CABLEWAY CRANE REFURBISHMENT

PART 1 GENERAL

1.1 OVERVIEW

A. The 150-ton cableway crane at the Hoover Dam needs to be refurbished. The ground to the middle of the track cables is approximately 600 feet. When work is being completed on the NV tower, the ground is approximately 100 feet below. The track cables spans from the AZ anchorage to behind the NV tower. The length of the track cable is 1,615', most of which is above the canyon.

B. The principal components of work include:

C. Replace the 6, 3-½" track wire ropes.

D. Replace the 2, 3/4" button line wire ropes, buttons and button line tensioners

E. Replace the 1-1/8" inhaul, outhaul and hoist wire ropes.

F. Refurbish the existing carriage

G. Redesign the slack carrier eye area, refurbish and install slack carriers

H. Replace sheaves

I. Lubricate the hoist house mechanical components

J. Re-tension the track cables

K. Replace the hydraulic hand pump and lines on the NV side tensioning system

L. Load test the cableway crane

M. Perform an annual inspection and certify the crane

1.2 DEFINITIONS

A. Days: Calendar days, unless otherwise specified

B. COR: Contracting Officer's Representative

C. CS: Contract Specialist

D. TPOC: Technical Point of Contact

E. GD&T: Geometric Dimensions and Tolerances

F. FAR: Federal Acquisition Regulations

1.3 SCHEDULE

A. The period of performance of this contract 850 days after award.

1. Within the first year, all materials need to be procured and delivered on site.

2. Installation and all onsite work will be performed in year two.

B. Onsite work is scheduled to begin for May of 2028, pending completion of penstock outage, due to plant activity.

C. On-site work shall be accomplished during normal hours, which are from 0600 hrs to 1600 hrs, 6:00 a.m. to 4:00 p.m., Pacific Time, - Monday through Saturday. If work is requested outside of these hours, the COR must approve.
Total project schedule using critical path method with Gantt chart showing:
1. Major items of work and duration.
2. Anticipated start and finish dates.
3. Material, manpower, and equipment resources.
4. Anticipated submittal dates.
5. Logical relations between activities.

After initial submission, update and resubmit the project schedule monthly with actual progress and impacts on milestones clearly identified.
A Notice to Proceed (NPT) will be given after submittal 000 to 003 have been submitted to purchase material. A second NPT will be issued when the contractor has provided a start date to begin on-site construction, after submittal 004 has been accepted by the TPOC. Other non-onsite construction related activities which are feasible during this time are permitted between the first and second NPT. The government will approve the given date for on-site construction.

1.4 PAYMENT

A. Cost: Include cost of submittals in prices offered in the schedule for contract line items.

B. Capture all costs associated with the requirements of this specification using the Bid Schedule.

C. Payment:

1. Payment for the materials acquired in year 1 will be issued after submittal 004 is accepted by the TPOC.

2. Ten percent of payment for contract line items will be withheld until all submittals are submitted to and accepted by the TPOC.

1.5 REFERENCE STANDARDS

Use the most recent edition of the standards listed in this section.

A. American Society for Testing and Materials (ASTM)

1. ASTM A36 Carbon Structural Steel
2. ASTM A148 Carbon Steel, Alloy Steel, and Stainless Steel Castings
3. ASTM A 307 Medium strength carbon steel fasteners
4. ASTM A 563 Carbon and Alloy Steel Nuts
5. ASTM A 569 Hot rolled carbon steel sheet and strip

B. American Society of Mechanical Engineers (ASME)

1. ASME Y14.5 Recommended practices for Geometric Dimensions and Tolerances

C. American Welding Society (AWS)

1. AWS D1.1 Structural Welding, Steel

D. Hoover Dam Guide Specifications

1. HV-GEN-0001-P General Terms, Purchase Specification
2. HV-GEN-0002-P General Terms Offsite, Purchase Specification
3. HV-NDE-0001-G Non-Destructive Examination

