriers, seal off the perimeter to the regulated area to completely isolate the regulated area from adjacent spaces. All surfaces in the regulated area must be covered to prevent contamination and to facilitate clean-up. Should adjacent areas become contaminated as a result of the work, Contractor shall immediately stop work and clean up the contamination at no additional cost to the VA. Provide firestopping and identify all fire barrier penetrations due to abatement work as specified in Section 2.2.7; FIRESTOPPING.
2. Preparation Prior To Sealing: The Regulated Area: Place all tools, scaffolding, materials and equipment needed for working in the regulated area prior to erecting any plastic sheeting. All uncontaminated removable furniture, equipment and/or supplies shall be removed by the VA from the regulated area before commencing work. Any objects remaining in the regulated area shall be completely covered with 2-layers of 6-mil fire retardant poly sheeting and secured with duct tape. Lock out and tag out any HVAC electrical systems in the regulated area.
3. Controlling Access to The Regulated Area: Access to the regulated area is allowed only through the personnel decontamination facility (PDF), if required. All other means of access shall be eliminated, and OSHA DANGER demarcation signs posted as required by OSHA. If the regulated area is adjacent to, or within view of an occupied area, provide a visual barrier of 6-mil opaque fire-retardant poly to

prevent building occupant observation. If the adjacent area is accessible to the public, the barrier must be solid and capable of withstanding the negative pressure.

4. Critical Barriers: Completely separate any operations in the regulated area from adjacent areas using 2-layers of independently installed 6-mil fire retardant poly and duct tape. Individually seal with 2-layers of 6-mil poly and duct tape all HVAC openings into the regulated area. Individually seal all lighting fixtures, clocks, doors, windows, convectors, speakers, or any other objects openings in the regulated area. Heat must be shut off any objects covered with poly.
5. Extension of the Regulated Area: If the enclosure of the regulated area is breached in any way that could allow contamination to occur, the affected area shall be included in the regulated area and constructed as per this section. If the affected area cannot be enclosed, decontamination measures and cleanup shall start immediately. All personnel shall be isolated from the affected area until decontamination/cleanup is completed as verified by visual inspection and air monitoring. Air monitoring at completion must indicate background levels.
6. Floor Barriers: If floor removal is not being done, all floors in the regulated area shall be covered with 2-layers of 6-mil fire retardant poly and brought up the wall 12 inches.

G. Personal Protective Equipment: Provide whole body clothing, head coverings, foot coverings and any other personal protective equipment as determined by conducting the hazard assessment required by OSHA at 29 CFR 1910.132 (d). The Competent Person shall ensure the integrity of personal protective equipment worn for the duration of the project. Duct tape shall be used to secure all suit sleeves to wrists and to secure foot coverings at the ankle.

H. Sanitary Facilities: The Contractor shall provide sanitary facilities for abatement personnel and maintain them in a clean and sanitary condition throughout the abatement project.

I. Pre-Cleaning:
1. Pre-Cleaning Moveable Objects:
a. Pre-cleaning of ACM contaminated items shall be performed after the enclosure has been erected and negative pressure has been

established in the work area. After items have been pre-cleaned and decontaminated, they may be removed from the work area for storage until the completion of abatement in the work area.Pre-cleaning may not be required if Transite-type materials are in good condition and are the only ACM present.

b. Pre-clean all movable objects within the regulated area using a HEPA filtered vacuum and/or wet cleaning methods as appropriate. After cleaning, these objects shall be removed from the regulated area and carefully stored in an uncontaminated location. Pre-cleaning may not be required if Transite-type materials are in good condition and are the only ACM present.

2. Pre-Cleaning Fixed Objects:

a. Pre-cleaning of ACM contaminated items shall be performed after the enclosure has been erected and negative pressure has been established in the work area. Pre-cleaning may not be required if Transite-type materials are in good condition and are the only ACM present.

b. Pre-clean all fixed objects in the regulated area using HEPA filtered vacuums and wet cleaning techniques as appropriate. Careful attention must be paid to machinery behind grills or gratings where access may be difficult but contamination may be significant. Also, pay particular attention to wall, floor and ceiling penetration behind fixed items. After pre-cleaning, enclose fixed objects with 2-layers of 6-mil poly and seal securely in place with duct tape. Objects (e.g., permanent fixtures, shelves, electronic equipment, laboratory tables, sprinklers, alarm systems, closed circuit TV equipment and computer cables) which must remain in the regulated area and that require special ventilation or enclosure requirements should be designated here along with specified means of protection. Contact the manufacturer for special protection requirements.

3. Pre-Cleaning Surfaces in the Regulated Area:

a. Pre-cleaning of ACM contaminated items shall be performed after the enclosure has been erected and negative pressure has been established in the work area. Pre-cleaning may not be required if flooring materials is in good condition and are the only ACM present.

b. Pre-clean all surfaces in the regulated area using HEPA filtered vacuums and/or wet cleaning methods as appropriate. Do not use any methods that would raise dust such as dry sweeping or vacuuming with equipment not equipped with HEPA filters. Do not disturb asbestos-containing materials during this pre-cleaning phase. Pre-cleaning may not be required if flooring materials is in good condition and are the only ACM present.

J. Pre-Abatement Activities:

1. Pre-Abatement Meeting: The VA Representative, upon receipt, review, and substantial approval of all pre-abatement submittals and verification by the CPIH that all materials and equipment required for the project are on the site, will arrange for a pre-abatement meeting between the Contractor, the CPIH, Competent Person, the VA Representative(s), and the VPIH/CIH. The purpose of the meeting is to discuss any aspect of the submittals needing clarification or amplification and to discuss any aspect of the project execution and the sequence of the operation. The Contractor shall be prepared to provide any supplemental information/ documentation to the VA's Representative regarding any submittals, documentation, materials or equipment. Upon satisfactory resolution of any outstanding issues, the VA's Representative will issue a written order to proceed to the Contractor. No abatement work of any kind described in the following provisions shall be initiated prior to the VA written order to proceed.

2. Pre-Abatement Inspections and Preparation:

a. Before any work begins on the construction of the regulated area, the Contractor will:

1) Conduct a space-by-space inspection with an authorized VA Representative and prepare a written inventory of all existing damage in those spaces where asbestos abatement will occur. Still or video photography may be used to supplement the written damage inventory. Document will be signed and certified as accurate by both parties.

2) The VA Representative, the Contractor, and the VPIH/CIH must be aware of AEQA 10-95 indicating the failure to identify asbestos in the areas listed as well as common issues when preparing specifications and contract documents. This is especially critical when demolition is planned, because AHERA

surveys are non-destructive, and ACM may remain undetected. A NESHAP-compliant (destructive) ACM inspection shall be conducted on all building structures that will be demolished. Ensure the following areas are inspected on the project: Lay-in ceilings concealing ACM; ACM behind walls/windows from previous renovations; inside utility chases/walls; Transite-type piping/ductwork/sheets; behind radiators; lab fume hoods; Transite-type lab countertops; roofing materials; below window sills; water/sewer lines; electrical conduit coverings; crawl spaces(previous abatement contamination); flooring/mastic covered by carpeting/new flooring; exterior insulated wall panels; on underground fuel tanks; steam line trench coverings.

3) Ensure that all furniture, machinery, equipment, curtains, drapes, blinds, and other movable objects required to be removed from the regulated area have been cleaned and removed or properly protected from contamination.

4) Shut down and seal with a minimum of 2-layers of independently installed 6-mil fire retardant poly all HVAC systems and critical openings in the regulated area. The regulated area critical barriers shall completely isolate the regulated area from any other air in the building. The VA's Representative will monitor the isolation provision.

5) Shut down and lock out in accordance with 29 CFR 1910.147 all electrical circuits which pose a potential hazard. Electrical arrangements will be tailored to the particular regulated area and the systems involved. All electrical circuits affected will be turned off at the circuit box outside the regulated area, not just the wall switch. The goal is to eliminate the potential for electrical shock which is a major threat to life in the regulated area due to water use and possible energized circuits. Electrical lines used to power equipment in the regulated area shall conform to all electrical safety standards and shall be isolated by the use of a ground fault circuit interrupter (GFCI). All GFCI shall be tested prior to use. The VA's Representative will monitor the electrical shutdown.

6) If required, remove and dispose of carpeting from floors in the regulated area.
7) Inspect existing firestopping in the regulated area. Correct as needed.

3. Pre-Abatement Construction and Operations:
   a. Perform all preparatory work for the first regulated area in accordance with the approved work schedule and with this specification.
   b. Upon completion of all preparatory work, the CPIH/CIH will inspect the work and systems and will notify the VA's Representative when the work is completed in accordance with this specification. The VA's Representative may inspect the regulated area and the systems with the VPIH/CIH and may require that upon satisfactory inspection, the Contractor's employees perform all major aspects of the approved AHAP(s), especially worker protection, respiratory systems, contingency plans, decontamination procedures, and monitoring to demonstrate satisfactory operation. The operational systems for respiratory protection and the negative pressure system shall be demonstrated for proper performance.
   c. The CPIH/CIH shall document the pre-abatement activities described above and deliver a copy to the VA's Representative.
   d. Upon satisfactory inspection of the installation of and operation of systems, the VA's Representative will notify the Contractor in writing to proceed with the asbestos abatement work in accordance with this specification and all applicable regulations.

3.2 REMOVAL OF CLASS II TRANSITE-TYPE MATERIALS

A. General: All applicable requirements of OSHA, EPA, and DOT shall be followed during Class II work. Keep materials intact; do not break up materials; wet while working with it; wrap as soon as possible with 2-layers of 6-mil plastic for disposal, and maintain good housekeeping in work areas during abatement.

B. Outdoor Work Areas: On some projects, work must be performed on exterior areas of the building. If outdoor work is to be performed, all applicable OSHA, State and Local regulations must be followed to ensure that outdoor work areas are in compliance so that workers, the general public and the environment are protected. Place 6-mil polyethylene sheeting placed 25 feet out from the outer perimeter of the work area

to aid in cleaning Transite-type material debris that may fall off building.

C. Scaffold Fall Protection: Each employee more than 6 feet above the base work level shall be protected from falls by guardrails or a fall arrest system. Fall arrest system includes harnesses, components of the harness/belt such as Dee-rings, and snap hooks, lifelines, and anchorage points. Lifelines must be independent of supports lines and suspension ropes and not attached to the same anchorage point as the support or suspension rope. OSHA's scaffolding standard defines a competent person as "one who is capable of identifying existing and predictable hazards in the surroundings or working conditions, which are unsanitary, hazardous to employees, and who has authorization to take prompt corrective measures to eliminate them." The competent person will determine if it is safe for employees to work on or from a scaffold or roof during storms or high winds and to ensure that a personal fall arrest system will protect the employees. The competent person will also inspect the scaffold and scaffold components for visible defects before each work shift and after any occurrence which could affect the structural integrity and to authorize prompt corrective measures.

D. Roof/Elevated Work Area Protection: The competent person shall determine if the walking/working surfaces on which the employees are to work on have the strength and structural integrity to support the employees safely. Each employee on a walking/working surface (horizontal and vertical surface) with an unprotected side or edge which is 6 feet or more above a lower level shall be protected from falling by the use of guardrail systems, safety net systems, or personal fall arrest system.

E. Excavation/Trenching Work Area Protection: Each employee who is working in excavation/trenching work areas to alter or remove materials such as underground piping shall be protected from hazards arising from such work areas. A competent person who is OSHA trained in excavation/trenching operations must be present on site at all time in which work in these areas occurs. The competent person will determine if it is safe for employees to work on or in excavation/trenching work areas and to ensure that all applicable safety measures will protect the employees. The competent person will also inspect the excavation/trenching areas for visible defects before each work shift

and after any occurrence which could affect the structural integrity of the excavation/trenching areas and to authorize prompt corrective measures.

F. Removal of Transite-Type:

1. All Transite-type must be wetted prior to removal. Unfasten Transite-type panels without disturbance. Keep Transite-type material intact to the extent feasible.
2. All waste must be wrapped in two layers of 6-mil poly and lowered carefully to the ground.
3. Materials may not be dropped from any height. Unless the material is carried or passed to the ground by hand, it shall be lowered to the ground via covered, dust-tight chute, crane or hoist.

3.3 DISPOSAL OF CLASS II WASTE MATERIAL

A. General: Dispose of waste ACM and debris which is packaged in accordance with these specifications, OSHA, EPA and DOT. The landfill requirements for packaging must also be met. Transport will be in compliance with 49 CFR 171-180 regulations. Disposal shall be done at an approved landfill in accordance with State and Local requirements, which are generally more restrictive than Federal EPA. Disposal of non-friable ACM shall be done in accordance with applicable State and Local regulations.

3.4 PROJECT DECONTAMINATION

A. General:

1. The entire work related to project decontamination shall be performed under the close supervision and monitoring of the CPIH/CIH.
2. If the asbestos abatement work is in an area which was contaminated prior to the start of abatement, the decontamination will be done by cleaning the primary barrier poly prior to its removal and cleanings of the surfaces of the regulated area after the primary barrier removal.
3. If the asbestos abatement work is in an area which was uncontaminated prior to the start of abatement, the decontamination will be done by cleaning the primary barrier poly prior to its removal, thus preventing contamination of the building when the regulated area critical barriers are removed.

B. Regulated Area Clearance: Air testing and other requirements which must be met before release of the Contractor and re-occupancy of the regulated area space are specified in Final Testing Procedures.

C. Work Description: Decontamination includes the clearance air testing in the regulated area and the decontamination and removal of the enclosures/facilities installed prior to the abatement work including primary/critical barriers, PDF and W/EDF facilities, and negative pressure systems.

D. Pre-Decontamination Conditions:

1. Before decontamination starts, all ACM waste from the regulated area shall be removed, all waste collected and removed, and the secondary barrier of poly removal and disposed of along with any gross debris generated by the work.

2. At the start of decontamination, the following shall be in place:

a. Critical barriers over all openings consisting of two layers of independently installed 6-mil poly which is the sole barrier between the regulated area and the rest of the building or outside.

b. Decontamination facilities, if required for personnel and equipment in operating condition.

E. Cleaning: Carry out a first cleaning of all surfaces of the regulated area including items of remaining poly sheeting, tools, scaffolding, ladders/staging by wet methods and/or HEPA vacuuming. Do not use dry dusting/sweeping/air blowing methods. Use each surface of a wetted cleaning cloth one time only and then dispose of as contaminated waste. Continue this cleaning until there is no visible residue from abated surfaces or poly or other surfaces. Remove all filters in the air handling system and dispose of as ACM waste in accordance with these specifications. The negative pressure system shall remain in operation during this time. Additional cleaning(s) may be needed as determined by the CPIH/VPIH/CIH.

3.5 VISUAL INSPECTION AND AIR CLEARANCE TESTING

A. General: Notify the VA Representative 24 hours in advance for the performance of the final visual inspection and testing. The final visual inspection and testing will be performed by the VPIH/CIH after the cleaning.

B. Visual Inspection: Final visual inspection will include the entire regulated area, all poly sheeting, seals over HVAC openings, doorways,

windows, and any other openings. If any debris, residue, dust or any other suspect material is detected, the cleaning shall be repeated at no additional cost to the VA. Dust/ material samples may be collected and analyzed at no additional cost to the VA at the discretion of the VPIH/CIH to confirm visual findings. When the regulated area is visually clean the final testing can be done.

C. Air Clearance Testing:

1. After an acceptable final visual inspection by the VPIH/CIH and VA Representative, the VPIH/CIH will perform the final clearance testing. Air samples will be collected and analyzed in accordance with procedures for AHERA and this specification. If work is less than 260 lf/160 sf/35 cf, 5 PCM samples shall be collected for clearance and a minimum of one field blank. If work is equal to or more than 260 lf/160 sf/35 cf, AHERA TEM sampling shall be performed for clearance. TEM analysis shall be done in accordance with procedures for EPA AHERA and this specification. If the release criteria are not met, the Contractor shall repeat the final cleaning and continue decontamination procedures until clearance is achieved. **All Additional inspection and testing costs will be borne by the Contractor**.
2. If release criteria are met, proceed to perform the abatement closeout and to issue the certificate of completion in accordance with these specifications.

D. Final Air Clearance Procedures:

1. Contractor's Release Criteria: Work in a regulated area is complete when the regulated area is visually clean and airborne fiber levels have been reduced to or below 0.01 f/cc as measured by the AHERA PCM protocol and $\leq$ 70 AHERA asbestos structures per square millimeter (s/mm^2) by AHERA TEM. No averaging of results will be used for this project. All five (5) TEM samples inside the regulated area shall be at or below 70 asbestos s/mm^2 to satisfy the project final clearance criteria.
   a. Air Monitoring and Final Clearance Sampling: To determine if the elevated airborne fiber counts encountered during abatement operations have been reduced to the specified level, the VPIH/CIH will secure samples and analyze them according to the following procedures:

1) Fibers Counted: "Fibers" referred to in this section shall be either all fibers regardless of composition as counted in the NIOSH 7400 PCM method or asbestos fibers counted using the AHERA TEM method.
2) Aggressive Sampling: All final air testing samples shall be collected using aggressive sampling techniques. Samples will be collected on 0.8μ MCE filters for PCM analysis and 0.45μ MCE for TEM. A minimum of 3850 Liters of air using calibrated sampling pumps shall be collected for PCM samples and a minimum of 1200 Liters of air using calibrated sampling pumps shall be collected for TEM clearance samples. Before pumps are started, initiate aggressive air mixing sampling as detailed in 40 CFR 763 Subpart E (AHERA) Appendix A (III)(B)(7)(d). Air samples will be collected in areas subject to normal air circulation away from corners, obstructed locations, and locations near windows, doors, or vents. After air sampling pumps have been shut off, circulating fans shall be shut off. The negative pressure system shall continue to operate.

3.6 ABATEMENT CLOSEOUT AND CERTIFICATE OF COMPLIANCE

A. Completion of Abatement Work:
1. After thorough decontamination, complete asbestos abatement work upon meeting the regulated area clearance criteria and fulfilling the following:
   a. Remove all equipment, materials, and debris from the project area.
   b. Package and dispose of all asbestos waste as required.
   c. Repair or replace all interior finishes damaged during the abatement work.
   d. Fulfill other project closeout requirements as specified elsewhere in this specification.

B. Certificate of Completion by Contractor: The CPIH shall complete and sign the "Certificate of Completion" in accordance with Attachment 1 at the completion of the abatement and decontamination of the regulated area.

C. Work Shifts:
1. All work shall generally be done during administrative hours (8:00 AM to 4:30 PM) Monday - Friday excluding Federal Holidays. Any

change in the work schedule must be approved in writing by the VA Representative.

2. Workers will be provided with adequate washing and break area facilities located away from the containment site.

ATTACHMENT #1
CERTIFICATE OF COMPLETION

DATE: _____ VA Project #:_____

PROJECT NAME:_____ Abatement Contractor:_____

VAMC/ADDRESS:_____

1. I certify that I have personally inspected, monitored and supervised the abatement work of (specify regulated area or Building):
   which took place from / / to / /
2. That throughout the work all applicable requirements/regulations and the VA's specifications were met.
3. That any person who entered the regulated area was protected with the appropriate personal protective equipment and respirator and that they followed the proper entry and exit procedures and the proper operating procedures for the duration of the work.
4. That all employees of the Abatement Contractor engaged in this work were trained in respiratory protection, were experienced with abatement work, had proper medical surveillance documentation, were fit-tested for their respirator, and were not exposed at any time during the work to asbestos without the benefit of appropriate respiratory protection.
5. That I performed and supervised all inspection and testing specified and required by applicable regulations and VA specifications.
6. That the conditions inside the regulated area were always maintained in a safe and healthy condition and the maximum fiber count never exceeded 0.5 f/cc, except as described below.
7. That all abatement work was done in accordance with OSHA requirements and the manufacturer’s recommendations.

CPIH/CIH Signature/Date:_____

CPIH/CIH Print Name:_____

Abatement Contractor Signature/Date:_____

Abatement Contractor Print Name:_____

ATTACHMENT #2

CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

PROJECT NAME:_____DATE:_____

PROJECT ADDRESS:_____

ABATEMENT CONTRACTOR'S NAME:_____

WORKING WITH ASBESTOS CAN BE HAZARDOUS TO YOUR HEALTH. INHALING ASBESTOS HAS BEEN LINKED WITH VARIOUS TYPES OF CANCERS. IF YOU SMOKE AND INHALE ASBESTOS FIBERS, YOUR CHANCES OF DEVELOPING LUNG CANCER IS GREATER THAN THAT OF THE NON-SMOKING PUBLIC.

Your employer's contract with the owner for the above project requires that: You must be supplied with the proper personal protective equipment including an adequate respirator and be trained in its use. You must be trained in safe and healthy work practices and in the use of the equipment found at an asbestos abatement project. You must receive/have a current medical examination for working with asbestos. These things shall be provided at no cost to you. By signing this certificate of worker’s acknowledgement you are indicating to the owner that your employer has met these obligations.

RESPIRATORY PROTECTION: I have been trained in the proper use of respirators and have been informed of the type of respirator to be used on the above indicated project. I have a copy of the written Respiratory Protection Program issued by my employer. I have been provided for my exclusive use, at no cost, with a respirator to be used on the above indicated project.

TRAINING COURSE: I have been trained by a third party, State/EPA accredited trainer in the requirements for an AHERA/OSHA Asbestos Abatement Worker training course, 32-hours minimum duration. I currently have a valid State accreditation certificate. The topics covered in the course include, as a minimum, the following:

- Physical Characteristics and Background Information on Asbestos
- Potential Health Effects Related to Exposure to Asbestos
- Employee Personal Protective Equipment
- Establishment of a Respiratory Protection Program
- State of the Art Work Practices
- Personal Hygiene
- Additional Safety Hazards
- Medical Monitoring
- Air Monitoring
- Relevant Federal, State and Local Regulatory Requirements, Procedures, and Standards
- Asbestos Waste Disposal

MEDICAL EXAMINATION: I have had a medical examination within the past 12 months which was paid for by my employer. This examination included: health history, occupational history, pulmonary function test, and may have included a chest x-ray evaluation. The physician issued a positive written opinion after the examination.

