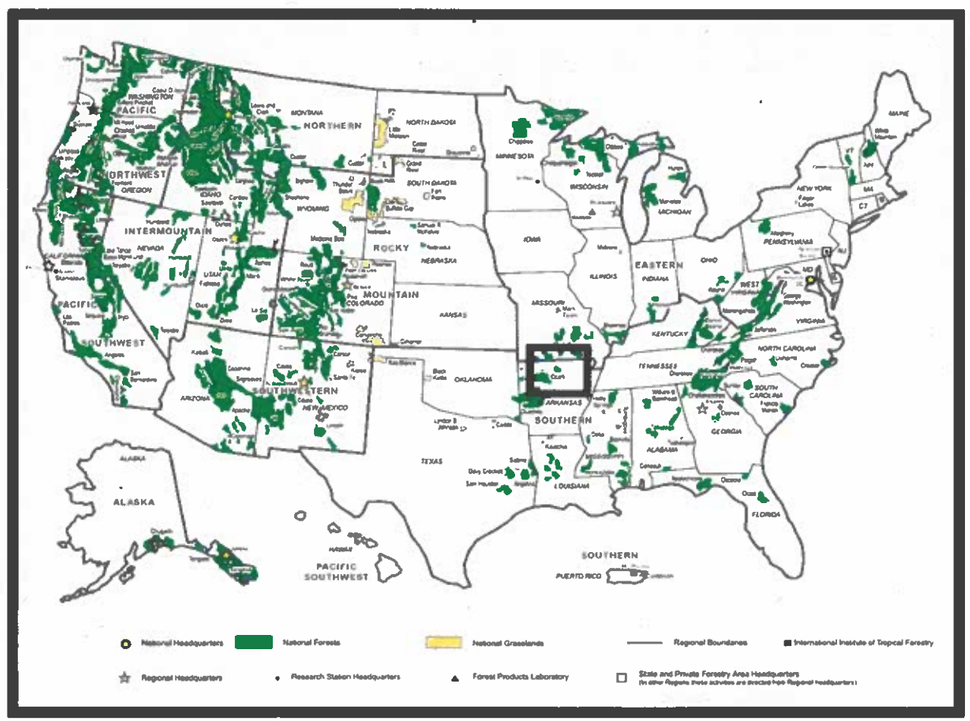
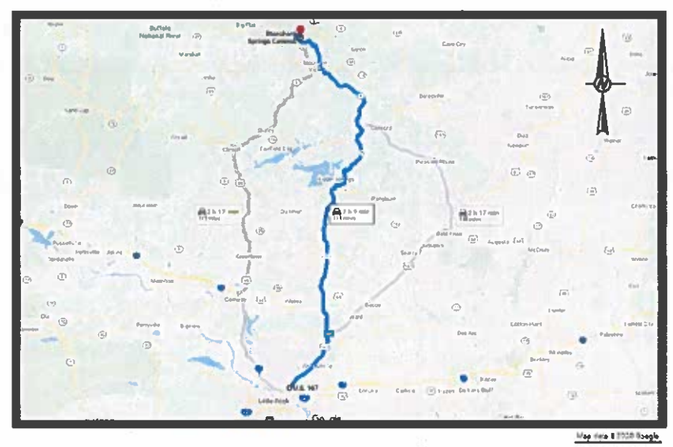
United States Department of Agriculture
Forest Service

ARKANSAS
UNITED STATES OF AMERICA
(R08) SOUTHERN REGION
OZARK-ST. FRANCIS NATIONAL FOREST
SYLAMORE RANGER DISTRICT

BLANCHARD SPRINGS CAVERNS TUNNEL REHABILITATION



FOREST LOCATION



VICINITY MAP

TRAVEL DIRECTIONS:

FROM LITTLE ROCK ARKANSAS TAKE U.S. HWY 167 NORTH, THEN TAKE EXIT 16B TO MERGE ONTO ARKANSAS HWY 5 NORTH. FOLLOW ARKANSAS HWY 5 FOR 86.2 MILES TO ALLISON, ARKANSAS AND TURN LEFT ONTO ARKANSAS HWY 14 WEST FOR 6.6 MILES. TURN RIGHT ONTO BLANCHARD ROAD (COUNTY ROAD 54) FOR 1.6 MILES, THEN TAKE ANOTHER RIGHT ONTO FOREST ROAD 1110-A AND ARRIVE AT THE BLANCHARD SPRINGS CAVERNS AFTER 0.4 MILES.

ISSUED FOR BID

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 16376
MARK N. HADDOCK
5/21/21

Sheet List Table

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C-06	DRIPSTONE CAVE ENTRANCE OUTER AIRLOCK DOORS	03/30/2021
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C-11	DRIPSTONE CAVE EXIT SECURITY DOORS	03/30/2021
C-12	DISCOVERY CAVE EXIT INNER AIRLOCK DOORS	03/30/2021
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C-14	DISCOVERY CAVE EXIT SECURITY DOORS	03/30/2021
C-15	SINKHOLE INFILL DETAIL	03/30/2021

RECOMMENDED BY:

SAMMIE MCDOWELL Digitally signed by SAMMIE MCDOWELL Date: 2026.04.23 16:07:22 -05'00'

FOREST ENGINEER MARY WIMBERLY Digitally signed by MARY WIMBERLY Date: 2026.04.27 15:23:42 -05'00' DATE

DISTRICT RANGER ROBERT MCBROOME Digitally signed by ROBERT MCBROOME Date: 2026.04.27 14:25:51 -05'00' DATE

FOREST SUPERVISOR DATE

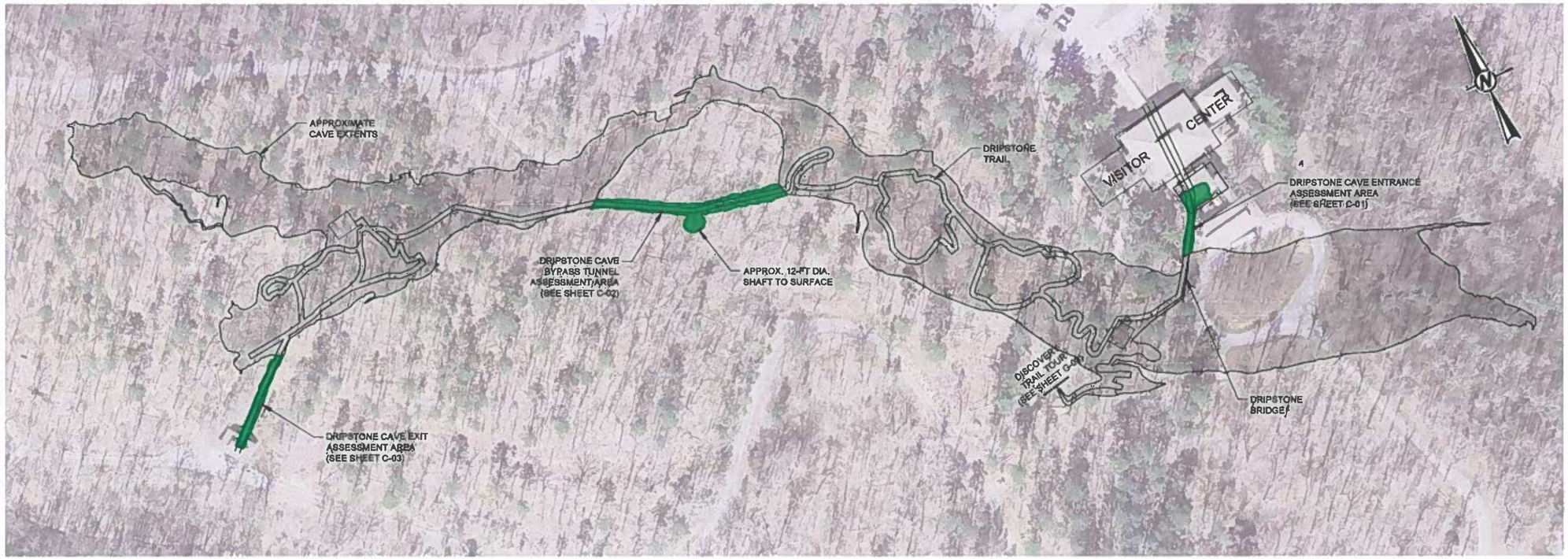
RO FACILITIES PROGRAM MANAGER DATE

APPROVED:

JONATHAN HEYL Digitally signed by JONATHAN HEYL Date: 2026.05.01 10:35:59 -05'00'

DIRECTOR OF ENGINEERING DATE

3/26/21 12:24 MLACOSTE C:\USERS\MLACOSTE\GOLDER ASSOCIATES\11912916\RPA BLANCHARD CAVERNS ASSESSMENT - 3 TECHNICAL WORK\DRAFTING\16% DRAWING\ENGINEAUX FOREST SERVICE COVER SHEET.DWG;



LEGEND

ASSESSMENT AREA

TRAIL

REFERENCE(S)

1. DRIPSTONE CAVE UNDERGROUND EXTENT AND TRAIL NETWORK ADAPTED FROM DRIPSTONE TRAIL TOUR MAP PROVIDED BY THE FOREST SERVICE.
2. AERIAL IMAGERY FROM GOOGLE EARTH PROFESSIONAL, DATED MARCH 15, 2016.

0 80 160
1" = 80' FEET

ISSUED FOR BID

USDA

United States Department of Agriculture
Forest Service

(R08)
SOUTHERN REGION

STAMPS, LOGOS, AND SEALS

GOLDER

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 18378 MARK N. HADDOCK 3/30/21

NO.	REVISION / ISSUE	DATE
D	ISSUED FOR BID	03/30/21
C	ISSUED FOR 95% REVIEW	02/12/21
B	ISSUED FOR 90% REVIEW	10/16/20
A	ISSUED FOR 50% REVIEW	07/31/20

PROJECT NAME

BLANCHARD SPRINGS CAVERNS TUNNEL REHABILITATION

OZARK-ST. FRANCIS NATIONAL FOREST

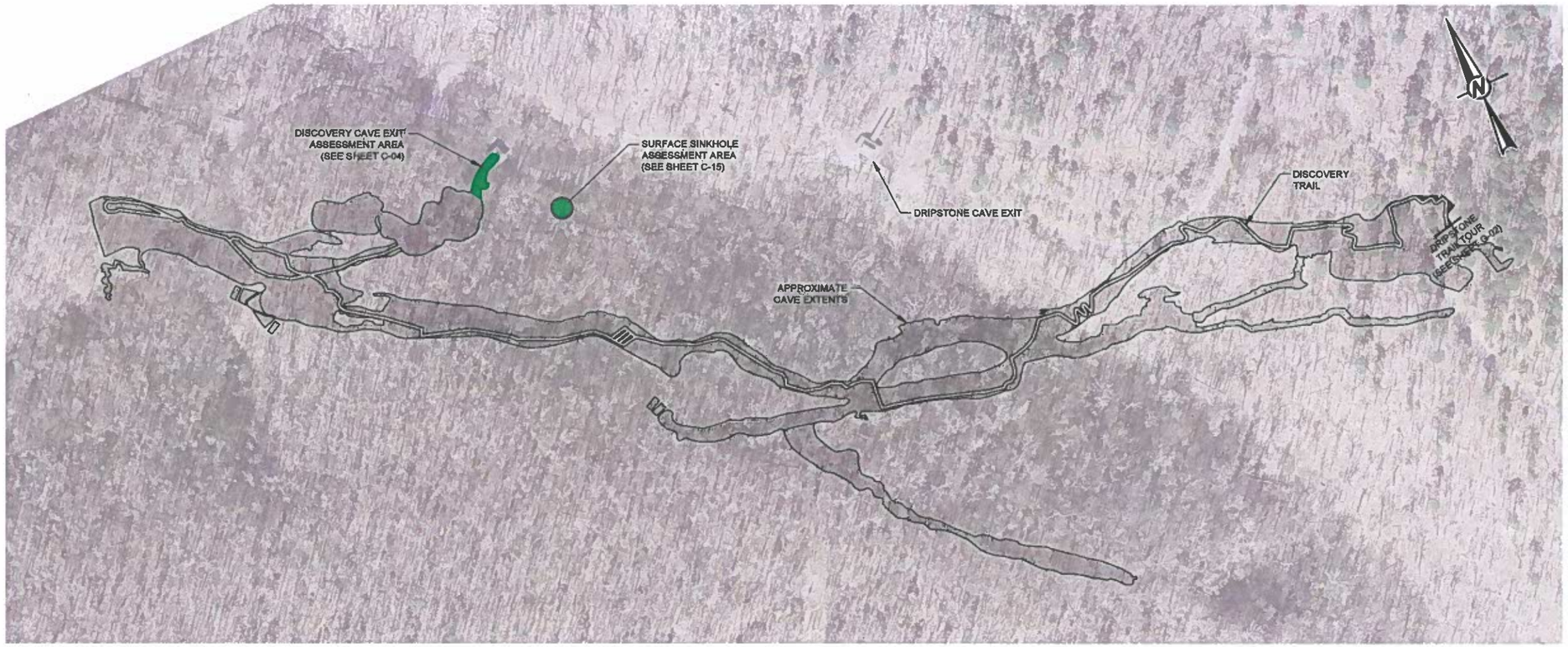
SYLAMORE RANGER DISTRICT

DRAWING TITLE

G-02 DRIPSTONE CAVE PLAN MAP

DATE 03/30/21	ARCHIVE NO.
DESIGNER N.OMR	DRAWING SHEET NO. G-02
DRAWN M.LAC	
CHECKED M.DRE/M.HAD	
PROJECT NO. 19129310	SHEET 2 OF 18

3/30/21 12:34 MLACOSTE C:\USERS\MLACOSTE\GOLDER ASSOCIATES\19129310.DPA BLANCHARD CAVERNS ASSESSMENT - 3 TECHNICAL WORK\DRAFTING\19PN DRAWING\DGN\GENERAL PLAN MAP\LDWG;



LEGEND

ASSESSMENT AREA

TRAIL

REFERENCE(S)

1. DISCOVERY CAVE UNDERGROUND EXTENT AND TRAIL NETWORK ADAPTED FROM DISCOVERY TRAIL TOUR MAP PROVIDED BY THE FOREST SERVICE.
2. AERIAL IMAGERY FROM GOOGLE EARTH PROFESSIONAL, DATED MARCH 15, 2016.

0 120 240
1" = 120' FEET

ISSUED FOR BID

USDA FOREST SERVICE

United States Department of Agriculture
Forest Service

(R08)
SOUTHERN REGION

STAMPS, LOGOS, AND SEALS

GOLDER

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 16376 MARK N. HADDOCK 3/30/21

NO.	REVISION / ISSUE	DATE
D	ISSUED FOR BID	03/30/21
C	ISSUED FOR 95% REVIEW	02/12/21
B	ISSUED FOR 90% REVIEW	10/16/20
A	ISSUED FOR 50% REVIEW	07/31/20

PROJECT NAME

BLANCHARD SPRINGS CAVERNS TUNNEL REHABILITATION

OZARK-ST. FRANCIS NATIONAL FOREST

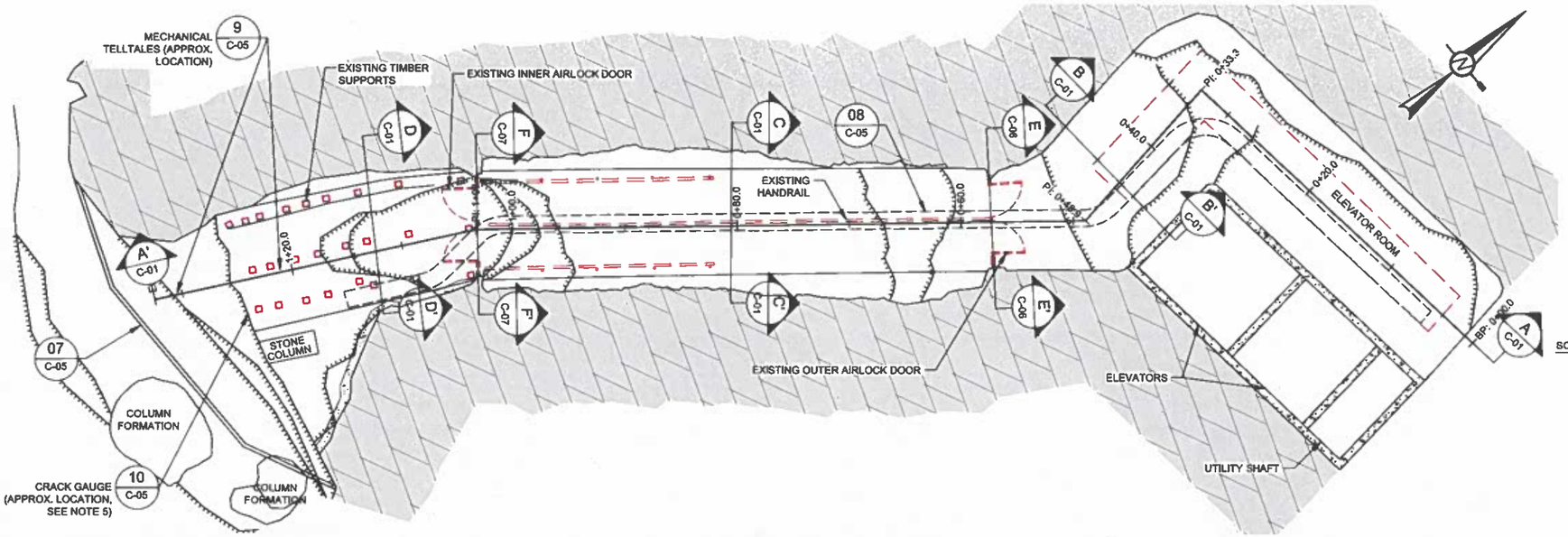
SYLAMORE RANGER DISTRICT

DRAWING TITLE

G-03 DISCOVERY CAVE PLAN MAP

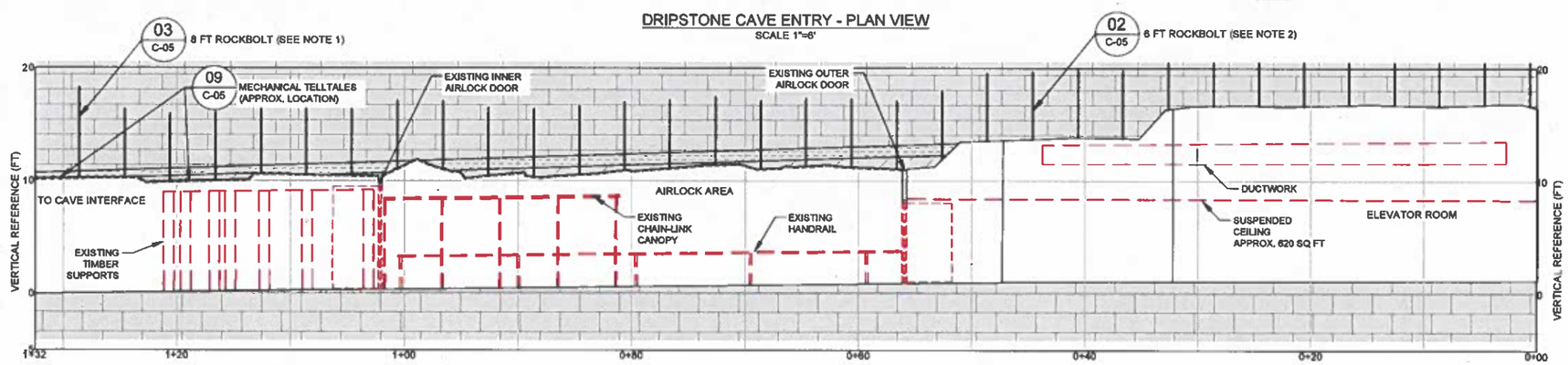
DATE 03/30/21	ARCHIVE NO.
DESIGNER N.OMR	DRAWING SHEET NO. G-03
DRAWN M.LAC	
CHECKED M.DRE/M.HAD	
PROJECT NO. 19129310	SHEET 3 OF 16

3/30/21 12:34 M.LACOSTE C:\USERS\M.LACOSTE\GOLDER ASSOCIATES\19129310\FA BLANCHARD CAVERNS ASSESSMENT - 5 TECHNICAL WORK\DRAFTING\19FA DRAWINGS\DISCHEMALPLAN MAP2.DWG:

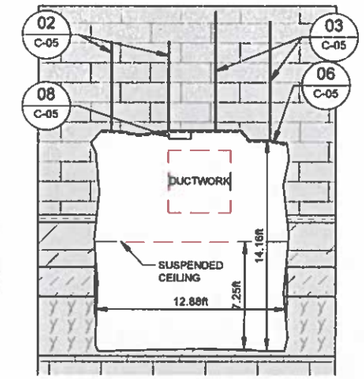


DRIPSTONE CAVE ENTRY - PLAN VIEW

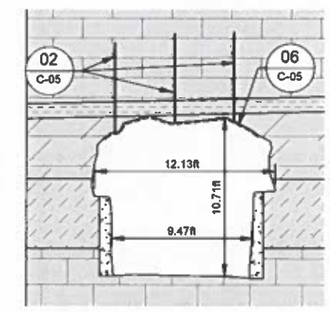
SCALE 1"=6'



SCALE 1"=6' A-A' C-01 **DRIPSTONE CAVE ENTRY - PROFILE VIEW**
LOOKING NORTHWEST



SCALE 1"=5' B-B' C-01 **DRIPSTONE CAVE ENTRANCE SECTION**
LOOKING NORTH



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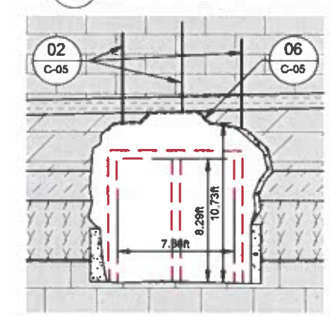
LOOKING NORTHEAST



SCALE 1"=5' D-D' C-01 **DRIPSTONE CAVE ENTRANCE SECTION**
LOOKING NORTHEAST

USDA FOREST SERVICE

United States Department of Agriculture
Forest Service

(R08)
SOUTHERN REGION

STAMPS, LOGOS, AND SEALS

GOLDER

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 16376 MARK N. HADDOCK 3/30/21

NO.	REVISION / ISSUE	DATE
D	ISSUED FOR BID	03/30/21
C	ISSUED FOR 95% REVIEW	02/12/21
B	ISSUED FOR 90% REVIEW	10/16/20
A	ISSUED FOR 50% REVIEW	07/31/20

PROJECT NAME

BLANCHARD SPRINGS CAVERNS TUNNEL REHABILITATION

OZARK-ST. FRANCIS NATIONAL FOREST

SYLAMORE RANGER DISTRICT

DRAWING TITLE

C-01 DRIPSTONE CAVE ENTRANCE PLAN AND SECTIONS

DATE 03/30/21	ARCHIVE NO.
DESIGNER N.OMR	DRAWING SHEET NO. C-01
DRAWN M.LAC	
CHECKED M.DRE/M.HAD	
PROJECT NO. 19129310	SHEET 4 OF 18

NOTE(S)

1. FIRST TWO ROWS OF ROCKBOLTS SURROUNDING ELEVATORS AND AT CAVERN INTERFACE SHALL BE 8FT-LONG, #5 FULLY RESIN GROUTED THREADED REBAR ROCKBOLTS ON MAX 4FT CENTERS.
2. REMAINING ROCKBOLTS SHALL BE 6FT-LONG, #5 FULLY RESIN GROUTED THREADED REBAR ROCKBOLTS ON MAX 4FT CENTERS.
3. 4-IN THICK FIBER REINFORCED SHOTCRETE WITH 1-IN THICK SMOOTHING SHOTCRETE (5-IN TOTAL) SHALL BE APPLIED BETWEEN INNER AIRLOCK DOOR AND INTERFACE ON THE SOUTHEAST WALL.
4. LOCATION AND THICKNESS OF GEOLOGIC UNITS SHOWN ARE APPROXIMATE AND IS BASED ON UNDERGROUND OBSERVATIONS.
5. INSTALL CRACK GAUGE MONITOR DEVICES ACROSS EXPOSED BEDDING PLANES AT CAVERN INTERFACE.