1.6 SUBMITTALS

A. General requirements:

1. Prepare in English
2. Use US customary units
3. Identify each submittal with the contract number, RSN, and title
4. Submit in accordance with Section 4
5. All submittals under this contract will become the property of the Government at the time they are submitted to the TPOC.
6. Drawings
   a. Submit copies in both DWG and PDF format
   b. In the title block, include the contractor's name, the drawing number, part name, and revision block noting as-built changes with revision dates.
   c. Use GD&T in accordance with ASME Y14.5.
7. Government Review
   a. Provide submittals to the TPOC for review and acceptance
   b. Make any revisions requested by the TPOC
   c. Resubmit any revised submittals to the TPOC for review and acceptance

d. Any submittal or resubmittal that has not been reviewed and accepted by the TPOC will be considered submitted for the purposes of processing final payment.

B. RSN 000, Performance and Payment Bonds

C. RSN 001, Schedule of Values

1. Proposed schedule of milestone invoices and amounts.

D. RSN 002, Schedule

1. Cost-loaded schedule using the critical path method showing:

a) Major items of work and milestones

b) Anticipated start and finish dates

c) Anticipated submittal dates

d) Logical relations between activities

E. RSN 003, Material Specifications

1. Material information and specifications for newly purchased components.

2. Data Sheets for all wire ropes delivered to include:

a. Grade of wire

b. Number and pattern of wires in the strand

c. Type of lay

d. Preforming

e. Type of core

f. Rope nominal dimensions

F. RSN 004, Material Delivery

1. Proof that all materials to complete the project has been procured and sent to Hoover Dam.

G. RSN 005, Safety Plan

1. Must include the rescue plan.

2. Work plan for excessive heat.

3. Job Hazard Analysis (JHA)

a. Daily JHAs must be conducted at the start of each shift

4. Must include methods of protecting workers and the public from overhead hazards (wire rope, tools, etc.).

H. RSN 006, Anchor Points/Concrete Footing Report

1. Report must show that the anchor points and concrete footings of the tower are sufficient for the installation and future use.

I. RSN 007, Personnel Qualifications

1. See section 1.8.

J. RSN 008, Material Testing Report

1. Refer to sections:

a. 3.1.I for cast steel

b. 3.5.C.6 for the track cables

c. 3.7.2 for the carriage refurbishment

K. RSN 009, Load Test Certification

L. RSN 0010, Annual Crane Inspection Certification

M. RSN 0011, Project Binder

1.7 PROJECT CONDITIONS

A. The cableway, NV tower and the AZ anchors are at significant height. Due to these dangers, workers must always have adequate fall protection when working at height. Refer to 45 - D – 2016 for the profile of the system.

B. The control house, main loading point, the hoist house, the NV tower and NV anchors are all located on top of the canyon rim. This area is congested with the parking garage and is on a narrow road with limited vehicle access. The tensioning device is at the NV anchors.

1. Hydraulic hand pump and lines are located at the NV anchors.

C. The AZ anchors are located in a tunnel, which is approximately 40 feet long, by 9 feet wide, by 6 –½ feet tall. The opening of the tunnel is on the canyon walls and can only be accessed by a series of ladders and stairs.

D. Drilling into canyon walls for rescue, rescue lines or support anchors is permitted with the approval of Reclamation.

E. The staging areas are the following:

1. Inside the Cableway Hoist House

    a. There is limited area inside for parts or smaller equipment.

2. Outside the warehouse

    a. Approximately 18,000 square feet of space available.

    b. Contractor is responsible for supplying fencing if desired. The perimeter of the fencing is approximated 700 feet.

3. If other staging areas are requested, the time and duration must be approved by the government.

1.8 QUALIFICATIONS

A. Industrial Rope Access Trade Association (IRATA) or Society of Professional Rope Access Technicians (SPRAT) for any work rope access work or rope access rescue.