Signature:_____

Printed Name:_____

Social Security Number:_____

Witness:_____

ATTACHMENT #3

AFFIDAVIT OF MEDICAL SURVEILLANCE, RESPIRATORY PROTECTION AND TRAINING/ACCREDITATION

VA PROJECT NAME AND NUMBER:_____

VA MEDICAL FACILITY:_____

ABATEMENT CONTRACTOR'S NAME AND ADDRESS:_____

1. I verify that the following individual
   Name:_____ Social Security Number:_____
   who is proposed to be employed in asbestos abatement work associated with the above project by the named Abatement Contractor, is included in a medical surveillance program in accordance with 29 CFR 1926.1101(m), and that complete records of the medical surveillance program as required by 29 CFR 1926.1101(m)(n) and 29 CFR 1910.20 are kept at the offices of the Abatement Contractor at the following address.
   Address:_____

2. I verify that this individual has been trained, fit-tested and instructed in the use of all appropriate respiratory protection systems and that the person is capable of working in safe and healthy manner as expected and required in the expected work environment of this project.

3. I verify that this individual has been trained as required by 29 CFR 1926.1101(k). This individual has also obtained a valid State accreditation certificate. Documentation will be kept on-site.

4. I verify that I meet the minimum qualifications criteria of the VA specifications for a CPIH.

Signature of CPIH/CIH:_____ Date:_____

Printed Name of CPIH/CIH:_____

Signature of Contractor:_____ Date:_____

Printed Name of Contractor:_____

ATTACHMENT #4

ABATEMENT CONTRACTOR/COMPETENT PERSON(S) REVIEW AND ACCEPTANCE OF THE VA'S ASBESTOS SPECIFICATIONS

VA Project Location:_____

VA Project #:_____

VA Project Description:_____

This form shall be signed by the Asbestos Abatement Contractor Owner and the Asbestos Abatement Contractor's Competent Person(s) prior to any start of work at the VA related to this Specification. If the Asbestos Abatement Contractor's/Competent Person(s) has not signed this form, they shall not be allowed to work on-site.

I, the undersigned, have read VA's Asbestos Specification regarding the asbestos abatement requirements. I understand the requirements of the VA's Asbestos Specification and agree to follow these requirements as well as all required rules and regulations of OSHA/EPA/DOT and State/Local requirements.

I have been given ample opportunity to read the VA's Asbestos Specification and have been given an opportunity to ask any questions regarding the content and have received a response related to those questions. I do not have any further questions regarding the content, intent and requirements of the VA's Asbestos Specification.

At the conclusion of the asbestos abatement, I will certify that all asbestos abatement work was done in accordance with the VA's Asbestos Specification and all ACM was removed properly and no fibrous residue remains on any abated surfaces.

Abatement Contractor Owner's Signature_____Date_____

- - - E N D - - -

SECTION 02 83 33.13
LEAD-BASED PAINT REMOVAL AND DISPOSAL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Removing and disposal of lead-based paint (LBP) at interior and exterior locations indicated in existing conditions report dated July 26, 2021. Available to contractor upon request to COR.

1. White Ceramic Wall Tile 0.63% Lead Building 111, Rm. 1659
   100 SF
2. Blue Wall Paint 0.61% Lead Building 70, Rm. B39
   600 SF
3. Gray/Red Floor Paint 3.3 % Lead Bldg. 70, Rm. B38
   150 SF
4. White Wall Paint 4.5% Lead Bldg. 70, Rms.E104HC, C126, D125 1200 SF
5. Gray Wall and Door Paint 0.51% Lead Bldg. 6, Rm. B206
   290 SF
6. Door/Window Frames 14% Lead Bldg. 6, B103, B206, C303
   5 EA
7. Window Frame Paint 39 % Lead Bldg. 112, Rm. 1081
   1 EA

1.2 RELATED WORK

A. Section 02 41 00, DEMOLITION
B. Section 02 82 11, TRADITIONAL ASBESTOS ABATEMENT
C. Section 02 82 13.13, GLOVEBAG ASBESTOS ABATEMENT
D. SECTION 02 82 13.19, ASBESTOS FLOOR TILE AND MASTIC ABATEMENT
E. SECTION 02 82 13.31, ASBESTOS TRANSITE ABATEMENT

1.3 SECTION 02 83 33.13 LEAD BASED PAINT REMOVAL AND DISPOSALDEFINITIONS

A. Action Level: Employee exposure, without regard to use of respirator, to an airborne lead concentration of 30 micrograms(µ) per cubic meter (m^3) of air determined as an 8-hour Time-Weighted Average (TWA). As used in this section, ”30 micrograms per cubic meter of air" refers to OSHA 29 CFR 1926.62 Lead in Construction Action Level (AL).

B. Area Monitoring: Sampling of lead concentrations within lead control area and inside physical boundaries which are representative of airborne lead concentrations which may reach breathing zone of personnel potentially exposed to lead.

C. Breathing Zone: Area within hemisphere, forward of shoulders, with 150 mm to 225 mm (6 to 9 inches) radius and center at nose or mouth of employee.

D. Certified Industrial Hygienist (CIH): As used in this section, refers to an Industrial Hygienist Certified in the Comprehensive Practice of Industrial Hygiene by the American Board of Industrial Hygiene and Board for Global EHS Credentialing, employed by Contractor.

E. Change Rooms and Shower Facilities: Rooms within designated physical boundary around lead control area equipped with separate storage facilities for clean protective work clothing and equipment and for street clothes which prevents cross contamination.

F. Competent Person: Person capable of identifying lead hazards in work area and authorized by contractor to take corrective action. Meets the OSHA definition of Competent Person.

G. Decontamination Room: Room for removal of contaminated personal protective equipment (PPE).

H. Eight-Hour Time Weighted Average (TWA): Airborne concentration of lead averaged over 8-hour workday to which an employee is exposed.

I. High Efficiency Particulate Air (HEPA) Filter Equipment:
HEPA filtered vacuuming equipment with UL 586 filter system capable of collecting and retaining lead-contaminated paint dust. HEPA filter means 99.97 percent efficient against 0.3 micron (0.012 mil) size particles.

J. Lead: Metallic lead, inorganic lead compounds, and organic lead soaps. Excluded from this definition are other organic lead compounds.

K. Lead Control Area: Enclosed area or structure with full containment to prevent spreading lead dust, paint chips, and debris from lead-based paint removal operations. Lead control area is isolated by physical boundaries to prevent unauthorized entry of personnel.

L. Lead Permissible Exposure Limit (PEL): Fifty micrograms per cubic meter of air (50 $\mu g/m^3$) determined as an 8-hour TWA as determined by 29 CFR Part 1926.62. When employee is exposed for more than 8-hours per

work day, determine PEL by the following formula. PEL micrograms/cubic meter (parts per million) of air = 400/No. of hrs. worked per day.

M. Personnel Monitoring: Sampling of lead concentrations within employee breathing zone to determine 8-hour time weighted average concentration according to 29 CFR Part 1926.62. Take samples that are representative of the various employee's work tasks.

N. Physical Boundary: Area physically roped or partitioned off around enclosed lead control area to limit unauthorized entry of personnel. As used in this section, "inside boundary" shall mean same as "outside lead control area."

1.4 APPLICABLE PUBLICATIONS

A. Comply with references to extent specified in this section.

B. American National Standards Institute (ANSI):

Z9.2-2018.....Fundamentals Governing the Design & Operation of Local Exhaust Ventilation Systems.

C. Code of Federal Regulations (CFR):

29 CFR Part 1910.....Occupational Safety and Health Standards.

29 CFR Part 1926.....Safety and Health Regulations for Construction.

40 CFR Part 260.....Hazardous Waste Management System: General.

40 CFR Part 261.....Identification and Listing of Hazardous Waste.

40 CFR Part 262.....Standards Applicable to Generators of Hazardous Waste.

40 CFR Part 263.....Standards Applicable to Transporters of Hazardous Waste.

40 CFR Part 264.....Standards for Owners and Operations of Hazardous Waste Treatment, Storage, and Disposal Facilities.

40 CFR Part 265.....Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities.

40 CFR Part 268.....Land Disposal Restrictions.

49 CFR Part 172.....Hazardous Material Table, Special Provisions, Hazardous Material Communications, Emergency Response Information, and Training Requirements, and Security Plans.

49 CFR Part 178.....Specifications for Packaging.

D. Underwriters Laboratories (UL):

586-09.....High-Efficiency, Particulate, Air Filter Units.

1.5 PRE-REMOVAL MEETINGS

A. Conduct pre-removal meetingat project site minimum 15 days before beginning Work of this section.

1. Required Participants:
   a. Contracting Officer's Representative.
   b. Certified Industrial Hygienist.
   c. Architect/Engineer.
   d. Inspection and Testing Agency.
   e. Contractor.
   f. Paint removal contractor.
   g. Other installers responsible for finishing resulting surfaces.

2. Meeting Agenda: Distribute agenda to participants minimum 3 days before meeting.
   a. Respiratory protection program.
   b. Hazard communication program.
   c. Hazardous waste management plan.
   d. Safety and health regulation compliance.
   e. Employee training.
   f. Removal schedule.
   g. Removal sequence.
   h. Preparatory work.
   i. Protection before, during, and after removal.
   j. Removal.
   k. Inspecting and testing.
   l. Other items affecting successful completion.
3. Document and distribute meeting minutes to participants to record decisions affecting installation.

1.6 SUBMITTALS

A. Submittal Procedures: Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Manufacturer's Literature and Data:
   1. Description of each product.
      a. Paint removal products.
      b. Vacuum filters.

c. Respirators.

2. Safety Data Sheet for each paint removal product.
3. Installation instructions.
   a. Paint removal products.

C. Test Reports: Submit testing laboratory reports.
1. Submit air monitoring results within three working days, signed by testing laboratory employee performing air monitoring, employee analyzing sample, and CIH.

D. Certificates: Certify completed lead training.
1. Submit certificate for each employee signed and dated by CIH and employee stating employee was trained.

E. Qualifications: Substantiate qualifications comply with specifications.
1. Paint removal contractor.
2. Testing laboratory.
   a. Name, address, and telephone number.
   b. Current evidence of participation in American Industrial Hygiene Association (AIHA) Laboratory Accreditation Program (LAP), LLC, Environmental Lead Laboratory Accreditation Program (ELLAP).
   c. Copy of current AIHA accreditation certificate.
3. Industrial hygienist.
   a. Name, address, and telephone number.
   b. Resume showing previous experience.
   c. Copy of current ABIH CIH certification.
4. Paint disposal facility.
   a. Name, address, and telephone number.
   b. Current license or authorization to receive and dispose lead contaminated waste.

F. Record Documents:

1. Completed and signed hazardous waste manifest from waste transporter.
2. Toxicity Characteristic Leaching Procedure (TCLP) test results to determine if waste is hazardous.
3. Paint disposal facility receipts and disposition reports.
4. Certification of medical examinations.

5. Medical Opinion that employee is qualified to wear a respirator, that employees has been trained and fit tested for the respirator.
6. Employee training certification.

1.7 QUALITY ASSURANCE

A. Safety and Health Regulation Compliance:
1. Comply with laws, ordinances, rules, and regulations of Federal, State, and Local authorities having jurisdiction regarding removing, handling, storing, transporting, and disposing lead waste materials.
a. Comply with applicable requirements of 29 CFR Part 1926.62.
b. Notify Contracting Officer's Representative and request resolution of conflicts between regulations and specified requirements before starting work.
2. Comply with the following local laws, ordinances, criteria, rules and regulations regarding removing, handling, storing, transporting, and disposing lead-contaminated materials:

B. Paint Removal Contractor: Experienced contractor, registered or licensed by applicable state agency regulating lead-based paint removal.

C. Testing Laboratory: State certified independent testing laboratory experienced in airborne lead monitoring, testing, and reporting.
1. Successful participant in American Industrial Hygiene Association (AIHA) Laboratory Accreditation Program (LAP), LLC, Environmental Lead Laboratory Accreditation Program (ELLAP).

D. Certified Industrial Hygienist: Certified as CIH by American Board of Industrial Hygiene in comprehensive practice and responsible for:
1. Certify Training.
2. Review and approve lead-based paint removal plan for conformance to applicable referenced standards.
3. Inspect lead-based paint removal work for conformance with approved plan.
4. Direct monitoring.
5. Ensure work is performed according to specifications.
6. Ensure personnel and environment hazardous exposures are adequately controlled.

E. Paint Disposal Facility: State certified disposal facility qualified to receive and dispose lead-based paint.

F. Lead-based Paint Removal Plan:

1. Submit detailed, site-specific plan describing lead-based paint removal procedures.
2. Include sketch showing location, size, and details of lead control areas, decontamination rooms, change rooms, shower facilities, and mechanical ventilation system.
3. Include eating, drinking, and restroom procedures, interface of trades, work sequencing, collected wastewater and paint debris disposal plan, air sampling plan, respirators, protective equipment, and detailed description of containment methods ensuring airborne lead concentrations do not exceed action level outside lead control area.
   a. Eating, drinking, and smoking are not acceptable within lead control area.
4. Include air sampling, training and strategy, sampling methodology, frequency, duration, and qualifications of air monitoring personnel.

G. Respiratory Protection Program: Establish and implement program required by 29 CFR Part 1910.134 and 29 CFR Part 1926.62.
   1. Provide each employee negative pressure or other appropriate respirator.
      a. Respirator fit each employee's respirator at initial fitting and at least annually thereafter, as required by 29 CFR Part 1910.134 Respiratory Protection.

H. Hazard Communication Program: Establish and implement program required by 29 CFR Part 1910.1200 which is the same as 29 CFR 1926.59.

I. Hazardous Waste Management Plan: Establish and implement plan according to applicable requirements of Federal, State, and Local hazardous waste regulations including the following:
   1. Identification of hazardous wastes associated with work.
   2. Estimated quantities of generated and disposed waste.
   3. Names and qualifications of each contractor transporting, storing, treating, and disposing wastes. Include facility location and 24-hour point of contact. Provide two copies of EPA, State and Local hazardous waste permit applications permits and EPA Identification numbers.
   4. Names and qualifications (experience and training) of personnel working on-site with hazardous wastes.

5. List of required waste handling equipment including cleaning, volume reduction, and transport equipment.
6. Spill prevention, containment, and cleanup contingency implementation measures.
7. Work plan and schedule for waste containment, removal, and disposal with daily waste cleaned up and containerization.
8. Hazardous waste disposal cost.

1.8 WARRANTY

A. Construction Warranty: FAR clause 52.246-21, "Warranty of Construction."

PART 2 - PRODUCTS

2.1 PAINT REMOVAL PRODUCTS

A. Chemical Stripper: Biodegradable, non-toxic, capable of removing existing paint layers in one application, and acceptable to CIH.

2.2 ACCESSORIES

A. Waste Collection Drums: 49 CFR Part 178; Type 1A2, steel, removable head, 200 L (55 gal.) capacity, capable of containing waste without loss.
B. Vacuum Cleaner: HEPA filtered type.
C. Scrapers:
   1. Metal type for use on metal, concrete, and masonry surfaces.
   2. Plastic type for use on wood, plaster, gypsum board, and other surfaces.
D. Rinse Water: Potable.
E. Cleaning Cloths: Cotton.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Before exposure to lead-contaminated dust, provide workers with comprehensive medical examination required by 29 CFR Part 1926.62 (j) Medical Surveillance.
B. Maintain complete and accurate employee medical records according to 29 CFR Part 1910.1020.
C. Train each employee performing paint removal, disposal, and air sampling operations according to 29 CFR Part 1926.62.
   1. Certify training is completed before employee is permitted to work on project and enter lead control area.

3.2

3.3 PREPARATION

A. Protect existing work indicated to remain.
   1. Perform paint removal work without damaging and contaminating adjacent work.
   2. Restore damage and contamination to original condition.
B. Notify Contracting Officer 20 days before starting paint removal work.
C. Lead Control Area Requirements:
   1. Establish lead control area by completely enclosing lead-based paint removal work area with containment screens.
   2. Contain removal operations using negative pressure full containment system with minimum one change room and HEPA filtered exhaust.
D. Boundary Requirements: Provide physical boundaries around lead control area by roping off area designated area or providing curtains, portable partitions or other enclosures to ensure that airborne lead concentrations do not meet or exceed action level outside of lead control area.
E. Heating, Ventilating and Air Conditioning (HVAC) Systems: Shut down, lock out, and isolate HVAC systems supplying exhausting, and passing through lead control areas. Seal HVAC inlets and outlet within lead control area with 6-mil plastic sheet and tape. Tape seal seams in HVAC components passing through lead control area.
F. Change Room and Shower Facilities: Provide clean change rooms and shower facilities within physical boundary around lead control area according to 29 CFR Part 1926.62.
G. Mechanical Ventilation System:
   1. Provide ventilation system to control personnel exposure to lead using HEPA equipped negative air machines.
   2. Design, construct, install, and maintain HEPA filtered fixed local exhaust ventilation system according to ANSI Z9.2 and approved by CIH.
   3. Exhaust ventilation air to exterior wherever possible.
   4. When exhaust ventilation air must be recirculated into work area, provide HEPA filter with reliable back-up filter and controls to monitor lead concentration in return air and to bypass recirculation system automatically when system fails.

H. Personnel Protection: Provide and use required protective clothing and equipment within lead control area.

I. Warning Signs: Provide warning signs complying with 29 CFR Part 1926.62 at lead control area approaches. Locate signs so personnel read signs and take necessary precautions before entering lead control area.

3.4 WORK PROCEDURES

A. Remove lead-based paint according to approved lead-based paint removal plan.

1. Perform work only in presence of CIH or Industrial Hygienist (IH) Technician under direction of CIH ensuring continuous inspection of work in progress and direction of air monitoring activities.
2. Handle, store, transport, and dispose lead or and lead contaminated waste according to 40 CFR Part 260, 40 CFR Part 261, 40 CFR Part 262, 40 CFR Part 263, 40 CFR Part 264, and 40 CFR Part 265. Comply with land disposal restriction notification requirements as required by 40 CFR Part 268.

B. Use procedures and equipment required to limit occupational and environmental lead exposure when lead-based paint is removed according to 29 CFR Part 1926.62.

C. Dispose removed paint and waste according to Environmental Protection Agency (EPA), federal, state, and local requirements.

D. Personnel Exiting Procedures:

1. When personnel exit lead control area, comply with the following procedures:
   a. Vacuum exposed clothing surfaces.
   b. Remove protective clothing and equipment in decontamination room. Place clothing in approved impermeable disposal bag.
   c. Shower.
   d. Dress in clean clothes before leaving lead control area.

E. Monitoring - General:

1. Monitor airborne lead concentrations according to 29 CFR Part 1910.1025by testing laboratory as directed by CIH.
2. Take personal air monitoring samples on employees anticipated to have greatest exposure risk as determined by CIH. Additionally, take air monitoring samples on minimum 25 percent of work crew or minimum of two employees, whichever is greater, during each work shift.

3. Submit results of air monitoring samples, signed by CIH, within 24 hours after taking air samples. Notify Contracting Officer's Representative immediately of lead exposure at or exceeding action level outside of lead control area.

F. Monitoring During Paint Removal:

1. Perform personal and area monitoring during entire paint removal operation.
2. Conduct area monitoring at physical boundary daily for each work shift to ensure unprotected personnel are not exposed above action level anytime.
3. For outdoor operations, take at least one sample on each shift leeward of lead control area. When adjacent areas are contaminated, clean area of contamination and have CIH visually inspect and certify lead contamination is cleaned.
4. Stop work when outside boundary lead levels meet or exceed action level. Notify Contracting Officer's Representative, immediately.
5. Correct conditions causing increased lead concentration as directed by CIH.
6. Review sampling data collected during work stoppage to determine if conditions require additional work method modifications as determined by CIH.
7. Resume paint removal when approved by CIH.

3.5 LEAD-BASED PAINT REMOVAL

A. Remove paint within areas indicated on drawings completely exposing substrate. Minimize damage to substrate.

B. Comply with paint removal processes described lead paint removal plan.

C. Lead-Based Paint Removal: Select processes for each application to minimize work area lead contamination and waste.

3.6 SUBSTRATE SURFACE PREPARATION

A. Protect substrates from deterioration and contamination until refinished.

1. Protect metal substrates from flash rusting.

B. Prepare and paint substrates according to Section 09 91 00, PAINTING.

3.7 FIELD QUALITY CONTROL

A. Field Tests: Performed by testing laboratory specified in Section 01 45 29, TESTING LABORATORY SERVICES.
B. Perform sampling and testing for:
   1. Air monitoring.
   2. Lead-Based Paint.

3.8 CLEANING AND DISPOSAL

A. Cleaning:
   1. Maintain lead control area surfaces free of accumulating paint chips and dust. Confine dust, debris, and waste to work area.
   2. HEPA vacuum clean and wet wipe with detergent solution work area daily, at end of each shift, and when paint removal operation is complete.
B. CIH Certification: Certify in writing that inside and outside lead control area air monitoring samples are less than action level, employee respiratory protection was adequate, the work was performed according to 29 CFR Part 1926.62, and no visible accumulations of lead-based paint and dust remain on worksite.
   1. Do not remove lead control area or roped-off boundary and warning signs before Contracting Officer's Representative's receipt of CIH's certification.
   2. Re-clean areas showing dust or residual paint chips.
C. Testing: Where indicated and when directed by Contracting Officer's Representative, test lead-based paint residue and used abrasive according to 40 CFR Part 261 for hazardous waste.
D. Waste Collection:
   1. Collect lead-contaminated materials including waste, scrap, debris, bags, containers, equipment, and clothing, which may produce airborne lead contamination.
   2. Place lead contaminated materials in waste disposal drums. Label each drum identifying waste type according to 49 CFR Part 172 and date waste materials were first put into drum. Obtain and complete the Uniform Hazardous Waste Manifest forms. Comply with land disposal restriction notification requirements required by 40 CFR Part 268:

3. Coordinate temporary storage location on project site with Contracting Officer's Representative.

E. Waste Disposal:
1. Minimum 14 days before delivery, notify Contracting Officer's Representative who will arrange for job site inspection of drums and manifests by paint disposal facility personnel.
2. Contracting Officer's Representative will arrange hazardous wastes removal, transport and delivery to paint disposal facility to ensure drums do not remain on project site longer than 90 calendar days from drum label date.

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F. Waste Disposal:
1. Do not store hazardous waste drums in temporary storage location longer than 90 calendar days from drum label date.
2. Remove, transport, and deliver drums to paint disposal facility.
   a. Obtain signed receipt including date, time, quantity, and description of materials received according to 40 CFR Part 262.
   b. Obtain final report of materials disposition after disposal completion.

- - - E N D - - -

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section specifies cast-in-place structural concrete and materials and mixes for other concrete.

