SPECIAL PROVISIONS
FOR

ANGOON FERRY TERMINAL
APRON REPAIRS

NOVEMBER, 2019

PROJECT NO. Z73221000

INDEX

SUPPLEMENTAL INFORMATION FOR BIDDERS

SECTION 504

STEEL STRUCTURES FOR MARINE FACILITIES

504-1.01 DESCRIPTION. This work shall consist of steel structures, structural metal portions of timber or other composite structures, electric cylinders and other items associated with all steel structures and other components as may be noted on the Plans.

The work shall include the furnishing, fabricating, erecting, and placing protective coatings of structural metals and composite materials shown on the plans. Structural metals shall include structural steel and aluminum of all grades, welding, special and alloy steels, metallic electrodes, steel forgings and castings, and iron castings. This work shall also include any incidental metal construction and elastomeric and plastic materials not otherwise provided for in accordance with the contract.

Subject to written approval, steel products equal or superior in both mechanical and chemical properties, may be substituted for the grade specified on the plans or in these specifications at no additional cost.

504-1.02 QUALITY CONTROL. The Contractor's Quality Control (Q.C.) efforts shall be in accordance with Sections 504-2.01, 504-2.03 and 504-3.01.

504-1.03 FABRICATION DRAWINGS. Submit fabrication drawings to the Engineer for approval prior to start of work.

504-2.01 MATERIALS. Structural steel shapes, plates, bars and angles shall be the sizes shown on the plans.

Steel Plates & Shapes

Unless otherwise noted on the Plans, steel materials shall conform to the following or approved equal:

Steel W-shapes shall conform to ASTM A992.

All other steel shapes, plates, bars and angles shall be per ASTM A36.

Structural plates and shapes and W-shapes for bridge and other vehicular structures shall conform to ASTM A709, Grade 36 or Grade 50 as noted on the Plans.

Hollow structural sections shall be ASTM A500 Grade B unless otherwise noted.

Steel pipe shall be ASTM A53 Grade B. Steel pipe piling shall conform to Section 505.

Raised pattern plate shall have the pattern shown on the plans and shall be commercial grade.

Charpy V-notch toughness requirements are mandatory for material designated on the plans as main load carrying member components subject to tensile stress or designated as fracture critical members. Charpy V-notch requirements shall be per ASTM A709 as identified on the Plans.

Sampling and testing procedures shall be in accordance with the requirements of ASTM A673. Submit Charpy test results for approval.

Steel Forgings

Steel forgings shall conform to the dimensions shown on the plans and the requirements as set forth in the following:

1. Alloy Steel Forgings for general industrial use shall conform to ASTM A668, Class G, unless otherwise specified.

2. Carbon Steel Forgings for general industrial use shall conform to ASTM A668, Class C, unless

otherwise specified.

3. Pins and Rollers. Pins and rollers more than seven inches in diameter shall be annealed carbon-steel forgings conforming to ASTM A668, Class C.

4. Pins and rollers seven inches or less in diameter shall be either annealed carbon-steel forgings conforming to ASTM A668, Class C or cold finished carbon-steel shafting conforming to ASTM A108, Grade 1016 to 1030, inclusive, with a minimum Rockwell Scale B hardness of 80. Material not conforming to the specifications for hardness may be accepted provided it develops a minimum tensile strength of 66,000 psi and a minimum yield point of 33,000 psi.

5. Bridge bearing pins and transition plate pins shall be Type 504, 304 or 316 stainless steel conforming to ASTM A276 and of the sizes shown on the plans.

1. Threads for pins shall conform to the American National Standard Institute B 1.1, Coarse Thread Series, Class 2-A or as called for on the plans.

2. Pins used in rod ends of electric cylinders shall be ASTM A276 Duplex 2205 – UNS31803 of the sizes shown on the Plans.