REFERENCE(S)

EXISTING CAVERNS SURVEY COMPLETED BY THE CENTER OF ADVANCED SPATIAL TECHNOLOGIES (CAST) AND PROVIDED BY NATIONAL FORESTS.

LEGEND

- BOONE LIMESTONE (FM)
- UPPER ST JOE (MBR)
- LOWER ST JOE (MBR)
- CHATTANOOGA SHALE (FM)
- LAFFERTY LIMESTONE (MBR)
- FERNVALE LIMESTONE (FM)
- ITEMS TO BE REMOVED
- HIGH SIDE / LOW SIDE LEDGE IN ROOF
- GEOSYNTHETIC MESH

KEY MAP

A / C-01 — SECTION NUMBER / SECTION VIEW DRAWING NUMBER

01 / C-01 — DETAIL CALLOUT NUMBER / SECTION VIEW DRAWING NUMBER

1+50' — STATION NUMBER (FEET)

DRIPSTONE CAVE ENTRANCE

CAVERN WORK AREA	ROCKBOLT CEILING AREA (SQ FT)	ESTIMATED QUANTITY OF 6 FT ROCKBOLTS	ESTIMATED QUANTITY OF 8 FT ROCKBOLTS
ELEVATOR ROOM	620	27	20
AIRLOCK AREA	552	42	0
AIRLOCK TO CAVE INTERFACE	330	18	7

ABBREVIATIONS

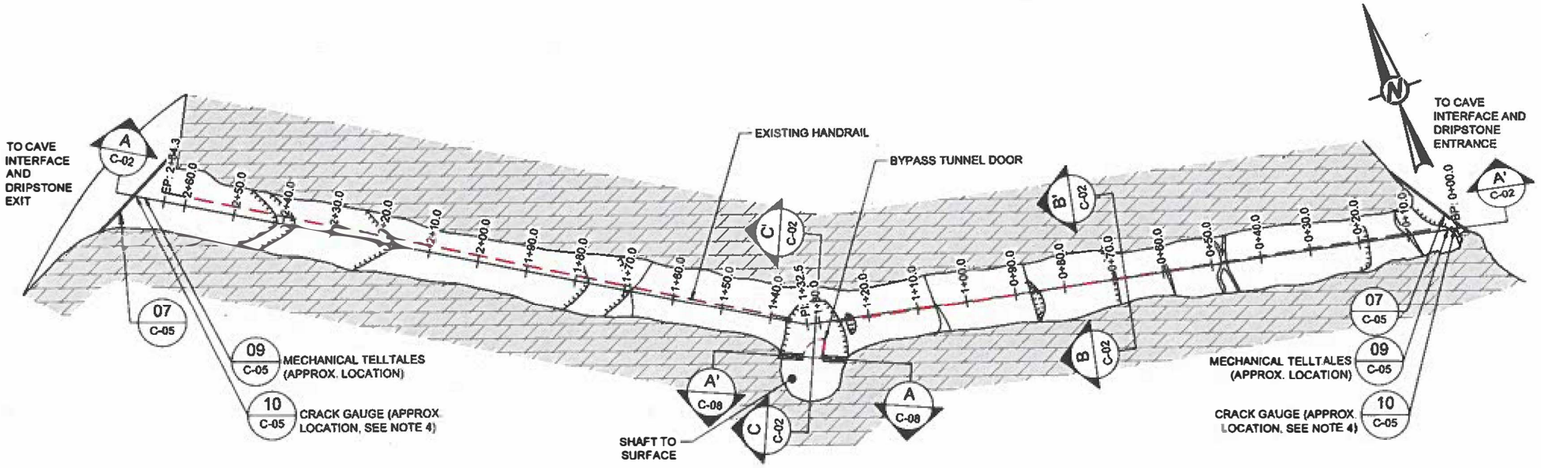
APPROX	APPROXIMATE
DIA	DIAMETER
MIN	MINIMUM
MAX	MAXIMUM
REF	REFERENCE
TYP	TYPICAL
BP	STATION BEGINING POINT
EP	STATION END POINT
FT	FEET
IN	INCH
FM	FORMATION
MBR	MEMBER
FRP	FIBER REINFORCED PLASTIC

0 6 12 — 1" = 6' FEET

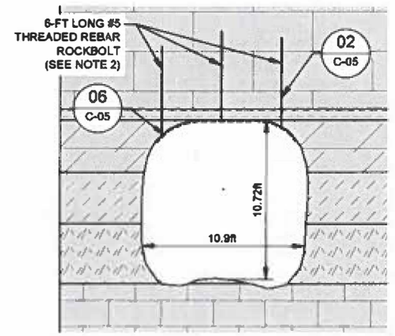
0 5 10 — 1" = 5' FEET

ISSUED FOR BID

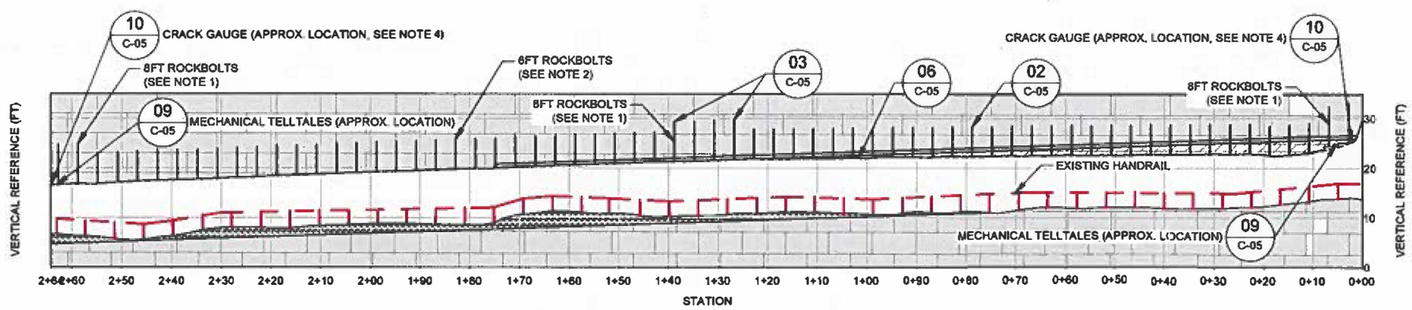
3/30/21 12:35 MLACORTE C:\USERS\MLACORTE\GOLDER ASSOCIATES\19129310_FOA BLANCHARD CAVERNS ASSESSMENT - 3 TECHNICAL WORK\DRAFTING\19129 DRAWINGS\GEOTECH\C-ALL\DRIPSTONE ENTRANCE.DWG;



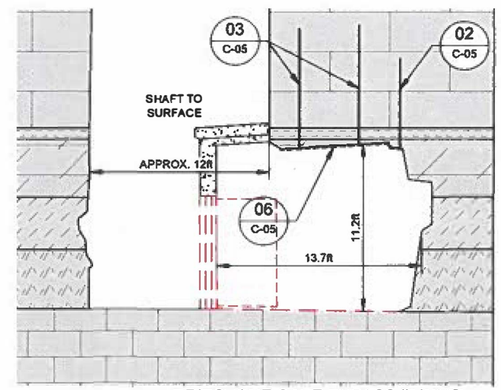
DRIPSTONE CAVE BYPASS - PLAN VIEW
SCALE 1"=15'



SCALE 1"=5' B-B' C-02 DRIPSTONE CAVE BYPASS TUNNEL SHORT SECTION
LOOKING NORTHWEST



SCALE 1"=15' A-A' C-02 DRIPSTONE CAVE BYPASS - PROFILE VIEW
LOOKING NORTHEAST



SCALE 1"=5' C-C' C-02 DRIPSTONE CAVE BYPASS TUNNEL SHORT SECTION
LOOKING NORTHWEST

DRIPSTONE CAVE BYPASS TUNNEL			
CAVERN WORK AREA	ROCKBOLT CEILING AREA (SQ FT)	ESTIMATED QUANTITY OF 6 FT ROCKBOLTS	ESTIMATED QUANTITY OF 8 FT ROCKBOLTS
BYPASS TUNNEL	3013	220	28

0 15 30
1" = 15' FEET
0 5 10
1" = 5' FEET

ISSUED FOR BID

NOTE(S)

1. FIRST TWO ROWS OF ROCKBOLTS AT ENTRANCE AND EXIT TO DRIPSTONE CAVE BYPASS TUNNEL, AS WELL AS ADJACENT SHAFT TO SURFACE, SHALL BE 8FT-LONG, #5 FULLY RESIN GROUTED THREADED REBAR ROCKBOLTS ON MAX 4FT CENTERS.
2. REMAINING ROCKBOLTS SHALL BE 6FT-LONG, #5 FULLY RESIN GROUTED THREADED REBAR ROCKBOLTS ON MAX 4FT CENTERS.
3. LOCATION AND THICKNESS OF GEOLOGIC UNITS SHOWN ARE APPROXIMATE AND IS BASED ON UNDERGROUND OBSERVATIONS.
4. INSTALL CRACK GAUGE MONITOR DEVICES ACROSS EXPOSED BEDDING PLANES AT CAVERN INTERFACE.

REFERENCE(S)

EXISTING CAVERNS SURVEY COMPLETED BY THE CENTER OF ADVANCED SPATIAL TECHNOLOGIES (CAST) AND PROVIDED BY NATIONAL FORESTS.

LEGEND

- BOONE LIMESTONE (FM)
- UPPER ST JOE (MBR)
- LOWER ST JOE (MBR)
- CHATTANOOGA SHALE (FM)
- LAFFERTY LIMESTONE (MBR)
- FERNVALE LIMESTONE (FM)
- ITEMS TO BE REMOVED
- HIGH SIDE / LOW SIDE LEDGE IN ROOF
- GEOSYNTHETIC MESH

KEY MAP

- A / C-01 — SECTION NUMBER / SECTION VIEW DRAWING NUMBER
- 1+50' — STATION NUMBER (FEET)
- 01 / C-01 — DETAIL CALLOUT NUMBER / SECTION VIEW DRAWING NUMBER

ABBREVIATIONS	
APPROX	APPROXIMATE
DIA	DIAMETER
MIN	MINIMUM
MAX	MAXIMUM
REF	REFERENCE
TYP	TYPICAL
BP	STATION BEGINING POINT
EP	STATION END POINT
FT	FEET
IN	INCH
FM	FORMATION
MBR	MEMBER
FRP	FIBER REINFORCED PLASTIC

USDA FOREST SERVICE
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STAMPS, LOGOS, AND SEALS

GOLDER

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 16378 MARK N. HADDOCK 3/30/21

NO.	REVISION / ISSUE	DATE
D	ISSUED FOR BID	03/30/21
C	ISSUED FOR 95% REVIEW	02/12/21
B	ISSUED FOR 90% REVIEW	10/16/20
A	ISSUED FOR 50% REVIEW	07/31/20

PROJECT NAME

BLANCHARD SPRINGS CAVERNS TUNNEL REHABILITATION

OZARK-ST. FRANCIS NATIONAL FOREST

SYLAMORE RANGER DISTRICT

DRAWING TITLE

C-02 DRIPSTONE CAVE BYPASS TUNNEL PLAN AND SECTIONS

DATE 03/30/21	ARCHIVE NO.
DESIGNER N.OMR	DRAWING SHEET NO. C-02
DRAWN M.LAC	
CHECKED M.DRE/M.HAD	
PROJECT NO. 19129310	SHEET 5 OF 18

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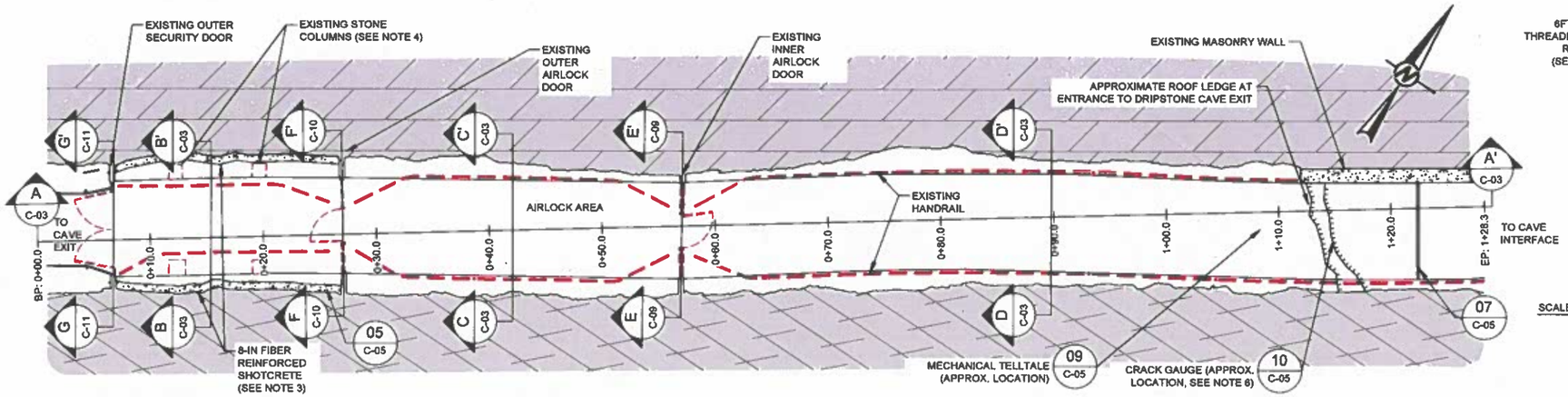
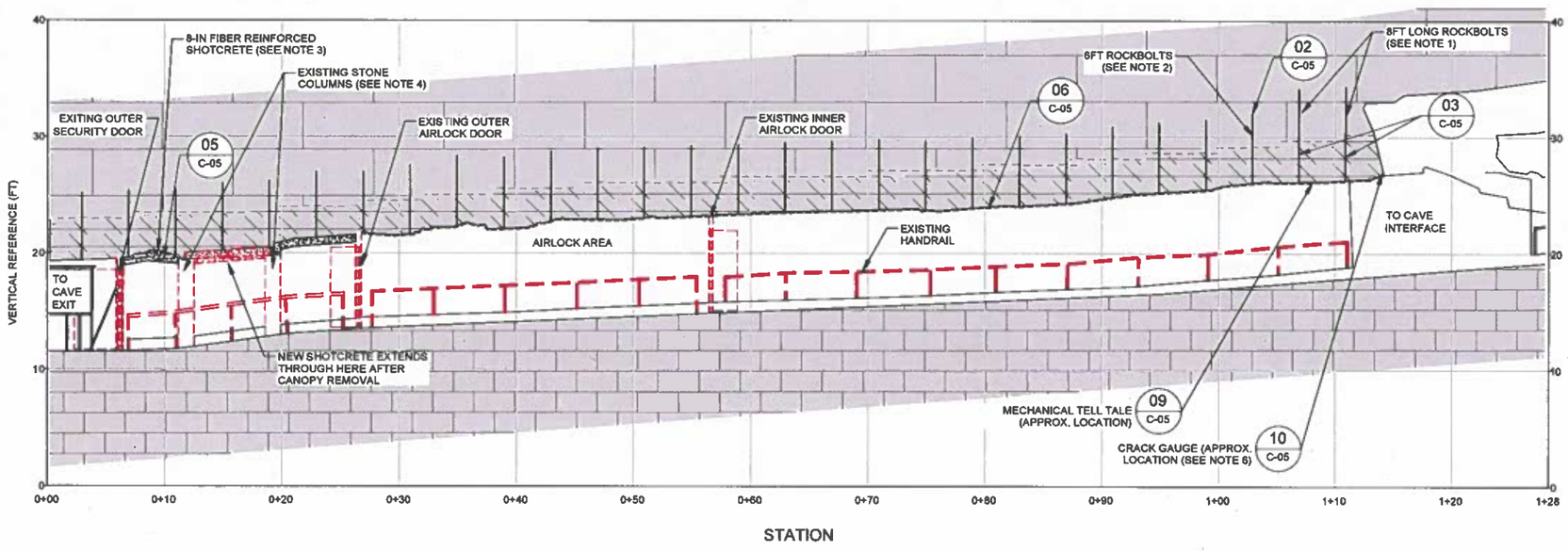
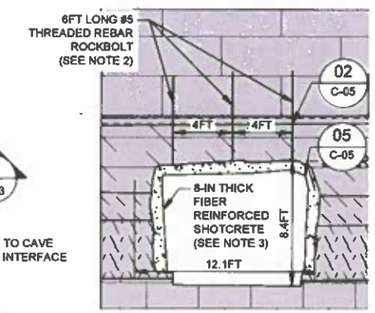


DRIPSTONE CAVE EXIT - PLAN VIEW

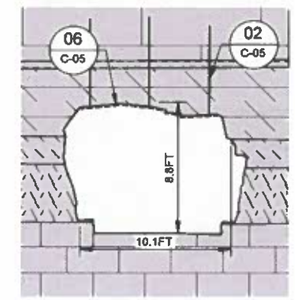
SCALE 1"=6'



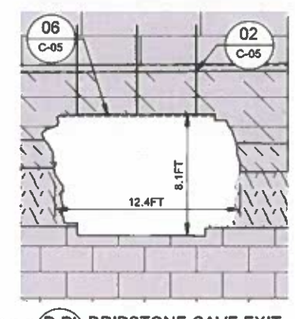
SCALE 1"=6' A-A' C-03 DRIPSTONE CAVE EXIT - PROFILE VIEW
LOOKING NORTHWEST



SCALE 1"=5' B-B' C-03 DRIPSTONE CAVE EXIT - SECTION
LOOKING SOUTHWEST



SCALE 1"=5' C-C' C-03 DRIPSTONE CAVE EXIT - SECTION
LOOKING SOUTHWEST



SCALE 1"=5' D-D' C-03 DRIPSTONE CAVE EXIT - SECTION
LOOKING SOUTHWEST

NOTE(S)

1. FIRST TWO ROWS OF ROCKBOLTS AT ENTRANCE TO DRIPSTONE CAVE EXIT TUNNEL SHALL BE 8FT-LONG, #5 FULLY RESIN GROUTED THREADED REBAR ROCKBOLTS ON MAX 4FT CENTERS.
2. REMAINING ROCKBOLTS SHALL BE 6FT-LONG, #5 FULLY RESIN GROUTED THREADED REBAR ROCKBOLTS ON MAX 4FT CENTERS.
3. 7-IN THICK FIBER REINFORCED SHOTCRETE WITH 1-IN THICK SMOOTHING SHOTCRETE (8-IN TOTAL) SHALL BE APPLIED BETWEEN EXISTING OUTER AIRLOCK DOOR AND EXISTING OUTER SECURITY DOOR ON THE CEILING AND WALLS (APPROX. 700 SQUARE FEET).
4. EXISTING STONE COLUMNS AND BEAM STRUCTURE - TO BE DEMOLISHED BEFORE SHOTCRETE APPLICATION.
5. LOCATION AND THICKNESS OF GEOLOGIC UNITS SHOWN ARE APPROXIMATE AND IS BASED ON UNDERGROUND OBSERVATIONS.
6. INSTALL CRACK GAUGE MONITOR DEVICES ACROSS EXPOSED BEDDING PLANES AT CAVERN INTERFACE.