1.2 RELATED WORK

A. Section 01 45 29, TESTING LABORATORY SERVICES: Materials testing and inspection during construction.

B. Section 01 81 13, SUSTAINABLE CONSTRUCTION REQUIREMENTS

C. Section 32 05 23, CEMENT AND CONCRETE FOR EXTERIOR IMPROVEMENTS: Concrete roads, walks, and similar exterior site work.

1.3 TESTING AGENCY FOR CONCRETE MIX DESIGN

A. Testing agency for the trial concrete mix design retained and reimbursed by the Contractor and approved by COR. For all other testing, refer to Section 01 45 29 Testing Laboratory Services.

B. Testing agency maintaining active participation in Program of Cement and Concrete Reference Laboratory (CCRL) of National Institute of Standards and Technology. Accompany request for approval of testing agency with a copy of Report of Latest Inspection of Laboratory Facilities by CCRL.

C. Testing agency shall furnish equipment and qualified technicians to establish proportions of ingredients for concrete mixes.

1.4 TOLERANCES

A. Formwork: ACI 117, except the elevation tolerance of formed surfaces before removal of shores is +0 mm (+0 inch) and -20 mm (-3/4 inch).

B. Reinforcement Fabricating and Placing: ACI 117, except that fabrication tolerance for bar sizes Nos. 10, 13, and 16 (Nos. 3, 4, and 5) (Tolerance Symbol 1 in Fig. 2.1(a), ACI, 117) used as column ties or stirrups is +0 mm (+0 inch) and -13 mm (-1/2 inch) where gross bar length is less than 3600 mm (12 feet), or +0 mm (+0 inch) and -20 mm (-3/4 inch) where gross bar length is 3600 mm (12 feet) or more.

C. Cross-Sectional Dimension: ACI 117, except tolerance for thickness of slabs 12 inches or less is +20 mm (+3/4 inch) and - 6 mm (-1/4 inch). Tolerance of thickness of beams more than 300 mm (12 inch) but less than 900 mm (3 feet) is +20 mm (+3/4 inch) and -10 mm (-3/8 inch).

D. Slab Finishes: ACI 117, Section 4.5.6, F-number method in accordance with ASTM E1155, except as follows:

1. Test entire slab surface, including those areas within 600 mm (2 feet) of construction joints and vertical elements that project through slab surface.
2. Maximum elevation change which may occur within 600 mm (2 feet) of any column or wall element is 6 mm (0.25 inches).
3. Allow sample measurement lines that are perpendicular to construction joints to extend past joint into previous placement no further than 1500 mm (5 feet).

1.5 REGULATORY REQUIREMENTS

A. ACI SP-66 – ACI Detailing Manual.

B. ACI 318 - Building Code Requirements for Reinforced Concrete.

C. ACI 301 – Standard Specifications for Structural Concrete.

1.6 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, and SAMPLES. All items indicated below are required submittals requiring Contracting Officer’s Representative (COR) review and approval.

B. Shop Drawings: Reinforcing steel: Complete shop drawings

C. Mill Test Reports:
   1. Reinforcing Steel.
   2. Cement.

D. Manufacturer's Certificates:
   1. Abrasive aggregate.
   2. Lightweight aggregate for structural concrete.
   3. Air-entraining admixture.
   4. Chemical admixtures, including chloride ion content.
   5. Waterproof paper for curing concrete.
   6. Liquid membrane-forming compounds for curing concrete.
   7. Non-shrinking grout.
   8. Liquid hardener.
   9. Waterstops.
   10. Expansion joint filler.
   11. Adhesive binder.

E. Testing Agency for Concrete Mix Design: Approval request including qualifications of principals and technicians and evidence of active participation in program of Cement and Concrete Reference Laboratory

(CCRL) of National Institute of Standards and Technologyand copy of report of latest CCRL, Inspection of Laboratory.

F. Test Report for Concrete Mix Designs: Trial mixes including watercement fly ash ratio curves, concrete mix ingredients, and admixtures.

G. Shoring and Reshoring Sequence: Submit for approval a shoring and reshoring sequence for flat slab/flat plate portions, prepared by a registered Professional Engineer. As a minimum, include timing of form stripping, reshoring, number of floors to be re-shored and timing of re-shore removal to serve as an initial outline of procedures subject to modification as construction progresses. Submit revisions to sequence, whether initiated by COR (see FORMWORK) or Contractor.

H. Test reports on splitting tensile strength (Fct) of lightweight concrete.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Conform to ACI 304. Store aggregate separately for each kind or grade, to prevent segregation of sizes and avoid inclusion of dirt and other materials.

B. Deliver cement in original sealed containers bearing name of brand and manufacturer, and marked with net weight of contents. Store in suitable watertight building in which floor is raised at least 300 mm (1 foot) above ground. Store bulk cement and fly ashin separate suitable bins.

C. Deliver other packaged materials for use in concrete in original sealed containers, plainly marked with manufacturer's name and brand, and protect from damage until used.

1.8 PRE-CONCRETE CONFERENCE

A. General: At least 15 days prior to submittal of design mixes, conduct a meeting to review proposed methods of concrete construction to achieve the required results.

B. Agenda: Includes but is not limited to:

1. Submittals.
2. Coordination of work.
3. Availability of material.
4. Concrete mix design including admixtures.
5. Methods of placing, finishing, and curing.
6. Finish criteria required to obtain required flatness and levelness.
7. Timing of floor finish measurements.
8. Material inspection and testing.

C. Attendees: Include but not limited to representatives of Contractor; subcontractors involved in supplying, conveying, placing, finishing, and curing concrete; lightweight aggregate manufacturer; admixture manufacturers; COR; Consulting Engineer; Contractor retained testing laboratories for concrete testing and finish (F-number) verification.

D. Minutes of the meeting: Contractor shall take minutes and type and distribute the minutes to attendees within five days of the meeting.

1.9 MOCK-UP

A. In addition to the other specified samples and tests, construct a mock-up using the materials, reinforcing, forming system and construction methods proposed for use in exposed architectural concrete.

B. Construct the mock-up with at least a 2.5 m by 2.5 m (8 feet by 8 feet) exposed surface and suitable foundations. Include the following where applicable: Control joints, reglets, recesses or other typical architectural details.

C. Before casting the mock-up, submit full detailed Shop Drawings of the mock-up formwork for review by the Architect. Perform all necessary preliminary tests to ensure that concrete used for the mock-up will exactly match the approved sample in color and texture.

D. Perform the surface treatment proposed for use on one or more areas not less than 300 mm by 300 mm (1 foot by 1 foot) on the back side of the mock-up to establish the texture of finish required by the Architect. Repeat as required until a sample satisfactory to the Architect has been obtained.

E. Treat the finished front surface of the mock-up to produce a uniform appearance similar in every respect to the approved sample area.

F. The completed mock-up shall be inspected by the Architect. Failure of the mock-up to match the approved sample will require the construction of further mock-ups until approval is obtained. Remove rejected mock-ups immediately.

G. Maintain the approved mock-ups in good condition at the job site until all architectural concrete surfaces have been completed and approved by the Architect. Remove the mock-up from the site after completion of the above.

1.10 APPLICABLE PUBLICATIONS

A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.

B. American Concrete Institute (ACI):

117-10.....Specifications for Tolerances for Concrete Construction and Materials and Commentary

211.1-91(R2009).....Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete

211.2-98(R2004).....Standard Practice for Selecting Proportions for Structural Lightweight Concrete

214R-11(R2019).....Guide to Evaluation of Strength Test Results of Concrete

301-16.....Specifications for Structural Concrete

304R-00(R2009).....Guide for Measuring, Mixing, Transporting, and Placing Concrete

305.1-14.....Specification for Hot Weather Concreting

306.1-90(R2002).....Standard Specification for Cold Weather Concreting

308.1-11.....Specification for Curing Concrete

309R-05.....Guide for Consolidation of Concrete

318/318-19.....Building Code Requirements for Structural Concrete and Commentary

347R-14.....Guide to Formwork for Concrete

SP-66-04.....ACI Detailing Manual

C. American National Standards Institute and American Hardboard Association (ANSI/AHA):

A135.4-2012.....Basic Hardboard

D. ASTM International (ASTM):

A615/A615M-20.....Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement

A653/A653M-20.....Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc Iron Alloy Coated (Galvannealed) by the Hot Dip Process

A706/A706M-16.....Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement

A767/A767M-19.....Standard Specification for Zinc Coated (Galvanized) Steel Bars for Concrete Reinforcement

A775/A775M-19.....Standard Specification for Epoxy Coated Steel Reinforcing Bars

A820/820M-16.....Standard Specification for Steel Fibers for Fiber Reinforced Concrete

A996/A996M-16.....Standard Specification for Rail Steel and Axle Steel Deformed Bars for Concrete Reinforcement

A1064/A1064M-18a.....Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete

C31/C31M-19a.....Standard Practice for Making and Curing Concrete Test Specimens in the field

C33/C33M-18.....Standard Specification for Concrete Aggregates

C39/C39M-20.....Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens

C94/C94M-19a.....Standard Specification for Ready Mixed Concrete

C143/C143M-20.....Standard Test Method for Slump of Hydraulic Cement Concrete

C150C150M-20.....Standard Specification for Portland Cement

C171-16.....Standard Specification for Sheet Materials for Curing Concrete

C172C172M-17.....Standard Practice for Sampling Freshly Mixed Concrete

C173/C173M-16.....Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method

C192/C192M-19.....Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory

C231/C231M-17a.....Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method

C260/C260M-10a(2016)....Standard Specification for Air Entraining Admixtures for Concrete

C309-19.....Standard Specification for Liquid Membrane Forming Compounds for Curing Concrete

C330/C330M-17a.....Standard Specification for Lightweight Aggregates for Structural Concrete

C494/C494M-19.....Standard Specification for Chemical Admixtures for Concrete

C618-19.....Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete

C666/C666M-15.....Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing

C881/C881M-20.....Standard Specification for Epoxy Resin Base Bonding Systems for Concrete

C1107/1107M-20.....Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-shrink)

C1315-19.....Standard Specification for Liquid Membrane Forming Compounds Having Special Properties for Curing and Sealing Concrete

D6/D6M-95(2018).....Standard Test Method for Loss on Heating of Oil and Asphaltic Compounds

D297-15(2019).....Standard Test Methods for Rubber Products Chemical Analysis

D412—16.....Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers - Tension

D1751-18.....Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types)

D4263-83(2018).....Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.

E1155-20.....Standard Test Method for Determining F_F Floor Flatness and F_L Floor Levelness Numbers

F1249-20.....Standard Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor

F1869-16a.....Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.

E. American Welding Society (AWS):

D1.4/D1.4M-18.....Structural Welding Code - Steel Reinforcing Bars

F. Concrete Reinforcing Steel Institute (CRSI):
Handbook 2008

G. National Cooperative Highway Research Program (NCHRP):
Report On.....Concrete Sealers for the Protection of Bridge Structures

H. U. S. Department of Commerce Product Standard (PS):
PS 1-07.....Structural Plywood
PS 20-20.....American Softwood Lumber Standard

I. U. S. Army Corps of Engineers Handbook for Concrete and Cement:
CRD C513.....Rubber Waterstops
CRD C572.....Polyvinyl Chloride Waterstops

PART 2 - PRODUCTS

2.1 FORMS

A. Wood: PS 20 free from loose knots and suitable to facilitate finishing concrete surface specified; tongue and grooved.

B. Plywood: PS-1 Exterior Grade B-B (concrete-form) 16 mm (5/8 inch), or 20 mm (3/4 inch) thick for unlined contact form. B-B High Density Concrete Form Overlay optional.

C. Metal for Concrete Rib-Type Construction: Steel (removal type) of suitable weight and form to provide required rigidity.

D. Permanent Steel Form for Concrete Slabs: Corrugated, ASTM A653, Grade E, and Galvanized, ASTM A653, G90. Provide venting where insulating concrete fill is used.

E. Corrugated Fiberboard Void Boxes: Double faced, completely impregnated with paraffin and laminated with moisture resistant adhesive, size as shown. Design forms to support not less than 48 KPa (1000 psf) and not lose more than 15 percent of their original strength after being completely submerged in water for 24 hours and then air dried.

F. Form Lining:
1. 1. Hardboard: ANSI/AHA A135.4, Class 2 with one (S1S) smooth side)
2. 2. Plywood: Grade B-B Exterior (concrete-form) not less than 6 mm (1/4 inch) thick.
3. 3. Plastic, fiberglass, or elastomeric capable of reproducing the desired pattern or texture.

G. Concrete products shall comply with following standards for biobased materials:

Material Type	Percent by Weight
Concrete Penetrating Liquid	79 percent biobased material
Concrete form Release Agent	87 percent biobased material
Concrete Sealer	11 percent biobased material

The minimum-content standards are based on the weight (not the volume) of the material.

H. Form Ties: Develop a minimum working strength of 13.35 kN (3000 pounds) when fully assembled. Ties shall be adjustable in length to permit tightening of forms and not have any lugs, cones, washers to act as spreader within form, nor leave a hole larger than 20 mm (3/4 inch) diameter, or a depression in exposed concrete surface, or leave metal closer than 40 mm (1 1/2 inches) to concrete surface. Wire ties not permitted. Cutting ties back from concrete face not permitted.

2.2 MATERIALS

A. Portland Cement: ASTM C150 Type I or II.

B. Fly Ash: ASTM C618, Class C or F including supplementary optional requirements relating to reactive aggregates and alkalies, and loss on ignition (LOI) not to exceed 5 percent. Do not exceed more than 25 percent total cementitious content by weight.

C. Coarse Aggregate: ASTM C33.

1. Size 67 or Size 467 may be used for footings and walls over 300 mm (12 inches) thick.
2. Coarse aggregate for interior slabs on grade shall conform to the following:
   a. Dense or well graded aggregate.
      1) Percent retained on each sieve below the top size and above the No. 100 sieve:
         a) 8 to 18 percent for 1-1/2 inches (38 mm)top size.
         b) 8 to 22 percent for 3/4 or 1 inch (19 or 25 mm) top size.
      2) The above requirements may be deviated from based on locally available material.
         a) One or two non-adjacent sieves sizes may fall outside of the limits set above.

b) Percent retained on two adjacent sieves sizes shall not be less than 5 percent of the above required.

c) Percent retained on three adjacent sieve sizes shall not be less than 8 percent of the above required.

d) When the percent retained on each of two adjacent sieve sizes is less than 8 percent the total percent retained on either of these sieves and the adjacent outside sieve should be at least 13 percent (for example, if both the No. 4 and No. 8 (4.75 and 2.36 mm)sieves have 6 percent retained on each item then: 1. the total retained on the 3/8 inch and No. 4 (9.5 and 4.75 mm) sieves should be at least 13 percent, and 2. the total retained on the No. 8 and No. 16 (2.36 and 1.18 mm) sieves should be at least 13 percent.

3. Coarse aggregate for applied topping, encasement of steel columns, and metal pan stair fill shall be Size 7.
4. Maximum size of coarse aggregates not more than one-fifth of narrowest dimension between sides of forms, one-third of depth of slabs, nor three-fourth of minimum clear spacing between reinforcing bars.

D. Lightweight Aggregates for Structural Concrete: ASTM C330, Table 1. Maximum size of aggregate not larger than one-fifth of narrowest dimension between forms, nor three-fourth of minimum clear distance between reinforcing bars. Contractor to furnish certified report to verify that aggregate is sound and durable, and has a durability factor of not less than 80 based on 300 cycles of freezing and thawing when tested in accordance with ASTM C666.

E. Fine Aggregate: ASTM C33. Fine aggregate for applied concrete floor topping shall pass a 4.75 mm (No. 4) sieve, 10 percent maximum shall pass a 150 µm (No. 100) sieve.

F. Mixing Water: Fresh, clean, and potable.

G. Admixtures:

1. Water Reducing Admixture: ASTM C494, Type A and not contain more chloride ions than are present in municipal drinking water.
2. Water Reducing, Retarding Admixture: ASTM C494, Type D and not contain more chloride ions than are present in municipal drinking water.

3. High-Range Water-Reducing Admixture (Superplasticizer): ASTM C494, Type F or G, and not contain more chloride ions than are present in municipal drinking water. Use of superplasticizer requires COR approval.
4. Non-Corrosive, Non-Chloride Accelerator: ASTM C494, Type C or E, and not contain more chloride ions than are present in municipal drinking water. Admixture manufacturer must have long-term non-corrosive test data from an independent testing laboratory of at least one year duration using an acceptable accelerated corrosion test method such as that using electrical potential measures.
5. Air Entraining Admixture: ASTM C260.
6. Microsilica: Use only with prior review and acceptance of the COR. Use only in conjunction with high range water reducer.
7. Calcium Nitrite corrosion inhibitor: ASTM C494 Type C.
8. Prohibited Admixtures: Calcium chloride, thiocyanate or admixtures containing more than 0.05 percent chloride ions are not permitted.
9. Certification: Written conformance to the requirements above and the chloride ion content of the admixture prior to mix design review.

H. Vapor Barrier: ASTM F1249,0.38 mm (15 mil) WVT 0.007 foot/hour .

I. Reinforcing Steel: ASTM A615, or ASTM A996, deformed, grade as shown.

J. Welded Wire Fabric: ASTM A185.

K. Reinforcing Bars to be Welded: ASTM A706.

L. Galvanized Reinforcing Bars: ASTM A767.

M. Epoxy Coated Reinforcing Bars: ASTM A775.

N. Cold Drawn Steel Wire: ASTM A1064.

O. Reinforcement for Concrete Fireproofing: 100 mm x 100 mm x 3.4 mm diameter (4 x 4-W1.4 x W1.4) welded wire fabric, secured in place to hold mesh 20 mm (3/4 inch) away from steel. Mesh at steel columns shall be wired to No. 10 (No. 3) vertical corner steel bars.

P. Supports, Spacers, and Chairs: Types which will hold reinforcement in position shown in accordance with requirements of ACI 318 except as specified.

Q. Expansion Joint Filler: ASTM D1751.

R. Sheet Materials for Curing Concrete: ASTM C171.

S. Liquid Membrane-forming Compounds for Curing Concrete: ASTM C309, Type I, with fugitive dye, and shall meet the requirements of ASTM C1315.Compound shall be compatible with scheduled surface treatment,

such as paint and resilient tile, and shall not discolor concrete surface.

T. Abrasive Aggregate: Aluminum oxide grains or emery grits.

U. Liquid Hardener and Dustproofer: Fluosilicate solution of magnesium fluosilicate or zinc fluosilicate. Magnesium and zinc may be used separately or in combination as recommended by manufacturer. Use only on exposed slab. Do not use where floor is covered with resilient flooring, paint or other finish coating.

V. Moisture Vapor Emissions & Alkalinity Control Sealer: 100 percent active colorless aqueous siliconate solution concrete surface.

1. ASTM C1315 Type 1 Class A, and ASTM C309 Type 1 Class A, penetrating product to have no less than 34 percent solid content, leaving no sheen, volatile organic compound (VOC) content rating as required to suite regulatory requirements. The product shall have at least a five (5) year documented history in controlling moisture vapor emission from damaging floor covering, compatible with all finish materials.

2. MVE 15-Year Warranty:

a. When a floor covering is installed on a below grade, on grade, or above grade concrete slab treated with Moisture Vapor Emissions & Alkalinity Control Sealer according to manufacturer's instruction, sealer manufacturer shall warrant the floor covering system against failure due to moisture vapor migration or moisture-born contaminates for a period of fifteen (15) years from the date of original installation. The warranty shall <u>cover all labor and materials</u> needed to replace all floor covering that fails due to moisture vapor emission & moisture born contaminates.

W. Penetrating Sealer: For use on parking garage ramps and decks. High penetration silane sealer providing minimum 95 percent screening per National Cooperative Highway Research Program (NCHRP) No. 244 standards for chloride ion penetration resistance. Requires moist (non-membrane) curing of slab.

X. Non-Shrink Grout:

1. ASTM C1107, pre-mixed, produce a compressive strength of at least 18 MPa at three days and 35 MPa (5000 psi) at 28 days. Furnish test data from an independent laboratory indicating that the grout when

placed at a fluid consistency shall achieve 95 percent bearing under a 1200 mm x 1200 mm (4 foot by 4 foot) base plate.

2. Where high fluidity or increased placing time is required, furnish test data from an independent laboratory indicating that the grout when placed at a fluid consistency shall achieve 95 percent under an 450 mm x 900 mm (18 inch by 36 inch) base plate.

Y. Adhesive Binder: ASTM C881.

Z. Waterstops:

1. Polyvinyl Chloride Waterstop: CRD C572.
2. Rubber Waterstops: CRD C513.
3. Bentonite Waterstop: Flexible strip of bentonite 25 mm x 20 mm (1 inch by 3/4 inch), weighing 8.7 kg/m (5.85 pounds per foot) composed of Butyl Rubber Hydrocarbon (ASTM D297), Bentonite (SS-S-210-A) and Volatile Matter (ASTM D6).
4. Non-Metallic Hydrophilic: Swellable strip type compound of polymer modified chloroprene rubber that swells upon contact with water shall conform to ASTM D412 as follows: Tensile strength 420 psi minimum; ultimate elongation 600 percent minimum. Hardness shall be 50 minimum on the type A durameter and the volumetric expansion ratio in in 70 deg water shall be 3 to 1 minimum.

AA. Porous Backfill: Crushed stone or gravel graded from 25 mm to 20 mm (1 inch to 3/4 inch).

BB. Fibers:

1. Synthetic Fibers: Monofilament or fibrillated polypropylene fibers for secondary reinforcing of concrete members. Use appropriate length and 0.9 kg/m^3 (1.5 lb. per cubic yard). Product shall have a UL rating.
2. Steel Fibers: ASTM A820, Type I cold drawn, high tensile steel wire for use as primary reinforcing in slab-on-grade. Minimum dosage rate 18 kg/m^3 (30 lb. per cubic yard).

CC. Epoxy Joint Filler: Two component, 100 percent solids compound, with a minimum shore D hardness of 50.

DD. Bonding Admixture: Non-rewettable, polymer modified, bonding compound.

EE. Architectural Concrete: For areas designated as architectural concrete on the Contract Documents, use colored cements and specially selected aggregates as necessary to produce a concrete of a color and finish which exactly matches the designated sample panel.