1. Level 1 minimum for any rope access workers at height.

2. Level 3 for rope access work supervisor.

B. Professional Engineering license for structural analysis.

1. Anchor points, concrete footings, ect.

PART 2 MATERIALS

2.1 METALLIC MATERIALS

A. Structural Steel: ASTM A 36 Carbon Structural Steel

B. Bolts: ASTM A 307 Medium strength carbon steel fasteners

C. Nuts: ASTM A 563 Carbon and Alloy Steel Nuts

D. Washers: Shall be steel, wrought iron, or a material where corrosion will not occur

E. Sheet Steel: ASTM A 569 Hot rolled carbon steel sheet and strip

2.2 NONMETALLIC MATERIAL

A. Lubrication of wire ropes shall be Grignard Strancore or equivalent.

B. The equipment in the cableway hoist house uses the following lubricant:

1. For the drum roll's electric motor bearings, use Castrol Tribol 943 AW 32 or equivalent.

2. For babbitt bearings, shaft support bearings, enclosed gear boxes, use Tribol 1100-220 or equivalent.

3. For tower sheave bushings, Castrol Tribol 4020-220-2

4. For open gears, use Molub Alloy 936 or equivalent.

PART 3 EXECUTION

3.1 GENERAL

A. Contractor shall furnish all labor, materials, equipment, instruments and tools required with the manufacturing, installation and testing of the items listed in this contract. The contractor is responsible for all transportation costs of materials, personnel and housing costs.

B. Prime contractor must perform a majority of the on-site work.

1. If subcontractors are used, the prime contractor must have at least one representative on site while work is being conducted.

C. All mechanical equipment shall be easily erected, inspected, adjusted, painted and taken a part. All steel castings, steel forgings, and rolled or forged steel wheels and sheaves shall be annealed properly. All torsional loads shall be transmitted by suitable keys, splines or pins. The transmission of loads by press fits only will not be permitted. Wherever practical, machinery shall be mounted on common bedplates or rigid steel supports. Computations of stresses shall consider live and dead loads. In the design of all affected parts, proper allowance shall be made for collisions between the bumpers and stops.

D. Bolts and nuts: Except where closer tolerances are required, all bolts for mechanical equipment shall be semifinished and shall have hexagonal heads and nuts. Bolt heads and nuts shall bear on seats at right angles to the bolts. On castings, the seats shall be finished bosses or on spot-faced surfaces. Nuts subject to vibration and frequent alternating loads shall be secured by effective locknuts. Double nuts shall be of standard thickness. Bolts in tension shall have a net section, at root of threat, 15% in excess of the net section required in tension.

E. Shafting and pins: Proper provisions shall be made to prevent longitudinal movement of shafting. Set collars shall not be used for this. The allowable bearing pressure for sheave and equalizing pins in steel frames shall not exceed 9,000 psi for fixed portions and 6,000 psi for movable portions.

F. Shaft couplings: All shaft couplings used on the crane shall be in regular production by a recognized manufacturer of couplings, not be a novel design, and be designed for the torques to be transmitted. Rigid couplings shall be permitted only between bearings which are more than 6 feet apart. Flexible couplings shall be of all metallic (except for grease seals), geared, grease-lubricated type.

G. Keys and keyways: The size of the keys shall be such as to be within safe bearing and shear limits for the materials in contact. Where round end keys are used, the total cross-sectional area may be considered in effective shear, but in calculating bearing stresses on keys and keyways, the projected area of the rounded ends shall be included in the effective bearing area. Feather keys shall have rounded ends and shall have a tight fit in the seats.

H. Setscrews: All setscrews shall have case-hardened cup points. When installed, heads shall be flush with the surface. Setscrews shall not be used for transmitting torsion.

I. Cast Steel: ASTM A 148, grade 80 – 40. All castings shall be annealed as required within. Radiographic examination or other non-destructive tests (NDT) to determine the acceptability of the steel castings are required before installation as submittal 8. If the initial castings are not acceptable the contractor must repair the castings; additional NDT is required to meet acceptable criteria before installation.