REFERENCE(S)

EXISTING CAVERNS SURVEY COMPLETED BY THE CENTER OF ADVANCED SPATIAL TECHNOLOGIES (CAST) AND PROVIDED BY FOREST SERVICE.

LEGEND

- BOONE LIMESTONE (FM)
- UPPER ST JOE (MBR)
- LOWER ST JOE (MBR)
- CHATTANOOGA SHALE (FM)
- GEOSYNTHETIC MESH
- SHOTCRETE
- LAFFERTY LIMESTONE (MBR)
- FERNVALE LIMESTONE (FM)
- ITEMS TO BE REMOVED
- HIGH SIDE / LOW SIDE — LEDGE IN ROOF

KEY MAP

- A / C-01 — SECTION NUMBER / SECTION VIEW DRAWING NUMBER
- 1+50' — STATION NUMBER (FEET)
- 01 / C-01 — DETAIL CALLOUT NUMBER / SECTION VIEW DRAWING NUMBER

ABBREVIATIONS

APPROX	APPROXIMATE
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MAX	MAXIMUM
REF	REFERENCE
TYP	TYPICAL
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EP	STATION END POINT
FT	FEET
IN	INCH
FM	FORMATION
MBR	MEMBER
FRP	FIBER REINFORCED PLASTIC

DRIPSTONE CAVE EXIT

CAVERN WORK AREA	ROCKBOLT CEILING AREA (SQ FT)	ESTIMATED QUANTITY OF 6 FT ROCKBOLTS	ESTIMATED QUANTITY OF 8 FT ROCKBOLTS
CAVE TO INNER AIRLOCK DOOR	594	38	7
AIRLOCK AREA	330	24	0
OUTER AIRLOCK DOOR TO SECURITY DOOR	240	18	0
SECURITY DOOR TO CAVE EXIT	220	15	0

0 6 12 — 1" = 6' FEET
0 6 12 — 1" = 6' FEET

ISSUED FOR BID

USDA FOREST SERVICE
United States Department of Agriculture
Forest Service
(R08)
SOUTHERN REGION

STAMPS, LOGOS, AND SEALS

GOLDER

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 18378 MARK N. HADDOCK 9/20/21

NO.	REVISION / ISSUE	DATE
D	ISSUED FOR BID	03/30/21
C	ISSUED FOR 99% REVIEW	02/12/21
B	ISSUED FOR 90% REVIEW	10/16/20
A	ISSUED FOR 50% REVIEW	07/31/20

PROJECT NAME

BLANCHARD SPRINGS CAVERNS TUNNEL REHABILITATION

OZARK-ST. FRANCIS NATIONAL FOREST

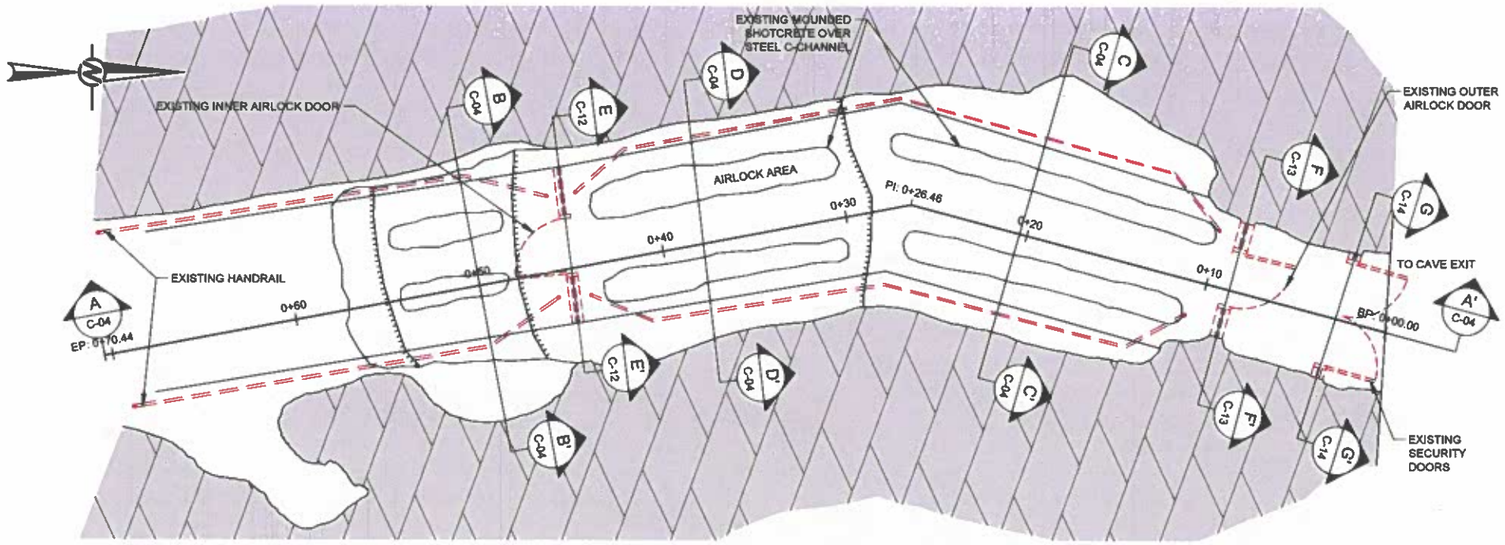
SYLAMORE RANGER DISTRICT

DRAWING TITLE

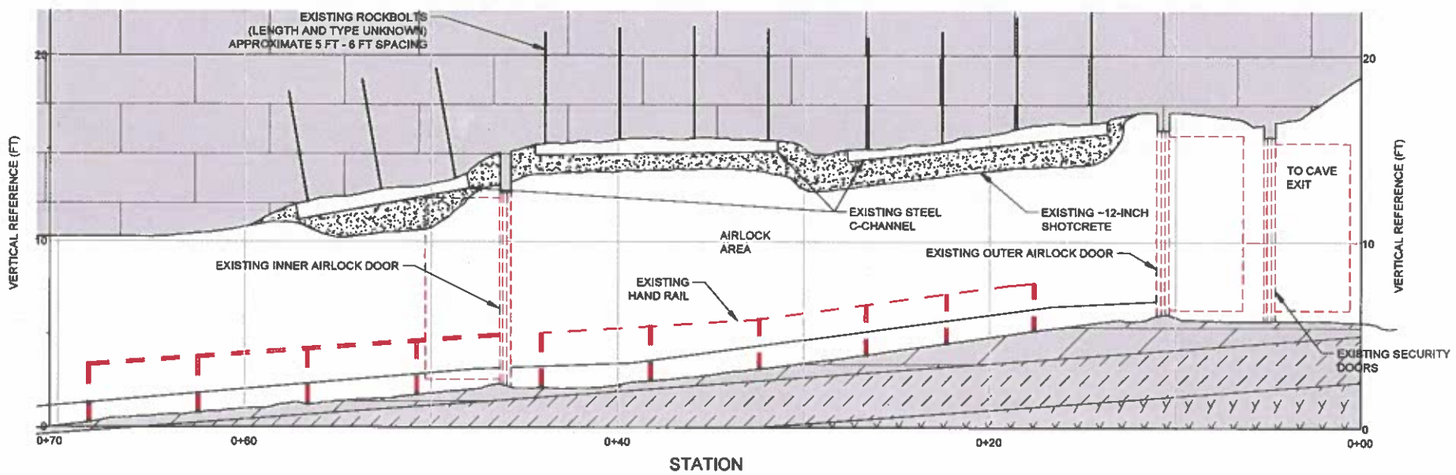
C-03 DRIPSTONE CAVE EXIT PLAN AND SECTIONS

DATE 03/30/21	ARCHIVE NO.
DESIGNER N.OMR	DRAWING SHEET NO. C-03
DRAWN M.LAC	
CHECKED M.DRE/M.HAD	
PROJECT NO. 19129310	SHEET 6 OF 18

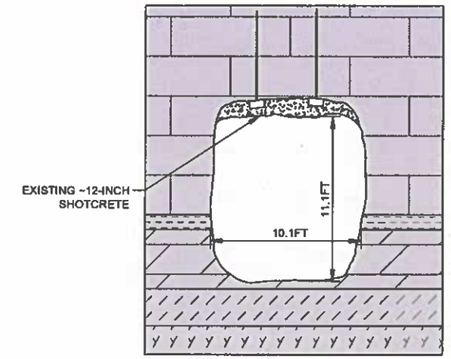
3/30/21 12:57 MLACOSTE C:\NRESWBLA\COSTEGOLDER.ASSOCIATES\19129310\APA BLANCHARD CAVERNS ASSESSMENT - 5 TECHNICAL WORK\DRAFTING\19% DRAWINGS\GEOTECHNICAL\DRIPSTONE EXIT.DWG;



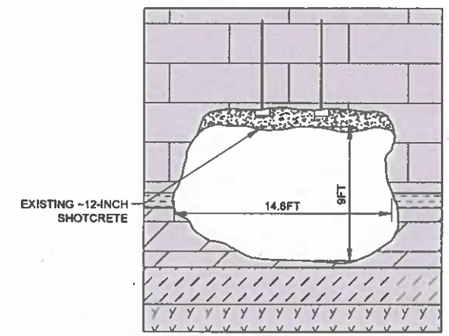
DISCOVERY CAVE EXIT - PLAN VIEW
SCALE 1"=4'



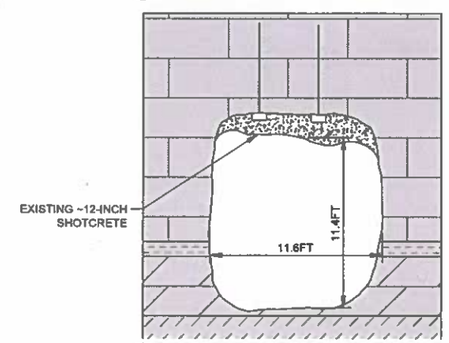
SCALE 1"=4' A-A' C-04 DISCOVERY CAVE EXIT - PROFILE VIEW
LOOKING WEST



SCALE 1"=5' B-B' C-04 DISCOVERY CAVE EXIT - SECTION
LOOKING NORTHEAST



SCALE 1"=5' C-C' C-04 DISCOVERY CAVE EXIT - SECTION
LOOKING NORTHEAST



SCALE 1"=5' D-D' C-04 DISCOVERY CAVE EXIT - SECTION
LOOKING NORTHWEST

NOTE(S)

1. GOLDER PROBE DRILLED THE EXISTING SHOTCRETE AND STEEL C-CHANEL GROUND SUPPORT DURING THE UNDERGROUND INSPECTION AT THE LOCATIONS SHOWN.
2. EXISTING SHOTCRETE APPEARED TO BE UP TO 12-INCHES THICK AND IN GOOD CONDITION.
3. DRAINAGE STRIPS WERE APPARENT ABOVE THE SHOTCRETE THAT DRAIN MOST WATER TO THE SIDEWALL.
4. TWO ROWS OF ROCKBOLTS OF UNKNOWN LENGTH ON 5 TO 6-FT CENTERS WERE INSTALLED THROUGH THE STEEL C-CHANNEL ABOVE THE SHOTCRETE.
5. LOCATION AND THICKNESS OF GEOLOGIC UNITS SHOWN ARE APPROXIMATE AND IS BASED ON UNDERGROUND OBSERVATIONS.

REFERENCE(S)

EXISTING CAVERNS SURVEY COMPLETED BY THE CENTER OF ADVANCED SPATIAL TECHNOLOGIES (CAST) AND PROVIDED BY NATIONAL FORESTS.

LEGEND

- BOONE LIMESTONE (FM)
- UPPER ST JOE (MBR)
- LOWER ST JOE (MBR)
- CHATTANOOGA SHALE (FM)
- LAFFERTY LIMESTONE (MBR)
- FERNVALE LIMESTONE (FM)
- ITEMS TO BE REMOVED
- HIGH SIDE LOW SIDE LEDGE IN ROOF
- GEOSYNTHETIC MESH

KEY MAP

A / C-01 — SECTION NUMBER / SECTION VIEW DRAWING NUMBER

01 / C-01 — SECTION NUMBER / SECTION VIEW DRAWING NUMBER

1+50' — STATION NUMBER (FT)

ABBREVIATIONS

APPROX	APPROXIMATE
DIA	DIAMETER
MIN	MINIMUM
MAX	MAXIMUM
REF	REFERENCE
TYP	TYPICAL
BP	STATION BEGINING POINT
EP	STATION END POINT
FT	FEET
IN	INCH
FM	FORMATION
MBR	MEMBER
FRP	FIBER REINFORCED PLASTIC

0 4 8 — 1" = 4' FEET

0 5 10 — 1" = 5' FEET

ISSUED FOR BID

USDA FOREST SERVICE

United States Department of Agriculture
Forest Service

(R08)
SOUTHERN REGION

STAMPS, LOGOS, AND SEALS

GOLDER

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 16376 MARK N. HADDOCK 3/30/21

NO.	REVISION / ISSUE	DATE
D	ISSUED FOR BID	03/30/21
C	ISSUED FOR 95% REVIEW	02/12/21
B	ISSUED FOR 90% REVIEW	10/16/20
A	ISSUED FOR 50% REVIEW	07/31/20

PROJECT NAME

BLANCHARD SPRINGS CAVERNS TUNNEL REHABILITATION

OZARK-ST. FRANCIS NATIONAL FOREST

SYLAMORE RANGER DISTRICT

DRAWING TITLE

C-04 DISCOVERY CAVE EXIT PLAN AND SECTIONS

DATE 03/30/21	ARCHIVE NO.
DESIGNER N.OMR	DRAWING SHEET NO. C-04
DRAWN M.LAC	
CHECKED M.DRE/M.HAD	
PROJECT NO. 19129310	SHEET 7 OF 18

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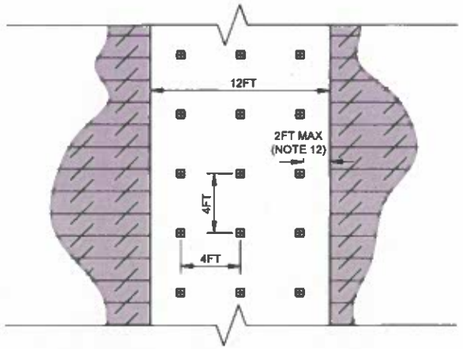
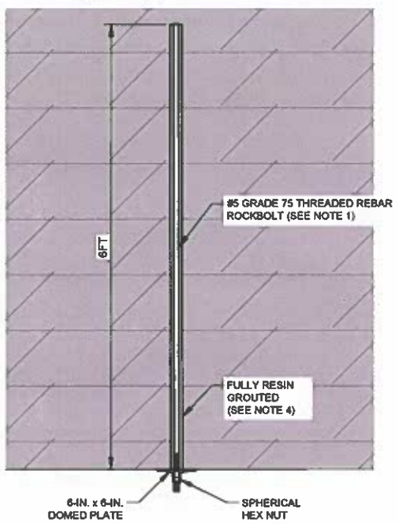
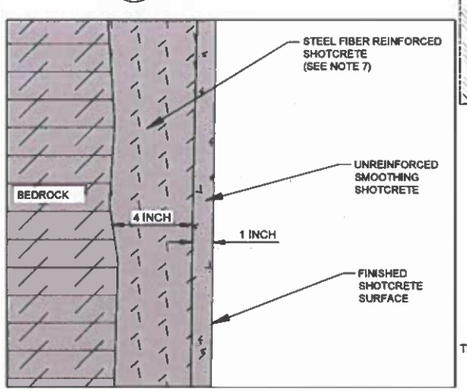


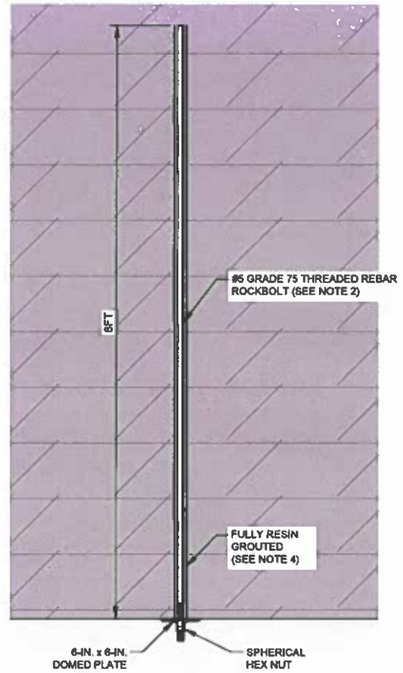
SCALE 1"=6' 01 C-05 ROOF ROCKBOLT PATTERN DETAIL



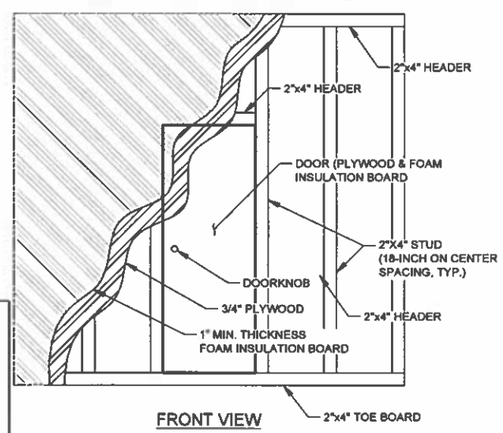
SCALE 1"=1' 02 C-05 6 FT ROCKBOLT DETAIL



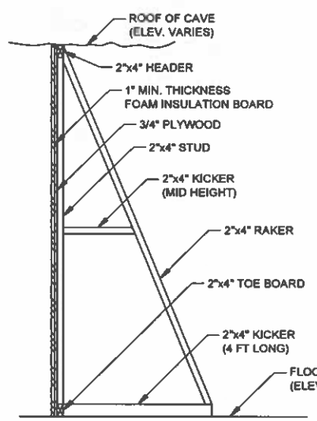
SCALE 3"=1' 04 C-05 SHOTCRETE SHELL DETAIL DRIPSTONE ENTRY



SCALE 1"=1' 03 C-05 8 FT ROCKBOLT DETAIL

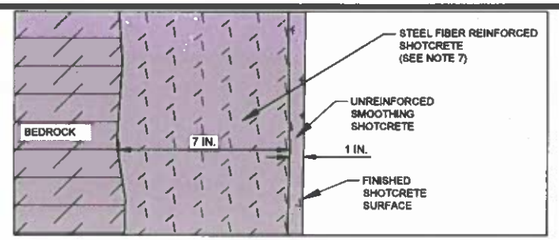


FRONT VIEW

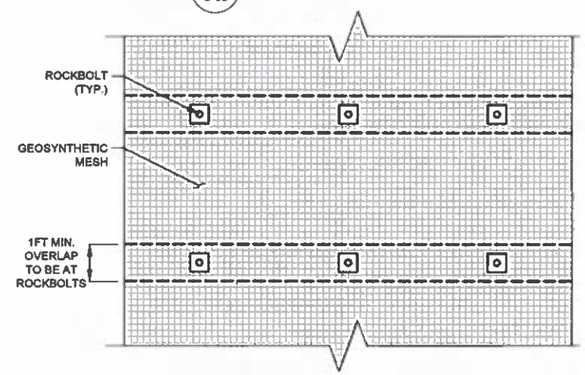


END SECTION

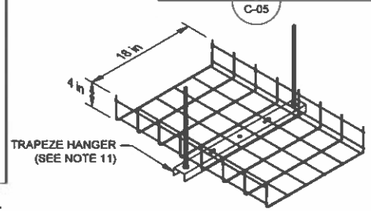
SCALE 1"=2' 07 C-05 TEMPORARY NOISE AND CONTAINMENT BARRIER DETAIL



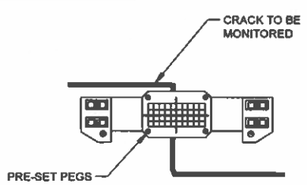
SCALE 3"=1' 05 C-05 SHOTCRETE SHELL DETAIL DRIPSTONE CAVE EXIT