Steel, gray iron and malleable iron casting shall conform to the size and dimensions shown on the plans, shall be true to pattern in form and shall conform to the requirements set forth in the following:

1.	Carbon Steel Castings Grade 65-35 shall be furnished unless otherwise specified.	ASTM A27
2.	Chromium Alloy Steel Castings Grade CA-15 shall be furnished unless otherwise specified.	ASTM A296
3.	Gray Iron Castings Class 30 shall be furnished unless otherwise specified.	ASTM A48
4.	Malleable Iron Castings Grade 35018 shall be furnished unless otherwise specified.	ASTM A47

Submit five (5) copies of a CERTIFIED mill test report covering chemical and mechanical tests conducted on the structural steel and steel forgings for the material in each shipment.

Provide all oils and lubricants to fill reservoirs and grease all bearings, cables and sliding surfaces. Hydraulic oil shall be selected for 100°F to -20°F service, cable dressing shall be Certified CCX-77, bearing/bushing lube shall be Certified Perma-Lube and lube for sliding surfaces shall be Chevron Pinion Grease MS.

Connection Hardware

High strength, heavy hex head bolt, nut and washer materials shall conform to the requirements of ASTM A325, Type I and ASTM A194 and A436 respectively.

High strength countersunk head bolts, washers and nuts shall conform to ASTM A449, Type I and ASTM F436 and A563 respectively.

Round head bolts or machine bolts, washers and nuts shall conform to ASTM A307.

Where noted on the plans, stainless steel bolts, screws and other hardware shall be ASTM F593. Alloy Group 316.

Unless otherwise noted on the Plans, all hardware associated with structural steel fabrications shall be ASTM A325 (heavy hex) or A449 as applicable.

All bolts and nuts shall be hot-dip galvanized in accordance with ASTM A153 if connected components are galvanized.

Manufacturer's certificates of bolt material per applicable ASTM specification standard shall be required.

All bolts, nuts, and washers are to be marked with a symbol identifying the manufacturer as required in ASTM A449, A325, A307, A563, A194, and F436. The supplier shall provide the symbol and address of each manufacturer for all the bolts, nuts, and washers supplied to the project.

The supplier's certification shall provide a corresponding lot number appearing on the shipping package and the certification. The supplier's certification shall note when and where all testing was done, including the rotational-capacity tests indicated below, and include zinc thickness when galvanized bolts and nuts are used.

Nuts shall be Grade 2H per ASTM A194 or DH per ASTM A563 for black or galvanized fasteners. For galvanized fasteners, the nuts shall be overtapped to the minimum amount required for the fastener assembly. All nuts, bolts and washers shall have the manufacturer's markings on them.

All galvanized nuts shall be lubricated with a lubricant containing a visible dye so a visual check can be made for the lubricant at the time of field installation. Black bolts shall be "oily" to the touch when installed. Weathered or rusted bolts shall be cleaned and re-lubricated prior to installation.

All bolts, nuts and load indicating washers in a connection shall be made by the same manufacturer.

All galvanized nuts are to be lubricated in accordance with ASTM A563 section 4.8. If requested by the Engineer, the name, method of application, and dilution of the lubrication applied to the nuts shall be provided with the documentation.

For high strength bolts requiring minimum bolt tensions (when specified on the Plans), utilize direct tension indicator unless otherwise approved by the Engineer. Direct tension indicators shall be galvanized if bolt and nut are galvanized.

Manufacturer's certifications of direct tension indicators shall be supplied with the washers along with written instructions and procedures for use. The certificate shall provide a corresponding lot number appearing on the shipping package and certification.

504-2.02 PROTECTIVE COATINGS AND TREATMENT. Except as noted on the plans all structural steel and hardware shall be hot-dip galvanized in as large of sizes as practical after fabrication in accordance with appropriate ASTM A123 or A153 as applicable.

Assemblies or subassemblies too large for available galvanizing equipment may be galvanized in pieces then spliced. Galvanized coatings for shop splices shall be repaired and treated in accordance with Section 504-3.03. Note: Large steel fabrications have the potential to develop stress cracking if galvanized utilizing multiple dips. In particular, the Contractor is advised that the steel fender panels shall not be hot-dip galvanized by multiple dipping processes unless otherwise approved by the Engineer.