J. Fabrication: Fabrication of metalwork shall be in accordance with AISC's Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings". Welding and related works shall be performed in accordance with AWS structural steel codes for steel. Material must be free of bends or kinks before being worked on. After fabrication, all materials must be straight and free of kinks, twists or warps. If straightening is necessary, the method cannot injure or compromise the metal.

K. The Contractor shall notify the Government that all contract personnel have obtained or will obtain security badges by the start of on-site work. No contract personnel without a proper security badge shall be allowed on-site at any time.

1. At the completion of on-site work, the Contractor shall:

a. Return all access keys and badges to the Hoover Police Office

3.2 Safety

A. The contractor shall comply with all federal, state, and local laws and standards as well as the Bureau of Reclamation manual Reclamation Safety and Health Standards (RSHS), current edition. This version is currently available at Safety | Bureau of Reclamation (usbr.gov).

B. For the protection of personnel, the contractor shall furnish a means of protecting workers and others passing under the crane and shall maintain it until the completion of all work within this contract. This includes under the NV tower, the span of the track cables, and during the load test. The means must be able to prevent track cables, tools, or other overhead items from falling onto personnel or structures below. This method must be detailed in the safety plan submittal.

C. A workplan for excessive heat.

1. Nighttime work is an option for heat mitigation with COR approval.

D. If the contractor would like to anchor to the NV tower, an analysis/study must be performed by a licensed professional engineer (PE) to verify that the tower can withstand the proposed loads. Industry standard factors of safety must be used.

E. All workers working in rope access conditions must be, at minimum, certified to SPRAT/IRATA level 1.

F. All workers must follow section pertinent sections of the RSHS.

1. Section 16 pertains to working at height.

G. An executable rescue plan is required at all times while work is being conducted at height. This includes rescues from the track cables, AZ anchor cave and NV tower. Hoover Dam is not responsible for providing rescue. Calling emergency services such as 911, is not a sufficient rescue plan. Please submit the rescue plan in the safety plan, submittal 5. The rescue plan must cover at least the following:

1. Risk Assessment and remediation for likely hazards.

2. Rescue procedures

3. A list of rescue equipment

4. Qualifications for all onsite personnel working at height

5. Estimated response and rescue times

6. First aid which will be rendered

H. There must be at least one certified SPRAT/IRATA level 3 on site available to coordinate rescues when there is rope access work being done at height.

3.3 GOVERNMENT FURNISHED EQUIPMENT, MATERIAL, AND UTILITIES

A. Utilities

1. The contractor will be permitted to access existing restrooms.
2. The following power will be made available to the contractor in the cableway house.

a) 3 Phase, 60 Hz, 480 V

b) 1 Phase, 60 Hz, 120/240 V

B. Contractor parking will be available in front of the warehouse, outside of the cableway hoist house, or on the 5th floor of the parking garage.

1. If contractors elect to park in the parking garage, the following information is needed for each vehicle.

a. Vehicle license plate information

b. Year, make and model of vehicle

3.4 Drawings

A. The following drawings are for reference purposes only. Some information may be inaccurate or contradictory. The contractor shall be responsible for verifying, by on-site inspection, all dimensions and other information for cableway refurbishment.

B. List of Drawings

1. Location Map 45-301-6374
2. Paving Plan, Parking Structure 45–D–17334
3. Conduit Layout 45-D-4743
4. Plan, Profile, Sections 45-D-2016
5. Anchorage Excavation Details 45-D-2248
6. Extension of Arizona Anchorage 45-D-2576
7. Arizona Saddle, Access Stairway 45-D-10075
8. Untitled (Main Cable Take-up Assembly) 45-D-15517
9. Untitled (Nevada Anchor) 45-D-15518
10. 3-½ Closed Type Bridge Socket 45-301-6402
11. Carriage Reinforcement 45-D-8021
12. Untitled (Cable Carriage/Fall Block) 45-D-15521
13. Frame for Main Cable Sheaves 45-301-5066
14. Equalizer Frame 45-301-5067
15. Slack Carrier/Carriage Rollers 45-301-5133
16. Rope Socket, 1-1/8” Inhaul/Outhaul 45-D-10590
17. 150 Ton Lifting Hook 45-301-5335
18. Cableway Hoist House, General 45-D-2240
19. Cableway Hoist House, 40 Ton Crane 45-D-2226
20. Cableway Hoist House, Foundation Plan 45-D-2238
21. Cableway Hoist House, Conduit Layout 45-D-2244