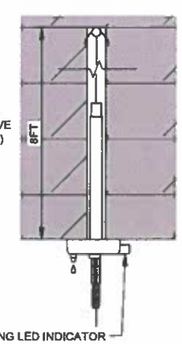
SCALE 1"=2' 06 C-05 GEOSYNTHETIC MESH DETAIL



N.T.S. 08 C-05 WIRE BASKET CABLE TRAY



N.T.S. 10 C-05 CRACK GAUGE



N.T.S. 09 C-05 MECHANICAL TELLTALE

0 6 12
1" = 6' FEET

0 5 10
1" = 5' FEET

ISSUED FOR BID

NOTES & SPECIFICATIONS

1. 6 FT ROCKBOLTS SHALL BE JENNMAR™ OR DYWIDAG™ THREADED REBAR (OR APPROVED EQUIVALENT) WITH THE FOLLOWING CHARACTERISTICS.
   A. #5 (5/8" DIA.) GRADE 75 STEEL.
   B. MINIMUM ULTIMATE STRENGTH OF 25 KIPS.
   C. INSTALLED WITH MANUFACTURER RECOMMENDED OVERDRILL LENGTH, TYPICALLY 1-3/8".
2. 8 FT ROCKBOLTS SHALL BE JENNMAR™ OR DYWIDAG™ THREADED REBAR (OR APPROVED EQUIVALENT) WITH THE FOLLOWING CHARACTERISTICS.
   A. #5 (5/8" DIA.) GRADE 75 STEEL.
   B. MINIMUM ULTIMATE STRENGTH OF 25 KIPS.
   C. INSTALLED WITH MANUFACTURER RECOMMENDED OVERDRILL LENGTH, TYPICALLY 1-3/8".
3. ROCKBOLTS SHALL BE INSTALLED WITH
   A. #5 SPHERICAL NUTS AND WASHERS
   B. 6-INCH SQUARE DOMED STEEL FACE PLATES
   C. NUTS SHALL BE TORQUED TO 150 FT-LBS
4. ROCKBOLT RESIN GROUT SHALL BE MINOVA™ OR JENNMAR™ J-LOKSET TYPE (OR APPROVED EQUIVALENT) WITH THE FOLLOWING CHARACTERISTICS
   A. 1-INCH RESIN CARTRIDGE DIAMETER
   B. USE SUFFICIENT COMBINATION OF CARTRIDGE LENGTH AND NUMBER OF CARTRIDGES TO ACHIEVE FULL GROUT ENCAPSULATION AND BOND STRENGTH OF 3,400 LBS PER INCH
5. SPOT ROCKBOLTS SHALL BE USED AS NEEDED, SUCH AS IN LOCATIONS WHERE LEDGES ARE FORMED IN THE ROOF.
6. ROCKBOLT AND RESIN CARTRIDGES SHALL BE PUSHED INTO THE DRILLHOLE WHILE SLOWLY ROTATING (~50 RPM) FOR APPROXIMATELY 5 SECONDS. THEN SPUN AT INCREASED SPEEDS (~300 RPM) FOR AN ADDITIONAL 5 SECONDS TO THOROUGHLY RUPTURE CARTRIDGES AND MIX RESIN. AFTER SPINNING, ROCKBOLTS SHALL BE PUSHED UPWARD WITH MAXIMUM THRUST AVAILABLE AND HELD FOR AN ADDITIONAL 60 SECONDS WITHOUT ROTATION.
7. SHOTCRETE SHALL HAVE THE FOLLOWING CHARACTERISTICS.
   A. STEEL FIBER REINFORCED SHOTCRETE (SFRS) TO CONTAIN WIREMIX W40 CRIMPED STEEL FIBERS, AND ARE TO BE ADDED TO THE SHOTCRETE MIX AT A MINIMUM RATE OF 75 LBS/CUBIC YARD.
   B. SHOTCRETE WILL HAVE FLEXURAL TESTS PERFORMED ACCORDING TO ASTM C1609M AND HAVE A MINIMUM COMPRESSIVE STRENGTH OF 6,000 PSI AND A MINIMUM FLEXURAL STRENGTH OF 600 PSI AT 28-DAYS.
8. INSTALLER SHALL POWER WASH ALL ROCK SURFACES WHERE SHOTCRETE IS TO BE APPLIED PRIOR TO APPLYING SHOTCRETE.
9. GEOSYTHETIC MESH SHALL BE INSTALLED WITH THE FOLLOWING SPECIFICATIONS
   A. MESH IS PINNED TO THE ROOF WITH 6-FT AND 8-FT ROCKBOLTS
   B. MESH SHALL BE MINEGRID PET 80T BY HUESKER, INC., OR APPROVED EQUIVALENT. PRODUCT SHALL BE BLACK GEOSYNTHETIC.
   C. OVERLAP MESH BY MINIMUM 1 FOOT, RESIN BOLTS SHOULD BE INSTALLED IN MESH OVERLAP.
   D. MESH SHALL BE PINNED TIGHT AGAINST THE ROOF.
   E. ALIGN MESH TO THE TUNNEL AXIS IN THE ROOF.
   F. IF DAMAGED FOLLOWING CONSTRUCTION, SECTIONS OF MESH MAY BE REPLACED USING SPARE ROLLS OF MATERIAL AFTER REMOVING ROCKBOLT PLATES AND NUTS.
10. CONTRACTOR TO PROPOSE A TEMPORARY NOISE AND CONTAINMENT BARRIER TO RETAIN SOUND AND DUST. A REPRESENTATIVE EXAMPLE IS INCLUDED AT DETAIL 07.
    A. THE SOUND LEVEL ON THE NATURAL CAVERN SIDE OF THE BARRIER SHALL BE A MAXIMUM OF 65 DB. THE CONTRACTOR SHALL DEMONSTRATE THE NOISE REDUCTION AND MAKE MODIFICATIONS TO THE BARRIER SYSTEM UNTIL THE NOISE REDUCTION IS ACCEPTABLE TO THE FOREST SERVICE.
    B. RAKER AND KICKERS ARE ONLY INTENDED ON ENDS. DOOR IS INTENDED TO BE MADE AND HUNG TO FIT OPENING.
    C. PERIMETER WALLS, CEILING, AND FLOOR WILL NOT BE SMOOTH. SPRAY FOAM GAP SEALER OR OTHER APPROVED METHODS WILL BE NEEDED.
    D. ADD WOOD MEMBERS AS NECESSARY FOR DOOR FRAMING.
11. ALL TRAY SECTIONS, FITTINGS, TRAPEZE HANGERS, ETC. FOR CABLE TRAY SHALL BE IN A FINISH SUITABLE FOR MARINE ENVIRONMENTS - ALUMINUM OR 316 STAINLESS STEEL.
12. OUTER ROW MAY BE ANGLED UP TO 30 DEGREES FROM VERTICAL.
13. MECHANICAL TELLTALES SHALL BE INSTALLED WITH THE FOLLOWING SPECIFICATIONS
    A. TELLTALES SHALL BE TROLEX™ RMT AUTO-WARNING TELLTALES (AWTT), OR APPROVED EQUIVALENT.
    B. TELLTALES SHALL BE INSTALLED WITH MONITORING ANCHOR POINT SET 8 FEET ABOVE THE ROOF USING MANUFACTURER RECOMMENDED DIAMETER DRILLHOLES (TYPICALLY 1-¾ INCH).
    C. TRIGGER THRESHOLD FOR FLASHING LED INDICATOR SHALL BE SET AT 5mm TRAVEL.
14. CRACK GAUGES SHALL BE HUMBOLDT™ CRACK MONITOR PLUS, OR APPROVED EQUIVALENT, AND SHALL BE INSTALLED OVER THE CRACK WITH THE ZERO LINE ON THE CALIBRATION SCALE PARALLEL WITH THE CRACK TO BE MONITORED. CRACK GAUGE SHALL BE FIXED TO THE ROCK USING APPROVED NON-TOXIC ADHESIVE.

LEGEND

- BOONE LIMESTONE
- UPPER ST JOE
- LOWER ST JOE
- CHATTANOOGA SHALE
- SMOOTHING SHOTCRETE
- LAFFERTY LIMESTONE
- FERNVALE LIMESTONE
- STEEL FIBER REINFORCED SHOTCRETE

KEY MAP

A / C-01 — SECTION NUMBER / SECTION VIEW DRAWING NUMBER

01 / C-01 — DETAIL CALLOUT NUMBER / SECTION VIEW DRAWING NUMBER

1+50' — STATION NUMBER (FT)

USDA FOREST SERVICE

United States Department of Agriculture
Forest Service

(R08)
SOUTHERN REGION

STAMPS, LOGOS, AND SEALS

GOLDER

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 16376 MARK N. HADDAD 3/30/21

NO.	REVISION / ISSUE	DATE
D	ISSUED FOR BID	03/30/21
C	ISSUED FOR 95% REVIEW	02/12/21
B	ISSUED FOR 90% REVIEW	10/16/20
A	ISSUED FOR 50% REVIEW	07/31/20

PROJECT NAME

BLANCHARD SPRINGS CAVERNS TUNNEL REHABILITATION

OZARK-ST. FRANCIS NATIONAL FOREST

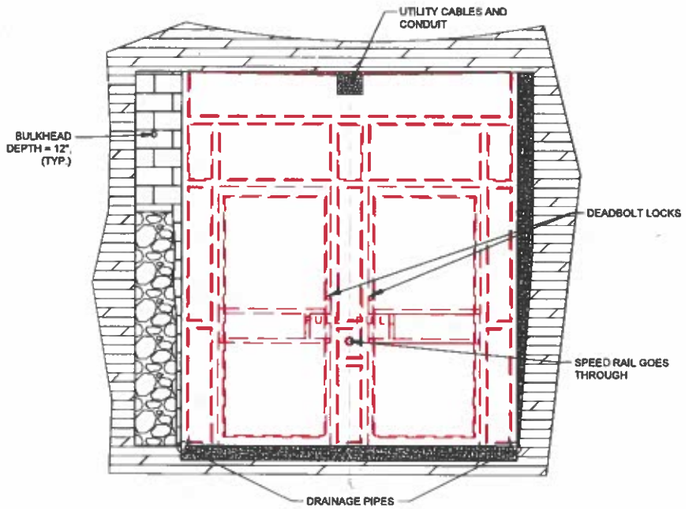
SYLAMORE RANGER DISTRICT

DRAWING TITLE

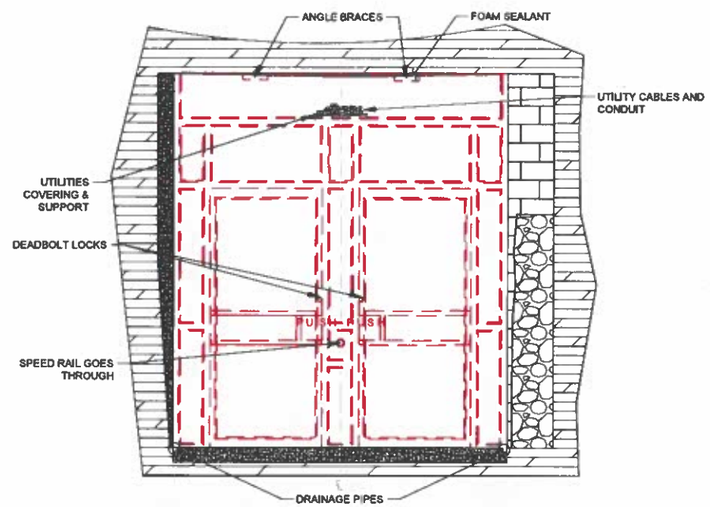
C-05 GEOTECHNICAL DETAILS AND NOTES

DATE 03/30/21	ARCHIVE NO.
DESIGNER N.OMR	DRAWING SHEET NO. C-05
DRAWN M.LAC	
CHECKED M.DRE/M.HAD	
PROJECT NO. 19129310	SHEET 8 OF 18

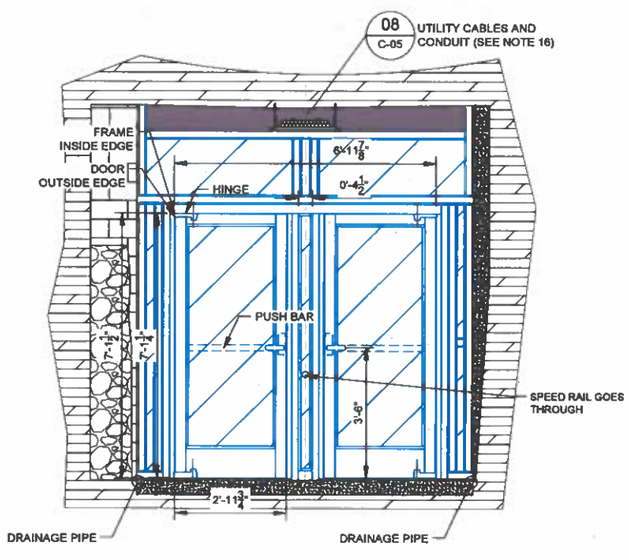
3/30/21 12:27 MLACOSTE C:\USERS\MLACOSTE\DOLDER ASSOCIATES\19129310 JFA BLANCHARD CAVERNS ASSESSMENT - 5 TECHNICAL WORK\DRAWINGS\GEOTECHNICAL\DRIPSTONE EXIT.DWG;



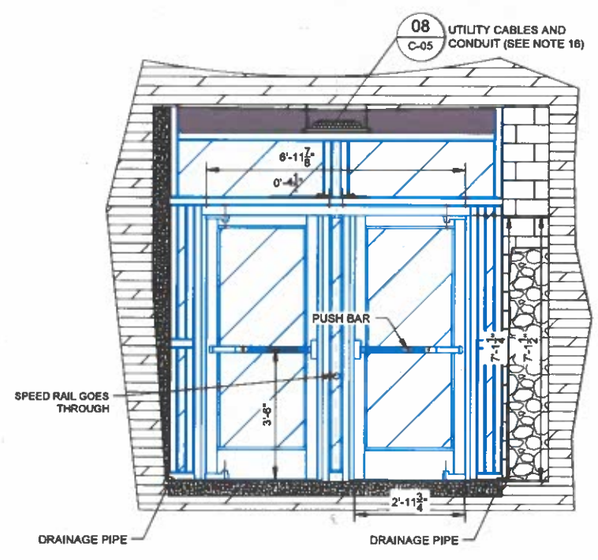
SCALE 1"=2' E-E' C-01 DRIPSTONE CAVE ENTRANCE - OUTER AIRLOCK DOORS - OUTSIDE VIEW - EXISTING



SCALE 1"=2' E-E' C-01 DRIPSTONE CAVE ENTRANCE - OUTER AIRLOCK DOORS - INSIDE VIEW - EXISTING



SCALE 1"=2' E-E' C-01 DRIPSTONE CAVE ENTRANCE - OUTER AIRLOCK DOORS - OUTSIDE VIEW - FOR CONSTRUCTION



SCALE 1"=2' E-E' C-01 DRIPSTONE CAVE ENTRANCE - OUTER AIRLOCK DOORS - INSIDE VIEW - FOR CONSTRUCTION

NOTE & SPECIFICATIONS

1. INSTALL UNITS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
2. EXISTING BULK HEADS TO BE EVALUATED FOR REPLACEMENT AFTER DOOR DEMOLITION
3. ANY REPLACEMENT BULKHEADS TO BE CONSTRUCTED OUT OF NATURAL CAVE ROCK AND GALVANIZED STEEL REINFORCEMENT
4. TUCKPOINTING SHALL BE COMPLETED AS NEEDED ON EXISTING MASONRY
5. DOORS SHALL BE CRL- U.S. ALUMINUM BALANCER™ SERIES ALUMINUM FULL FRAMED BALANCED DOORS AND SHALL HAVE THE FOLLOWING CHARACTERISTICS.
   - A. TYPE: TWO SINGLE DOORS SIDE-BY-SIDE WITH SIDE LIGHT BETWEEN AND AROUND DOORS
   - B. MATERIAL: GRADE 316 STAINLESS STEEL CLAD ALUMINUM
   - C. FINISH: STAINLESS STEEL, BHMA 629, SATIN
   - D. STILE OPTION: CONCEALED
6. DOOR HANDLES SHALL BE LEVER-STYLE AND SOLID GRADE 316 STAINLESS STEEL.
7. EXIT DEVICE SHALL BE SARGENT 8800 SERIES RIM EXIT DEVICE.
8. LATCHING MECHANISM SHALL BE SOLID GRADE 316 STAINLESS STEEL.
9. GLASS SHALL HAVE THE FOLLOWING CHARACTERISTICS.
   - A. ½" IN THICKNESS OR GREATER
   - B. IMPACT RESISTANT RATED
   - C. CLEAR WITH NO TINTING APPLIED FOR MAXIMUM VISIBILITY
10. FRP COMPONENTS OF BULKHEADS SHALL BE FIBERCORR™ OR EQUIVALENT MOISTURE AND CORROSION RESISTANT PANELS.
11. DOOR CLOSERS SHALL BE STANDARD PROVIDED WITH U.S. ALUMINUM BALANCER™ SERIES ALUMINUM FULL FRAMED BALANCED DOOR SYSTEM.
12. FLOOR THRESHOLD SHALL BE SOLID GRADE 316 STAINLESS STEEL.
13. ALL EXISTING HANDRAILS SHALL BE REPLACED WITH SPEED-RAIL®, OR EQUIVALENT, AND HAVE THE FOLLOWING CHARACTERISTICS.
   - A. HEIGHT OF TOP RAIL ABOVE WALKING SURFACE SHALL BE 34"
   - B. POST SPACING AND MOUNTING SHALL BE DETERMINED BY SITE CONDITIONS
   - C. POSTS SHALL BE ALUMINUM 6005-T5, 1 ½" IPS (48.2 MM O.D.) SCHEDULE 80 WALL (CLEAR ANODIZED) OR COMPARABLE
   - D. RAILS SHALL BE ALUMINUM 6063-T6, 1 ½" IPS (48.2 MM O.D.) SCHEDULE 40 WALL (CLEAR ANODIZED) OR COMPARABLE
   - E. FITTINGS SHALL BE ALUMINUM 6063-T6 (CLEAR ANODIZED)
   - F. BASE FLANGES SHALL BE CAST ALUMINUM
   - G. FASTENERS SHALL BE ALLOY 6063-T6 ALUMINUM
   - H. RAILS TO TERMINATE AT NEW DOORS WHERE APPLICABLE
14. UTILITIES PORTS SHALL BE REPLACED WHERE SPECIFIED
15. DRAINAGE PIPES SHALL BE MINIMUM 1-INCH DIAMETER PVC PIPE CONDUIT TO BE INSTALLED IN EACH LOWER CORNER TO PROVIDE DRAINAGE.
16. WHERE CABLE TRAYS MEET BALANCED DOOR ENTRIES, TRAY WILL TERMINATE APPROXIMATELY 2 INCHES FROM FRP AND CABLES WILL CONTINUE THROUGH GROMMETS INSTALLED IN THE FRP.