2.3 CONCRETE MIXES

A. Mix Designs: Proportioned in accordance with Section 5.3, "Proportioning on the Basis of Field Experience and/or Trial Mixtures" of ACI 318.
   1. If trial mixes are used, make a set of at least 6 cylinders in accordance with ASTM C192 for test purposes from each trial mix; test three for compressive strength at 7 days and three at 28 days.
   2. Submit a report of results of each test series, include a detailed listing of the proportions of trial mix or mixes, including cement, fly ash,admixtures, weight of fine and coarse aggregate per m^3 (cubic yard) measured dry rodded and damp loose, specific gravity, fineness modulus, percentage of moisture, air content, watercement fly ash ratio, and consistency of each cylinder in terms of slump. include dry unit weight of lightweight structural concrete.
   3. Prepare a curve showing relationship between watercement fly ash ratio at 7day and 28day compressive strengths. Plot each curve using at least three specimens.
   4. If the field experience method is used, submit complete standard deviation analysis.
B. Fly Ash Testing: Submit certificate verifying conformance with ASTM 618 initially with mix design and for each truck load of fly ash delivered from source. Submit test results performed within 6 months of submittal date. Notify the COR immediately when change in source is anticipated.
   1. Testing Laboratory used for fly ash certification testing shall participate in the Cement and Concrete Reference Laboratory (CCRL) program. Submit most recent CCRL inspection report.
C. After approval of mixes no substitution in material or change in proportions of approval mixes may be made without additional tests and approval of the COR or as specified. Making and testing of preliminary test cylinders may be carried on pending approval of cement and fly ash , providing Contractor and manufacturer certify that ingredients used in making test cylinders are the same. The COR may allow Contractor to proceed with depositing concrete for certain portions of work, pending final approval of cement and fly ash and approval of design mix.
D. Cement Factor: Maintain minimum cement factors in Table I regardless of compressive strength developed above minimums. Use Fly Ash as an

admixture with maximum of 25 percent replacement by weight in all structural work. Increase this replacement to 40 percent for mass concrete, and reduce it to 10 percent for drilled piers and caissons. Fly ash shall not be used in high-early mix design.

TABLE I - CEMENT AND WATER FACTORS FOR CONCRETE

Concrete Strength		Non-Air-Entrained	Air-Entrained	
Min. 28 Day Comp. Str. MPa (psi)	Min. Cement kg/m3 (lbs/c. yd)	Max. Water Cement Ratio	Min. Cement kg/m3 (lbs/c. yd)	Max. Water Cement Ratio
35 (5000)1,3	375 (630)	0.45	385 (650)	0.40
30 (4000)1,3	325 (550)	0.55	340 (570)	0.50
25 (3000)1,3	280 (470)	0.65	290 (490)	0.55
25 (3000)1,2	300 (500)	See 4 below	310 (520)	See 4 below

1. If trial mixes are used, the proposed mix design shall achieve a compressive strength 8.3 MPa (1200 psi) in excess of f'c. For concrete strengths above 35 Mpa (5000 psi), the proposed mix design shall achieve a compressive strength 9.7 MPa (1400 psi) in excess of f’c.
2. Lightweight Structural Concrete. Pump mixes may require higher cement values.
3. For concrete exposed to high sulfate content soils maximum water cement ratio is 0.44.
4. Determined by Laboratory in accordance with ACI 211.1 for normal concrete or ACI 211.2 for lightweight structural concrete.

E. Maximum Slump: Maximum slump, as determined by ASTM C143 with tolerances as established by ASTM C94, for concrete to be vibrated shall be as shown in Table II.

TABLE II - MAXIMUM SLUMP, MM (INCHES)

Type of Construction	Normal Weight Concrete	Lightweight Structural Concrete
Reinforced Footings and Substructure Walls	75mm (3 inches)	75 mm (3 inches)
Slabs, Beams, Reinforced Walls, and Building Columns	100 mm (4 inches)	100 mm (4 inches)

F. Slump may be increased by the use of the approved high-range water-reducing admixture (superplasticizer). Tolerances as established by ASTM C94. Concrete containing the high-range-water-reducing admixture may have a maximum slump of 225 mm (9 inches). The concrete shall arrive at the job site at a slump of 50 mm to 75 mm (2 inches to 3 inches), and 75 mm to 100 mm (3 inches to 4 inches) for lightweight concrete. This should be verified, and then the high-range-water-reducing admixture added to increase the slump to the approved level.

G. Air-Entrainment: Air-entrainment of normal weight concrete shall conform with Table III. Air-entrainment of lightweight structural concrete shall conform with Table IV. Determine air content by either ASTM C173 or ASTM C231.

TABLE III - TOTAL AIR CONTENT
FOR VARIOUS SIZES OF COARSE AGGREGATES (NORMAL CONCRETE)

Nominal Maximum Size of Total Air Content	Coarse Aggregate, mm (Inches) Percentage by Volume
10 mm (3/8 in).6 to 10	13 mm (1/2 in).5 to 9
20 mm (3/4 in).4 to 8	25 mm (1 in).3-1/2 to 6-1/2
40 mm (1 1/2 in).3 to 6	

TABLE IV
AIR CONTENT OF LIGHTWEIGHT STRUCTURAL CONCRETE

Nominal Maximum size of Total Air Content	Coarse Aggregate, mm's (Inches) Percentage by Volume
Greater than 10 mm (3/8 in) 4 to 8	10 mm (3/8 in) or less 5 to 9

H. High early strength concrete, made with Type III cement or Type I cement plus non-corrosive accelerator, shall have a 7-day compressive strength equal to specified minimum 28-day compressive strength for concrete type specified made with standard Portland cement.

I. Lightweight structural concrete shall not weigh more than air-dry unit weight shown. Air-dry unit weight determined on 150 mm by 300 mm (6 inch by 12 inch) test cylinders after seven days standard moist curing followed by 21 days drying at 23 degrees C ± 1.7 degrees C (73.4 ± 3 degrees Fahrenheit), and 50 (plus or minus 7) percent relative humidity. Use wet unit weight of fresh concrete as basis of control in field.

J. Concrete slabs placed at air temperatures below 10 degrees C (50 degrees Fahrenheit) use non-corrosive, non-chloride accelerator. Concrete required to be air entrained use approved air entraining admixture. Pumped concrete, synthetic fiber concrete, architectural concrete, concrete required to be watertight, and concrete with a water/cement ratio below 0.50 use high-range water-reducing admixture (superplasticizer).

K. Durability: Use air entrainment for exterior exposed concrete subjected to freezing and thawing and other concrete shown or specified. For air content requirements see Table III or Table IV.

L. Enforcing Strength Requirements: Test as specified in Section 01 45 29, TESTING LABORATORY SERVICES, during the progress of the work. Seven-day tests may be used as indicators of 28-day strength. Average of any three 28-day consecutive strength tests of laboratory-cured specimens representing each type of concrete shall be equal to or greater than specified strength. No single test shall be more than 3.5 MPa (500 psi) below specified strength. Interpret field test results in accordance with ACI 214. Should strengths shown by test specimens fall below required values, the COR may require any one or any combination of the following corrective actions, at no additional cost to the Government:

1. Require changes in mix proportions by selecting one of the other appropriate trial mixes or changing proportions, including cement content, of approved trial mix.
2. Require additional curing and protection.
3. If five consecutive tests fall below 95 percent of minimum values given in Table I or if test results are so low as to raise a question as to the safety of the structure, the COR may direct Contractor to take cores from portions of the structure. Use results from cores tested by the Contractor retained testing agency to analyze structure.
4. If strength of core drilled specimens falls below 85 percent of minimum value given in Table I, the COR may order load tests, made by Contractor retained testing agency, on portions of building so affected. Load tests in accordance with ACI 318 and criteria of acceptability of concrete under test as given therein.

5. Concrete work, judged inadequate by structural analysis, by results of load test, or for any reason, shall be reinforced with additional construction or replaced, if directed by the COR.

2.4 BATCHING AND MIXING

A. General: Concrete shall be "Ready-Mixed" and comply with ACI 318 and ASTM C94, except as specified. Batch mixing at the site is permitted. Mixing process and equipment must be approved by the COR. With each batch of concrete, furnish certified delivery tickets listing information in Paragraph 16.1 and 16.2 of ASTM C94. Maximum delivery temperature of concrete is 38 degrees C (100 degrees Fahrenheit). Minimum delivery temperature as follows:

Atmospheric Temperature	Minimum Concrete Temperature
-1. degrees to 4.4 degrees C (30 degrees to 40 degrees F)	15.6 degrees C (60 degrees F.)
-17 degrees C to -1.1 degrees C (0 degrees to 30 degrees F.)	21 degrees C (70 degrees F.)

1. Services of aggregate manufacturer's representative shall be furnished during the design of trial mixes and as requested by the COR for consultation during batching, mixing, and placing operations of lightweight structural concrete. Services will be required until field controls indicate that concrete of required quality is being furnished. Representative shall be thoroughly familiar with the structural lightweight aggregate, adjustment and control of mixes to produce concrete of required quality. Representative shall assist and advise the COR.

PART 3 - EXECUTION

3.1 FORMWORK

A. General: Design in accordance with ACI 347 is the responsibility of the Contractor. The Contractor shall retain a registered Professional Engineer to design the formwork, shores, and reshores.

1. Form boards and plywood forms may be reused for contact surfaces of exposed concrete only if thoroughly cleaned, patched, and repaired and the COR approves their reuse.
2. Provide forms for concrete footings unless the COR determines forms are not necessary.

3. Corrugated fiberboard forms: Place forms on a smooth firm bed, set tight, with no buckled cartons to prevent horizontal displacement, and in a dry condition when concrete is placed.

B. Treating and Wetting: Treat or wet contact forms as follows:
1. Coat plywood and board forms with non-staining form sealer. In hot weather, cool forms by wetting with cool water just before concrete is placed.
2. Clean and coat removable metal forms with light form oil before reinforcement is placed. In hot weather, cool metal forms by thoroughly wetting with water just before placing concrete.
3. Use sealer on reused plywood forms as specified for new material.

C. Size and Spacing of Studs: Size and space studs, wales and other framing members for wall forms so as not to exceed safe working stress of kind of lumber used nor to develop deflection greater than 1/270 of free span of member.

D. Unlined Forms: Use plywood forms to obtain a smooth finish for concrete surfaces. Tightly butt edges of sheets to prevent leakage. Back up all vertical joints solidly and nail edges of adjacent sheets to same stud with 6d box nails spaced not over 150 mm (6 inches) apart.

E. Lined Forms: May be used in lieu of unlined plywood forms. Back up form lining solidly with square edge board lumber securely nailed to studs with all edges in close contact to prevent bulging of lining. No joints in lining and backing may coincide. Nail abutted edges of sheets to same backing board. Nail lining at not over 200 mm (8 inches) on center along edges and with at least one nail to each square foot of surface area; nails to be 3d blued shingle or similar nails with thin flatheads.

F. Architectural Liner: Attach liner as recommended by the manufacturer with tight joints to prevent leakage.

G. Wall Form Ties: Locate wall form ties in symmetrically level horizontal rows at each line of wales and in plumb vertical tiers. Space ties to maintain true, plumb surfaces. Provide one row of ties within 150 mm (6 inches) above each construction joint. Space through-ties adjacent to horizontal and vertical construction joints not over 450 mm (18 inches) on center.
1. Tighten row of ties at bottom of form just before placing concrete and, if necessary, during placing of concrete to prevent seepage of

concrete and to obtain a clean line. Ties to be entirely removed shall be loosened 24 hours after concrete is placed and shall be pulled from least important face when removed.

2. Coat surfaces of all metal that is to be removed with paraffin, cup grease or a suitable compound to facilitate removal.

H. Inserts, Sleeves, and Similar Items: Flashing reglets, steel strips, masonry ties, anchors, wood blocks, nailing strips, grounds, inserts, wire hangers, sleeves, drains, guard angles, forms for floor hinge boxes, inserts or bond blocks for elevator guide rails and supports, and other items specified as furnished under this and other sections of specifications and required to be in their final position at time concrete is placed shall be properly located, accurately positioned, and built into construction, and maintained securely in place.

1. Locate inserts or hanger wires for furred and suspended ceilings only in bottom of concrete joists, or similar concrete member of overhead concrete joist construction.
2. Install sleeves, inserts and similar items for mechanical services in accordance with drawings prepared specially for mechanical services. Contractor is responsible for accuracy and completeness of drawings and shall coordinate requirements for mechanical services and equipment.
3. Do not install sleeves in beams, joists or columns except where shown or permitted by the COR. Install sleeves in beams, joists, or columns that are not shown, but are permitted by the COR, and require no structural changes, at no additional cost to the Government.
4. Minimum clear distance of embedded items such as conduit and pipe is at least three times diameter of conduit or pipe, except at stub-ups and other similar locations.
5. Provide recesses and blockouts in floor slabs for door closers and other hardware as necessary in accordance with manufacturer's instructions.

I. Construction Tolerances:

1. Set and maintain concrete formwork to assure erection of completed work within tolerances specified and to accommodate installation of other rough and finish materials. Accomplish remedial work necessary for correcting excessive tolerances. Erected work that exceeds

specified tolerance limits shall be remedied or removed and replaced, at no additional cost to the Government.

2. Permissible surface irregularities for various classes of materials are defined as "finishes" in specification sections covering individual materials. They are to be distinguished from tolerances specified which are applicable to surface irregularities of structural elements.

3.2 PLACING REINFORCEMENT

A. General: Details of concrete reinforcement in accordance with ACI 318 unless otherwise shown.

B. Placing: Place reinforcement conforming to CRSI DA4, unless otherwise shown.

1. Place reinforcing bars accurately and tie securely at intersections and splices with 1.6 mm (16 gauge) black annealed wire. Use epoxy-coated tie wire with epoxy-coated reinforcing. Secure reinforcing bars against displacement during the placing of concrete by spacers, chairs, or other similar supports. Portions of supports, spacers, and chairs in contact with formwork shall be made of plastic in areas that will be exposed when building is occupied. Type, number, and spacing of supports conform to ACI 318. Where concrete slabs are placed on ground, use concrete blocks or other non-corrodible material of proper height, for support of reinforcement. Use of brick or stone supports will not be permitted.

2. Lap welded wire fabric at least 1 1/2 mesh panels plus end extension of wires not less than 300 mm (12 inches) in structural slabs. Lap welded wire fabric at least 1/2 mesh panels plus end extension of wires not less than 150 mm (6 inches) in slabs on grade.

3. Splice column steel at no points other than at footings and floor levels unless otherwise shown.

C. Spacing: Minimum clear distances between parallel bars, except in columns and multiple layers of bars in beams shall be equal to nominal diameter of bars. Minimum clear spacing is 25 mm (1 inch) or 1-1/3 times maximum size of coarse aggregate.

D. Splicing: Splices of reinforcement made only as required or shown or specified. Accomplish splicing as follows:

1. Lap splices: Do not use lap splices for bars larger than Number 36 (Number 11). Minimum lengths of lap as shown.

2. Welded splices: Splicing by butt-welding of reinforcement permitted providing the weld develops in tension at least 125 percent of the yield strength (fy) for the bars. Welding conform to the requirements of AWS D1.4. Welded reinforcing steel conform to the chemical analysis requirements of AWS D1.4.
   a. Submit test reports indicating the chemical analysis to establish weldability of reinforcing steel.
   b. Submit a field quality control procedure to insure proper inspection, materials and welding procedure for welded splices.
   c. Contractor retained testing agency shall test a minimum of three splices, for compliance, locations selected by the COR.
3. Mechanical Splices: Develop in tension and compression at least 125 percent of the yield strength (fy) of the bars. Stresses of transition splices between two reinforcing bar sizes based on area of smaller bar. Provide mechanical splices at locations indicated. Use approved exothermic, tapered threaded coupling, or swaged and threaded sleeve. Exposed threads and swaging in the field not permitted.
   a. Initial qualification: In the presence of the COR, make three test mechanical splices of each bar size proposed to be spliced. Contractor retained testing laboratory will perform load test.
   b. During installation: Furnish, at no additional cost to the Government, one companion (sister) splice for every 50 splices for load testing. Contractor retained testing laboratory will perform the load test.

E. Bending: Bend bars cold, unless otherwise approved. Do not field bend bars partially embedded in concrete, except when approved by the COR.

F. Cleaning: Metal reinforcement, at time concrete is placed, shall be free from loose flaky rust, mud, oil, or similar coatings that will reduce bond.

G. Future Bonding: Protect exposed reinforcement bars intended for bonding with future work by wrapping with felt and coating felt with a bituminous compound unless otherwise shown.

3.3 VAPOR BARRIER

A. Except where membrane waterproofing is required, interior concrete slab on grade shall be placed on a continuous vapor barrier.

1. Place 100 mm (4 inches) of fine granular fill over the vapor barrier to act as a blotter for concrete slab.
2. Vapor barrier joints lapped 150 mm (6 inches) and sealed with compatible waterproof pressure-sensitive tape.
3. Patch punctures and tears.

3.4 SLABS RECEIVING RESILIENT COVERING

A. Slab shall be allowed to cure for 6 weeks minimum prior to placing resilient covering. After curing, slab shall be tested by the Contractor for moisture in accordance with ASTM D4263 or ASTM F1869. Moisture content shall be less than 3 pounds per 1000 sf prior to placing covering.

B. In lieu of curing for 6 weeks, Contractor has the option, at his own cost, to utilize the Moisture Vapor Emissions & Alkalinity Control Sealer as follows:

1. Sealer is applied on the day of the concrete pour or as soon as harsh weather permits, prior to any other chemical treatments for concrete slabs either on grade, below grade or above grade receiving resilient flooring, such as, sheet vinyl, vinyl composition tile, rubber, wood flooring, epoxy coatings and overlays.
2. Manufacturer’s representative will be on the site the day of concrete pour to install or train its application and document. He shall return on every application thereafter to verify that proper procedures are followed.
   a. Apply Sealer to concrete slabs as soon as final finishing operations are complete and the concrete has hardened sufficiently to sustain floor traffic without damage.
   b. Spray apply Sealer at the rate of 20 m^2 (200 square feet) per gallon. Lightly broom product evenly over the substrate and product has completely penetrated the surface.
   c. If within two (2) hours after initial application areas are subjected to heavy rainfall and puddling occurs, reapply Sealer product to these areas as soon as weather condition permits.

3.5 CONSTRUCTION JOINTS

A. Unless otherwise shown, location of construction joints to limit individual placement shall not exceed 24,000 mm (80 feet) in any horizontal direction, except slabs on grade which shall have

construction joints shown. Allow 48 hours to elapse between pouring adjacent sections unless this requirement is waived by the COR.

B. Locate construction joints in suspended floors near the quarter-point of spans for slabs, beams or girders, unless a beam intersects a girder at center, in which case joint in girder shall be offset a distance equal to twice width of beam. Provide keys and inclined dowels as shown. Provide longitudinal keys as shown.

C. Place concrete for columns slowly and in one operation between joints. Install joints in concrete columns at underside of deepest beam or girder framing into column.

D. Allow 2 hours to elapse after column is cast before concrete of supported beam, girder or slab is placed. Place girders, beams, grade beams, column capitals, brackets, and haunches at the same time as slab unless otherwise shown.

E. Install polyvinyl chloride or rubber water seals, as shown in accordance with manufacturer's instructions, to form continuous watertight seal.

3.6 EXPANSION JOINTS AND CONTRACTION JOINTS

A. Clean expansion joint surfaces before installing premolded filler and placing adjacent concrete.

B. Install polyvinyl chloride or rubber water seals, as shown in accordance with manufacturer's instructions, to form continuous watertight seal.

C. Provide contraction (control) joints in floor slabs as indicated on the contract drawings. Joints shall be either formed or saw cut, to the indicated depth after the surface has been finished. Complete saw joints within 4 to 12 hours after concrete placement. Protect joints from intrusion of foreign matter.

1.11 3.7 PLACING CONCRETE

A. Preparation:

1. Remove hardened concrete, wood chips, shavings and other debris from forms.
2. Remove hardened concrete and foreign materials from interior surfaces of mixing and conveying equipment.
3. Have forms and reinforcement inspected and approved by the COR before depositing concrete.

4. Provide runways for wheeling equipment to convey concrete to point of deposit. Keep equipment on runways which are not supported by or bear on reinforcement. Provide similar runways for protection of vapor barrier on coarse fill.

B. Bonding: Before depositing new concrete on or against concrete which has been set, thoroughly roughen and clean existing surfaces of laitance, foreign matter, and loose particles.

1. Preparing surface for applied topping:
   a. Remove laitance, mortar, oil, grease, paint, or other foreign material by sand blasting. Clean with vacuum type equipment to remove sand and other loose material.
   b. Broom clean and keep base slab wet for at least four hours before topping is applied.
   c. Use a thin coat of one part Portland cement, 1.5 parts fine sand, bonding admixture; and water at a 50: 50 ratio and mix to achieve the consistency of thick paint. Apply to a damp base slab by scrubbing with a stiff fiber brush. New concrete shall be placed while the bonding grout is still tacky.

C. Conveying Concrete: Convey concrete from mixer to final place of deposit by a method which will prevent segregation. Method of conveying concrete is subject to approval of the COR.

D. Placing: For special requirements see Paragraphs, HOT WEATHER and COLD WEATHER.

1. Do not place concrete when weather conditions prevent proper placement and consolidation, or when concrete has attained its initial set, or has contained its water or cement content more than 1 1/2 hours.
2. Deposit concrete in forms as near as practicable in its final position. Prevent splashing of forms or reinforcement with concrete in advance of placing concrete.
3. Do not drop concrete freely more than 3000 mm (10 feet) for concrete containing the high-range water-reducing admixture (superplasticizer) or 1500 mm (5 feet) for conventional concrete. Where greater drops are required, use a tremie or flexible spout (canvas elephant trunk), attached to a suitable hopper.
4. Discharge contents of tremies or flexible spouts in horizontal layers not exceeding 500 mm (20 inches) in thickness, and space

tremies such as to provide a minimum of lateral movement of concrete.

5. Continuously place concrete until an entire unit between construction joints is placed. Rate and method of placing concrete shall be such that no concrete between construction joints will be deposited upon or against partly set concrete, after its initial set has taken place, or after 45 minutes of elapsed time during concrete placement.
6. On bottom of members with severe congestion of reinforcement, deposit 25 mm (1 inch) layer of flowing concrete containing the specified high-range water-reducing admixture (superplasticizer). Successive concrete lifts may be a continuation of this concrete or concrete with a conventional slump.
7. Concrete on metal deck:
   a. Concrete on metal deck shall be minimum thickness shown. Allow for deflection of steel beams and metal deck under the weight of wet concrete in calculating concrete quantities for slab.
      1) The Contractor shall become familiar with deflection characteristics of structural frame to include proper amount of additional concrete due to beam/deck deflection.