22. Equalizer Frame 45-MD-75-001
23. Frame Assembly for Main Cable and Button Rope Sheaves 45-MD-75-002
24. Frame Assembly for Main Cable Sheaves 45-MD-75-003
25. Hoist Sheave Detail, Single Arrangement 45-MD-75-004
26. Hoist Sheave Assembly, Single Arrangement 45-MD-75-005
27. Frame for Main Cable Sheaves 45-MD-75-014
28. Frame for Main Cable and Button Rope Sheaves 45-MD-75-015
29. Shackle for Fall Block 45-MD-75-016
30. Button Rope Sheave 45-MD-75-021
31. Main Cable Horn Sheave 45-MD-75-022
32. Main Cable Sheave, Bearing Assembly 45-MD-75-023
33. Hoist Sheave, Bearing Assembly 45-MD-75-024
34. Main Cable Sheave Detail 45-MD-75-025
35. Hoist Sheave Detail, Double Arrangement 45-MD-75-026
36. Button Rope Sheave Assembly 45-MD-75-027
37. Main Cable Horn Sheave Assembly 45-MD-75-028
38. Equalizer for Conveying Ropes 45-MD-75-029
39. Assembly of Conveying Hoist Brake 45-MD-75-049
40. Tower and Saddle Sheave 45-MD-75-050
41. Spring For Brakes 45-MD-75-053
42. Assembly of Lifting Hoist Brake 45-MD-75-055
43. Tower Sheave 45-MD-75-056
44. Arrangement for Guide Sheave 45-MD-75-058
45. Guide Sheave 45-MD-75-059
46. Shaft Assembly, Head Tower Hoisting 45-MD-75-065
47. Shaft Assembly, Head Tower Outhaul 45-MD-75-066

48. Shaft Assembly, Head Tower Inhaul 45-MD-75-067

49. Shaft Assembly, Head Tower Outhaul 45-MD-75-068

50. Shaft Assembly, Head Tower Hoist 45-MD-75-069

51. Shaft Assembly, Head Tower Hoist 45-MD-75-070

52. Conveying Drum Assembly 45-MD-75-072

53. Lifting Hoist Drum Assembly 45-MD-75-073

54. Rope Carriers 45-MD-75-073-(1)

55. Cross Connection for Fall Block 45-MD-75-074

56. Tail Saddle and Sheave Support 45-MD-75-092

57. Alternate Tower Design 45-MD-75-110

58. Cable Carriage and Fall Block 45-MD-75-113

59. Head Tower Sheave Arrangement 45-MD-75-121

60. Fall Block 45-MD-75-123

61. Side Member Fall Block 45-MD-75-127

62. Connection of Side Frames and Equalizer 45-MD-75-130

3.5 Track Cable Replacement

A. The contractor is responsible for furnishing and installing six 3 and ½-inch diameter track cables, each about 1600 feet in length, with sockets installed. The wire rope must meet to the latest Federal Specification RR-W-410 and the following requirements:

B. Anchor points and concrete footing on the NV and AZ side must be inspected by the contractor. The anchors and footing must be determined to be capable of installing and tensioning the new track cables.

1. If the concrete footing or anchor points are not in an acceptable condition, a repair plan which can accommodate the track cable and tensioning is required.