LEGEND

- NATIVE ROCK
- MASONRY WALL
- BULKHEAD (BRICK)
- BULKHEAD (CONCRETE) AND CONCRETE PADS
- BULKHEAD (STONE)
- BULKHEAD (WOOD)
- FIBERGLASS REINFORCED PLASTIC (FRP)
- GLASS
- ITEMS TO REMAIN UNDISTURBED
- ITEMS TO REMOVE
- ITEMS IN FOREGROUND TO REMOVE
- NEW ITEMS
- NEW ITEMS IN BACKGROUND

0 1 2
1" = 1' FEET

ISSUED FOR BID

USDA FOREST SERVICE

United States Department of Agriculture
Forest Service

(R08)
SOUTHERN REGION

STAMPS, LOGOS, AND SEALS

GOLDER

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 16376 MARK N. HADDOCK 9/20/21

NO.	REVISION / ISSUE	DATE
D	ISSUED FOR BID	03/30/21
C	ISSUED FOR 95% REVIEW	02/12/21
B	ISSUED FOR 90% REVIEW	10/16/20
A	ISSUED FOR 50% REVIEW	07/31/20

PROJECT NAME

BLANCHARD SPRINGS CAVERNS TUNNEL REHABILITATION

OZARK-ST. FRANCIS NATIONAL FOREST

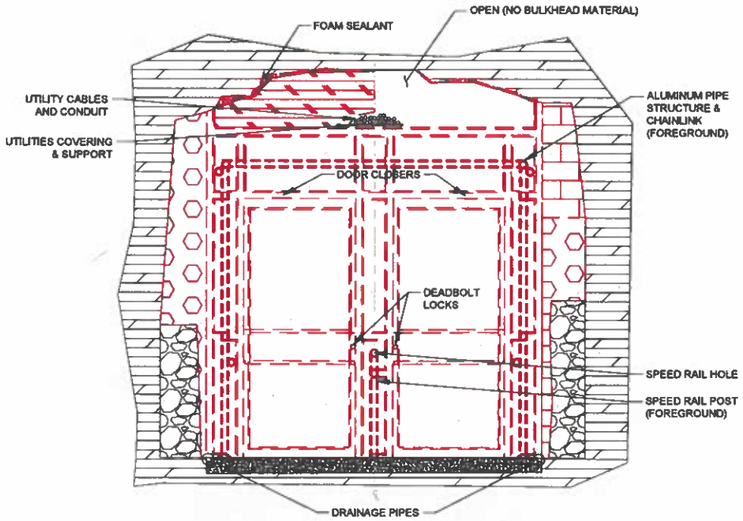
SYLAMORE RANGER DISTRICT

DRAWING TITLE

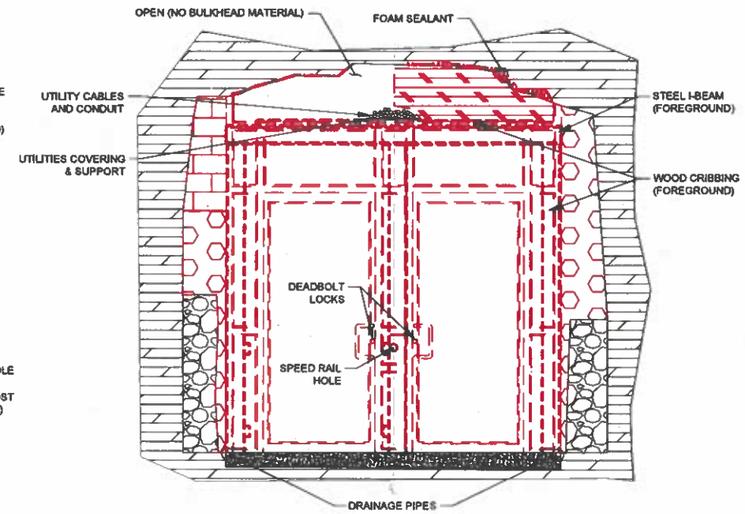
C-06 DRIPSTONE CAVE ENTRANCE OUTER AIRLOCK DOORS

DATE 03/30/21	ARCHIVE NO.
DESIGNER N.OMR	DRAWING SHEET NO. C-06
DRAWN M.LAC	
CHECKED M.DRE/M.HAD	
PROJECT NO. 19129310	SHEET 9 OF 18

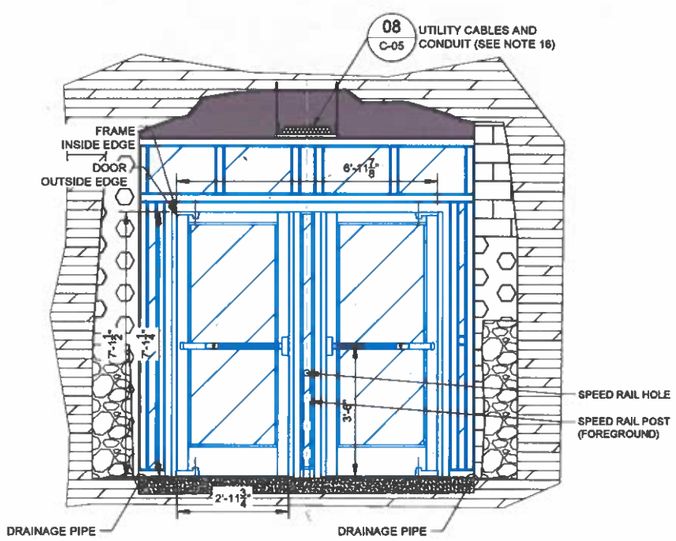
3/30/21 12:28 MLACOSTE C:\USERS\MLACOSTE\GOLDER ASSOCIATES\19129310\RFA BLANCHARD CAVERNS ASSESSMENT - 3 TECHNICAL WORK\DRAFTING\19% DRAWINGS\ARCHITECTURAL CONSTRUCTION\DRIPSTONE ENTRANCE.DWG;



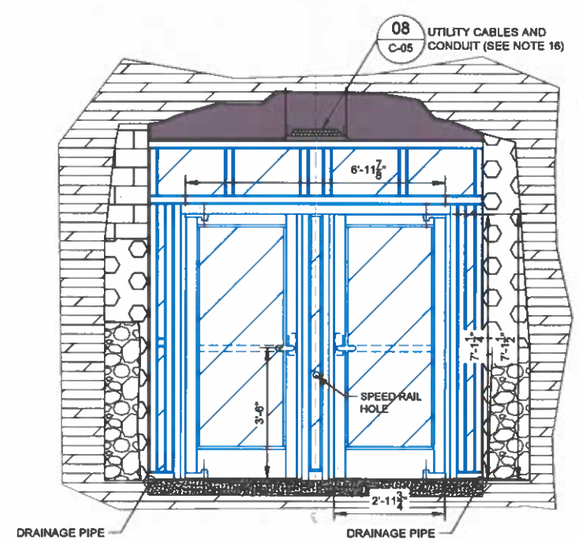
SCALE 1"=2' F-F' C-01 DRIPSTONE CAVE ENTRANCE - INNER AIRLOCK DOORS - OUTSIDE VIEW - EXISTING



SCALE 1"=2' F-F' C-01 DRIPSTONE CAVE ENTRANCE - INNER AIRLOCK DOORS - INSIDE VIEW - EXISTING



SCALE 1"=2' F-F' C-01 DRIPSTONE CAVE ENTRANCE - INNER AIRLOCK DOORS - OUTSIDE VIEW - FOR CONSTRUCTION



SCALE 1"=2' F-F' C-01 DRIPSTONE CAVE ENTRANCE - INNER AIRLOCK DOORS - INSIDE VIEW - FOR CONSTRUCTION

NOTE & SPECIFICATIONS

1. INSTALL UNITS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
2. EXISTING BULK HEADS TO BE EVALUATED FOR REPLACEMENT AFTER DOOR DEMOLITION
3. ANY REPLACEMENT BULKHEADS TO BE CONSTRUCTED OUT OF NATURAL CAVE ROCK AND GALVANIZED STEEL REINFORCEMENT
4. TUCKPOINTING SHALL BE COMPLETED AS NEEDED ON EXISTING MASONRY
5. DOORS SHALL BE CRL- U.S. ALUMINUM BALANCER™ SERIES ALUMINUM FULL FRAMED BALANCED DOORS AND SHALL HAVE THE FOLLOWING CHARACTERISTICS.
   A. TYPE: TWO SINGLE DOORS SIDE-BY-SIDE WITH SIDE LIGHT BETWEEN AND AROUND DOORS
   B. MATERIAL: GRADE 316 STAINLESS STEEL CLAD ALUMINUM
   C. FINISH: STAINLESS STEEL, BHMA 629, SATIN
   D. STILE OPTION: CONCEALED
6. DOOR HANDLES SHALL BE LEVER-STYLE AND SOLID GRADE 316 STAINLESS STEEL
7. EXIT DEVICE SHALL BE SARGENT 8800 SERIES RIM EXIT DEVICE.
8. LATCHING MECHANISM SHALL BE SOLID GRADE 316 STAINLESS STEEL.
9. GLASS SHALL HAVE THE FOLLOWING CHARACTERISTICS.
   A. ½" IN THICKNESS OR GREATER
   B. IMPACT RESISTANT RATED
   C. CLEAR WITH NO TINTING APPLIED FOR MAXIMUM VISIBILITY
10. FRP COMPONENTS OF BULKHEADS SHALL BE FIBERCORR™ OR EQUIVALENT MOISTURE AND CORROSION RESISTANT PANELS.
11. DOOR CLOSERS SHALL BE STANDARD PROVIDED WITH U.S. ALUMINUM BALANCER™ SERIES ALUMINUM FULL FRAMED BALANCED DOOR SYSTEM.
12. FLOOR THRESHOLD SHALL BE SOLID GRADE 316 STAINLESS STEEL.
13. ALL EXISTING HANDRAILS SHALL BE REPLACED WITH SPEED-RAIL®, OR EQUIVALENT, AND HAVE THE FOLLOWING CHARACTERISTICS.
   A. HEIGHT OF TOP RAIL ABOVE WALKING SURFACE SHALL BE 34"
   B. POST SPACING AND MOUNTING SHALL BE DETERMINED BY SITE CONDITIONS
   C. POSTS SHALL BE ALUMINUM 6005-T5, 1 ½" IPS (48.2 MM O.D.) SCHEDULE 80 WALL (CLEAR ANODIZED) OR COMPARABLE
   D. RAILS SHALL BE ALUMINUM 6063-T6, 1 ½" IPS (48.2 MM O.D.) SCHEDULE 40 WALL (CLEAR ANODIZED) OR COMPARABLE
   E. FITTINGS SHALL BE ALUMINUM 6063-T6 (CLEAR ANODIZED)
   F. BASE FLANGES SHALL BE CAST ALUMINUM
   G. FASTENERS SHALL BE ALLOY 6063-T6 ALUMINUM
   H. RAILS TO TERMINATE AT NEW DOORS WHERE APPLICABLE
14. UTILITIES PORTS SHALL BE REPLACED WHERE SPECIFIED
15. DRAINAGE PIPES SHALL BE MINIMUM 1-INCH DIAMETER PVC PIPE CONDUIT TO BE INSTALLED IN EACH LOWER CORNER TO PROVIDE DRAINAGE.
16. WHERE CABLE TRAYS MEET BALANCED DOOR ENTRIES, TRAY WILL TERMINATE APPROXIMATELY 2 INCHES FROM FRP AND CABLES WILL CONTINUE THROUGH GROMMETS INSTALLED IN THE FRP.

LEGEND

- NATIVE ROCK
- MASONRY WALL
- BULKHEAD (BRICK)
- BULKHEAD (CONCRETE) AND CONCRETE PADS
- BULKHEAD (STONE)
- BULKHEAD (WOOD)
- FIBERGLASS REINFORCED PLASTIC (FRP)
- GLASS
- ITEMS TO REMAIN UNDISTURBED
- ITEMS TO REMOVE
- ITEMS IN FOREGROUND TO REMOVE
- NEW ITEMS
- NEW ITEMS IN BACKGROUND

0 1 2
1" = 1' FEET

ISSUED FOR BID

USDA FOREST SERVICE

United States Department of Agriculture
Forest Service

(R08)
SOUTHERN REGION

STAMPS, LOGOS, AND SEALS

GOLDER

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 10378 MARK N. HADDOX

NO.	REVISION / ISSUE	DATE
D	ISSUED FOR BID	03/30/21
C	ISSUED FOR 95% REVIEW	02/12/21
B	ISSUED FOR 90% REVIEW	10/16/20
A	ISSUED FOR 50% REVIEW	07/31/20

PROJECT NAME

BLANCHARD SPRINGS CAVERNS TUNNEL REHABILITATION

OZARK-ST. FRANCIS NATIONAL FOREST

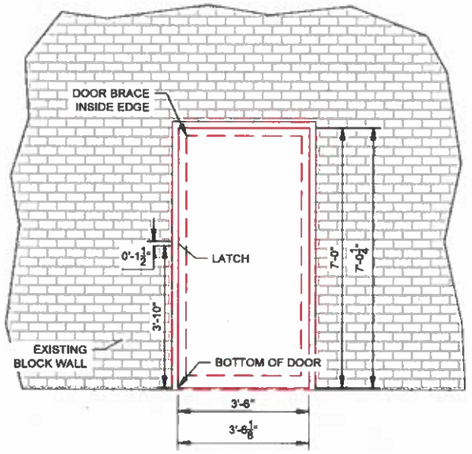
SYLAMORE RANGER DISTRICT

DRAWING TITLE

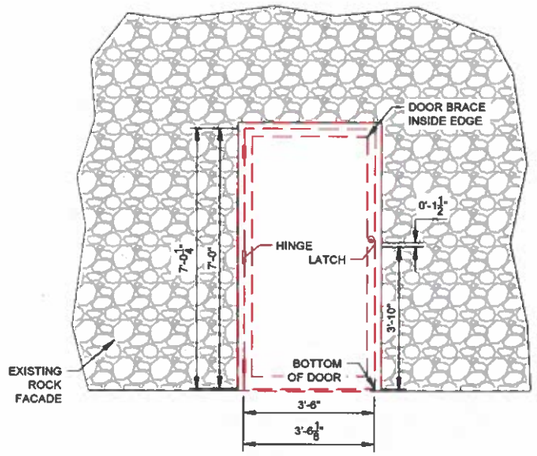
C-07 DRIPSTONE CAVE ENTRANCE INNER AIRLOCK DOORS

DATE 03/30/21	ARCHIVE NO.
DESIGNER N.OMR	DRAWING SHEET NO. C-07
DRAWN M.LAC	
CHECKED M.DRE/M.HAD	
PROJECT NO. 19129310	SHEET 10 OF 18

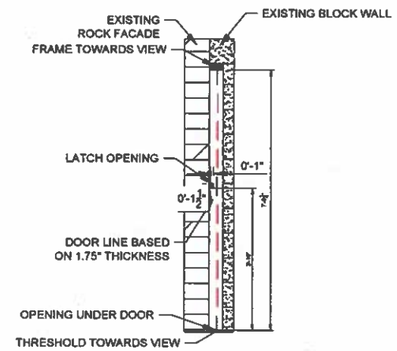
3/30/21 12:29 M:\LACOSTE C:\USERS\M.LACOSTE\OLDER ASSOCIATES\19129310_RFA BLANCHARD CAVERNS ASSESSMENT - 5 TECHNICAL WORK\DRAFTING\19PN DRAWINGS\ARCHITECTURAL CONSTRUCTION\DRIPSTONE ENTRANCE.DWG;



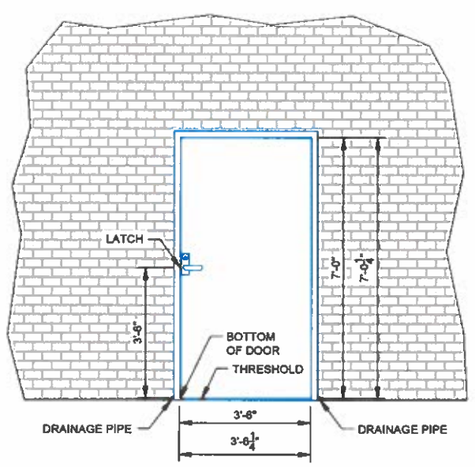
SCALE 1"=2' (A-A' / C-02) DRIPSTONE CAVE BYPASS TUNNEL DOOR - OUTSIDE VIEW - EXISTING



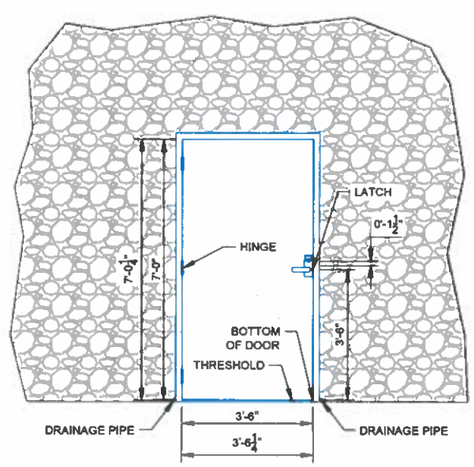
SCALE 1"=2' (A-A' / C-02) DRIPSTONE CAVE BYPASS TUNNEL DOOR - INSIDE VIEW - EXISTING



SCALE 1"=2' (C-C' / C-02) DRIPSTONE CAVE BYPASS TUNNEL DOOR - SECTION VIEW - EXISTING



SCALE 1"=2' (A-A' / C-02) DRIPSTONE CAVE BYPASS TUNNEL DOOR - OUTSIDE VIEW - FOR CONSTRUCTION



SCALE 1"=2' (A-A' / C-02) DRIPSTONE CAVE BYPASS TUNNEL DOOR - INSIDE VIEW - FOR CONSTRUCTION

LEGEND

- NATIVE ROCK
- MASONRY WALL
- BULKHEAD (BRICK)
- BULKHEAD (CONCRETE) AND CONCRETE PADS
- BULKHEAD (STONE)
- BULKHEAD (WOOD)
- ITEMS TO REMAIN UNDISTURBED
- ITEMS TO REMOVE
- ITEMS IN FOREGROUND TO REMOVE
- NEW ITEMS
- NEW ITEMS IN BACKGROUND

NOTE & SPECIFICATIONS

1. INSTALL UNITS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
2. TUCKPOINTING SHALL BE COMPLETED AS NEEDED ON THE EXISTING MASONRY WALL AND STONE FACADE
3. DOOR SHALL BE A SINGLE CHEM-PRUF FRP PHARMACEUTICAL DOOR AND SHALL HAVE THE FOLLOWING CHARACTERISTICS:
   A. TYPE: SINGLE DOOR
   B. MATERIAL: FIBERGLASS REINFORCED PLASTIC
   C. FINISH: 25 MIL RESIN-RICH GELCOAT
4. DOOR HANDLES SHALL BE LEVER-STYLE AND SOLID GRADE 316 STAINLESS STEEL.
5. LOCKING MECHANISM SHALL BE SOLID GRADE 316 STAINLESS STEEL.
6. FLOOR THRESHOLD SHALL BE SOLID GRADE 316 STAINLESS STEEL.
7. DRAINAGE PIPES SHALL BE MINIMUM 1-INCH DIAMETER PVC PIPE CONDUIT TO BE INSTALLED IN EACH LOWER CORNER TO PROVIDE DRAINAGE
8. UTILITIES PORTS SHALL BE REPLACED WHERE SPECIFIED

0 2 4
1" = 2' FEET

ISSUED FOR BID

USDA FOREST SERVICE

United States Department of Agriculture
Forest Service

(R08)
SOUTHERN REGION

STAMPS, LOGOS, AND SEALS

GOLDER

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 10378 MARK N. HADDOCK 3/30/21

NO.	REVISION / ISSUE	DATE
D	ISSUED FOR BID	03/30/21
C	ISSUED FOR 90% REVIEW	02/12/21
B	ISSUED FOR 60% REVIEW	10/10/20
A	ISSUED FOR 30% REVIEW	07/31/20

PROJECT NAME

BLANCHARD SPRINGS CAVERNS TUNNEL REHABILITATION

OZARK-ST. FRANCIS NATIONAL FOREST

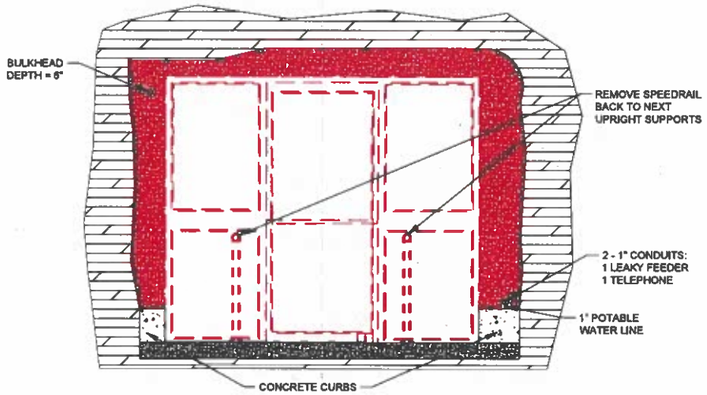
SYLAMORE RANGER DISTRICT

DRAWING TITLE

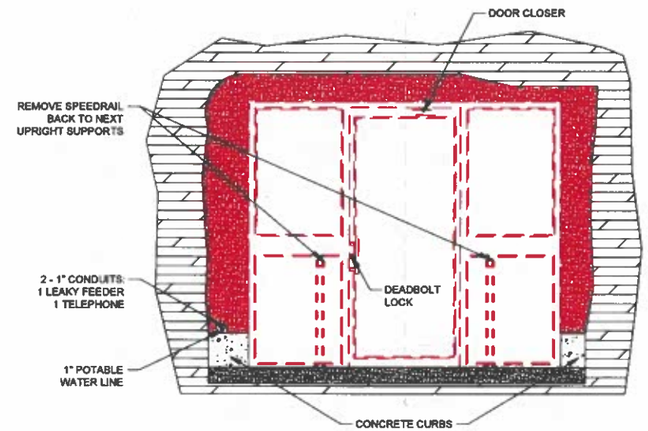
C-08 DRIPSTONE CAVE BYPASS TUNNEL DOOR

DATE 03/30/21	ARCHIVE NO.
DESIGNER N.OMR	DRAWING SHEET NO. C-08
DRAWN M.LAC	
CHECKED M.DRE/M.HAD	
PROJECT NO. 19129310	SHEET 11 OF 18

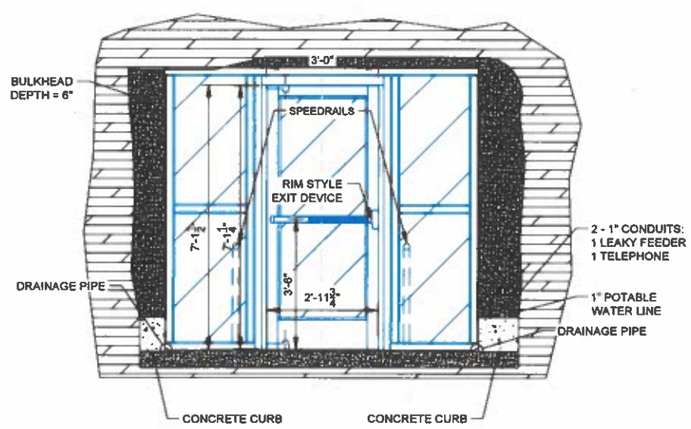
3/30/21 12:39 M:\LACOSTE C:\USERS\M.LACOSTE\DOCUMENTS\ACCOSTE\DOLDER ASSOCIATES\19129310_FFA BLANCHARD CAVERNS ASSESSMENT - 5 TECHNICAL WORK\DRAFTING\19PFA DRAWINGS\C-08 DRIPSTONE CAVE BYPASS TUNNEL DOOR.DWG;