Field Coating Repair: Field splices, field welds and areas damaged or otherwise removed in transit or field shall be recoated per Section 504-3.03.

504-2.03 QUALIFICATIONS OF FABRICATOR AND QUALITY CONTROL. Quality control of materials, fabrication and plant facilities shall be in accordance with Sections 105 and 106 and as further outlined below.

Other Structures and Metal Fabrications

The fabrication plant and personnel used to produce non-bridge steel structures and other metal fabrications for this project shall conform to a quality control program that meets the minimum requirements and provisions

of the following AISC Certifications: Standard for Steel Building Structures (STD) or Simple Steel Bridge Structures (SBR). Alternative quality control programs may be utilized, subject to the minimum requirements outlined below and subject to approval of the Engineer.

The Contractor shall furnish to the Engineer satisfactory evidence that the plant meets the requirements specified prior to the start of production and that all recommended certifications, checks, and tests are performed at the recommended intervals and the Q.C. program, personnel, and equipment are in place and operational. Satisfactory evidence shall take the form of a copy of the plant and personnel's current AISC certification or other approved Q.C. program. The following minimum criteria shall be included in the Q.C. Program:

1. Material Receiving:

    A. Verify (random) incoming material is marked with specification number and heat number traceable to the MTR (plates, shapes, etc.).

    B. Verify (random) incoming material is of the correct specification (bolts, welding materials, etc.).

2. Material Preparation:

    A. Verify (random) materials are identified and identifications transferred correctly through cutting, handling, etc.

    B. Verify (random) materials are correct and per plan and specification required quality.

    C. Inspect (random) for base metal defects, e.g., lops, fins, laminations, etc.

3. Fit-up and Tack Welding:

    A. Verify (random) tack welds are performed by qualified tack welders.

    B. Verify (random) weld joint fit-ups are in conformance to AWS or qualified weld procedures.

    C. Verify (random) assembly fit-up dimensions and configurations are correct.

    D. Verify (random) that the current (and only the current) revision of released shop drawings are in production areas.

4. In-process Welding and Operations:

    A. Verify (random) welding being performed only in accordance with issued weld procedures proper for the weld being performed (e.g., lose metal, process, position, thickness, joint design).

    B. Verify (random) welding is being performed by a welder currently qualified for the process, material, thickness and position being welded.

    C. Verify (random) welders identification being marked on all pieces or otherwise recorded.

    D. Verify (random) welding filler materials are being properly identified, stored and handled.

    E. Check and adjust (periodically) welding machine amp and volt meters.

    F. Verify (random) special processes, e.g., flame straightening are performed in accordance with issued procedures or codes.

    G. Record and communicate non-conformances (as applicable), and verify (100%) corrections are re-inspected.

H. Check (periodically) tape (and other instruments, as applicable) calibration.

5. Final:

A. Inspect (100%) fillet welds for size, length, profile and visual quality.

B. Inspect (100%) groove welds for profile and visual quality.

C. Inspect (random) dimensions and out-of-tolerances (straightness, camber, etc.).

D. Verify that NDT or NDE (where noted on the plans) has been performed, accepted and records prepared and filed.

Results of all NDE tests shall be signed/certified by the inspector/personnel in charge of the evaluation. All test results shall be submitted to the Engineer prior to acceptance of the steel structures produced from the proposed plant.

Copies of all required certifications, evaluations, and test results shall be available to the Engineer prior to field inspection and incorporation into the work and prior to consideration for payment for materials on hand per Section 109-1.07.

The Engineer shall inspect materials and plant facilities for quality assurance and the conditions outlined in Section 106-1.04 shall be met. The Engineer may also conduct any independent tests or inspections as deem appropriate or necessary.

CONSTRUCTION REQUIREMENTS

504-3.01 FABRICATION.