2. The condition of the anchor points and concrete footings must be analyzed and documented by a PE.

C. Manufacture

1. 3 and ½-inch diameter, 6 x 49 Seale Warrington Seale, right lang lay with 7 x 7 Independent Wire Rope Core (IWRC). If a different rope construction is

proposed, the contractor must supply COR with sufficient proof of suitability. Any other wire rope construction must be approved by the COR.

2. Breaking Strength Minimum: 560 tons each

3. A factor of safety of 3 or more is required, based on the maximum tensile stress produced in the cable by the rated load, which is 150 tons.

4. Material: Extra Improved Plow Steel, Bright Wire (Ungalvanized)

5. Length:

    a. The cables shall be prestressed at the factory to remove stretch before cutting to length and socketing.

    b. The length of each existing cable is 1,616.08 (before stretching). The contractor is responsible for determining the correct length for the new cables.

    c. No splicing of the cables is permitted. Each cable shall be continuous length.

    d. Special vertical clearance consideration should be given at Station 6+84.6 shown in drawing 45-D-2016.

    e. Marking: The track cables shall be marked with a visible stripe as they are prestressed to prevent twist during installation. If another method is used to ensure twisting does not occur during installation it must be approved by the COR.

6. Testing: The government must approve the following submittals before the track cables and sockets are shipped. The testing shall provide the following information:

    a. Data showing the materials supplied meet the requirements of the solicitation.

    b. Calculations of the cable length, maximum tensile stress at the rated load, and the sag at the midpoint of the span and at Station 6+84.6. The tensile stress tests shall be conducted at 30° F and at 10 pounds per square foot horizontal wind pressure. The sag shall be calculated at 120° F.

    c. Certified breaking tests shall be performed on samples of the track cable

    d. Socket connections shall be tension tested to two-fifths of the breaking strength of the track cable

7. Sockets: Cast steel sockets meeting the most up to date version of RR-S-550 and matching the original sockets shall be attached to the cables at the factory. Drawings of the original sockets are 45-301-6402n.

8. Socketing Procedure: Socketing of wire rope shall be performed by craftsmen skilled in this work according to the procedure below under controlled factory conditions:

   a. Ropes shall be properly seized before socketing to prevent twisting and to ensure equal tension in the strands when the load is applied.

   b. Untwist and broom out all wires.

   c. Clean wires to a length equal to the socket length by washing in gasoline or naptha.

   d. Dip wires to a length not less than five-eighths, nor more than three-fourths the length of the sockets in commercial muriatic acid for 30 to 60 seconds. To prevent brittleness, the acid must not come in contact with any other section of the wire rope.

   e. Rinse the wires in boiling water.

   f. Insert wires in socket, making sure that the socket is in line with the axis of the rope. Seal base of socket with clay, putty or a similar substance.

   g. Pour molten zinc into warm basket until full. Temperature of zinc when poured shall not be more than 830 F nor less than 800 F.

9. Installation

   a. Contractor is responsible for implementing a system which will allow the removal and installation of the track cables. This system must prevent cables from falling below during the removal and installation process. The method for preventing the track cables from falling in between the canyon must be included in the safety plan, which must be approved by the COR.

   b. Contractor must remove the existing track cables and sockets. After the removal of the track cables, the cables must be spooled before being transported offsite for disposal.

   c. After socketing and testing at the factory, the cables must be spooled on large diameter spools prior to shipping to the site. Cable unspooling must be done in a way that prevents unlaying and unkinking.

   d. The cables shall be installed as shown the drawings and with approved methods/industry standards to prevent damage to the cables. The cables shall be installed without twist. The cables must be compatible with the newly installed sheaves.

3.6 Slack Carrier Refurbishment

A. The contractor is responsible for refurbishment of the slack carriers.

B. Contractor is responsible for removal, refurbishment and installation of all slack carrier bodies.

C. Contractor to re-design slack carrier eyelets and appropriate items for use with rollers of such diameter to ride on the button ropes at a tangent to the top of the eyelets. Design must allow for carrier stacking such that no excessive wear occurs on the rollers.