E. Consolidation: Conform to ACI 309. Immediately after depositing, spade concrete next to forms, work around reinforcement and into angles of forms, tamp lightly by hand, and compact with mechanical vibrator applied directly into concrete at approximately 450 mm (18 inch) intervals. Mechanical vibrator shall be power driven, hand operated type with minimum frequency of 5000 cycles per minute having an intensity sufficient to cause flow or settlement of concrete into place. Vibrate concrete to produce thorough compaction, complete embedment of reinforcement and concrete of uniform and maximum density without segregation of mix. Do not transport concrete in forms by vibration.

1. Use of form vibration shall be approved only when concrete sections are too thin or too inaccessible for use of internal vibration.
2. Carry on vibration continuously with placing of concrete. Do not insert vibrator into concrete that has begun to set.

3.8 HOT WEATHER

A. Follow the recommendations of ACI 305 or as specified to prevent problems in the manufacturing, placing, and curing of concrete that can adversely affect the properties and serviceability of the hardened concrete. Methods proposed for cooling materials and arrangements for protecting concrete shall be made in advance of concrete placement and approved by the COR.

3.9 COLD WEATHER

A. Follow the recommendations of ACI 306 or as specified to prevent freezing of concrete and to permit concrete to gain strength properly. Use only the specified non-corrosive, non-chloride accelerator. Do not use calcium chloride, thiocyantes or admixtures containing more than 0.05 percent chloride ions. Methods proposed for heating materials and arrangements for protecting concrete shall be made in advance of concrete placement and approved by the COR.

3.10 PROTECTION AND CURING

A. Conform to ACI 308: Initial curing shall immediately follow the finishing operation. Protect exposed surfaces of concrete from premature drying, wash by rain and running water, wind, mechanical injury, and excessively hot or cold temperatures. Keep concrete not covered with membrane or other curing material continuously wet for at least 7 days after placing, except wet curing period for high-early-strength concrete shall be not less than 3 days. Keep wood forms continuously wet to prevent moisture loss until forms are removed. Cure exposed concrete surfaces as described below. Other curing methods may be used if approved by the COR.

1. Liquid curing and sealing compounds: Apply by power-driven spray or roller in accordance with the manufacturer’s instructions. Apply immediately after finishing. Maximum coverage $10m^2/L$ (400 square feet per gallon) on steel troweled surfaces and $7.5m^2/L$ (300 square feet per gallon) on floated or broomed surfaces for the curing/sealing compound.
2. Plastic sheets: Apply as soon as concrete has hardened sufficiently to prevent surface damage. Utilize widest practical width sheet and overlap adjacent sheets 50 mm (2 inches). Tightly seal joints with tape.

3. Paper: Utilize widest practical width paper and overlap adjacent sheets 50 mm (2 inches). Tightly seal joints with sand, wood planks, pressure-sensitive tape, mastic or glue.

3.11 REMOVAL OF FORMS

A. Remove in a manner to assure complete safety of structure after the following conditions have been met.
   1. Where structure as a whole is supported on shores, forms for beams and girder sides, columns, and similar vertical structural members may be removed after 24 hours, provided concrete has hardened sufficiently to prevent surface damage and curing is continued without any lapse in time as specified for exposed surfaces.
   2. Take particular care in removing forms of architectural exposed concrete to insure surfaces are not marred or gouged, and that corners and arises are true, sharp and unbroken.

B. Control Test: Use to determine if the concrete has attained sufficient strength and curing to permit removal of supporting forms. Cylinders required for control tests taken in accordance with ASTM C172, molded in accordance with ASTM C31, and tested in accordance with ASTM C39. Control cylinders cured and protected in the same manner as the structure they represent. Supporting forms or shoring not removed until strength of control test cylinders have attained at least 70 percent of minimum 28-day compressive strength specified. For post-tensioned systems supporting forms and shoring not removed until stressing is completed. Exercise care to assure that newly unsupported portions of structure are not subjected to heavy construction or material loading.

C. Reshoring: Reshoring is required if superimposed load plus dead load of the floor exceeds the capacity of the floor at the time of loading. In addition, for flat slab/plate, reshoring is required immediately after stripping operations are complete and not later than the end of the same day. Reshoring accomplished in accordance with ACI 347 at no additional cost to the Government.

3.12 CONCRETE SURFACE PREPARATION

A. Metal Removal: Unnecessary metal items cut back flush with face of concrete members.

B. Patching: Maintain curing and start patching as soon as forms are removed. Do not apply curing compounds to concrete surfaces requiring patching until patching is completed. Use cement mortar for patching of

same composition as that used in concrete. Use white or gray Portland cement as necessary to obtain finish color matching surrounding concrete. Thoroughly clean areas to be patched. Cut out honeycombed or otherwise defective areas to solid concrete to a depth of not less than 25 mm (1 inch). Cut edge perpendicular to surface of concrete. Saturate with water area to be patched, and at least 150 mm (6 inches) surrounding before placing patching mortar. Give area to be patched a brush coat of cement grout followed immediately by patching mortar. Cement grout composed of one part Portland cement, 1.5 parts fine sand, bonding admixture, and water at a 50:50 ratio, mix to achieve consistency of thick paint. Mix patching mortar approximately 1 hour before placing and remix occasionally during this period without addition of water. Compact mortar into place and screed slightly higher than surrounding surface. After initial shrinkage has occurred, finish to match color and texture of adjoining surfaces. Cure patches as specified for other concrete. Fill form tie holes which extend entirely through walls from unexposed face by means of a pressure gun or other suitable device to force mortar through wall. Wipe excess mortar off exposed face with a cloth.

C. Upon removal of forms, clean vertical concrete surface that is to receive bonded applied cementitious application with wire brushes or by sand blasting to remove unset material, laitance, and loose particles to expose aggregates to provide a clean, firm, granular surface for bond of applied finish.

3.13 CONCRETE FINISHES

A. Vertical and Overhead Surface Finishes:

1. Unfinished areas: Vertical and overhead concrete surfaces exposed in pipe basements, elevator and dumbwaiter shafts, pipe spaces, pipe trenches, above suspended ceilings, manholes, and other unfinished areas will not require additional finishing.
2. Interior and exterior exposed areas to be painted: Remove fins, burrs and similar projections on surfaces flush, and smooth by mechanical means approved by the COR, and by rubbing lightly with a fine abrasive stone or hone. Use ample water during rubbing without working up a lather of mortar or changing texture of concrete.

3. Interior and exterior exposed areas finished: Give a grout finish of uniform color and smooth finish treated as follows:
   a. After concrete has hardened and laitance, fins and burrs removed, scrub concrete with wire brushes. Clean stained concrete surfaces by use of a hone stone.
   b. Apply grout composed of one part of Portland cement, one part fine sand, smaller than a 600 µm (No. 30) sieve. Work grout into surface of concrete with cork floats or fiber brushes until all pits, and honeycombs are filled.
   c. After grout has hardened slightly, but while still plastic, scrape grout off with a sponge rubber float and, about 1 hour later, rub concrete vigorously with burlap to remove any excess grout remaining on surfaces.
   d. In hot, dry weather use a fog spray to keep grout wet during setting period. Complete finish of area in same day. Make limits of finished areas at natural breaks in wall surface. Leave no grout on concrete surface overnight.
4. Textured: Finish as specified. Maximum quantity of patched area 0.2 m^2 (2 square feet) in each 93 m^2 (1000 square feet) of textured surface.

B. Slab Finishes:
1. Monitoring and Adjustment: Provide continuous cycle of placement, measurement, evaluation and adjustment of procedures to produce slabs within specified tolerances. Monitor elevations of structural steel in key locations before and after concrete placement to establish typical deflection patterns for the structural steel. Determine elevations of cast-in-place slab soffits prior to removal of shores. Provide information to the COR and floor consultant for evaluation and recommendations for subsequent placements.
2. Set perimeter forms to serve as screed using either optical or laser instruments. For slabs on grade, wet screeds may be used to establish initial grade during strike-off, unless the COR determines that the method is proving insufficient to meet required finish tolerances and directs use of rigid screed guides. Where wet screeds are allowed, they shall be placed using grade stakes set by optical or laser instruments. Use rigid screed guides, as opposed to wet screeds, to control strike-off elevation for all types of elevated

(non slab-on-grade) slabs. Divide bays into halves or thirds by hard screeds. Adjust as necessary where monitoring of previous placements indicates unshored structural steel deflections to other than a level profile.

3. Place slabs monolithically. Once slab placement commences, complete finishing operations within same day. Slope finished slab to floor drains where they occur, whether shown or not.
4. Use straightedges specifically made for screeding, such as hollow magnesium straightedges or power strike-offs. Do not use pieces of dimensioned lumber. Strike off and screed slab to a true surface at required elevations. Use optical or laser instruments to check concrete finished surface grade after strike-off. Repeat strike-off as necessary. Complete screeding before any excess moisture or bleeding water is present on surface. Do not sprinkle dry cement on the surface.
5. Immediately following screeding, and before any bleed water appears, use a 3000 mm (10 foot) wide highway straightedge in a cutting and filling operation to achieve surface flatness. Do not use bull floats or darbys, except that darbying may be allowed for narrow slabs and restricted spaces.
6. Wait until water sheen disappears and surface stiffens before proceeding further. Do not perform subsequent operations until concrete will sustain foot pressure with maximum of 6 mm (1/4 inch) indentation.
7. Scratch Finish: Finish base slab to receive a bonded applied cementitious application as indicated above, except that bull floats and darbys may be used. Thoroughly coarse wire broom within two hours after placing to roughen slab surface to insure a permanent bond between base slab and applied materials.
8. Float Finish: Slabs to receive unbonded toppings, steel trowel finish, fill, mortar setting beds, or a built-up roof, and ramps, stair treads, platforms (interior and exterior), and equipment pads shall be floated to a smooth, dense uniform, sandy textured finish. During floating, while surface is still soft, check surface for flatness using a 3000 mm (10 foot) highway straightedge. Correct high spots by cutting down and correct low spots by filling in with

material of same composition as floor finish. Remove any surface projections and re-float to a uniform texture.

9. Steel Trowel Finish: Concrete surfaces to receive resilient floor covering or carpet, monolithic floor slabs to be exposed to view in finished work, future floor roof slabs, applied toppings, and other interior surfaces for which no other finish is indicated. Steel trowel immediately following floating. During final troweling, tilt steel trowel at a slight angle and exert heavy pressure to compact cement paste and form a dense, smooth surface. Finished surface shall be smooth, free of trowel marks, and uniform in texture and appearance.
10. Broom Finish: Finish exterior slabs, ramps, and stair treads with a bristle brush moistened with clear water after surfaces have been floated. Brush in a direction transverse to main traffic. Match texture approved by the COR from sample panel.
11. Finished slab flatness (FF) and levelness (FL) values comply with the following minimum requirements:
    a. Areas covered with carpeting, or not specified otherwise in b. below:
        1) Slab on Grade:
            a) Specified overall value F_F 25/F_L 20
            b) Minimum local value F_F 17/F_L 15
        2) Level suspended slabs (shored until after testing) and topping slabs:
            a) Specified overall value FF 25/FL 20
            b) Minimum local value FF 17/FL 15
        3) Unshored suspended slabs:
            a) Specified overall value FF 25
            b) Minimum local value FF 17
        4) Level tolerance such that 80 percent of all points fall within a 20 mm (3/4 inch) envelope +10 mm, -10 mm (+3/8 inch, -3/8 inch) from the design elevation.
    b. Areas that will be exposed, receive thin-set tile or resilient flooring, or roof areas designed as future floors:
        1) Slab on grade:
            a) Specified overall value FF 36/FL 20
            b) Minimum local value FF 24/FL 15

2) Level suspended slabs (shored until after testing) and topping slabs
   a) Specified overall value FF 30/FL 20
   b) Minimum local value FF 24/FL 15
3) Unshored suspended slabs:
   a) Specified overall value FF 30
   b) Minimum local value FF 24
4) Level tolerance such that 80 percent of all points fall within a 20 mm (3/4 inch) envelope +10 mm, -10 mm (+3/8 inch, -3/8 inch) from the design elevation.

c. "Specified overall value" is based on the composite of all measured values in a placement derived in accordance with ASTM E1155.

d. "Minimum local value" (MLV) describes the flatness or levelness below which repair or replacement is required. MLV is based on the results of an individual placement and applies to a minimum local area. Minimum local area boundaries may not cross a construction joint or expansion joint. A minimum local area will be bounded by construction and/or control joints, or by column lines and/or half-column lines, whichever is smaller.

12. Measurements

a. Contractor retained testing laboratory will take measurements as directed by the COR, to verify compliance with FF, FL, and other finish requirements. Measurements will occur within 72 hours after completion of concrete placement (weekends and holidays excluded). Make measurements before shores or forms are removed to insure the "as-built" levelness is accurately assessed. Profile data for above characteristics may be collected using a laser level or any Type II apparatus (ASTM E1155, "profileograph" or "dipstick"). Contractor's surveyor shall establish reference elevations to be used by Contractor retained testing laboratory.

b. Contractor not experienced in using FF and FL criteria is encouraged to retain the services of a floor consultant to assist with recommendations concerning adjustments to slab thicknesses, finishing techniques, and procedures on measurements of the finish as it progresses in order to achieve the specific flatness and levelness numbers.

13. Acceptance/ Rejection:
    a. If individual slab section measures less than either of specified minimum local F_F/F_L numbers, that section shall be rejected and remedial measures shall be required. Sectional boundaries may be set at construction and contraction (control) joints, and not smaller than one-half bay.
    b. If composite value of entire slab installation, combination of all local results, measures less than either of specified overall F_F/F_L numbers, then whole slab shall be rejected and remedial measures shall be required.
14. Remedial Measures for Rejected Slabs: Correct rejected slab areas by grinding, planing, surface repair with underlayment compound or repair topping, retopping, or removal and replacement of entire rejected slab areas, as directed by the COR, until a slab finish constructed within specified tolerances is accepted.

3.14 SURFACE TREATMENTS:

A. Use on exposed concrete floors and concrete floors to receive carpeting except those specified to receive non-slip finish.

B. Liquid Densifier/Sealer: Apply in accordance with manufacturer's directions just prior to completion of construction.

C. Non-Slip Finish: Except where safety nosing and tread coverings are shown, apply non-slip abrasive aggregate to treads and platforms of concrete steps and stairs, and to surfaces of exterior concrete ramps and platforms. Broadcast aggregate uniformly over concrete surface at rate of application of 8 percent per 1/10th m^2 (7.5 percent per square foot) of area. Trowel concrete surface to smooth dense finish. After curing, rub treated surface with abrasive brick and water to slightly expose abrasive aggregate.

3.15 APPLIED TOPPING

A. Separate concrete topping on floor base slab of thickness and strength shown. Topping mix shall have a maximum slump of 200 mm (8 inches) for concrete containing a high-range water-reducing admixture (superplasticizer) and 100 mm (4 inches) for conventional mix. Neatly bevel or slope at door openings and at slabs adjoining spaces not receiving an applied finish.

B. Placing: Place continuously until entire section is complete, struck off with straightedge, leveled with a highway straightedge or highway

bull float, floated and troweled by machine to a hard dense finish. Slope to floor drains as required. Do not start floating until free water has disappeared and no water sheen is visible. Allow drying of surface moisture naturally. Do not hasten by "dusting" with cement or sand.

3.16 RESURFACING FLOORS

A. Remove existing flooring areas to receive resurfacing to expose existing structural slab and extend not less than 25 mm (1 inch) below new finished floor level. Prepare exposed structural slab surface by roughening, broom cleaning, and dampening. Apply specified bonding grout. Place topping while the bonding grout is still tacky.

3.17 RETAINING WALLS

A. Use air-entrained concrete.

B. Expansion and contraction joints, waterstops, weep holes, reinforcement and railing sleeves installed and constructed as shown.

C. Exposed surfaces finished to match adjacent concrete surfaces, new or existing.

D. Place porous backfill as shown.

3.18 PRECAST CONCRETE ITEMS

A. Precast concrete items, not specified elsewhere. Cast using 25 MPa (3000 psi) air-entrained concrete to shapes and dimensions shown. Finish to match corresponding adjacent concrete surfaces. Reinforce with steel for safe handling and erection.

SECTION 06 10 00
ROUGH CARPENTRY

PART 1 - GENERAL

1.1 DESCRIPTION:

A. This section specifies wood blocking, framing, sheathing, furring, nailers, sub-flooring, rough hardware, and light wood construction.

1.2 RELATED WORK:

A. Sustainable design requirements: Section 01 81 13, SUSTAINABLE CONSTRUCTION REQUIREMENTS.

B. Manufactured Wood Casework: Section 12 32 00, FINISH CARPENTRY.

C. Gypsum sheathing: Section 09 29 00, GYPSUM BOARD.

1.3 SUBMITTALS:

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Sustainable Design Submittals, as described below:

1. Postconsumer and preconsumer recycled content as specified in PART 2 - PRODUCTS.
2. Volatile organic compounds per volume as specified PART 2 - PRODUCTS.
3. For composite wood products, submit documentation indicating that product contains no added urea formaldehyde.

C. Shop Drawings showing framing connection details, fasteners, connections and dimensions.

D. Manufacturer’s Literature and Data:

1. Submit data for lumber, panels, hardware and adhesives.
2. Submit data for wood-preservative treatment from chemical treatment manufacturer and certification from treating plants that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
3. Submit data for fire retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.

4. For products receiving a waterborne treatment, submit statement that moisture content of treated materials was reduced to levels specified before shipment to project site.

E. Manufacturer's certificate for unmarked lumber.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING:

A. Protect lumber and other products from dampness both during and after delivery at site.

B. Pile lumber in stacks in such manner as to provide air circulation around surfaces of each piece.

C. Stack plywood and other board products so as to prevent warping.

D. Locate stacks on well drained areas, supported at least 152 mm (6 inches) above grade and cover with well-ventilated sheds having firmly constructed over hanging roof with sufficient end wall to protect lumber from driving rain.

1.5 QUALITY ASSURANCE:

A. Installer: A firm with a minimum of three (3) years' experience in the type of work required by this section.

1.6 GRADING AND MARKINGS:

A. Any unmarked lumber or plywood panel for its grade and species will not be allowed on VA Construction sites for lumber and material not normally grade marked, provide manufacturer's certificates (approved by an American Lumber Standards approved agency) attesting that lumber and material meet the specified the specified requirements.

1.7 APPLICABLE PUBLICATIONS:

A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in the text by basic designation only.

B. American Forest and Paper Association (AFPA):

NDS-15.....National Design Specification for Wood Construction

WCD1-01.....Details for Conventional Wood Frame Construction

C. American Institute of Timber Construction (AITC):

A190.1-07.....Structural Glued Laminated Timber

D. American Society of Mechanical Engineers (ASME):

B18.2.1-12(R2013).....Square and Hex Bolts and Screws

B18.2.2-10.....Square and Hex Nuts

B18.6.1-81(R2008).....Wood Screws

E. American Plywood Association (APA):

E30-11.....Engineered Wood Construction Guide

F. ASTM International (ASTM):

A653/A653M-13.....Steel Sheet Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot Dip Process

C954-11.....Steel Drill Screws for the Application of Gypsum Board or Metal Plaster Bases to Steel Studs from 0.033 inch (2.24 mm) to 0.112-inch (2.84 mm) in thickness

C1002-14.....Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Metal Studs

D198-14.....Test Methods of Static Tests of Lumber in Structural Sizes

D2344/D2344M-13.....Test Method for Short-Beam Strength of Polymer Matrix Composite Materials and Their Laminates

D2559-12a.....Adhesives for Structural Laminated Wood Products for Use Under Exterior (Wet Use) Exposure Conditions

D3498-03(R2011).....Adhesives for Field-Gluing Plywood to Lumber Framing for Floor Systems

D6108-13.....Test Method for Compressive Properties of Plastic Lumber and Shapes

D6109-13.....Test Methods for Flexural Properties of Unreinforced and Reinforced Plastic Lumber and Related Products

D6111-13a.....Test Method for Bulk Density and Specific Gravity of Plastic Lumber and Shapes by Displacement

D6112-13.....Test Methods for Compressive and Flexural Creep and Creep-Rupture of Plastic Lumber and Shapes

F844-07a(R2013).....Washers, Steel, Plan (Flat) Unhardened for General Use

F1667-13.....Nails, Spikes, and Staples

G. American Wood Protection Association (AWPA):

AWPA Book of Standards

H. Commercial Item Description (CID):

A-A-55615.....Shield, Expansion (Wood Screw and Lag Bolt Self Threading Anchors)

I. Forest Stewardship Council (FSC):

FSC-STD-01-001(Ver. 4-0)FSC Principles and Criteria for Forest Stewardship

J. Military Specification (Mil. Spec.):

MIL-L-19140E.....Lumber and Plywood, Fire-Retardant Treated

K. Environmental Protection Agency (EPA):

40 CFR 59(2014).....National Volatile Organic Compound Emission Standards for Consumer and Commercial Products

L. Truss Plate Institute (TPI):

TPI-85.....Metal Plate Connected Wood Trusses

M. U.S. Department of Commerce Product Standard (PS)

PS 1-95.....Construction and Industrial Plywood

PS 20-10.....American Softwood Lumber Standard

N. ICC Evaluation Service (ICC ES):

AC09.....Quality Control of Wood Shakes and Shingles

AC174.....Deck Board Span Ratings and Guardrail Systems (Guards and Handrails)

PART 2 - PRODUCTS

2.1 LUMBER:

A. Lumber Other Than Structural:

1. Unless otherwise specified, species graded under the grading rules of an inspection agency approved by Board of Review, American Lumber Standards Committee.
2. Framing lumber: Minimum extreme fiber stress in bending of 7584 kPa (1100 PSI).
3. Furring, blocking, nailers and similar items 101 mm (4 inches) and narrower Standard Grade; and, members 152 mm (6 inches) and wider, Number 2 Grade.
4. Board Sub-flooring: Shiplap edge, 25 mm (1 inch) thick, not less than 203 mm (8 inches) wide.

D. Sizes:

1. Conforming to PS 20.

2. Size references are nominal sizes, unless otherwise specified, actual sizes within manufacturing tolerances allowed by standard under which produced.

E. Moisture Content:

1. Maximum moisture content of wood products is to be as follows at the time of delivery to site.
   a. Boards and lumber 50 mm (2 inches) and less in thickness: 19 percent or less.
   b. Lumber over 50 mm (2 inches) thick: 25 percent or less.