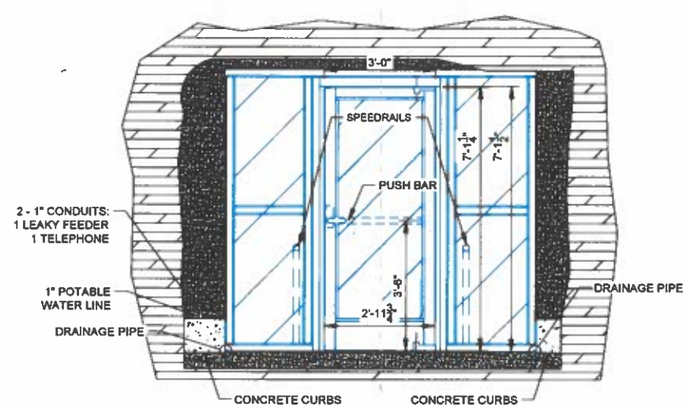
SCALE 1"=2' E-E' C-03 DRIPSTONE CAVE EXIT - INNER AIRLOCK DOOR - OUTSIDE VIEW - EXISTING



SCALE 1"=2' E-E' C-03 DRIPSTONE CAVE EXIT - INNER AIRLOCK DOOR - INSIDE VIEW - EXISTING



SCALE 1"=2' E-E' C-03 DRIPSTONE CAVE EXIT - INNER AIRLOCK DOOR - OUTSIDE VIEW - FOR CONSTRUCTION



SCALE 1"=2' E-E' C-03 DRIPSTONE CAVE EXIT - INNER AIRLOCK DOOR - INSIDE VIEW - FOR CONSTRUCTION

NOTE & SPECIFICATIONS

1. INSTALL UNITS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
2. EXISTING BULK HEADS TO BE EVALUATED FOR REPLACEMENT AFTER DOOR DEMOLITION.
3. ANY REPLACEMENT BULKHEADS TO BE CONSTRUCTED OUT OF NATURAL CAVE ROCKÚND GALVANIZED STEEL REINFORCEMENT
4. DOOR SHALL BE CRL- U.S. ALUMINUM BALANCER™ SERIES ALUMINUM FULL FRAMED BALANCED DOOR AND SHALL HAVE THE FOLLOWING CHARACTERISTICS.
   - A. TYPE: SINGLE DOORS WITH SIDE LIGHTS AROUND DOOR
   - B. MATERIAL: GRADE 316 STAINLESS STEEL CLAD ALUMINUM
   - C. FINISH: STAINLESS STEEL, BHMA 629, SATIN
   - D. STILE OPTION: CONCEALED
5. DOOR HANDLE SHALL BE LEVER-STYLE AND SOLID GRADE 316 STAINLESS STEEL.
6. EXIT DEVICE SHALL BE SARGENT 8800 SERIES RIM EXIT DEVICE.
7. LATCHING MECHANISM SHALL BE SOLID GRADE 316 STAINLESS STEEL.
8. GLASS SHALL HAVE THE FOLLOWING CHARACTERISTICS.
   - A. ½" IN THICKNESS OR GREATER
   - B. IMPACT RESISTANT RATED
   - C. CLEAR WITH NO TINTING APPLIED FOR MAXIMUM VISIBILITY
9. DOOR CLOSER SHALL BE STANDARD PROVIDED WITH U.S. ALUMINUM BALANCER™ SERIES ALUMINUM FULL FRAMED BALANCED DOOR SYSTEM.
10. FLOOR THRESHOLD SHALL BE SOLID GRADE 316 STAINLESS STEEL.
11. ALL EXISTING HANDRAILS SHALL BE REPLACED WITH SPEED-RAIL®, OR EQUIVALENT, AND HAVE THE FOLLOWING CHARACTERISTICS.
    - A. HEIGHT OF TOP RAIL ABOVE WALKING SURFACE SHALL BE 34"
    - B. POST SPACING AND MOUNTING SHALL BE DETERMINED BY SITE CONDITIONS
    - C. POSTS SHALL BE ALUMINUM 6005-T5, 1 ½" IPS (48.2 MM O.D.) SCHEDULE 80 WALL (CLEAR ANODIZED) OR COMPARABLE
    - D. RAILS SHALL BE ALUMINUM 6063-T6, 1 ½" IPS (48.2 MM O.D.) SCHEDULE 40 WALL (CLEAR ANODIZED) OR COMPARABLE
    - E. FITTINGS SHALL BE ALUMINUM 6063-T6 (CLEAR ANODIZED)
    - F. BASE FLANGES SHALL BE CAST ALUMINUM
    - G. FASTENERS SHALL BE ALLOY 6063-T6 ALUMINUM
12. UTILITIES PORTS SHALL BE REPLACED WHERE SPECIFIED
13. DRAINAGE PIPES SHALL BE MINIMUM 1-INCH DIAMETER PVC PIPE CONDUIT TO BE INSTALLED IN EACH LOWER CORNER TO PROVIDE DRAINAGE

LEGEND

- NATIVE ROCK
- MASONRY WALL
- BULKHEAD (BRICK)
- BULKHEAD (CONCRETE) AND CONCRETE PADS
- BULKHEAD (STONE)
- BULKHEAD (WOOD)
- GLASS
- ITEMS TO REMAIN UNDISTURBED
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0 1 2
1" = 1' FEET

ISSUED FOR BID

USDA FOREST SERVICE

United States Department of Agriculture
Forest Service

(R08)
SOUTHERN REGION

STAMPS, LOGOS, AND SEALS

GOLDER

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 15376 MARK A. HADDOCK 3/30/21

NO.	REVISION / ISSUE	DATE
D	ISSUED FOR BID	03/30/21
C	ISSUED FOR 95% REVIEW	02/12/21
B	ISSUED FOR 90% REVIEW	10/16/20
A	ISSUED FOR 50% REVIEW	07/31/20

PROJECT NAME

BLANCHARD SPRINGS CAVERNS TUNNEL REHABILITATION

OZARK-ST. FRANCIS NATIONAL FOREST

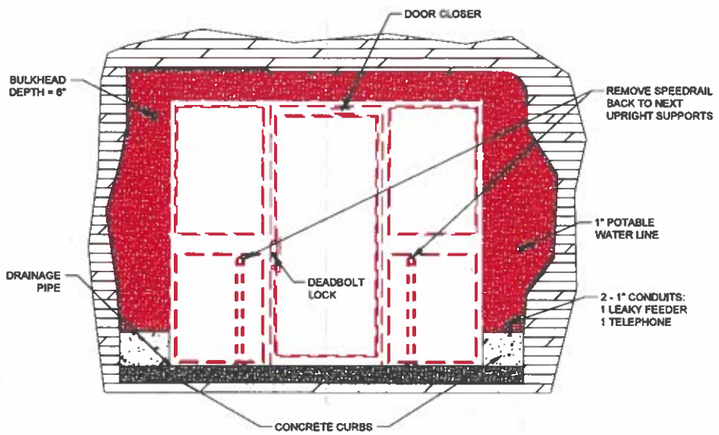
SYLAMORE RANGER DISTRICT

DRAWING TITLE

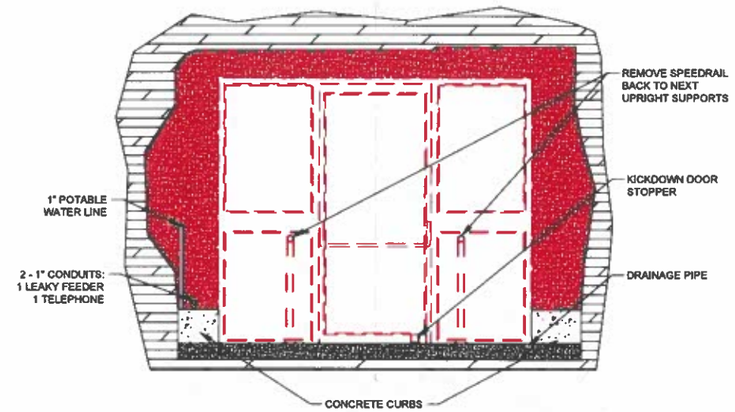
C-09 DRIPSTONE CAVE EXIT INNER AIRLOCK DOOR

DATE 03/30/21	ARCHIVE NO.
DESIGNER N.OMR	DRAWING SHEET NO. C-09
DRAWN M.LAC	
CHECKED M.DRE/M.HAD	
PROJECT NO. 19129310	SHEET 12 OF 18

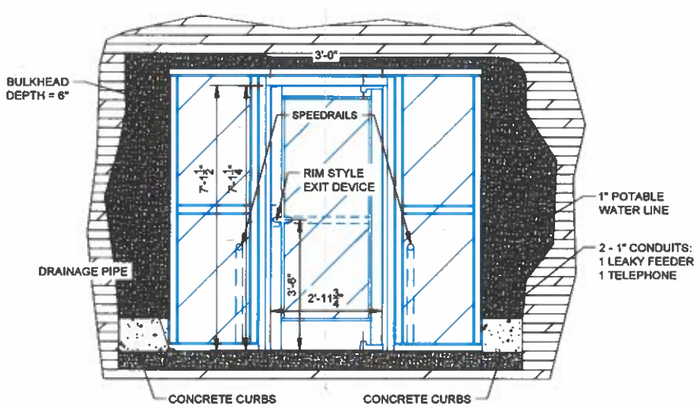
3/30/21 12:36 M.LACOSTE C:\USERS\M.LACOSTE\DOLDER ASSOCIATES\19129310_RFA BLANCHARD CAVERNS ASSESSMENT - 5 TECHNICAL WORK\DRAFTING\PWK DRAWINGS\ARCHITECTURAL CONSTRUCTION\DRIPSTONE EXIT.DWG



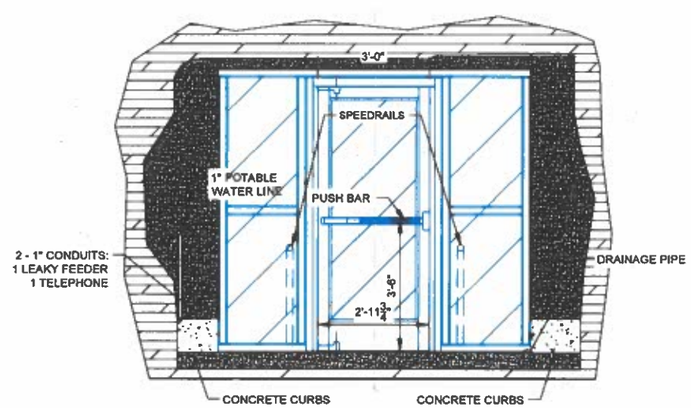
SCALE 1"=2' (F-F' / C-03) DRIPSTONE CAVE EXIT - OUTER AIRLOCK DOOR - OUTSIDE VIEW - EXISTING



SCALE 1"=2' (F-F' / C-03) DRIPSTONE CAVE EXIT - OUTER AIRLOCK DOOR - INSIDE VIEW - EXISTING



SCALE 1"=2' (F-F' / C-03) DRIPSTONE CAVE EXIT - OUTER AIRLOCK DOOR - OUTSIDE VIEW - FOR CONSTRUCTION



SCALE 1"=2' (F-F' / C-03) DRIPSTONE CAVE EXIT - OUTER AIRLOCK DOOR - INSIDE VIEW - FOR CONSTRUCTION

NOTE & SPECIFICATIONS

1. INSTALL UNITS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
2. EXISTING BULK HEADS TO BE EVALUATED FOR REPLACEMENT AFTER DOOR DEMOLITION.
3. ANY REPLACEMENT BULKHEADS TO BE CONSTRUCTED OUT OF NATURAL CAVE ROCKÚND GALVANIZED STEEL REINFORCEMENT
4. DOOR SHALL BE CRL- U.S. ALUMINUM BALANCER™ SERIES ALUMINUM FULL FRAMED BALANCED DOOR AND SHALL HAVE THE FOLLOWING CHARACTERISTICS.
   - A. TYPE: SINGLE DOORS WITH SIDE LIGHTS AROUND DOOR
   - B. MATERIAL: GRADE 316 STAINLESS STEEL CLAD ALUMINUM
   - C. FINISH: STAINLESS STEEL, BHMA 629, SATIN
   - D. STILE OPTION: CONCEALED
5. DOOR HANDLE SHALL BE LEVER-STYLE AND SOLID GRADE 316 STAINLESS STEEL.
6. EXIT DEVICE SHALL BE SARGENT 8800 SERIES RIM EXIT DEVICE.
7. LATCHING MECHANISM SHALL BE SOLID GRADE 316 STAINLESS STEEL.
8. GLASS SHALL HAVE THE FOLLOWING CHARACTERISTICS.
   - A. ½" IN THICKNESS OR GREATER
   - B. IMPACT RESISTANT RATED
   - C. CLEAR WITH NO TINTING APPLIED FOR MAXIMUM VISIBILITY
9. DOOR CLOSER SHALL BE STANDARD PROVIDED WITH U.S. ALUMINUM BALANCER™ SERIES ALUMINUM FULL FRAMED BALANCED DOOR SYSTEM.
10. FLOOR THRESHOLD SHALL BE SOLID GRADE 316 STAINLESS STEEL.
11. ALL EXISTING HANDRAILS SHALL BE REPLACED WITH SPEED-RAIL®, OR EQUIVALENT, AND HAVE THE FOLLOWING CHARACTERISTICS.
    - A. HEIGHT OF TOP RAIL ABOVE WALKING SURFACE SHALL BE 34"
    - B. POST SPACING AND MOUNTING SHALL BE DETERMINED BY SITE CONDITIONS
    - C. POSTS SHALL BE ALUMINUM 6005-T5, 1 ½" IPS (48.2 MM O.D.) SCHEDULE 80 WALL (CLEAR ANODIZED) OR COMPARABLE
    - D. RAILS SHALL BE ALUMINUM 6063-T6, 1 ½" IPS (48.2 MM O.D.) SCHEDULE 40 WALL (CLEAR ANODIZED) OR COMPARABLE
    - E. FITTINGS SHALL BE ALUMINUM 6063-T6 (CLEAR ANODIZED)
    - F. BASE FLANGES SHALL BE CAST ALUMINUM
    - G. FASTENERS SHALL BE ALLOY 6063-T6 ALUMINUM
12. UTILITIES PORTS SHALL BE REPLACED WHERE SPECIFIED
13. DRAINAGE PIPES SHALL BE MINIMUM 1-INCH DIAMETER PVC PIPE CONDUIT TO BE INSTALLED IN EACH LOWER CORNER TO PROVIDE DRAINAGE

LEGEND

- NATIVE ROCK
- MASONRY WALL
- BULKHEAD (BRICK)
- BULKHEAD (CONCRETE) AND CONCRETE PADS
- BULKHEAD (STONE)
- BULKHEAD (WOOD)
- GLASS
- ITEMS TO REMAIN UNDISTURBED
- ITEMS TO REMOVE
- ITEMS IN FOREGROUND TO REMOVE
- NEW ITEMS
- NEW ITEMS IN BACKGROUND

0 1 2
1" = 1' FEET

ISSUED FOR BID

USDA FOREST SERVICE

United States Department of Agriculture
Forest Service

(R08)
SOUTHERN REGION

STAMPS, LOGOS, AND SEALS

GOLDER

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 10370 MARK N. HADDOX 3/30/21

NO.	REVISION / ISSUE	DATE
D	ISSUED FOR BID	03/30/21
C	ISSUED FOR 90% REVIEW	02/12/21
B	ISSUED FOR 60% REVIEW	10/16/20
A	ISSUED FOR 30% REVIEW	07/31/20

PROJECT NAME

BLANCHARD SPRINGS CAVERNS TUNNEL REHABILITATION

OZARK-ST. FRANCIS NATIONAL FOREST

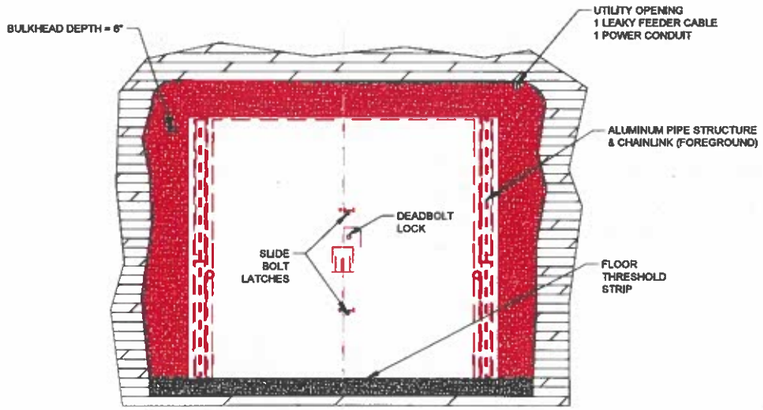
SYLAMORE RANGER DISTRICT

DRAWING TITLE

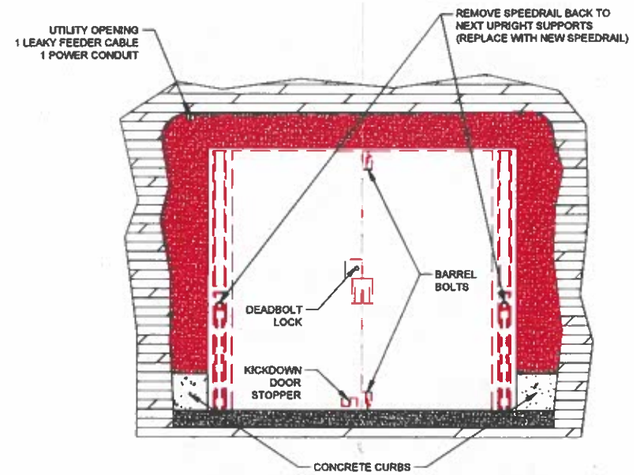
C-10 DRIPSTONE CAVE EXIT OUTER AIRLOCK DOORS

DATE 03/30/21	ARCHIVE NO.
DESIGNER N.OMR	DRAWING SHEET NO. C-10
DRAWN M.LAC	
CHECKED M.DRE/M.HAD	
PROJECT NO. 19129310	SHEET 13 OF 18

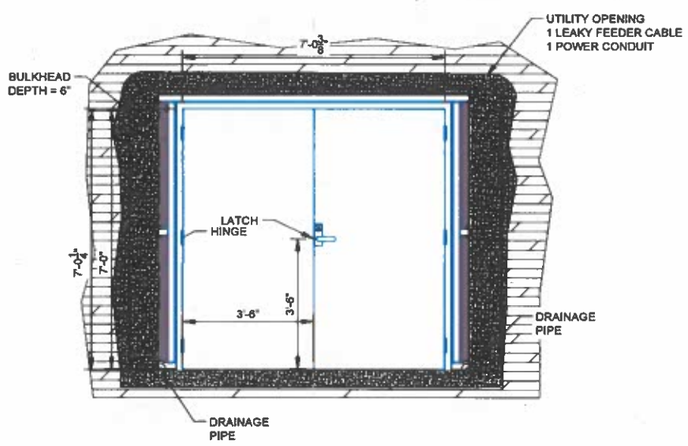
3/30/21 12:36 M.LACOSTE C:\USERS\M.LACOSTE\DOCUMENTS\BLANCHARD CAVERNS ASSESSMENT - 5 TECHNICAL WORK\DRAFTING\19129310_DFA_BLANCHARD CAVERNS ASSESSMENT - 5 TECHNICAL WORK\DRAWINGS\ARCHITECTURAL CONSTRUCTION\DRIPSTONE EXIT.DWG



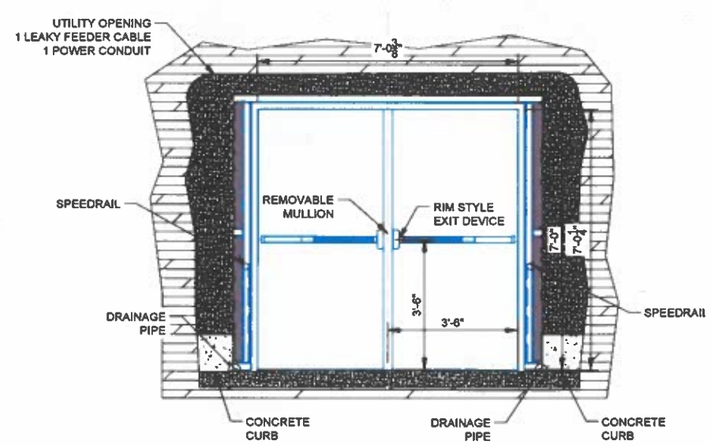
SCALE 1"=2' G-G' C-03 DRIPSTONE CAVE EXIT - SECURITY DOORS - OUTSIDE VIEW - EXISTING