D. Contractor to modify or install slack carriers in such a way to avoid wear or rubbing on other wire ropes and structures.

E. Contractor must replace all bolting, carrier eyes, bearings, wooden and non-metallic components.

F. The contractor is responsible for cleaning and painting of all steel slack carrier items disassembled for refurbishment or replaced with new.

G. One set of slack carriers is on-hand in storage. After refurbishment/replacement of existing slack carriers one set will be placed in storage for future use. If the installed slack carriers have abnormal issues found during functioning because it does not meet OEM design, a modification will be issued to purchase a new set of slack carriers.

3.7 Sheave Replacement

A. All sheave bearings and appurtenant components shall be replaced using new bearings from the original manufacturer or equal in dimensions and material properties.

B. Refer to the drawing set attached for the name, quantity, dimensions and material properties of the sheaves to be replaced.

C. Replace all guide sheaves.

D. Replace all fall block and carriage assembly sheaves.

Consists of button sheaves, main cable sheaves, and hoist sheaves. Refer to 45-D-15521.

E. Replace all tower sheaves

Refer to 137195-C, 137167-C and 137088-C.

Refer to 45-MD-75-121 for the arrangement.

Inhaul, outhaul and hoist ropes will need to be removed before this replacement.

3.8 Carriage Refurbishment

A. The contractor is responsible for the complete refurbishment of the carriage and fall block including inspecting disassembled parts for damage, wear, or fatigue.

B. All bearings to be replaced with new from original manufacturer or equal, other wear items to be replaced in-kind or refurbished to as-new condition.

C. Contractor shall prepare a full report of all test results, photographs, x-ray radiographs, and general information on the serviced features.

D. The contractor is responsible for cleaning and painting of steel carriage and fall block items disassembled for refurbishment or replaced with new. Including but not limited to; carriage frame, lifting hook, bracing.

3.9 Button Rope Replacement

A. The contractor is responsible for furnishing and installation of new button ropes and associated parts. There are two 3/4" button ropes each approximately 1400' in length. Each rope contains 13 buttons for capture of corresponding slack carrier.

B. The contractor is to install and tension button ropes to assure proper and consistent function with the slack carriers.

C. The contractor is to supply new button ropes complete with new buttons compatible with slack carrier button eyes.

1. Button ropes are to be supplied lubricated from the manufacturer.

D. The contractor is responsible to supply and install new tensioning devices on the button ropes.

3.10 Track Cable Tensioning

A. Location of the tensioning device is located near the Nevada anchors.

B. The total pull of the track cables shall be 2,058,000 pounds and 2,100,000 pounds on the Arizona and Nevada side respectively.

C. The horizontal component of the track cable pull on the tower shall be 29,000 pounds.

D. The track cable load on the tower shall be 880,000 pounds.

E. The load on the tower from the track cables and operating ropes shall be 937,000 pounds.

F. Track cable must be tensioned so that there are no vertical clearance issues when lifting the rated load of the cableway. Refer to the minimum distance for max load on drawing 45 – D – 2016.

G. The track cable saddles on both AZ and NV towers are to be inspected after track cable removal and refurbished or replaced as dictated by inspection.

3.11 Hydraulic Tensioning System

A. The hydraulic tensioning system is to be replaced, refer to drawing 45-D-15517:

1. 60 Ton Hydraulic Jack
    a. 5” Ram
    b. 12” stroke
2. Oil Tank
    a. 400 cubic inches of capacity
    b. Must fit on the existing pad
    c. Filled with suitable hydraulic oil
3. Hand Pump
    a. Must fit on the existing pad
    b. Right-handed
4. Hydraulic Lines
    a. 6 Lines
    b. ¼" copper pipe inner diameter
    c. ¼" wall thickness