F. Fire Retardant Treatment:

1. Comply with Mil Spec. MIL-L-19140.
2. Treatment and performance inspection, by an independent and qualified testing agency that establishes performance ratings.

G. Preservative Treatment:

1. Do not treat Heart Redwood and Western Red Cedar.
2. Treat wood members and plywood exposed to weather or in contact with plaster, masonry or concrete, including framing of open roofed structures; sills, sole plates, furring, and sleepers that are less than 610 mm (24 inches) from ground; nailers, edge strips, blocking, crickets, curbs, cant, vent strips and other members provided in connection with roofing and flashing materials.
3. Treat other members specified as preservative treated (PT).
4. Preservative treat by the pressure method complying with AWPA Book use category system standards U1 and T1, except any process involving the use of Chromated Copper Arsenate (CCA) or other agents classified as carcinogenic for pressure treating wood is not permitted.

2.3 PLYWOOD:

A. Comply with PS 1.

B. Bear the mark of a recognized association or independent inspection agency that maintains continuing control over quality of plywood which identifies compliance by veneer grade, group number, span rating where applicable, and glue type.

C. Sheathing:

1. APA rated Exposure 1 or Exterior; panel grade CD or better.
2. Wall sheathing:
   a. Minimum 9 mm (11/32 inch) thick with supports 406 mm (16 inches) on center and 12 mm (15/32 inch) thick with supports 610 mm (24 inches) on center unless specified otherwise.
   b. Minimum 1200 mm (48 inches) wide at corners without corner bracing of framing.

2.5 ROUGH HARDWARE AND ADHESIVES:

A. Anchor Bolts:
   1. ASME B18.2.1 and ASME B18.2.2 galvanized, 13 mm (1/2 inch) unless shown otherwise.
   2. Extend at least 203 mm (8 inches) into masonry or concrete with ends bent 50 mm (2 inches).

B. Miscellaneous Bolts: Expansion Bolts: C1D A-A-55615; lag bolt, long enough to extend at least 65 mm (2-1/2 inches) into masonry or concrete. Provide 13 mm (1/2 inch) bolt unless shown otherwise.

C. Washers
   1. ASTM F844.
   2. Provide zinc or cadmium coated steel or cast iron for washers exposed to weather.

D. Screws:
   1. Wood to Wood: ASME B18.6.1 or ASTM C1002.
   2. Wood to Steel: ASTM C954, or ASTM C1002.

E. Nails:
   1. Size and type best suited for purpose unless noted otherwise. Provide aluminum-alloy nails, plated nails, or zinc-coated nails, for nailing wood work exposed to weather and on roof blocking.
   2. ASTM F1667:
      a. Common: Type I, Style 10.
      b. Concrete: Type I, Style 11.
      c. Barbed: Type I, Style 26.
      d. Underlayment: Type I, Style 25.
      e. Masonry: Type I, Style 27.
      f. Provide special nails designed for use with ties, strap anchors, framing connectors, joists hangers, and similar items. Nails not

less than 32 mm (1-1/4 inches) long, 8d and deformed or annular ring shank.

3. Adhesives to have a VOC content of 70 g/L or less when calculated according to 40 CFR 59, (EPA Method 24).

PART 3 - EXECUTION

3.1 INSTALLATION OF FRAMING AND MISCELLANEOUS WOOD MEMBERS:

A. Conform to applicable requirements of the following:

B. Fasteners:

1. Nails.
   a. Nail in accordance with the Recommended Nailing Schedule as specified in AFPA WCD1 where detailed nailing requirements are not specified in nailing schedule. Select nail size and nail spacing sufficient to develop adequate strength for the connection without splitting the members.
   b. Use special nails with framing connectors.

2. Bolts:
   a. Fit bolt heads and nuts bearing on wood with washers.
   b. Countersink bolt heads flush with the surface of nailers.
   c. Embed in concrete and solid masonry or provide expansion bolts.
3. Drill Screws to steel less than 2.84 mm (0.112 inch) thick.
   a. ASTM C1002 for steel less than 0.84 mm (0.033 inch) thick.
   b. ASTM C954 for steel over 0.84 mm (0.033 inch) thick.

C. Blocking Nailers, and Furring:

1. Install furring, blocking, nailers, and grounds where shown.
2. Provide longest lengths practicable.
3. Provide fire retardant treated wood blocking where shown at openings and where shown or specified.
4. Layers of Blocking or Plates:
   a. Stagger end joints between upper and lower pieces.
   b. Nail at ends and not over 610 mm (24 inches) between ends.
   c. Stagger nails from side to side of wood member over 127 mm (5 inches) in width.

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relative levels on joist hangers unless

and to ceiling joists except when secured with and triple studs at corners.

, with members lapped at least 610 mm (2-

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SECTION 07 84 00
FIRESTOPPING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Provide UL or equivalent approved firestopping system for the closures of openings in walls, floors, and roof decks against penetration of flame, heat, and smoke or gases in fire resistant rated construction.

B. Provide UL or equivalent approved firestopping system for the closure of openings in walls against penetration of gases or smoke in smoke partitions.

1.2 RELATED WORK

A. Section 01 81 13, SUSTAINABLE CONSTRUCTION REQUIREMENTS: Sustainable Design Requirements.

B. Section 07 95 13, EXPANSION JOINT COVER ASSEMBLIES: Expansion and seismic joint firestopping.

C. Section 07 92 00, JOINT SEALANTS: Sealants and application.

D. Section 23 31 00, HVAC DUCTS AND CASINGS: Fire and smoke damper assemblies in ductwork.

E. Section 23 37 00, AIR OUTLETS AND INLETS: Fire and smoke damper assemblies in ductwork.

1.3 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Sustainable Design Submittals, as described below:

1. Volatile organic compounds per volume as specified in PART 2 - PRODUCTS.

C. Installer qualifications.

D. Inspector qualifications.

E. Manufacturers literature, data, and installation instructions for types of firestopping and smoke stopping used.

F. List of FM, UL, or WH classification number of systems installed.

G. Certified laboratory test reports for ASTM E814 tests for systems not listed by FM, UL, or WH proposed for use.

H. Submit certificates from manufacturer attesting that firestopping materials comply with the specified requirements.

I. Provide current versions of Firestop Selection Chart/Table and Firestop Systems Installers Guide.

1.4 DELIVERY AND STORAGE

A. Deliver materials in their original unopened containers with manufacturer's name and product identification.

B. Store in a location providing protection from damage and exposure to the elements.

1.5 QUALITY ASSURANCE

A. FM, UL, or WH or other approved laboratory tested products will be acceptable.

B. Installer Qualifications: A firm that has been approved by FM Global according to FM Global 4991 or been evaluated by UL and found to comply with UL's "Qualified Firestop Contractor Program Requirements." Submit qualification data.

C. Inspector Qualifications: Contractor to engage a qualified inspector to perform inspections and final reports. The inspector to meet the criteria contained in ASTM E699 for agencies involved in quality assurance and to have a minimum of two years' experience in construction field inspections of firestopping systems, products, and assemblies. The inspector to be completely independent of, and divested from, the Contractor, the installer, the manufacturer, and the supplier of material or item being inspected. Submit inspector qualifications.

1.6 APPLICABLE PUBLICATIONS

A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only.

B. ASTM International (ASTM):

E84-20.....Surface Burning Characteristics of Building Materials

E699-16.....Standard Specification for Agencies Involved in Testing, Quality Assurance, and Evaluating of Manufactured Building Components

E814-13a(2017).....Fire Tests of Penetration Firestop Systems

E2174-20a.....Standard Practice for On-Site Inspection of Installed Firestop Systems

E2393-20.....Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers

C. FM Global (FM):

Annual Issue Approval Guide Building Materials
4991-13.....Approval of Firestop Contractors

D. Underwriters Laboratories, Inc. (UL):
Annual Issue Building Materials Directory

E. Annual Issue Fire Resistance Directory
723-Edition 11(2018)....Standard for Test for Surface Burning Characteristics of Building Materials
1479-04(2015).....Fire Tests of Penetration Firestops

F. Intertek Testing Services - Warnock Hersey (ITS-WH):
Annual Issue Certification Listings

G. Environmental Protection Agency (EPA):
40 CFR 59(2014).....National Volatile Organic Compound Emission Standards for Consumer and Commercial Products

PART 2 - PRODUCTS

2.1 FIRESTOP SYSTEMS

A. Provide either factory built (Firestop Devices) or field erected (through-Penetration Firestop Systems) to form a specific building system maintaining required integrity of the fire barrier and stop the passage of gases or smoke. Firestop systems to accommodate building movements without impairing their integrity.

B. Provide single firestopping system on this contract. Contractor shall not mix multiple manufacturers. Provide HILTI or Equal.

C. Through-penetration firestop systems and firestop devices tested in accordance with ASTM E814 or UL 1479 using the "F" or "T" rating to maintain the same rating and integrity as the fire barrier being sealed. "T" ratings are not required for penetrations smaller than or equal to 101 mm (4 inches) nominal pipe or 0.01 square meter (16 square inches) in overall cross sectional area.

D. Firestop sealants used for firestopping or smoke sealing to have the following properties:
   1. Contain no flammable or toxic solvents.
   2. Release no dangerous or flammable out gassing during the drying or curing of products.
   3. Water-resistant after drying or curing and unaffected by high humidity, condensation or transient water exposure.

4. When installed in exposed areas, capable of being sanded and finished with similar surface treatments as used on the surrounding wall or floor surface.
5. VOC Content: Firestopping sealants and sealant primers to comply with the following limits for VOC content when calculated according to 40 CFR 59, (EPA Method 24):
   a. Sealants: 250 g/L.
   b. Sealant Primers for Nonporous Substrates: 250 g/L.
   c. Sealant Primers for Porous Substrates: 775 g/L.

E. Firestopping system or devices used for penetrations by glass pipe, plastic pipe or conduits, unenclosed cables, or other non-metallic materials to have following properties:
1. Classified for use with the particular type of penetrating material used.
2. Penetrations containing loose electrical cables, computer data cables, and communications cables protected using firestopping systems that allow unrestricted cable changes without damage to the seal.

F. Maximum flame spread of 25 and smoke development of 50 when tested in accordance with ASTM E84 or UL 723. Material to be an approved firestopping material as listed in UL Fire Resistance Directory or by a nationally recognized testing laboratory.

G. FM, UL, or WH rated or tested by an approved laboratory in accordance with ASTM E814.

H. Materials to be nontoxic and noncarcinogen at all stages of application or during fire conditions and to not contain hazardous chemicals. Provide firestop material that is free from Ethylene Glycol, PCB, MEK, and asbestos.

I. For firestopping exposed to view, traffic, moisture, and physical damage, provide products that do not deteriorate when exposed to these conditions.
1. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.
2. For floor penetrations with annular spaces exceeding 101 mm (4 inches) or more in width and exposed to possible loading and traffic, provide firestop systems capable of supporting the floor

loads involved either by installing floor plates or by other means acceptable to the firestop manufacturer.

3. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.

J. Engineering Judgements: For situations where custom drawings for firestopping assemblies are required to accommodate conditions/applications not identified in the manufacturer's Firestop Systems Installers Guide, Contractor shall complete documentation requested per the guide to request an engineering judgement from the manufacturer.

2.2 SMOKE STOPPING IN SMOKE PARTITIONS

A. Provide silicone sealant in smoke partitions as specified in Section 07 92 00, JOINT SEALANTS.

B. Provide mineral fiber filler and bond breaker behind sealant.

C. Sealants to have a maximum flame spread of 25 and smoke developed of 50 when tested in accordance with ASTM E84.

D. When used in exposed areas capable of being sanded and finished with similar surface treatments as used on the surrounding wall or floor surface.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Submit product data and installation instructions, as required by article, submittals, after an on-site examination of areas to receive firestopping.

B. Examine substrates and conditions with installer present for compliance with requirements for opening configuration, penetrating items, substrates, and other conditions affecting performance of firestopping. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove dirt, grease, oil, laitance and form-release agents from concrete, loose materials, or other substances that prevent adherence and bonding or application of the firestopping or smoke stopping materials. Additionally, remove existing firestopping (if present) in its entirety to ensure firestopping systems are not mixed.

B. Remove insulation on insulated pipe for a distance of 150 mm (6 inches) on each side of the fire rated assembly prior to applying the

firestopping materials unless the firestopping materials are tested and approved for use on insulated pipes.

C. Prime substrates where required by joint firestopping system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

D. Masking Tape: Apply masking tape to prevent firestopping from contacting adjoining surfaces that will remain exposed upon completion of work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestopping materials. Remove tape as soon as it is possible to do so without disturbing seal of firestopping with substrates.

3.3 INSTALLATION

A. Do not begin firestopping work until the specified material data and installation instructions of the proposed firestopping systems have been submitted and approved.

B. Install firestopping systems with smoke stopping in accordance with FM, UL, WH, or other approved system details and installation instructions.

C. Install smoke stopping seals in smoke partitions.

3.4 CLEAN-UP

A. As work on each floor is completed, remove materials, litter, and debris.

B. Clean up spills of liquid type materials.

C. Clean off excess fill materials and sealants adjacent to openings and joints as work progresses by methods and with cleaning materials approved by manufacturers of firestopping products and of products in which opening and joints occur.

D. Protect firestopping during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated firestopping immediately and install new materials to provide firestopping complying with specified requirements.

3.5 INSPECTIONS AND ACCEPTANCE OF WORK

A. Do not conceal or enclose firestop assemblies until inspection is complete and approved by the Contracting Officer Representative (COR).

B. Furnish service of approved inspector to inspect firestopping in accordance with ASTM E2393 and ASTM E2174 for firestop inspection, and document inspection results. Submit written reports indicating locations of and types of penetrations and type of firestopping used at each location; type is to be recorded by UL listed printed numbers.

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SECTION 07 92 00
JOINT SEALANTS

PART 1 - GENERAL

1.1 DESCRIPTION:

A. This section covers interior and exterior sealant and their application, wherever required for complete installation of building materials or systems.

1.2 RELATED WORK (INCLUDING BUT NOT LIMITED TO THE FOLLOWING):

A. Sustainable Design Requirements: Section 01 81 13, SUSTAINABLE CONSTRUCTION REQUIREMENTS.

B. Sealing of Site Work Concrete Paving: Section 32 05 23, CEMENT AND CONCRETE FOR EXTERIOR IMPROVEMENTS.

C. Firestopping Penetrations: Section 07 84 00, FIRESTOPPING.

D. Sound Rated Gypsum Partitions/Sound Sealants: Section 09 29 00, GYPSUM BOARD.

E. Section 22 05 11, COMMON WORK RESULTS FOR PLUMBING

F. Section 23 05 11, COMMON WORK RESULTS FOR HVAC

1.3 QUALITY ASSURANCE:

A. Installer Qualifications: An experienced installer with a minimum of three (3) years' experience and who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in-service performance. Submit qualification.

B. Source Limitations: Obtain each type of joint sealant through one (1) source from a single manufacturer.

C. Product Testing: Obtain test results from a qualified testing agency based on testing current sealant formulations within a 12-month period.

1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C1021.
2. Test elastomeric joint sealants for compliance with requirements specified by reference to ASTM C920, and where applicable, to other standard test methods.
3. Test elastomeric joint sealants according to SWRI's Sealant Validation Program for compliance with requirements specified by

reference to ASTM C920 for adhesion and cohesion under cyclic movement, adhesion-in peel, and indentation hardness.

4. Test other joint sealants for compliance with requirements indicated by referencing standard specifications and test methods.

D. Lab Tests: Submit samples of materials that will be in contact or affect joint sealants to joint sealant manufacturers for tests as follows:

1. Adhesion Testing: Before installing elastomeric sealants, test their adhesion to protect joint substrates according to the method in ASTM C794 to determine if primer or other specific joint preparation techniques are required.
2. Compatibility Testing: Before installing elastomeric sealants, determine compatibility when in contact with glazing and gasket materials.
3. Stain Testing: Perform testing per ASTM C1248 on interior and exterior sealants to determine if sealants or primers will stain adjacent surfaces. No sealant work is to start until results of these tests have been submitted to the Contracting Officer Representative (COR) and the COR has given written approval to proceed with the work.

E. Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to joint substrates according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1.1 in ASTM C1193 or Method A, Tail Procedure, in ASTM C1521.

1. Locate test joints where indicated in construction documents or, if not indicated, as directed by COR.
2. Conduct field tests for each application indicated below:
   a. Each type of elastomeric sealant and joint substrate indicated.
   b. Each type of non-elastomeric sealant and joint substrate indicated.
3. Notify COR seven (7) days in advance of dates and times when test joints will be erected.
4. Arrange for tests to take place with joint sealant manufacturer’s technical representative present.

F. Mockups: Before installing joint sealants, apply elastomeric sealants as follows to verify selections and to demonstrate aesthetic effects and qualities of materials and execution:

1. Joints in mockups of assemblies that are indicated to receive elastomeric joint sealants.

1.4 CERTIFICATION:

A. Contractor is to submit to the COR written certification that joints are of the proper size and design, that the materials supplied are compatible with adjacent materials and backing, that the materials will properly perform to provide permanent watertight, airtight or vapor tight seals (as applicable), and that materials supplied meet specified performance requirements.

1.5 SUBMITTALS:

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Sustainable Design Submittals, as described below:

1. Volatile organic compounds per volume as specified in PART 2 PRODUCTS.

C. Installer qualifications.

D. Contractor certification.

E. Manufacturer's installation instructions for each product used.

F. Cured samples of exposed sealants for each color.

G. Manufacturer's Literature and Data:

1. Primers
2. Sealing compound, each type, including compatibility when different sealants are in contact with each other.

H. Manufacturer warranty.

1.6 PROJECT CONDITIONS:

A. Environmental Limitations:

1. Do not proceed with installation of joint sealants under following conditions:
   a. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 degrees C (40 degrees F).
   b. When joint substrates are wet.

B. Joint-Width Conditions:

1. Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

C. Joint-Substrate Conditions:

1. Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.7 DELIVERY, HANDLING, AND STORAGE:

A. Deliver materials in manufacturers' original unopened containers, with brand names, date of manufacture, shelf life, and material designation clearly marked thereon.

B. Carefully handle and store to prevent inclusion of foreign materials.

C. Do not subject to sustained temperatures exceeding 32 degrees C (90 degrees F) or less than 5 degrees C (40 degrees F).

1.8 DEFINITIONS:

A. Definitions of terms in accordance with ASTM C717 and as specified.

B. Backing Rod: A type of sealant backing.

C. Bond Breakers: A type of sealant backing.

D. Filler: A sealant backing used behind a back-up rod.

1.9 WARRANTY:

A. Construction Warranty: Comply with FAR clause 52.246-21 "Warranty of Construction".

B. Manufacturer Warranty: Manufacturer shall warranty their sealant for a minimum of five (5) years from the date of installation and final acceptance by the Government. Submit manufacturer warranty.

1.10 APPLICABLE PUBLICATIONS:

A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.

B. ASTM International (ASTM):

C509-06.....Elastomeric Cellular Preformed Gasket and Sealing Material

C612-14.....Mineral Fiber Block and Board Thermal Insulation

C717-14a.....Standard Terminology of Building Seals and Sealants

C734-06(R2012).....Test Method for Low-Temperature Flexibility of Latex Sealants after Artificial Weathering

C794-10.....Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants

C919-12.....Use of Sealants in Acoustical Applications.

C920-14a.....Elastomeric Joint Sealants.

C1021-08(R2014).....Laboratories Engaged in Testing of Building Sealants

C1193-13.....Standard Guide for Use of Joint Sealants.

C1248-08(R2012).....Test Method for Staining of Porous Substrate by Joint Sealants

C1330-02(R2013).....Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants

C1521-13.....Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints

D217-10.....Test Methods for Cone Penetration of Lubricating Grease

D1056-14.....Specification for Flexible Cellular Materials—Sponge or Expanded Rubber

E84-09.....Surface Burning Characteristics of Building Materials

C. Sealant, Waterproofing and Restoration Institute (SWRI).
The Professionals' Guide

D. Environmental Protection Agency (EPA):
40 CFR 59(2014).....National Volatile Organic Compound Emission Standards for Consumer and Commercial Products

PART 2 - PRODUCTS

2.1 SEALANTS:

A. Exterior Sealants:

1. S-# Vertical surfaces, provide non-staining ASTM C920, Type S or M, Grade NS, Class 25, Use NT. 2.S-# Horizontal surfaces, provide ASTM C920, Type S or M, Grade P, Class 25, Use T.

3. Provide location(s) of exterior sealant as follows:

a. Joints formed where frames and subsills of windows, doors, louvers, and vents adjoin masonry, concrete, or metal frames. Provide sealant at exterior surfaces of exterior wall penetrations.

b. Metal to metal.

c. Masonry to masonry or stone.

d. Stone to stone.

e. Cast stone to cast stone.

f. Masonry expansion and control joints.

g. Wood to masonry.

h. Masonry joints where shelf angles occur.

i. Voids where items penetrate exterior walls.

j. Metal reglets, where flashing is inserted into masonry joints, and where flashing is penetrated by coping dowels.

B. Floor Joint Sealant:

1. ASTM C920, Type S or M, Grade P, Class 25, Use T. S-#

2. S-# Provide location(s) of floor joint sealant as follows.

a. Seats of metal thresholds exterior doors.

b. Control and expansion joints in floors, slabs, ceramic tile, and walkways.

C. Interior Sealants:

1. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system are to comply with the following limits for VOC content when calculated according to 40 CFR 59, (EPA Method 24):

a. Architectural Sealants: 250 g/L.

b. Sealant Primers for Nonporous Substrates: 250 g/L.

c. Sealant Primers for Porous Substrates: 775 g/L.

2. S-# Vertical and Horizontal Surfaces: ASTM C920, Type S or M, Grade NS, Class 25, Use NT.

3. S-#Food Service: Use a Vinyl Acetate Homopolymer, or other low VOC, non-toxic sealant approved for use in food preparation areas.

4. Provide location(s) of interior sealant as follows:

a. Typical narrow joint 6 mm, (1/4 inch) or less at walls and adjacent components.

b. Perimeter of doors, windows, access panels which adjoin concrete or masonry surfaces.

c. Interior surfaces of exterior wall penetrations.

d. Joints at masonry walls and columns, piers, concrete walls or exterior walls.

e. Perimeter of lead faced control windows and plaster or gypsum wallboard walls.

f. Exposed isolation joints at top of full height walls.

g. Joints between bathtubs and ceramic tile; joints between shower receptors and ceramic tile; joints formed where nonplanar tile surfaces meet.

h. Joints formed between tile floors and tile base cove; joints between tile and dissimilar materials; joints occurring where substrates change.

i. Behind escutcheon plates at valve pipe penetrations and showerheads in showers.