1. Quality Assurance and Inspection.

The Contractor shall furnish notice as required by 106-1.01 and 108-1.03 prior to the beginning of work at the mill or in the shop, so that quality assurance (QA) inspection may be provided if deemed necessary by the Engineer. The term "mill" means any rolling mill or foundry where material for the work is to be manufactured, "shop" means fabrication plant or any site where items are to be fabricated, treated, coated, assembled or pre-erected.

2. General.

Fabrication shall be in accordance with the plans and approved shop or working drawings.

Workmanship and finish shall be equal to the best practice in modern fabrication shops. Portions of the work exposed to view shall be finished neatly. Shearing, flame cutting, and chipping shall be done carefully and accurately.

Structural material, either plan or fabricated, shall be stored in a covered location at the fabricating shop above the ground on platforms, skids, or other supports. It shall be kept free from dirt, grease, or other foreign matter, and shall be protected from corrosion.

Rolled material, before being laid off or worked, must be straight. If straightening is necessary, it shall be done by methods that will not injure the metal. Sharp kinks and bends shall be cause for rejection of the material.

Steel or wrought iron may be flame cut, provided a smooth surface is secured by the use of a mechanical guide. Flame cutting by hand shall be done only where approved, and the surface shall be made smooth by planing, chipping, or grinding. The cutting flame shall be adjusted and manipulated so as to avoid cutting beyond the prescribed lines. Re-entrant cuts shall be filleted to a radius of not less than 1 inch or as shown on the plans.

Finishing and Shaping. Finished members shall be true to line and free from twists, bends, and open joints.

Edge Planing. Sheared edges of plates more than 5/8 inch in thickness and carrying calculated stresses shall be planed to a depth of 1/4 inch.

Facing of Bearing Surfaces. The surface finish of bearing and base plates and other bearing surfaces that are to come in contact with each other or with concrete shall meet the American National Standards Institute surface roughness requirements as defined in B-46.1, surface roughness, waviness, and lay, Part I:

Steel Slabs	ANSI 2,000
Heavy plates in contact with shoes to be welded	ANSI 1,000
Milled ends of compression members, stiffeners, and fillers	ANSI 500
Bridge rollers and rockers	ANSI 250
Pins and Pin rockers	ANSI 125
Slide Bearings	ANSI 125

Abutting Joints. Abutting joints in compression members and girder flanges, and in tension members where so specified on the drawings shall be faced and brought to an even bearing. Where joints are not faced, the opening shall not exceed 1/4 inch.

Bent Plates. Cold-bent load carrying rolled steel plates shall conform to the following:

They shall be so taken from the stock plates that the bendline will be at right angles to the direction of rolling.

The radius of bends, measured to the concave face of the metal, shall not be less, and preferably shall be greater than shown in the following tabulation, in which T is the thickness of the plate.

Angle Through Which Plate is Bent	**Minimum Radius**
61 – 90 Degrees	1.0T
91 – 120 Degrees	1.5T
121 – 150 Degrees	2.0T

If shorter radius is essential, the plates shall be bent hot.

Before bending, the edges of the plate shall be rounded to a radius of 1/16 inch throughout that portion of the plate where the bending is to occur.

Fit of Stiffeners. Fitting up and attachment of end and intermediate stiffeners shall be as shown on the plans. Stiffeners and other attachments shall not be welded to bottom flanges or other areas subject to tensile stress unless shown on the Plans or otherwise approved by the Engineer.

Stress Relieving. Where called for on the plans, welded members shall be stress relieved in accordance with the requirements of Article 3.8 of the AASHTO/AWS D1.5 specifications.

Tacks, Temporary Bolts or Aids. Tack welds, temporary erection welds, bolts or fitting aids shall be shown on the shop drawings.

3. Shop Splices.

In addition to those shown on the plans, girder webs and flanges may contain a maximum of 2 shop splices per plate per span, at the option of the Contractor. All such splices shall be indicated on the shop drawings and are subject to approval. These splices are subject to the following limitations:

All splices shall be full penetration butt welds. Flange splices shall be ground flush. Web splices shall be ground flush on the outside face only. All such grinding shall be parallel to the longitudinal axis of the girder.