SCALE 1"=2' G-G' C-03 DRIPSTONE CAVE EXIT - SECURITY DOORS - INSIDE VIEW - EXISTING



SCALE 1"=2' G-G' C-03 DRIPSTONE CAVE EXIT - SECURITY DOORS - OUTSIDE VIEW - FOR CONSTRUCTION



SCALE 1"=2' G-G' C-03 DRIPSTONE CAVE EXIT - SECURITY DOORS - INSIDE VIEW - FOR CONSTRUCTION

NOTE & SPECIFICATIONS

1. INSTALL UNITS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
2. EXISTING BULK HEADS TO BE EVALUATED FOR REPLACEMENT AFTER DOOR DEMOLITION
3. ANY REPLACEMENT BULKHEADS TO BE CONSTRUCTED OUT OF NATURAL CAVE ROCK AND GALVANIZED STEEL REINFORCEMENT
4. DOORS SHALL BE CHEM-PRUF FRP PHARMACEUTICAL DOORS AND SHALL HAVE THE FOLLOWING CHARACTERISTICS.
   - A. TYPE: DOUBLE DOORS WITH REMOVABLE MULLION BETWEEN DOORS
   - B. MATERIAL: FIBERGLASS REINFORCED PLASTIC
   - C. FINISH: 25 MIL RESIN-RICH GELCOAT
5. DOOR HANDLES SHALL BE LEVER-STYLE AND SOLID GRADE 316 STAINLESS STEEL.
6. MULLION SHALL BE PURCHASED FROM CRL.
7. EXIT DEVICE SHALL BE SARGENT 8800 SERIES RIM EXIT DEVICE.
8. LOCKING MECHANISM SHALL BE SOLID GRADE 316 STAINLESS STEEL.
9. DOOR CLOSERS SHALL BE STANDARD PROVIDED WITH CHEM-PRUF FRP PHARMACEUTICAL DOOR SYSTEM.
10. FLOOR THRESHOLD SHALL BE SOLID GRADE 316 STAINLESS STEEL.
11. ALL EXISTING HANDRAILS SHALL BE REPLACED WITH SPEED-RAIL®, OR EQUIVALENT, AND HAVE THE FOLLOWING CHARACTERISTICS.
    - A. HEIGHT OF TOP RAIL ABOVE WALKING SURFACE SHALL BE 34"
    - B. POST SPACING AND MOUNTING SHALL BE DETERMINED BY SITE CONDITIONS
    - C. POSTS SHALL BE ALUMINUM 6005-T5, 1 ½" IPS (48.2 MM O.D.) SCHEDULE 80 WALL (CLEAR ANODIZED) OR COMPARABLE
    - D. RAILS SHALL BE ALUMINUM 6063-T6, 1 ½" IPS (48.2 MM O.D.) SCHEDULE 40 WALL (CLEAR ANODIZED) OR COMPARABLE
    - E. FITTINGS SHALL BE ALUMINUM 6063-T6 (CLEAR ANODIZED)
    - F. BASE FLANGES SHALL BE CAST ALUMINUM
    - G. FASTENERS SHALL BE ALLOY 6063-T6 ALUMINUM
12. FRP COMPONENTS OF BULKHEADS SHALL BE FIBERCORR™ OR EQUIVALENT MOISTURE AND CORROSION RESISTANT PANELS.
13. DRAINAGE PIPES SHALL BE MINIMUM 1-INCH DIAMETER PVC PIPE CONDUIT TO BE INSTALLED IN EACH LOWER CORNER TO PROVIDE DRAINAGE.
14. UTILITIES PORTS SHALL BE REPLACED WHERE SPECIFIED

LEGEND

- NATIVE ROCK
- MASONRY WALL
- BULKHEAD (BRICK)
- BULKHEAD (CONCRETE) AND CONCRETE PADS
- BULKHEAD (STONE)
- BULKHEAD (WOOD)
- FIBERGLASS REINFORCED PLASTIC (FRP)
- ITEMS TO REMAIN UNDISTURBED
- ITEMS TO REMOVE
- ITEMS IN FOREGROUND TO REMOVE
- NEW ITEMS
- NEW ITEMS IN BACKGROUND

0 1 2
1" = 1' FEET

ISSUED FOR BID

USDA FOREST SERVICE

United States Department of Agriculture
Forest Service

(R08)
SOUTHERN REGION

STAMPS, LOGOS, AND SEALS

GOLDER

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 18376
MARK N. HADDOCK
3/30/21

NO.	REVISION / ISSUE	DATE
D	ISSUED FOR BID	03/30/21
C	ISSUED FOR 95% REVIEW	02/12/21
B	ISSUED FOR 80% REVIEW	10/16/20
A	ISSUED FOR 50% REVIEW	07/31/20

PROJECT NAME

BLANCHARD SPRINGS CAVERNS TUNNEL REHABILITATION

OZARK-ST. FRANCIS NATIONAL FOREST

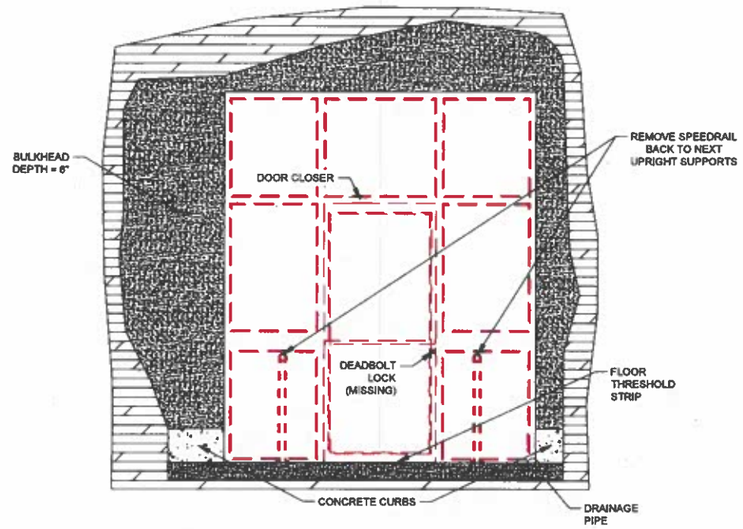
SYLAMORE RANGER DISTRICT

DRAWING TITLE

C-11 DRIPSTONE CAVE EXIT SECURITY DOORS

DATE 03/30/21	ARCHIVE NO.
DESIGNER N.OMR	DRAWING SHEET NO. C-11
DRAWN M.LAC	
CHECKED M.DRE/M.HAD	
PROJECT NO. 19129310	SHEET 14 OF 18

3/30/21 12:39 M.LACOSTE C:\USERS\M.LACOSTE\DOULDER ASSOCIATES\19129310_RFA BLANCHARD CAVERNS ASSESSMENT - 5 TECHNICAL WORK\DRAFTING\19PA DRAWINGS\ARCHITECTURAL CONSTRUCTION\DRIPSTONE SECURITY DOOR.DWG;



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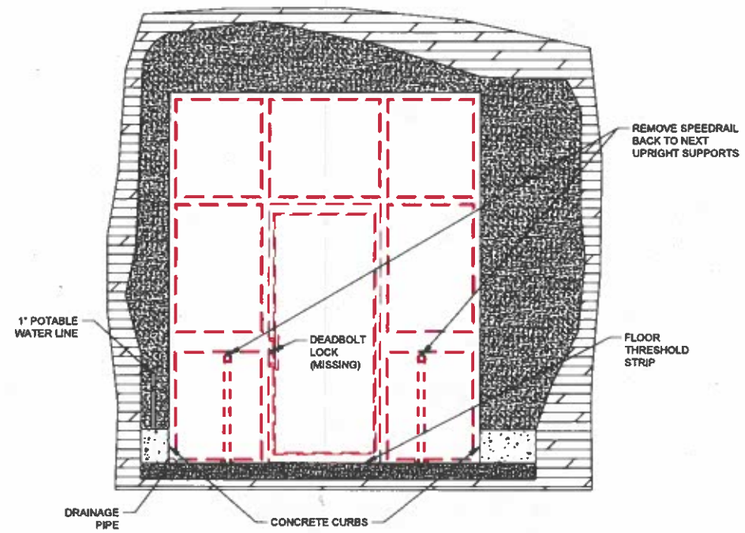
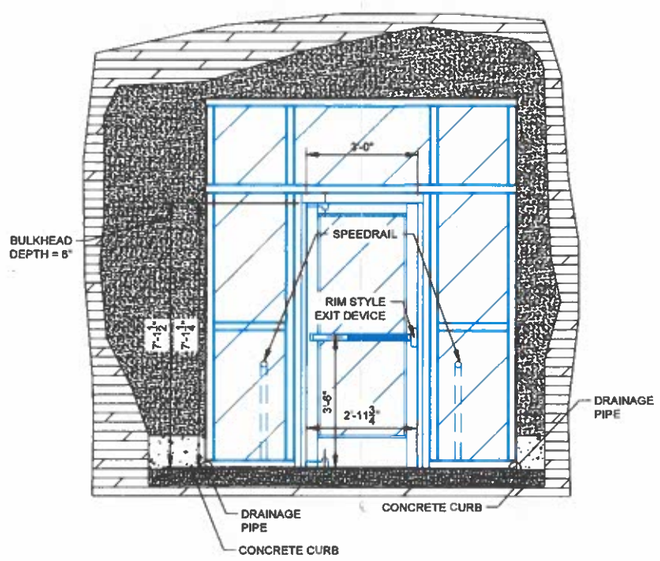
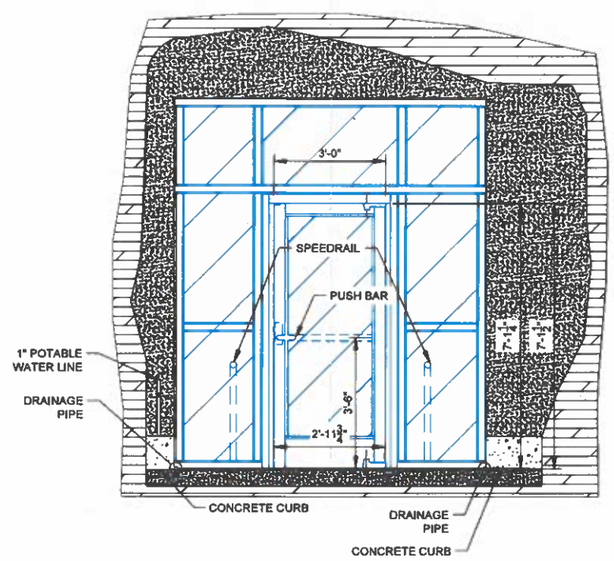


SCALE 1"=2' E-E' C-04 DISCOVERY CAVE EXIT - INNER AIRLOCK DOORS - INSIDE VIEW - EXISTING



SCALE 1"=2' E-E' C-04 DISCOVERY CAVE EXIT - INNER AIRLOCK DOORS - OUTSIDE VIEW - FOR CONSTRUCTION



SCALE 1"=2' E-E' C-04 DISCOVERY CAVE EXIT - INNER AIRLOCK DOORS - INSIDE VIEW - FOR CONSTRUCTION

NOTE & SPECIFICATIONS

1. INSTALL UNITS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
2. EXISTING BULK HEADS TO BE EVALUATED FOR REPLACEMENT AFTER DOOR DEMOLITION
3. ANY REPLACEMENT BULKHEADS TO BE CONSTRUCTED OUT OF NATURAL CAVE ROCK AND GALVANIZED STEEL REINFORCEMENT
4. DOOR SHALL BE CRL- U.S. ALUMINUM BALANCER™ SERIES ALUMINUM FULL FRAMED BALANCED DOOR AND SHALL HAVE THE FOLLOWING CHARACTERISTICS.
   - A. TYPE: SINGLE DOORS WITH SIDE LIGHTS AROUND DOOR
   - B. MATERIAL: GRADE 316 STAINLESS STEEL CLAD ALUMINUM
   - C. FINISH: STAINLESS STEEL, BHMA 629, SATIN
   - D. STILE OPTION: CONCEALED
5. DOOR HANDLE SHALL BE LEVER-STYLE AND SOLID GRADE 316 STAINLESS STEEL.
6. EXIT DEVICE SHALL BE SARGENT 8800 SERIES RIM EXIT DEVICE.
7. LATCHING MECHANISM SHALL BE SOLID GRADE 316 STAINLESS STEEL.
8. GLASS SHALL HAVE THE FOLLOWING CHARACTERISTICS.
   - A. ½" IN THICKNESS OR GREATER
   - B. IMPACT RESISTANT RATED
   - C. CLEAR WITH NO TINTING APPLIED FOR MAXIMUM VISIBILITY
9. DOOR CLOSER SHALL BE STANDARD PROVIDED WITH U.S. ALUMINUM BALANCER™ SERIES ALUMINUM FULL FRAMED BALANCED DOOR SYSTEM.
10. FLOOR THRESHOLD SHALL BE SOLID GRADE 316 STAINLESS STEEL.
11. ALL EXISTING HANDRAILS SHALL BE REPLACED WITH SPEED-RAIL®, OR EQUIVALENT, AND HAVE THE FOLLOWING CHARACTERISTICS.
    - A. HEIGHT OF TOP RAIL ABOVE WALKING SURFACE SHALL BE 34"
    - B. POST SPACING AND MOUNTING SHALL BE DETERMINED BY SITE CONDITIONS
    - C. POSTS SHALL BE ALUMINUM 6005-T5, 1 ½" IPS (48.2 MM O.D.) SCHEDULE 80 WALL (CLEAR ANODIZED) OR COMPARABLE
    - D. RAILS SHALL BE ALUMINUM 6063-T6, 1 ½" IPS (48.2 MM O.D.) SCHEDULE 40 WALL (CLEAR ANODIZED) OR COMPARABLE
    - E. FITTINGS SHALL BE ALUMINUM 6063-T6 (CLEAR ANODIZED)
    - F. BASE FLANGES SHALL BE CAST ALUMINUM
    - G. FASTENERS SHALL BE ALLOY 6063-T6 ALUMINUM
12. UTILITIES PORTS SHALL BE REPLACED WHERE SPECIFIED
13. DRAINAGE PIPES SHALL BE MINIMUM 1-INCH DIAMETER PVC PIPE CONDUIT TO BE INSTALLED IN EACH LOWER CORNER TO PROVIDE DRAINAGE.

LEGEND

- NATIVE ROCK
- MASONRY WALL
- BULKHEAD (BRICK)
- BULKHEAD (CONCRETE) AND CONCRETE PADS
- BULKHEAD (STONE)
- BULKHEAD (WOOD)
- GLASS
- ITEMS TO REMAIN UNDISTURBED
- ITEMS TO REMOVE
- ITEMS IN FOREGROUND TO REMOVE
- NEW ITEMS
- NEW ITEMS IN BACKGROUND

0 1 2
1" = 1' FEET

ISSUED FOR BID

USDA FOREST SERVICE

United States Department of Agriculture
Forest Service

(R08)
SOUTHERN REGION

STAMPS, LOGOS, AND SEALS

GOLDER

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 18376 MARK N. HADDOCK 03/30/21

NO.	REVISION / ISSUE	DATE
D	ISSUED FOR BID	03/30/21
C	ISSUED FOR 95% REVIEW	02/12/21
B	ISSUED FOR 90% REVIEW	10/16/20
A	ISSUED FOR 50% REVIEW	07/31/20

PROJECT NAME

BLANCHARD SPRINGS CAVERNS TUNNEL REHABILITATION

OZARK-ST. FRANCIS NATIONAL FOREST

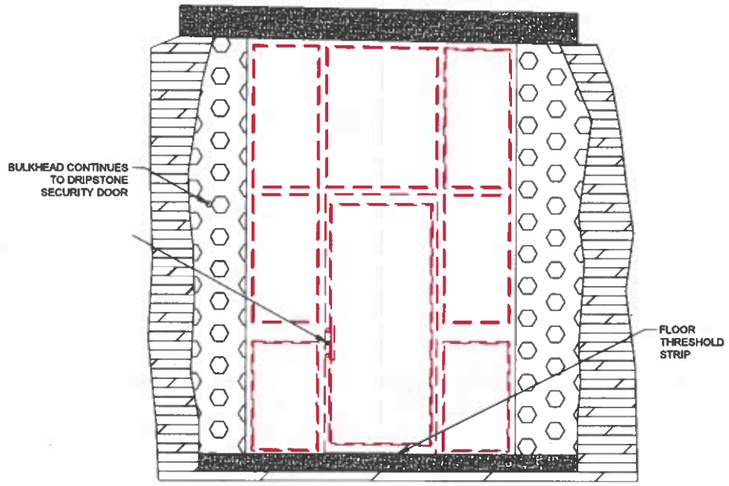
SYLAMORE RANGER DISTRICT

DRAWING TITLE

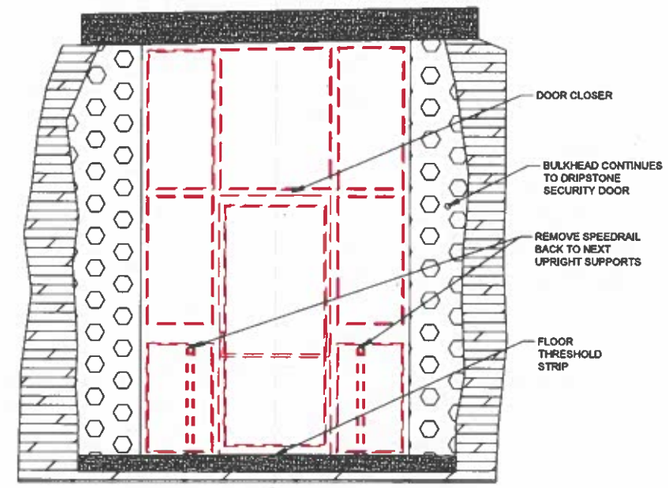
C-12 DISCOVERY CAVE EXIT INNER AIRLOCK DOORS

DATE 03/30/21	ARCHIVE NO.
DESIGNER N.OMR	DRAWING SHEET NO. C-12
DRAWN M.LAC	
CHECKED M.DRE/M.HAD	
PROJECT NO. 19129310	SHEET 15 OF 18

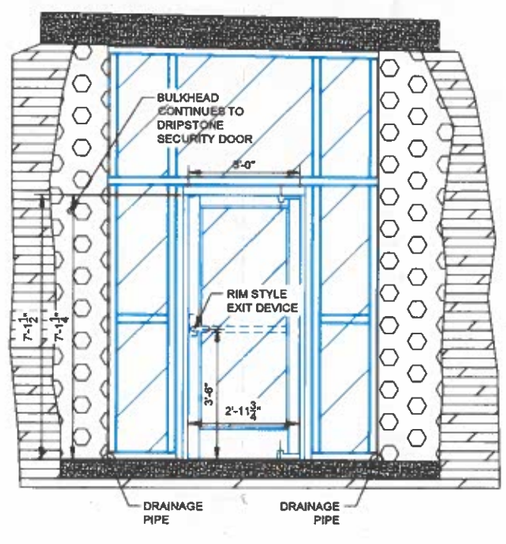
3/30/21 12:39 M:\ACOSTE C:\USERS\M.ACOSTE\DOCUMENTS\DOCUMENTS\DOCUMENTS



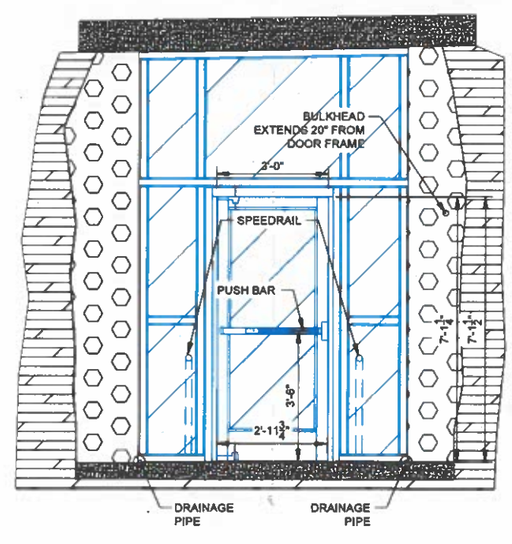
SCALE 1"=2' F-F' C-04 DISCOVERY CAVE EXIT - OUTER AIRLOCK DOORS - OUTSIDE VIEW - EXISTING



SCALE 1"=2' F-F' C-04 DISCOVERY CAVE EXIT - OUTER AIRLOCK DOORS - INSIDE VIEW - EXISTING



SCALE 1"=2' F-F' C-04 DISCOVERY CAVE EXIT - OUTER AIRLOCK DOORS - OUTSIDE VIEW - FOR CONSTRUCTION



SCALE 1"=2' F-F' C-04 DISCOVERY CAVE EXIT - OUTER AIRLOCK DOORS - INSIDE VIEW - FOR CONSTRUCTION

NOTE & SPECIFICATIONS

1. INSTALL UNITS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
2. TUCKPOINTING SHALL BE COMPLETED AS NEEDED ON EXISTING MASONRY
3. DOORS SHALL BE CRL- U.S. ALUMINUM BALANCER™ SERIES ALUMINUM FULL FRAMED BALANCED DOORS AND SHALL HAVE THE FOLLOWING CHARACTERISTICS.
   - A. TYPE: TWO SINGLE DOORS SIDE-BY-SIDE WITH SIDE LIGHT BETWEEN DOORS
   - B. MATERIAL: GRADE 316 STAINLESS STEEL CLAD ALUMINUM
   - C. FINISH: STAINLESS STEEL, BHMA 629, SATIN
   - D. STILE OPTION: CONCEALED
4. DOOR HANDLES SHALL BE LEVER-STYLE AND SOLID GRADE 316 STAINLESS STEEL.
5. EXIT DEVICE SHALL BE SARGENT 8800 SERIES RIM EXIT DEVICE.
6. LATCHING MECHANISM SHALL BE SOLID GRADE 316 STAINLESS STEEL.
7. GLASS SHALL HAVE THE FOLLOWING CHARACTERISTICS.
   - A. ½" IN THICKNESS OR GREATER
   - B. IMPACT RESISTANT RATED
   - C. CLEAR WITH NO TINTING APPLIED FOR MAXIMUM VISIBILITY
8. DOOR CLOSERS SHALL BE STANDARD PROVIDED WITH U.S. ALUMINUM BALANCER™ SERIES ALUMINUM FULL FRAMED BALANCED DOOR SYSTEM.
9. FLOOR THRESHOLD SHALL BE SOLID GRADE 316 STAINLESS STEEL.
10. ALL EXISTING HANDRAILS SHALL BE REPLACED WITH SPEED-RAIL®, OR EQUIVALENT, AND HAVE THE FOLLOWING CHARACTERISTICS.
    - A. HEIGHT OF TOP RAIL ABOVE WALKING SURFACE SHALL BE 34"
    - B. POST SPACING AND MOUNTING SHALL BE DETERMINED BY SITE CONDITIONS
    - C. POSTS SHALL BE ALUMINUM 6005-T5, 1 ½" IPS (48.2 MM O.D.) SCHEDULE 80 WALL (CLEAR ANODIZED) OR COMPARABLE
    - D. RAILS SHALL BE ALUMINUM 6063-T6, 1 ½" IPS (48.2 MM O.D.) SCHEDULE 40 WALL (CLEAR ANODIZED) OR COMPARABLE
    - E. FITTINGS SHALL BE ALUMINUM 6063-T6 (CLEAR ANODIZED)
    - F. BASE FLANGES SHALL BE CAST ALUMINUM
    - G. FASTENERS SHALL BE ALLOY 6063-T6 ALUMINUM
11. UTILITIES PORTS SHALL BE REPLACED WHERE SPECIFIED
12. DRAINAGE PIPES SHALL BE MINIMUM 1-INCH DIAMETER PVC PIPE CONDUIT TO BE INSTALLED IN EACH LOWER CORNER TO PROVIDE DRAINAGE.