D. Acoustical Sealant:

1. Conforming to ASTM C919; flame spread of 25 or less; and a smoke developed rating of 50 or less when tested in accordance with ASTM E84. Acoustical sealant have a consistency of 250 to 310 when tested in accordance with ASTM D217; remain flexible and adhesive after 500 hours of accelerated weathering as specified in ASTM C734; and be non-staining.
2. Provide location(s) of acoustical sealant as follows:
   a. Exposed acoustical joint at sound rated partitions.
   b. Concealed acoustic joints at sound rated partitions.
   c. Joints where item pass-through sound rated partitions.

2.2 COLOR:

A. Sealants used with exposed masonry are to match color of mortar joints.

B. Sealants used with unpainted concrete are to match color of adjacent concrete.

C. Color of sealants for other locations to be light gray or aluminum, unless otherwise indicated in construction documents.

2.3 JOINT SEALANT BACKING:

A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C1330, of type indicated below and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:

1. Type C: Closed-cell material with a surface skin.

C. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D1056 or synthetic rubber (ASTM C509), nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 32 degrees C (minus 26 degrees F). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and otherwise contribute to optimum sealant performance.

D. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint

where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.4 WEEPS:

A. Weep/Vent Products: Provide the following unless otherwise indicated or approved.

1. Round Plastic Tubing: Medium-density polyethylene, 10 mm (3/8-inch) OD by thickness of stone or masonry veneer.

2.5 FILLER:

A. Mineral fiberboard: ASTM C612, Class 1.

B. Thickness same as joint width.

C. Depth to fill void completely behind back-up rod.

2.6 PRIMER:

A. As recommended by manufacturer of caulking or sealant material.

B. Stain free type.

2.7 CLEANERS-NON POROUS SURFACES:

A. Chemical cleaners compatible with sealant and acceptable to manufacturer of sealants and sealant backing material. Cleaners to be free of oily residues and other substances capable of staining or harming joint substrates and adjacent non-porous surfaces and formulated to promote adhesion of sealant and substrates.

PART 3 - EXECUTION

3.1 INSPECTION:

A. Inspect substrate surface for bond breaker contamination and unsound materials at adherent faces of sealant.

B. Coordinate for repair and resolution of unsound substrate materials.

C. Inspect for uniform joint widths and that dimensions are within tolerance established by sealant manufacturer.

3.2 PREPARATIONS:

A. Prepare joints in accordance with manufacturer's instructions and SWRI (The Professionals’ Guide).

B. Clean surfaces of joint to receive caulking or sealants leaving joint dry to the touch, free from frost, moisture, grease, oil, wax, lacquer paint, or other foreign matter that would tend to destroy or impair adhesion.

1. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants.

2. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air. Porous joint surfaces include but are not limited to the following:
   a. Concrete.
   b. Masonry.
   c. Unglazed surfaces of ceramic tile.
3. Remove laitance and form-release agents from concrete.
4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous surfaces include but are not limited to the following:
   a. Metal.
   b. Glass.
   c. Porcelain enamel.
   d. Glazed surfaces of ceramic tile.

C. Do not cut or damage joint edges.

D. Apply non-staining masking tape to face of surfaces adjacent to joints before applying primers, caulking, or sealing compounds.
   1. Do not leave gaps between ends of sealant backings.
   2. Do not stretch, twist, puncture, or tear sealant backings.
   3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

E. Apply primer to sides of joints wherever required by compound manufacturer's printed instructions or as indicated by pre-construction joint sealant substrate test.
   1. Apply primer prior to installation of back-up rod or bond breaker tape.
   2. Use brush or other approved means that will reach all parts of joints. Avoid application to or spillage onto adjacent substrate surfaces.

3.3 BACKING INSTALLATION:

A. Install backing material, to form joints enclosed on three sides as required for specified depth of sealant.

B. Where deep joints occur, install filler to fill space behind the backing rod and position the rod at proper depth.

C. Cut fillers installed by others to proper depth for installation of backing rod and sealants.

D. Install backing rod, without puncturing the material, to a uniform depth, within plus or minus 3 mm (1/8 inch) for sealant depths specified.

E. Where space for backing rod does not exist, install bond breaker tape strip at bottom (or back) of joint so sealant bonds only to two opposing surfaces.

3.4 SEALANT DEPTHS AND GEOMETRY:

A. At widths up to 6 mm (1/4 inch), sealant depth equal to width.

B. At widths over 6 mm (1/4 inch), sealant depth 1/2 of width up to 13 mm (1/2 inch) maximum depth at center of joint with sealant thickness at center of joint approximately 1/2 of depth at adhesion surface.

3.5 INSTALLATION:

A. General:

1. Apply sealants and caulking only when ambient temperature is between 5 degrees C and 38 degrees C (40 degrees and 100 degrees F).
2. Do not install polysulfide base sealants where sealant may be exposed to fumes from bituminous materials, or where water vapor in continuous contact with cementitious materials may be present.
3. Do not install sealant type listed by the manufacturer as not suitable for use in locations specified.
4. Apply caulking and sealing compound in accordance with manufacturer's printed instructions.
5. Avoid dropping or smearing compound on adjacent surfaces.
6. Fill joints solidly with compound and finish compound smooth.
7. Tool exposed joints to form smooth and uniform beds, with slightly concave surface conforming to joint configuration per Figure 5A in ASTM C1193 unless shown or specified otherwise in construction documents. Remove masking tape immediately after tooling of sealant and before sealant face starts to “skin” over. Remove any excess sealant from adjacent surfaces of joint, leaving the working in a clean finished condition.
8. Finish paving or floor joints flush unless joint is otherwise detailed.
9. Apply compounds with nozzle size to fit joint width.
10. Test sealants for compatibility with each other and substrate. Use only compatible sealant. Submit test reports.
11. Replace sealant which is damaged during the construction process.

B. Weeps: Place weep holes and vents in joints where moisture may accumulate, including at base of cavity walls, above shelf angles, at all flashing, and as indicated on construction documents.
   1. Use round plastic tubing to form weep holes.
   2. Space weep holes formed from plastic tubing not more than 406 mm (16 inches) o.c.
   3. Trim tubing material used in weep holes flush with exterior wall face after sealant has set.

C. For application of sealants, follow requirements of ASTM C1193 unless specified otherwise. Take all necessary steps to prevent three-sided adhesion of sealants.

D. Interior Sealants: Where gypsum board partitions are of sound rated, fire rated, or smoke barrier construction, follow requirements of ASTM C919 only to seal all cut-outs and intersections with the adjoining construction unless specified otherwise.
   1. Apply a 6 mm (1/4 inch) minimum bead of sealant each side of runners (tracks), including those used at partition intersections with dissimilar wall construction.
   2. Coordinate with application of gypsum board to install sealant immediately prior to application of gypsum board.
   3. Partition intersections: Seal edges of face layer of gypsum board abutting intersecting partitions, before taping and finishing or application of veneer plaster-joint reinforcing.
   4. Openings: Apply a 6 mm (1/4 inch) bead of sealant around all cutouts to seal openings of electrical boxes, ducts, pipes and similar penetrations. To seal electrical boxes, seal sides and backs.
   5. Control Joints: Before control joints are installed, apply sealant in back of control joint to reduce flanking path for sound through control joint.

3.6 FIELD QUALITY CONTROL:

A. Field-Adhesion Testing: Field-test joint-sealant adhesion to joint substrates according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C1193 or Method A, Tail Procedure, in ASTM C1521.
   1. Extent of Testing: Test completed elastomeric sealant joints as follows:

a. Perform 10 tests for first 305 m (1000 feet) of joint length for each type of elastomeric sealant and joint substrate.

b. Perform one test for each 305 m (1000 feet) of joint length thereafter or one test per each floor per elevation.

B. Inspect joints for complete fill, for absence of voids, and for joint configuration complying with specified requirements. Record results in a field adhesion test log.

C. Inspect tested joints and report on following:

1. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate.
2. Compare these results to determine if adhesion passes sealant manufacturer's field-adhesion hand-pull test criteria.
3. Whether sealants filled joint cavities and are free from voids.
4. Whether sealant dimensions and configurations comply with specified requirements.

D. Record test results in a field adhesion test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant fill, sealant configuration, and sealant dimensions.

E. Repair sealants pulled from test area by applying new sealants following same procedures used to originally seal joints. Ensure that original sealant surfaces are clean and new sealant contacts original sealant.

F. Evaluation of Field-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements, will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.7 CLEANING:

A. Fresh compound accidentally smeared on adjoining surfaces: Scrape off immediately and rub clean with a solvent as recommended by manufacturer of the adjacent material or if not otherwise indicated by the caulking or sealant manufacturer.

B. Leave adjacent surfaces in a clean and unstained condition.

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SECTION 07 95 13
EXPANSION JOINT COVER ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Prefabricated floor, wall, and ceiling and building expansion joint assemblies.
   a. Metal plate covers at floor wall and ceiling joints.
   b. Preformed elastomeric sealant joint at interior floor and wall control joints.

1.2 APPLICABLE PUBLICATIONS

A. Comply with references to extent specified in this Section.

B. American Society of Civil Engineers (ASCE):

ASCE/SEI 7-10 - Minimum Design Loads For Buildings and Other Structures.

C. ASTM International (ASTM):

A36/A36M-19 - Structural Steel.

A240/A240M-20 - Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels and for General Applications.

A283/A283M-18 - Low and Intermediate Tensile Strength Carbon Steel Plates.

A786/A786M-15 - Hot-Rolled Carbon, Low-Alloy, High-Strength Low-Alloy, and Alloy Steel Floor Plates.

B36/B36M-18 - Brass, Plate, Sheet, Strip, and Rolled Bar.

B121/B121M-16 - Leaded Brass Plate, Sheet, Strip and Rolled Bar.

B209-14 - Aluminum and Aluminum-Alloy Sheet and Plate.

B209M-14 - Aluminum and Aluminum-Alloy Sheet and Plate (Metric).

B221-14 - Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

B221M-13 - Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric).

B455/B455M-20 - Copper-Zinc-Lead Alloy (Leaded-Brass) Extruded Shapes.

C864-05(2019) - Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.

D1187/D1187M-97(2018) - Asphalt-Base Emulsions for Use as Protective Coatings for Metal.

E1399/E1399M-97(2017) - Standard Test Method for Cyclic Movement and Measuring the Minimum and Maximum Joint Widths of Architectural Joint Systems.

E1966-15(2019) - Standard Test Method for Fire-Resistive Joint Systems.

D. National Association of Architectural Metal Manufacturers (NAAMM):
AMP 500-06 - Metal Finishes Manual.

E. UL LLC (UL):
2079-15 - Standard for Tests for Fire Resistance of Building Joint Systems.

1.3 PREINSTALLATION MEETINGS

A. Conduct preinstallation meeting at project site minimum 30 days before beginning Work of this Section.
   1. Required Participants:
      a. Contracting Officer's Representative.
      b. Architect/Engineer.
      c. Inspection and Testing Agency.
      d. Contractor.
      e. Installer.
      f. Manufacturer's field representative.
      g. Other installers responsible for adjacent and intersecting work, including _____ .
   2. Meeting Agenda: Distribute agenda to participants minimum 3 days before meeting.
      a. Installation schedule.
      b. Installation sequence.
      c. Preparatory work.
      d. Protection before, during, and after installation.
      e. Installation.
      f. Terminations.
      g. Transitions and connections to other work.
      h. Other items affecting successful completion.
   3. Document and distribute meeting minutes to participants to record decisions affecting installation.

1.4 SUBMITTALS

A. Submittal Procedures: Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Submittal Drawings:

1. Include large-scale details indicating profiles of each type of expansion joint cover, splice joints between joint sections, transitions to other assemblies, terminations, anchorages, fasteners, and relationship to adjoining work and finishes.
2. Show size, configuration, and fabrication and installation details.
3. Include composite drawings showing work specified in other Sections coordinated with expansion joints.

C. Manufacturer's Literature and Data:
1. Description of each product specified.
2. Show movement capability of each cover assembly and suitability of material used in exterior seals for ultraviolet exposure.
3. Description of materials and finishes.
4. Installation instructions.

D. Samples: Submit 300 mm (12 inch) long samples.
1. Each type and color of metal finish for each required thickness and alloy.
2. Each type and color of flexible seal.

E. Sustainable Construction Submittals:
1. Recycled Content: Identify post-consumer and pre-consumer recycled content percentage by weight.
2. Low Pollutant-Emitting Materials:
a. Identify volatile organic compound types and quantities.

F. Qualifications: Substantiate qualifications comply with specifications.
1. Installer with project experience list.

G. Certificates: Indicate products comply with specifications.
1. Fire rated expansion joint cover assemblies.

H. Operation and Maintenance Data:
1. Care instructions for each exposed finish product.

1.5 QUALITY ASSURANCE

A. Installer Qualifications:
1. Regularly installs specified products.
2. Installed specified products with satisfactory service on five similar installations for minimum five years.
a. Project Experience List: Provide contact names and addresses for completed projects.

1.6 DELIVERY

A. Deliver products in manufacturer's original sealed packaging.

B. Mark packaging, legibly. Indicate manufacturer's name or brand, type, color, and manufacture date.

C. Before installation, return or dispose of products within distorted, damaged, or opened packaging.

1.7 STORAGE AND HANDLING

A. Store products indoors in dry, weathertight facility.

B. Protect products from damage during handling and construction operations.

1.8 FIELD CONDITIONS

A. Field Measurements: Verify field conditions affecting expansion joint cover assembly fabrication and installation. Show field measurements on Submittal Drawings.

1. Coordinate field measurement and fabrication schedule to avoid delay.

1.9 WARRANTY

A. Construction Warranty: FAR clause 52.246-21, "Warranty of Construction."

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Provide joint cover assemblies that permit unrestrained movement of joint without disengagement of cover, and, where applicable, maintain moisture, watertight and fire-rated protection.

B. Provide templates to related trades for location of support and anchorage items.

2.2 SYSTEM PERFORMANCE

A. Design expansion joint cover assemblies complying with specified performance.

B. Joint Movement: ASTM E1399.

1. Nominal Joint Width: 2 inches.
2. Minimum Movement Capability: 25 percent.
3. Movement Type: Thermal and wind.

C. Floor Joints: Live loads, including rolling loads.

1. Load Resistance: ASCE/SEI 7; Design criteria as indicated on Drawings.
2. Maximum Deflection: 1/360 of span, maximum.

D. Fire Rated Joints: ASTM E1399, ASTM E1966, or UL 2079, including hose stream test at full-rated period.

1. Fire rating: Match adjacent floor, wall, and ceiling construction.

2. System: Capable of anticipated movement while maintaining fire rating.
3. Coverless Applications: Maintain fire rating without joint cover system.

2.3 MATERIALS

A. Stainless Steel: ASTM A240/A240M, Type 302 or 304.
B. Structural Steel Shapes: ASTM A36/A36M.
C. Steel Plate: ASTM A283/A283M, Grade C.
D. Rolled Steel Floor Plate: ASTM A786/A786M.
E. Aluminum:
1. Extruded: ASTM B221M (ASTM B221), alloy 6063-T5, 6063-T6, or 6061-T6.
2. Plate and Sheet: ASTM B209M (ASTM B209), alloy 6061-T6.
F. Bronze: Manufacturer's standard alloy.
1. Extruded: ASTM B455.
2. Plate: ASTM B121.
G. Brass: ASTM B36/B36M.
H. Elastomeric Sealant: As specified in Section 07 92 00, JOINT SEALANTS.
I. Elastomeric Seals:
1. Flexible extruded polyvinyl chloride, meeting a Shore A hardness of 75 with UV stabilizer. Manufacturer's standard colors.
J. Thermoplastic Rubber:
1. ASTM C864.
2. Dense Neoprene or other material standard with expansion joint manufacturers having the same physical properties.
K. Compression Seals: Pre-compressed secondary sealant using preformed expanding foam sealant; open-cell polyurethane foam impregnated with polymer-modified acrylic adhesive.
L. Water Barrier Sheets: Neoprene or EPDM flexible sheet materials minimum 45 mils thick.
1. Provide with drain tubes for horizontal applications.
M. Vinyl Invertor Sealant Waterstops: Manufacturer's standard shapes and grade.
N. Moisture Barrier: Fabric reinforced clear vinyl sheet material sized to accommodate opening.
O. Flexible Membrane: 1.5 mm (60 mil) EPDM sheet, with manufacturer's standard support foam.

P. Fire Barrier: Labeled by an approved independent testing laboratory for fire resistance ratingindicated for maximum joint width.
   a. Thermal Insulation: Manufacturer's standard with factory cut miters and transitions.
   b. Fire Barrier Lengths:
      1) Joint widths up to and including 150 mm (6 inches): Maximum 15 m (50 feet) to minimize field splicing.
      2) Other Joint widths: 3 m (10 foot) with overlapping ends for field splicing.

Q. Ceramic Blanket: Manufacturer's standard joint filler to achieve fire rating indicated.

R. Butyl Caulk Tape: Self adhering double sided butyl rubber sealant tape with easy-release silicone coated paper.

S. Covers shall be minimum 1/4" thick, smooth, flush with floorinig. Non-anchored side of joint requires joint sealant.

2.4 PRODUCTS - GENERAL

A. Basis of Design: Section 09 06 00, SCHEDULE FOR FINISHES.

B. Provide each product from one manufacturer.
   1. Provide ceiling and wall expansion joint cover assemblies design matching floor to wall and floor to floor expansion joint cover design.
   2. Provide expansion joint cover assembly designs, profiles, materials and configuration indicated, as required to accommodate joint size variations in adjacent surfaces, and anticipated movement.

C. Sustainable Construction Requirements:
   1. Steel Recycled Content: 30 percent total recycled content, minimum.
   2. Stainless Steel Recycled Content: 70 percent total recycled content, minimum.
   3. Aluminum Recycled Content: 80 percent total recycled content, minimum.
   4. Low Pollutant-Emitting Materials: Maximum VOC content by weight.
      a. Non-Flooring Adhesives and Sealants.

2.5 FABRICATION

A. Fabricate Expansion Joint Cover Assemblies:
   1. As complete assembly ready for installation.
   2. In longest practicable lengths to minimize number of end joints.
   3. With factory mitered corners where joint changes directions or abuts other materials.

a. With closure materials and transition pieces, tee-joints, corners, curbs, cross-connections and other assemblies.

4. Joints within enclosed spaces such as chase walls, include 1 mm (0.04 inch) thick galvanized steel cover where conventional expansion joint cover is not used.
5. Where floor slab is fire rated provide ceramic blanket at joints.
6. Seal Strip: Factory-formed and bonded to metal frames and anchor members.
7. Compression Seals: Fabricate from expanding foam as secondary seal and elastomeric sealant to sizes and profiles shown.

B. Floor-to-Floor Metal Plate Joints:

1. Frames: Metal, continuous on both sides of joint designed to support cover plate.
   a. Flush Design: Seating surface and raised floor rim to accommodate adjacent flooring.
   b. Anchorage: Concealed bolt and steel anchors for embedment in concrete.
2. Cover Plate: Metal, matching frames where exposed.
   a. Supported Load: 19.2 MPa (400 psf), minimum.
   b. Rattle-free due to traffic.
3. Fillers: Resilient material between raised rim of frame and edge of cover plate, where shown.
   a. No gaps or bulges over full design range joint movement.
4. Fire Barrier: As required for fire resistance rating.
5. Water Stop: Manufacturer's standard, continuous, full length of joint.
6. Seismic: As required by Code.
7. Finishes: As specified in Section 09 06 00, SCHEDULE FOR FINISHES.

C. Floor-to-Wall Metal Plate Joints:

1. Frames: Metal, continuous on floor side of joint only.
   a. Provide wall side frame where required by manufacturer's design.
2. Cover Plates: Angle cover plates with countersunk flat-head exposed fasteners for securing cover plate to wall unless shown otherwise.
   a. Fastener Spacing: As recommended by manufacturer.
3. Joint Design: Match adjacent floor to floor design.
4. Fire Barrier: As required for fire resistance rating.
5. Water Stop: Manufacturer's standard, continuous, full length of joint.

6. Seismic: As required by Code.
7. Finishes: As specified in Section 09 06 00, SCHEDULE FOR FINISHES.

D. Interior Wall Joint Cover Assemblies:
1. Frame: Metal, surface mounted, concealed fastening to wall on one sides of joint.
2. Cover Plate: Metal, smooth surface, lap both sides of joint and permitting free movement on one side.
   a. Fabricate with concealed attachment of cover to frame when cover is in close contact with adjacent wall surface finish.
   b. Use angle cover plates at intersecting walls.
3. Joint Design: Match adjacent floor to floor design.
4. Fire Barrier: As required for fire resistance rating.
5. Seismic: As required by Code.
6. Finishes: As specified in Section 09 06 00, SCHEDULE FOR FINISHES.

E. Exterior Wall Joint Assemblies:
1. Design seal for variable movement and prevention of water and air infiltration.
2. Frame: Metal, concealed, for fastening to wall on one side of joint.
3. Cover Plate: Metal, surface mounted, lap both sides of joint, permitting free movement on one side.
   a. Fabricate with concealed attachment of cover to frame for cover with cover in close contact with adjacent finish surfaces.
   b. Use angle cover plate at intersecting walls.
4. Water Seal: Vinyl seal strip as secondary seal behind primary seal.
5. Seismic: As required by Code.
6. Finish: As specified in Section 09 06 00, SCHEDULE FOR FINISHES.

F. Extruded Thermoplastic Rubber Joint Assemblies:
1. Frames: Aluminum, both sides of joint.
2. Primary Seal: Flexible rubber on exposed face after frame installation with factory welded watertight miters and transitions.
   a. Anchor spaced at ends and not over 600 mm (24 inches).
      1) Variable movement extruded rubber primary seal designed to remain in aluminum frame, throughout movement of joint.
   b. Flush mounted seal minimum 3 mm (0.12 inch) thick with dual movement grooves designed for plus or minus 50 percent, movement of joint width.

c. Recessed front face seal minimum 3 mm (0.12 inch) thick with no movement grooves, designed for plus or minus 50 percent movement of joint width.

d. Provide pantographic wind load supports, maximum 2400 mm (8 feet) on center to support seal systems of 300 mm (12 inches) wide and greater.