No bottom flange or bottom chord splice will be permitted within the middle third of any span. Tension flange splices will be permitted only as shown on the Plans or the approved shop drawings.

4. Pins and Rollers.

Pins and rollers shall be accurately turned to the dimensions shown on the drawings and shall be straight, smooth and free from flaws in conformance with ANSI 125 finish unless shown otherwise.

5. Bolt Holes.

All holes for bolts shall be either punched or drilled. Material forming parts of a member composed of not more than 5 thicknesses of metal may be punched 1/16-inch larger than the nominal diameter of the bolts whenever the thickness of the metal is not greater than 3/4-inch for structural carbon steel or 5/8-inch for alloy steel.

When there are more than 5 thicknesses or when any of the main material is thicker than 3/4-inch in carbon steel, or 5/8-inch in alloy steel, all the holes shall be subpunched or subdrilled 3/16-inch smaller, and after assembling, reamed 1/16 inch larger, or drilled from the solid to 1/16-inch larger than the nominal diameter of the bolts.

Punched Holes. The diameter of the die shall not exceed the diameter of the punch by more than 1/16-inch. If any holes must be enlarged to admit bolts, they shall be reamed. Holes must be clean cut, without torn or ragged edges. Poor matching of holes will be cause for rejection.

Reamed or Drilled Holes. Reamed holes shall be cylindrical, perpendicular to the member, and not more than 1/16 inch larger than the nominal diameter of the bolt. Where practicable, reamers shall be directed by mechanical means. Drilled holes shall be 1/16-inch larger than the nominal diameter of the bolt. Poor matching of holes will be cause for rejection. Reaming and drilling shall be done with twist drills.

Holes for Hot-Dip Galvanized Members. For fabrications and associated hardware that are hot-dip galvanized, bolt holes may be 1/8-inch larger than the nominal diameter of the bolt if approved by the Engineer.

Accuracy of Punched or Subdrilled Holes. All holes punched full size, subpunched, or subdrilled shall be so accurately punched that after assembling (before any reaming is done) a cylindrical pin 1/8-inch smaller in diameter than the nominal size of the punched hole may be entered perpendicular to the face of the member, without drifting, in at least 75 percent of the contiguous holes in the same plane. If the requirement is not fulfilled, the badly punched pieces will be rejected. If any hole will not pass a pin 3/16-inch smaller in diameter than at the nominal size of the punched hole, this will be cause for rejection.

All steel templates shall have hardened steel bushings in holes accurately dimensioned from the center lines of the connection as inscribed on the template. The center lines shall be used in locating accurately the template from the milled or scribed ends of the members.

6. Bolted Connections, High Tensile Strength Bolts.

Bolt Lengths. Unless otherwise noted on the Plans, bolt lengths shall be determined by adding the grip length values given in Table 504-1 to the total thickness of connected material. Add additional length as required for connections requiring washers and double or jam nuts. The below listed values compensate for thickness of nut and bolt point. The total length shall be adjusted to the next longer 1/4-inch increment up to a 5-inch length and to the next longer 1/2-inch increment for lengths over 5 inches. In any case, the minimum bolt length shall be flush with the face of the tightened nut or jam nut. Unless otherwise permitted by the Engineer, the maximum length of bolt shall extend out no more than 1-inch from the face of the tightened nut or jam nut.

TABLE 504-1

BOLT LENGTH DETERMINATION

Bolt Diameter Size (Inches)	Added Length (Inches)
1/2	11/16
5/8	7/8
3/4	1
7/8	1-1/8
1	1-1/4
1-1/8	1-1/2
1-1/4	1-5/8

Bolted Parts and Assembly. Bolted parts shall fit solidly together when assembled and shall not be separated by gaskets or other interposed compressible material.

When assembled, all joint surfaces, including those adjacent to washers, shall be free of scale and excess galvanizing. They shall be free of dirt, loose rust, burrs, and other defects that would prevent solid seating of the parts.

Contact surfaces shall be free of oil, paint or lacquer.