LEGEND

- NATIVE ROCK
- MASONRY WALL
- BULKHEAD (BRICK)
- BULKHEAD (CONCRETE) AND CONCRETE PADS
- BULKHEAD (STONE)
- BULKHEAD (WOOD)
- GLASS
- ITEMS TO REMAIN UNDISTURBED
- ITEMS TO REMOVE
- ITEMS IN FOREGROUND TO REMOVE
- NEW ITEMS
- NEW ITEMS IN BACKGROUND

0 1 2
1" = 1' FEET

ISSUED FOR BID

USDA FOREST SERVICE

United States Department of Agriculture
Forest Service

(R08)
SOUTHERN REGION

STAMPS, LOGOS, AND SEALS

GOLDER

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 18378 MARK N. HADDOCK

NO.	REVISION / ISSUE	DATE
D	ISSUED FOR BID	03/30/21
C	ISSUED FOR 90% REVIEW	02/12/21
B	ISSUED FOR 60% REVIEW	10/16/20
A	ISSUED FOR 30% REVIEW	07/31/20

PROJECT NAME

BLANCHARD SPRINGS CAVERNS TUNNEL REHABILITATION

OZARK-ST. FRANCIS NATIONAL FOREST

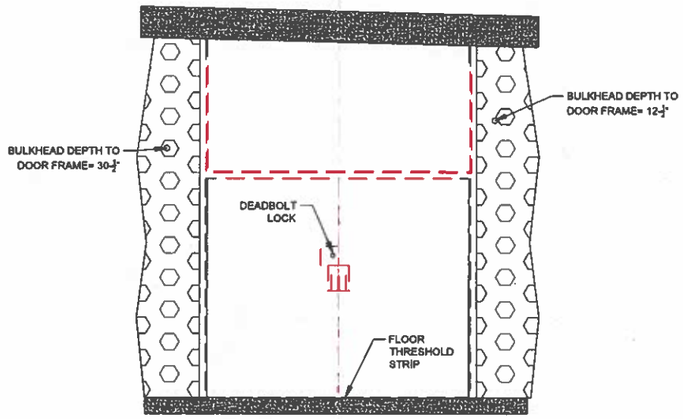
SYLAMORE RANGER DISTRICT

DRAWING TITLE

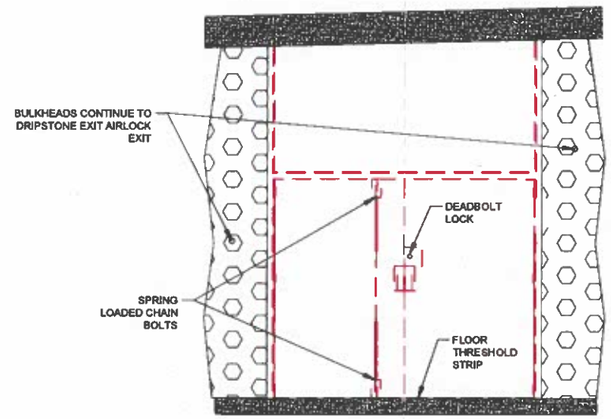
C-13 DISCOVERY CAVE EXIT OUTER AIRLOCK DOORS

DATE 03/30/21	ARCHIVE NO.
DESIGNER N.OMR	DRAWING SHEET NO. C-13
DRAWN M.LAC	
CHECKED M.DRE/M.HAD	
PROJECT NO. 19129310	SHEET 16 OF 18

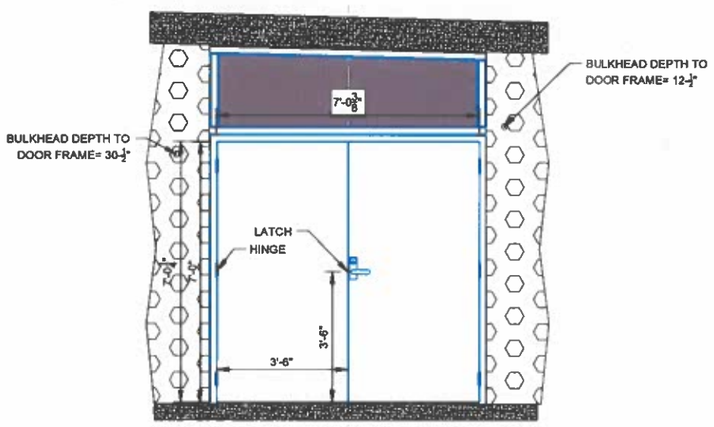
3/30/21 12:39 M.LACOSTE C:\USERS\M.LACOSTE\DOLDER ASSOCIATES\19129310\FA BLANCHARD CAVERNS ASSESSMENT - 3 TECHNICAL WORK\DRAFTING\19FA DRAWINGS\ARCHITECTURAL CONSTRUCTION\DISCOVERY ENTRANCE.DWG;



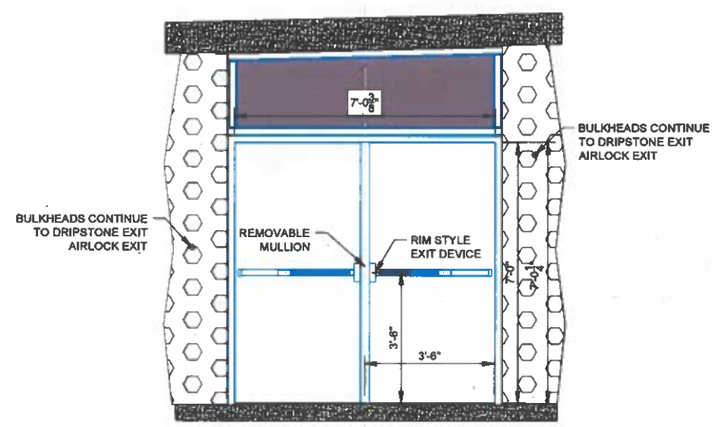
SCALE 1"=2' (G-G' / C-04) DISCOVERY CAVE EXIT - SECURITY DOORS - OUTSIDE VIEW - EXISTING



SCALE 1"=2' (G-G' / C-04) DISCOVERY CAVE EXIT - SECURITY DOORS - INSIDE VIEW - EXISTING



SCALE 1"=2' (G-G' / C-04) DISCOVERY CAVE EXIT - SECURITY DOORS - OUTSIDE VIEW - FOR CONSTRUCTION



SCALE 1"=2' (G-G' / C-04) DISCOVERY CAVE EXIT - SECURITY DOORS - INSIDE VIEW - FOR CONSTRUCTION

NOTE & SPECIFICATIONS

1. INSTALL UNITS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
2. TUCKPOINTG SHALL BE COMPLETED AS NEEDED ON EXISTING MASONRY.
3. DOORS SHALL BE CHEM-PRUF FRP PHARMACEUTICAL DOORS AND SHALL HAVE THE FOLLOWING CHARACTERISTICS.
   - A. TYPE: DOUBLE DOORS WITH REMOVABLE MULLION BETWEEN DOORS
   - B. MATERIAL: FIBERGLASS REINFORCED PLASTIC
   - C. FINISH: 25 MIL RESIN-RICH GELCOAT
4. DOOR HANDLES SHALL BE LEVER-STYLE AND SOLID GRADE 316 STAINLESS STEEL.
5. MULLION SHALL BE PURCHASED FROM CRL.
6. EXIT DEVICE SHALL BE SARGENT 8800 SERIES RIM EXIT DEVICE.
7. LOCKING MECHANISM SHALL BE SOLID GRADE 316 STAINLESS STEEL.
8. DOOR CLOSERS SHALL BE STANDARD PROVIDED WITH CHEM-PRUF FRP PHARMACEUTICAL DOOR SYSTEM.
9. FLOOR THRESHOLD SHALL BE SOLID GRADE 316 STAINLESS STEEL.
10. FRP COMPONENTS OF BULKHEADS SHALL BE FIBERCORR™ OR EQUIVALENT MOISTURE AND CORROSION RESISTANT PANELS.
11. ALL EXISTING HANDRAILS SHALL BE REPLACED WITH SPEED-RAIL®, OR EQUIVALENT, AND HAVE THE FOLLOWING CHARACTERISTICS.
    - A. HEIGHT OF TOP RAIL ABOVE WALKING SURFACE SHALL BE 34"
    - B. POST SPACING AND MOUNTING SHALL BE DETERMINED BY SITE CONDITIONS
    - C. POSTS SHALL BE ALUMINUM 6005-T5, 1 ½" IPS (48.2 MM O.D.) SCHEDULE 80 WALL (CLEAR ANODIZED) OR COMPARABLE
    - D. RAILS SHALL BE ALUMINUM 6063-T6, 1 ½" IPS (48.2 MM O.D.) SCHEDULE 40 WALL (CLEAR ANODIZED) OR COMPARABLE
    - E. FITTINGS SHALL BE ALUMINUM 6063-T6 (CLEAR ANODIZED)
    - F. BASE FLANGES SHALL BE CAST ALUMINUM
    - G. FASTENERS SHALL BE ALLOY 6063-T6 ALUMINUM
12. UTILITIES PORTS SHALL BE REPLACED WHERE SPECIFIED

LEGEND

- NATIVE ROCK
- MASONRY WALL
- BULKHEAD (BRICK)
- BULKHEAD (CONCRETE) AND CONCRETE PADS
- BULKHEAD (STONE)
- BULKHEAD (WOOD)
- FIBERGLASS REINFORCED PLASTIC (FRP)
- ITEMS TO REMAIN UNDISTURBED
- ITEMS TO REMOVE
- ITEMS IN FOREGROUND TO REMOVE
- NEW ITEMS
- NEW ITEMS IN BACKGROUND

0 1 2
1" = 1' FEET

ISSUED FOR BID

USDA FOREST SERVICE

United States Department of Agriculture
Forest Service

(R08)
SOUTHERN REGION

STAMPS, LOGOS, AND SEALS

GOLDER

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 10378 MARK N. HADDOCK 9/20/21

NO.	REVISION / ISSUE	DATE
D	ISSUED FOR BID	03/30/21
C	ISSUED FOR 95% REVIEW	02/12/21
B	ISSUED FOR 90% REVIEW	10/16/20
A	ISSUED FOR 50% REVIEW	07/31/20

PROJECT NAME

BLANCHARD SPRINGS CAVERNS TUNNEL REHABILITATION

OZARK-ST. FRANCIS NATIONAL FOREST

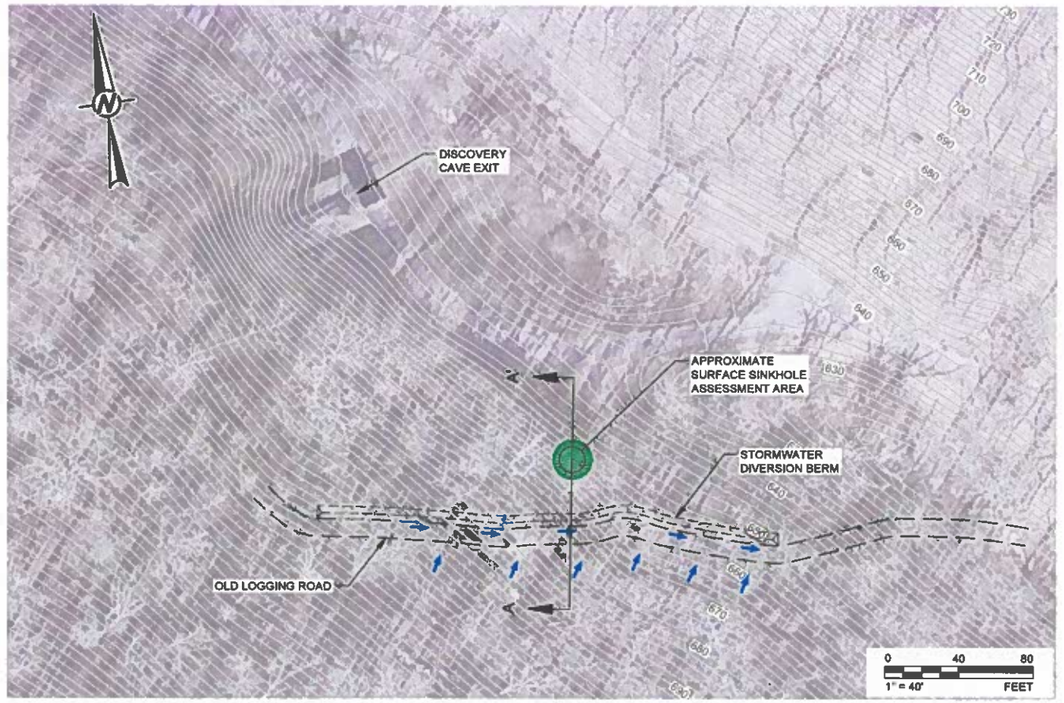
SYLAMORE RANGER DISTRICT

DRAWING TITLE

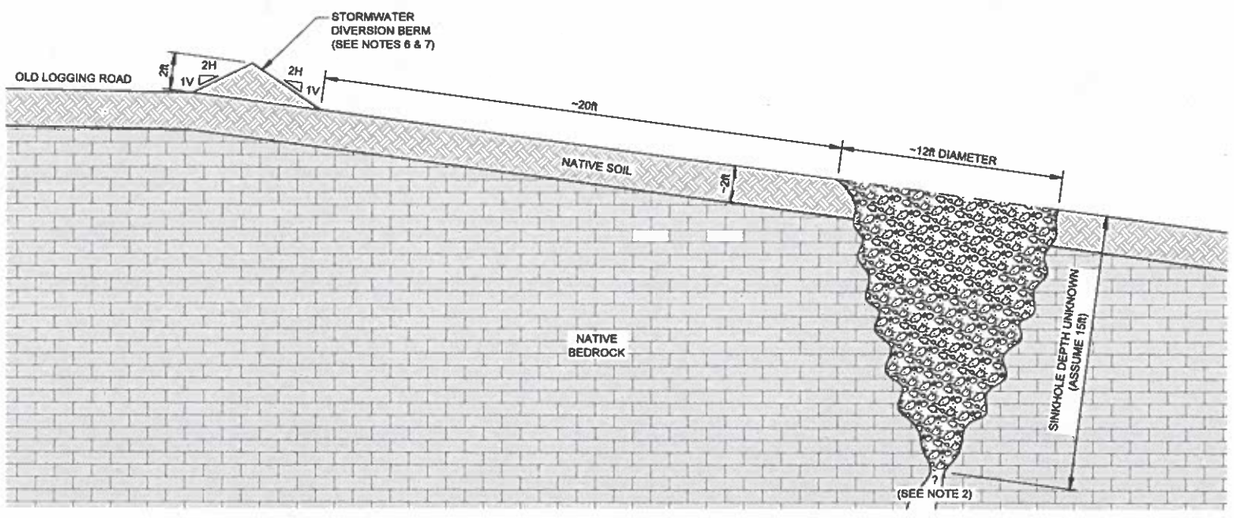
C-14 DISCOVERY CAVE EXIT SECURITY DOORS

DATE 03/30/21	ARCHIVE NO.
DESIGNER N.OMR	DRAWING SHEET NO. C-14
DRAWN M.LAC	
CHECKED M.DRE/M.HAD	
PROJECT NO. 19129310	SHEET 17 OF 18

3/30/21 12:39 MLACOSTE C:\USERS\MLACOSTE\GOLDER ASSOCIATES\19129310_RFA BLANCHARD CAVERNS ASSESSMENT - 3 TECHNICAL WORK\DRAFTING\19% DRAWINGS\ARCHITECTURAL CONSTRUCTION\DISCOVERY SECURITY DOOR.DWG;



SINKHOLE PLAN VIEW



N.T.S. A-A' C-15 SINKHOLE INFILLING APPROXIMATE SECTION

NOTE & SPECIFICATIONS

1. SINKHOLE IS APPROXIMATELY 12 FT IN DIAMETER AND AT LEAST 15 FT DEEP.
2. EXTENT OF SINKHOLE BELOW GROUND IS UNKNOWN BEYOND WHAT IS VISIBLE FROM SURFACE.
3. SINKHOLE IS PROPOSED TO BE BACKFILLED WITH CRUSHED STONE FROM GROUND SURFACE USING AN EXCAVATOR. STONE SHOULD BE ADDED UNTIL SINKHOLE IS CHOKED OFF AND THEN BACKFILLED TO JUST ABOVE SURFACE LEVEL. THIS MAY TAKE SEVERAL FILLINGS.
4. SINKHOLE INFILL MATERIAL SHALL BE LIMESTONE FROM A LOCALLY AVAILABLE QUARRY WITH GREATER THAN 80% BEING PARTICLES BETWEEN 1 AND 2 FEET IN DIAMETER.
5. CONTRACTOR SHOULD WATCH FOR SIGNS OF SLOUGHING, SETTLING OR OTHER INSTABILITY DURING INFILLING.
6. A STORMWATER DIVERSION BERM SHALL BE CONSTRUCTED AS SHOWN TO DIVERT SURFACE WATER FROM THE ADJACENT OLD LOGGING ROAD AND LIMIT MAN-MADE WATER INFLOWS.
7. BERM MATERIAL SHALL CONSIST OF FINE-GRAINED SOIL PLACED IN LIFTS NO GREATER THAN 9-INCHES COMPACTED DEPTH AND SHALL BE COMPACTED AND PROOF-ROLLED AND APPROVED BY ENGINEER.
8. STORMWATER DIVERSION BERM AND SURROUNDING DISTURBED AREAS SHALL BE SEEDED AND REVEGETATED USING A NATIVE SPECIES SEED MIX APPROVED BY THE FOREST SERVICE.

LEGEND

- OLD LOGGING ROAD
- STORMWATER DIVERSION BERM
- SURFACE WATER FLOW DIRECTION

ISSUED FOR BID

USDA FOREST SERVICE

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C-15 SINKHOLE INFILL DETAIL

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DRAWN M.LAC	
CHECKED M.DRE/M.HAD	
PROJECT NO. 19129310	SHEET 18 OF 18

3/30/21 12:49 M.LACORTE C:\USERS\M.LACORTE\GOLDER ASSOCIATES\19129310_RPA BLANCHARD CAVERNS ASSESSMENT - 3 TECHNICAL WORK\DRAFTING\19% DRAWING\RC-15 SINKHOLE INFILL DETAIL.DWG;