3. Secondary Seal: Continuous vinyl sheet seal.

4. Finishes: As specified in Section 09 06 00, SCHEDULE FOR FINISHES.

G. Ceiling and Soffit Assemblies:

1. Frames: Metal, continuous on both sides of joint, flush mounted with no exposed fasteners.

2. Flexible Insert: Variable movement semi-rigid vinyl locked into frame.

a. Face Style: Flush or accordion, as shown, to span joint width without sagging.

3. Seismic: As required by Code.

4. Finishes: As specified in Section 09 06 00, SCHEDULE FOR FINISHES.

H. Garage Floor Joint Cover Plate:

1. Frame: Angle edge frame on both sides of joint, size as shown.

a. Anchors: Stud bolts minimum 100 mm (4 inches) long and 10 mm (3/8 inch) diameter welded to angle spaced maximum 600 mm (24 inches) on center.

b. Drill and top one frame for cover plate fasteners.

2. Cover Plate: Aluminum or steel cover plate minimum 10 mm (3/8 inch) thick with edges beveled, smooth finish, drilled for countersunk fasteners at ends and maximum 600 mm (24 inches) on center.

3. Seismic: As required by Code.

4. Finishes: As specified in Section 09 06 00, SCHEDULE FOR FINISHES.

I. Preformed Sealant Joint: Factory installed elastomeric sealant between extruded aluminum angle frame both sides.

1. Frames: Extruded aluminum angle on both sides of joint.

2. Filler: Elastomeric sealant.

3. Anticipated movement: 25 percent maximum.

4. Finishes: As specified in Section 09 06 00, SCHEDULE FOR FINISHES.

2.6 FINISHES

A. Carbon Steel: NAAMM AMP 500, Galvanized G90.

B. Stainless Steel: NAAMM AMP 500, No. 2B bright finish.

C. Aluminum Anodized Finish: NAAMM AMP 500.

1. Clear Anodized Finish: AA-C22A41; Class I Architectural, 0.018 mm (0.7 mil) thick.
2. Color Anodized Finish: AA-C22A42 or AA-C22A44; Class I Architectural, 0.018 mm (0.7 mil) thick.

D. Aluminum Paint Finish:
1. Fluorocarbon Finish: AAMA 2605; 70 percent fluoropolymer resin, 2-coat system.
2. Fluorocarbon Finish: AAMA 605; 70 percent fluoropolymer resin, 2-coat system.

E. Bronze Finish: NAAMM-AMP 500, M32 mechanical finish, directional textured, natural medium satin.

2.7 ACCESSORIES

A. General: Manufacturer's standard anchors, fasteners, set screws, spaces, protective coating, and filler materials, adhesive and other accessories required for installation.

B. Barrier Coating: ASTM D1187/D1187M.

C. Adhesives: Low pollutant-emitting, water-based type recommended by adhered product manufacturer for each application.

D. Fasteners: Type and size recommended by expansion joint cover assembly manufacturer.
1. Exterior Applications: Stainless steel.
2. Fasteners for Aluminum: Stainless steel.
3. Other Applications: Galvanized steel or stainless steel.

PART 3 - EXECUTION

3.1 PREPARATION

A. Examine and verify substrate suitability for product installation.
1. Provide items embedded in concrete and masonry in time for building into work without delaying work.

B. Protect existing construction and completed work from damage.

C. Apply barrier coating to aluminum brass bronze steel surfaces in contact with dissimilar metals and cementitious materials to minimum 0.7 mm (30 mils) dry film thickness.

3.2 INSTALLATION

A. Install products according to manufacturer's instructions and approved submittal drawings .
1. When manufacturer's instructions deviate from specifications, submit proposed resolution for Contracting Officer's Representative consideration.

B. Install anchorage devices and fasteners for securing expansion joint assemblies to in-place construction where anchors are not embedded in concrete and masonry.
   1. Secure with metal fasteners, type and size to suit application.
C. Perform cutting, drilling and fitting required for installation of expansion joint cover assemblies.
D. Install joint cover assemblies aligned and positioned in correct relationship to expansion joint opening and adjoining finished surfaces measured from established lines and levels.
   1. Allow for thermal expansion and contraction of metal to avoid buckling.
   2. Accommodate joint opening size at time of installation.
E. Set floor covers at elevations flush with adjacent finished flooring, unless shown otherwise.
F. Grout floor frames set in prepared recesses.
G. Locate wall, ceiling and soffit covers in continuous contact with adjacent surfaces. Secure with required accessories.
H. Locate anchors at interval recommended by manufacturer, but minimum 75 mm (3 inches) from each end, and, maximum 600 mm (24 inches) on centers.
I. Maintain continuity of expansion joint cover assemblies with end joints held to a minimum and metal members aligned mechanically using splice joints.
J. Cut and fit ends to accommodate thermal expansion and contraction of metal to avoid buckling of frames and cover plates.
K. Flush Metal Cover Plates:
   1. Secure flexible filler between frames to allow compression and expansion.
   2. Adhere flexible filler materials to frames with adhesive or pressure-sensitive tape as recommended by manufacturer.
L. Waterstops:
   1. Install in conjunction with floor joints, and where shown.
   2. Install continuously to prevent water damage to finish spaces.
   3. Seal waterstop to frames to prevent water leakage.
   4. Install drainage tubes from waterstops to discharge collected water in nearest plumbing air gap drain.
M. Fire Barriers:
   1. Install in compliance with tested assembly.

2. Install at joints in floors and in fire rated walls.
3. Use fire barrier sealant furnished with expansion joint assembly.

N. Apply sealant where required to prevent water and air infiltration.

O. Vertical Exterior Extruded Thermoplastic Rubber.
1. Install side frames mounted on sealant or butyl caulk tape with appropriate anchors 600 mm (24 inches) on center complete with secondary seal.
2. Install primary seals retained in extruded aluminum side frames.

P. Extruded Thermoplastic Rubber or Seals:
1. For straight sections, install preformed seals in continuous lengths.
2. Vulcanize or heat-seal field spliced joints to provide watertight joints as recommended by manufacturer.

Q. Preformed Elastomeric Sealant Joint:
1. Locate joint directly over joints in wall and floor substrates.
2. Fasten full length to substrate using construction adhesive.
3. Install flush or slightly below finish material.

3.3 CLEANING

A. Remove excess adhesive before adhesive sets.

B. Clean exposed metal surfaces. Remove contaminants and stains.

3.4 PROTECTION

A. Cover floor joints with plywood where wheel traffic occurs before Substantial completion.

B. Remove protective covering when adjacent work areas are completed. Clean exposed surfaces in compliance with manufacture's printed instructions.

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SECTION 08 11 13
HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Hollow metal doors and transom panels hung in hollow metal frames at interior and exterior locations.
2. Hollow metal door frames for wood doors at interior locations.

1.2 RELATED WORK

A. Section 08 71 00, DOOR HARDWARE: Door Hardware:

B. Card Readers and Biometric Devices: Section 28 13 00, PHYSICAL ACCESS CONTROL SYSTEM.

C. Security Monitors: Section 28 23 00, VIDEO SURVEILLANCE.

1.3 APPLICABLE PUBLICATIONS

A. Comply with references to extent specified in this section.

B. American National Standard Institute (ANSI):

A250.8-2014.....Standard Steel Doors and Frames

C. ASTM International (ASTM):

A240/A240M-15b.....Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications

A653/A653M-15.....Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip

A1008/A1008M-15.....Steel, Sheet, Cold-Rolled, Carbon, Structural, High Strength Low Alloy and High Strength Low Alloy with Improved Formability, Solution Hardened, and Bake Hardenable

B209-14.....Aluminum and Aluminum-Alloy Sheet and Plate

B209M-14.....Aluminum and Aluminum-Alloy Sheet and Plate (Metric)

B221-14.....Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes

B221M-13.....Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric)

D3656/D3656M-13.....Insect Screening and Louver Cloth Woven from Vinyl Coated Glass Yarns

E90-09.....Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements

D. Federal Specifications (Fed. Spec.):

L-S-125B.....Screening, Insect, Nonmetallic

E. Master Painters Institute (MPI):

No. 18.....Primer, Zinc Rich, Organic

F. National Association of Architectural Metal Manufacturers (NAAMM):

AMP 500-06.....Metal Finishes Manual

G. National Fire Protection Association (NFPA):

80-16.....Fire Doors and Other Opening Protectives

H. UL LLC (UL):

10C-09.....Positive Pressure Fire Tests of Door Assemblies

1784-15.....Air Leakage Tests of Door Assemblies and Other Opening Protectives

I. Department of Veterans Affairs

VA Physical Security and Resiliency Design Manual October 1, 2020

1.4 SUBMITTALS

A. Submittal Procedures: Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Submittal Drawings:

1. Show size, configuration, and fabrication and installation details.

C. Manufacturer's Literature and Data:

1. Description of each product.
2. Include schedule showing each door and frame requirements fire label and smoke control label for openings.
3. Installation instructions.

D. Sustainable Construction Submittals:

1. Recycled Content: Identify post-consumer and pre-consumer recycled content percentage by weight.

E. Test reports: Certify each product complieswith specifications.

1. Sound rated door.

F. Qualifications: Substantiate qualifications comply with specifications.

1. Manufacturer with project experience list.

G. Blast Design Calculations.

1. Submit calculations for review and approval prepared by qualified blast consultant, with a minimum of 5 years of experience in design of blast resistant window systems, verifying door assembly including

anchors comply with specified blast resistance performance. The magnitudes of the design threats W1, W2 and GP1, GP2 are defined in the Physical Security and Resiliency Design Standards Data Definitions which is a document separate from the referenced VA Security and Resiliency Design Manual. The Physical Security and Resiliency Design Standards Data Definitions are provided on a need to know basis by the structural blast specialist performing the blast design on VA projects. It is the responsibility of the delegated engineer responsible for the design of blast resistant doors to request and obtain the Physical Security and Resiliency Design Data Standard Data Definitions from the VA Office of Construction and Facilities Management (CFM). Any associated delays or increased costs due to failure to obtain this information will be borne by the contractor.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications:
   1. Regularly manufactures specified products.
   2. Manufactured specified products with satisfactory service on five similar installations for minimum five years.
      a. Project Experience List: Provide contact names and addresses for completed projects.

1.6 DELIVERY

A. Fasten temporary steel spreaders across the bottom of each door frame before shipment.
B. Deliver products in manufacturer's original sealed packaging.
C. Mark packaging, legibly. Indicate manufacturer's name or brand, type, production run number, and manufacture date.
D. Before installation, return or dispose of products within distorted, damaged, or opened packaging.

1.7 STORAGE AND HANDLING

A. Store products indoors in dry, weathertight conditioned facility.
B. Protect products from damage during handling and construction operations.

1.8 WARRANTY

A. Construction Warranty: FAR clause 52.246-21, "Warranty of Construction."

PART 2 - PRODUCTS

2.1 SYSTEM PERFORMANCE

A. Design hollow metal doors and frames complying with specified performance:

1. Fire Doors and Frames: UL 10C; NFPA 80 labeled.
   a. Fire Ratings: See drawings.
2. Stair Doors: Temperature rise rated fire doors.
3. Smoke Control Doors and Frames: UL 1784; NFPA 80 labeled, maximum 0.15424 cubic meter/second/square meter (3.0 cubic feet/minute/square foot) at 24.9 Pa (0.10 inches water gauge) pressure differential.
4. Sound Rated Doors and Frames: Minimum 45 sound transmission class (STC) when tested according to ASTM E90.
5. Thermal Transmittance: 19 U-value 19 U-value), maximum
6. Thermal Resistance: 19 R-value (19 R-value), minimum.

2.2 MATERIALS

A. Stainless Steel: ASTM A240/A240M; Type 304 Type 316.

B. Sheet Steel: ASTM A1008/A1008M, cold-rolled.

C. Galvanized Sheet Steel: ASTM A653.

D. Insect Screening: ASTM D3656/D3656M, 18 by 18 aluminum wire mesh.

E. Aluminum Sheet: ASTM B209M (ASTM B209).

F. Aluminum Extrusions: ASTM B221M (ASTM B221).

2.3 PRODUCTS - GENERAL

A. Basis of Design: Section 09 06 00, SCHEDULE FOR FINISHES.

B. Provide hollow metal doors and frames from one manufacturer.

C. Sustainable Construction Requirements:

1. Steel Recycled Content: 30 percent total recycled content, minimum.
2. Stainless Steel Recycled Content: 70 percent total recycled content, minimum.
3. Aluminum Recycled Content: 50 percent total recycled content, minimum.

2.4 HOLLOW METAL FRAMES

A. Hollow Metal Frames: ANSI A250.8; face welded. See drawings for sizes and designs.

1. Interior Frames:
   a. Level 1 Hollow Metal Doors: (0.042 inch) thick.
   b. Level 2 and Level 3 Hollow Metal Doors: (0.053 inch) thick.
   c. Level 1 Hollow Metal Doors: (0.042 inch) thick.

d. Wood Doors and Borrowed Lights: (0.042 inch)thick.

e. All hollow metal frames shall be sulushed/filled with grout completely.

f. All hollow metal frames shall be a minimum of 45 minute rated in a one-hour rated wall.

g. Terminated hospital stops are required at all patient-area doors to aid in cleaning. The contractor shall discuss where 6” high hospital are required within the construction area with the COR.

h. Basis of design for hollow metal frames is Steelcraft.

2. Interior Borrowed Light Frames: (0.051 inch) thick.

B. Frame Materials:

1. Interior Frames: Sheet steel coating.

2.5 FABRICATION

A. Hardware Preparation: ANSI A250.8; for hardware specified in Section 08 71 00, DOOR HARDWARE.

B. Hollow Metal Door Fabrication:

1. Close top edge of exterior doors flush and seal to prevent water intrusion.

2. Fill spaces between vertical steel stiffeners with insulation.

C. Fire and Smoke Control Doors:

1. Close top and vertical edges flush.

2. Apply steel astragal to active leaf at pair and double egress doors.

a. Exception: Where vertical rod exit devices are specified for both leaves swinging in same direction.

3. Fire and Smoke Control Door Clearances: NFPA 80.

D. Sound Rated Doors:

1. Seals: Integral spring type automatic door bottom seal.

2. Fabricate vision panel cutouts and frames to receive double glazing as shown on drawings.

E. Hollow Metal Frame Fabrication:

1. Fasten mortar guards to back of hardware reinforcements, except on lead-lined frames.

2. Concealed Closers in Head Frame: Provide 1 mm (0.042 inch) thick steel removable stop sections for access to concealed face plates and control valves, except when cover plates are furnished with closer.

3. Terminated Stops: ANSI A250.8.

4. Borrowed Light and Panel Opening Frames:

a. Provide integral stop on exterior, corridor, or secure side of door.
b. Design rabbet width and depth to receive glazing material or panel shown on drawings.

5. Two Piece Frames:
   a. One piece unequal leg finished rough buck sub-frames as shown, drilled for anchor bolts.
   b. Unequal leg finished frames formed to fit subframes and secured to subframe legs with countersunk, flat head screws, spaced 300 mm (12 inches) on center at head and jambs on both sides.
   c. Preassemble at factory for alignment.
6. Frame Anchors:
   a. Floor anchors:
      1) Provide extension type floor anchors to compensate for depth of floor fills.
      2) Provide 1.3 mm (0.053 inch) thick steel clip angles welded to jamb and drilled to receive floor fasteners.
      3) Provide 50 mm by 50 mm by 9 mm (2 inch by 2 inch by 3/8 inch) clip angle for lead lined frames, drilled for floor fasteners.
      4) Provide mullion 2.3 mm (0.093 inch) thick steel channel anchors, drilled for two floor fasteners and frame anchor screws.
      5) Provide continuous 1 mm (0.042 inch) thick steel rough bucks drilled for floor fasteners and frame anchor screws for sill sections.
         a) Space floor bolts50 mm (24 inches) on center.
   b. Jamb anchors:
      1) Place anchors on jambs:
         a) Near top and bottom of each frame.
         b) At intermediate points at maximum 600 mm (24 inches) spacing.
      2) Form jamb anchors from steel minimum 1 mm (0.042 inch) thick.
      3) Anchors set in masonry: Provide adjustable anchors designed for friction fit against frame and extended into masonry minimum 250 mm (10 inches). Provide one of following types:
         a) Wire Loop Type: 5 mm (3/16 inch) diameter wire.
         b) T-Shape type.

c) Strap and stirrup type: Corrugated or perforated sheet steel.

4) Anchors for stud partitions: Provide tabs for securing anchor to sides of studs. Provide one of the following:

a) Welded type.

b) Lock-in snap-in type.

5) Anchors for frames set in prepared openings:

a) Steel pipe spacers 6 mm (1/4 inch) inside diameter, welded to plate reinforcing at jamb stops, or hat shaped formed strap spacers 50 mm (2 inches) wide, welded to jamb near stop.

b) Drill jamb stop and strap spacers for 6 mm (1/4 inch) flat head bolts to pass through frame and spacers.

c) Two piece frames: Subframe or rough buck drilled for 6 mm (1/4 inch) bolts.

6) Anchors for observation windows and other continuous frames set in stud partitions.

a) Weld clip anchors to sills and heads of continuous frames over 1200 mm (4 feet) long.

b) Space maximum 600 mm (24 inches) on centers.

7) Modify frame anchors to fit special frame and wall construction.

8) Provide special anchors where shown on drawings and where required to suit application.

F. Sound Rated Door Frames:

1. Seals: Integral continuous gaskets on frames.

G. Louver Fabrication:

1. Fabricate louvers as complete units.
2. Weld stationary blades to frames.
3. Factory install louvers in door cutouts, welded to door.

H. Louver Screen Fabrication:

1. Fabricate frame to hold wire fabric in channel with retaining bar anchor and to mount on surface of door with screws.
2. Do not lap frame over louver opening.
3. Miter frame corners and join by concealed mechanical fastenings extending about 57 mm (2-1/4 inches) into ends of each member.
4. Drill frame and doors for screw attachment:

5. Space screws 50 mm (2 inches) from end of each leg of frame and maximum 300 mm (12 inches) on center.
6. Insect Screens: Fasten insect screens to interior side of doors with retaining bar against door and not exposed to view.
7. Wire Guards: Fasten wire guard to exterior side of door with retaining bar against door and not exposed to view.

2.6 FINISHES

A. Steel: ANSI A250.8; shop primed.
B. Stainless Steel: NAAMM AMP 500; No. 4 polished finish.
   1. Blend welds to match adjacent finish.
C. Finish exposed surfaces after fabrication.
D. Aluminum Anodized Finish: NAAMM AMP 500.
   1. Clear Anodized Finish: AA-C22A41; Class I Architectural, 0.018 mm (0.7 mil) thick.
   2. Color Anodized Finish: AA-C22A42 or AA-C22A44; Class I Architectural, 0.018 mm (0.7 mil) thick.
   3. Clear Anodized Finish: AA-C22A31; Class II Architectural, 0.01 mm (0.4 mil) thick.
   4. Color Anodized Finish: AA-C22A32 or AA-C22A34; Class II Architectural, 0.01 mm (0.4 mil) thick.

2.7 ACCESSORIES

A. Primers: ANSI A250.8.
B. Barrier Coating: ASTM D1187/D1187M.
C. Welding Materials: AWS D1.1/D1.1M, type to suit application.
D. Clips Connecting Members and Sleeves: Match door faces.
E. Fasteners: Galvanized steel.
   1. Metal Framing: Steel drill screws.
   2. Masonry and Concrete: Expansion bolts and power actuated drive pins.
F. Anchors:Galvanized steel .
G. Galvanizing Repair Paint: MPI No. 18.
H. Insulation: Unfaced mineral wool.

PART 3 - EXECUTION

3.1 PREPARATION

A. Examine and verify substrate suitability for product installation.
B. Protect existing construction and completed work from damage.
C. Apply barrier coating to metal surfaces in contact with cementitious materials to minimum 0.7 mm (30 mils) dry film thickness.

3.2 INSTALLATION - GENERAL

A. Install products according to manufacturer's instructions and approved submittal drawings.
   1. When manufacturer's instructions deviate from specifications, submit proposed resolution for Contracting Officer's Representative consideration.
   2. Install fire doors and frames according to NFPA 80.
   3. Install smoke control doors and frames according to NFPA 105.

3.3 FRAME INSTALLATION

A. Apply barrier coating to concealed surfaces of frames built into masonry.
B. Plumb, align, and brace frames until permanent anchors are set.
   1. Use triangular bracing near each corner on both sides of frames with temporary wood spreaders at midpoint.
   2. Use wood spreaders at bottom of frame when shipping spreader is removed.
   3. Where construction permits concealment, leave shipping spreaders in place after installation, otherwise remove spreaders when frames are set and anchored.
   4. Remove wood spreaders and braces when walls are built and jamb anchors are secured.
C. Floor Anchors:
   1. Anchor frame jambs to floor with two expansion bolts.
      a. Lead Lined Frames: Use 9 mm (3/8 inch) diameter bolts.
      b. Other Frames: Use 6 mm (1/4 inch) diameter bolts.
   2. Power actuated drive pins are acceptable to secure frame anchors to concrete floors.
D. Jamb Anchors:
   1. Masonry Walls:
      a. Embed anchors in mortar.
      b. Fill space between frame and masonry with grout or mortar as walls are built.
   2. Metal Framed Walls: Secure anchors to sides of studs with two fasteners through anchor tabs.
   3. Prepared Masonry and Concrete Openings:
      a. Direct Securement: 6 mm (1/4 inch) diameter expansion bolts through spacers.
      b. Subframe or Rough Buck Securement:

1) 6 mm (1/4 inch) diameter expansion bolts on 600 mm (24 inch) centers.
2) Power activated drive pins on 600 mm (24 inches) centers.

c. Secure two-piece frames to subframe or rough buck with machine screws on both faces.

E. Frames for Sound Rated Doors: Fill frames with insulation.

F. Touch up damaged factory finishes.

1. Repair galvanized surfaces with galvanized repair paint.
2. Repair painted surfaces with touch up primer.

3.4 DOOR INSTALLATION

A. Install doors plumb and level.

B. Adjust doors for smooth operation.

C. Touch up damaged factory finishes.

1. Repair galvanized surfaces with galvanized repair paint.
2. Repair painted surfaces with touch up primer.

3.5 CLEANING

A. Clean exposed door and frame surfaces. Remove contaminants and stains.

3.6 PROTECTION

A. Protect doors and frames from construction operations.

B. Remove protective materials immediately before acceptance.

C. Repair damage.

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