When the other face of the bolted parts has a slope of more than 1:20, a smooth beveled washer shall be used in contact with the sloped surface, a hardened washer shall be placed under the turned part.

Unless otherwise noted on the Plans, or approved by the Engineer, utilize standard washers under all nuts.

Bolting of joints shall be accomplished in accordance with the following:

Where bolted connections do not connect or splice main stress carrying members, bolted fasteners shall be installed to “snug-tight” condition. Snug-tight is defined as the tightness that exists when all plies are in firm contact. This is obtained by applying 2-3 impacts to the nut with an impact wrench or the full effort of a man using an ordinary spud wrench.

In all cases, bolts shall be installed in all holes of the connection and brought to snug tight condition uniformly. All fasteners shall then be tightened, progressing systematically from the most rigid part (usually near the center) of the connection to the free edges in a manner that will minimize relaxation of previously tightened fasteners. It may be necessary to provide multiple cycles of systematic tightening.

Bolted connections located on primary structural members or main members splices shall be tensioned by the “turn of the nut” method or to other specified tension criteria using direct tension indicators or other approved methods. Methods of bolt tensioning shall be in accordance with the provisions of the Specification for Structural Joints Using ASTM A325 or A490 Bolts as published by the Research Council on Structure on Structural Connections (RCSC).

Manufacturer's written installation instructions and procedures shall be followed for installation of direct tension indicators or other special bolts or devices. Special attention shall be given to proper installation of flat, hardened washers when load indicating washers are used with bolts installed in oversized or slotted holes.

High-strength bolts that have been tensioned shall not be reused. Previously fully tightened bolts which may have been loosened by the tightening of adjacent bolts shall be removed and replaced with new bolts, nuts, and direction tension indicators as may be applicable.

Where noted on the Plans, lock or jam nuts shall be installed after completion of initial and final tensioning on all fasteners in the bolted connection. When installing jam nuts, use wrench to prevent further turning of primary nut. Tighten jam nut to snug tight conditions utilizing second spud wrench.

7. Welding.

Steel Structures

All welding and field welds specified on the Plans shall conform to AWS Structural Welding Code D1.1 unless otherwise noted on the Plans.

504-3.02 ERECTION.

1. General.

The Contractor shall provide all materials labor, tools and equipment necessary for the expeditious handling of work, and shall erect the structural steel, remove the temporary construction, and do all work necessary to complete the structure, as required by the contract and in accordance with the plans and specifications. All temporary field welds to structural steel shall be made in accordance with the procedures required by these specifications. Sharp kinks or bends shall be cause for rejection of the steel.

2. Handling and Storing Materials.

Material to be stored shall be placed on skids above the ground. It shall be kept clean and properly drained. Girders and beams shall be placed upright and shored. Long members shall be adequately supported on skids to prevent injury from deflection.

3. Falsework.

The falsework shall be properly designed and substantially constructed and maintained for the loads, which will come upon it. The Contractor shall prepare and submit plans for false work or for changes in an existing structure necessary for maintaining traffic.

4. Method and Equipment.

Before starting the work of erection the Contractor shall inform the Engineer fully as the method of erection he proposes to follow, and the amount and character of equipment he proposes to use.

Handling and erection procedures shall be conducted in such a manner as to avoid inducing critical buckling stresses in the structure and to avoid damaging the protective coating or paint system. Plans showing the method of erection shall be submitted for approval. Stress sheets and deflection diagrams for any design or unusual erection method shall be furnished, if requested.

All of the above shall be subject to approval. The approval of the Engineer shall not be considered as relieving the contractor of the responsibility for the safety of his method or equipment or from carrying out the work in full accordance with the plans and specifications. No work shall be done until approval has been obtained.