B. Approximately 12’ long

3.12 Inhaul, Outhaul, and Hoist Cables Replacement

A. Remove the existing inhaul, outhaul and hoist cables.

B. Reinstall the two hoist, inhaul and outhaul ropes with the following characteristics:
1. Material: Extra Improved Plow Steel
2. Steel Core (IWRC)
3. 1-1/8” outer diameter
4. 6 x 37 Filler Wire – Right Regular Lay
5. Made is accordance to RR-W-410G specification.
6. Factor of safety of at least 4.5
7. Breaking Strength Minimum: 130,000 pounds

C. Sockets for the inhaul and outhaul ropes must be replaced.

D. The lengths of the ropes (2 each) are approximately:
1. Hoist: 6,800 feet each

2. Inhaul: 1,300 feet each
3. Outhaul: 2,600 feet each
4. The contractor shall be responsible for determining the required length for each segment of wire rope.

3.13 Lubrication of Cables

A. Lubricant is to be applied at the factory over the entirety of all new wire ropes.

B. High pressure lubrication of all cables on the Cableway. The applicator must be capable of applying the lubrication to the core of the wire ropes.

3.14 Lubrication of Hoist House Components

A. Several components inside of the cableway hoist house require lubrication.

B. Specific bearings and gears/gear boxes lubricants can be found in the "Non-metallic materials" section of the statement of work.

C. Lubricants shall be applied in accordance with the manufacturer's instructions.

3.15 Load Testing and Annual Inspection

A. Perform a 125% capacity load test on the150-ton rated crane. The load test must:
1. Load testing shall be in accordance with applicable sections of ASME B30.2 and 29 CFR 1910.
2. Be performed with water bags or solid weights as specified in drawing 45-300-322
    a. Minimum clearance MUST be confirmed during load test, clearance with test weight of 125% rated capacity shall be 2' above any railing at control station #1 on drawing 45-D-2016 with an overall height of test weight of 32.5' from bottom of weight to hook
3. After testing the water bags must be emptied in the river.
4. Water bags must be disinfected before and after the load test to limit decontaminants entering the river or other locations.
    a. If disinfection is done before the bags arrive on site, proper documentation must be presented.

Be staged at the downstream side of the Arizona transformer bay.

5. Filling the bags can be done using fire piping outlets from the 3rd floor canyon wall and pedestal near the rolling doors.

After the load test, the crane must undergo an annual inspection and be certified to the rated capacity.

6. The annual inspection shall be in accordance with applicable sections of ASME B30.2.

3.16 DAMAGES, REPAIR AND REMEDIAL WORK

A. In accordance with Federal Acquisition Regulation (FAR) 52.245-1, the Contractor shall use reasonable care to avoid damaging existing buildings, equipment, and vegetation on Government installations.

1. If the Contractor's failure to use reasonable care causes damage to Government property, the Contractor shall replace or repair the damage at no expense to the Government -- as the Contracting Officer directs.

2. If the Contractor fails or refuses to make such repair(s) or replacement(s), the Contractor shall be liable for Government incurred costs, which may be deducted from the contract price.

PART 4 TABLES

4.1 SUBMITTAL SCHEDULE

RSN	Submittal Title	Due Date	Submit to [X]		
			CS	COR	TPOC
000	Performance and Payment Bonds	Within 15 days after receipt of notice of award.	X		
001	Schedule of Values	Within 15 days after receipt of notice of award.	X	X	X
002	Schedule	Initial: Within 15 days after receipt of Notice of Award	X	X	X
003	Material Specifications	30 days after receipt of notice of award.	X	X	X
004	Material Delivery	365 days after award	X	X	X
005	Safety Plan	30 days prior to commencement of work	X	X	X
006	Anchor Points/Concrete Footing Report	15 days prior to commencement of work	X	X	X
007	Personnel Qualifications	15 days prior to commencement of work	X	X	X
008	Material Testing Report	15 days prior to commencement of work	X	X	X
009	Load Testing Certification	7 days after the load test is completed.	X	X	X
0010	Annual Crane Inspection Certification	7 days after annual inspection is completed.	X	X	X
011	Project Binder	After completion of work and prior to final payment	X	X	X

END OF SECTION