5. Straightening Bent Material.

The straightening of plates and angles or other shapes shall be done by methods not likely to produce fracture or other injury. The metal shall not be heated unless permitted by the Engineer, in which case the heating shall be in accordance with the following publication: *FHWA-1F-99-004, Heat Straightening Repairs of Damaged Steel Bridges – A Technical Guide and Manual of Practice, October, 1998.*

6. Assembling.

The parts shall be accurately assembled as shown on the plans and match marks shall be followed. The material shall be carefully handled so that no parts will be bent, broken, or otherwise damaged. Hammering which will injure or distort the members will not be permitted. Bearing surfaces and surfaces to be in permanent contact shall be cleaned before the members are assembled.

7. Pin Connections.

Pilot and driving nuts furnished by the Contractor shall be used in driving pins. Pins shall be so driven that the members will take full bearing on them. Pin nuts shall be screwed up tight and secured as shown on the plans.

8. Setting Shoes, Bearings and Other Anchorages.

Shoes, bearing plates and elastomeric bearing pads set directly on concrete surfaces shall be placed on bearing areas that are properly finished. The concrete surfaces shall be floated on a level plane, which shall not vary more than 1/16 inch from a straight edge placed in any direction across the area. The finished surface shall not vary more than 1/8 inch from the elevation shown on the plans. The shoes, elastomeric bearing pads, and bearing plates shall be set as shown on the plans in exact position with full and even bearing.

Grout to be placed under plates shall consist by volume, of 1 part Portland cement and 3 parts clean concrete sand. Alternatively, a premixed non-shrink grout may be used subject to approval. Grout shall contain only sufficient water to permit packing and shaping. Concrete areas to be in contact with the grout shall be cleaned of all loose and foreign matter that would in any way prevent bond between the mortar and the concrete surfaces and shall be kept thoroughly saturated with water for a period of not less than 24 hours immediately prior to placing grout.

The grout shall be tightly packed under the plates to provide full bearing. After placing, all exposed surfaces of grout pads shall be kept covered with a heavy thickness of burlap saturated with water for a period of 3 days. All improperly cured or otherwise defective grout shall be removed and replaced at the contractor's expense. No load shall be placed on the grout until it has reached 75% of design strength or has set for at least 96 hours, whichever results in a greater period.

If noted on the Plans, the location of the anchor bolts in relation to the slotted holes in the expansion shoes shall correspond with the temperature at the time of erection. The nuts on anchor bolts at the expansion ends of spans shall be adjusted to permit the free movement of the span.

504-3.03 FIELD OR SHOP REPAIR OF GALVANIZED COATING. For areas of galvanizing damaged by welding or other fabrication work, the Contractor shall use a hot applied repair stick method as outlined below. All field repairs to galvanized surfaces are to be made using the hot-stick method unless requested by the Contractor and approved in writing by the Engineer prior to start of work.

Hot Applied Repair Method

Repair sticks used to repair galvanizing shall be zinc-cadmium alloys (melting point 518° - 527°F (270° - 275°C), such as "Rev-Galv" or zinc-tin-lead alloys (melting point 446° - 500°F) (230° - 260°C), such as "Galv-Weld", "Zilt" and "Galvover". The zinc-tin-lead alloys shall comply with U.S. Federal Specification O-G-93 and contain fluxing ingredients.

The procedure for using repair sticks is as follows:

1. Remove welding slag by chipping hammer and clean weld or damaged area by vigorous wire brushing.

2. Preheat the region to be repaired by means of an oxyacetylene torch or other convenient method to between 600°F and 750°F (315°C). The alloys do not spread well at temperatures lower than 600^{O}F. Also as temperatures rise above 600^{O}F increasing amounts of dross are formed.

3. Wire brush surface again.

4. Apply coating by rubbing bar of the alloy over the heated surface while it is hot enough to melt the alloy.

5. Spread the molten alloy by briskly wire brushing or rubbing with a flat edged strip of steel or palette knife.

6. Remove flux residues by wiping with a damp cloth or rinsing with water.

7. Brush apply two coats zinc rich paint (cold galvanized repair paint).

It is possible to utilize the residual heat in the weld to melt the repair stick, and the procedure for welds that are still hot (600°F or over) is:

1. Remove slag and wire brush vigorously.

2. Apply coating of alloy as above and paint as per 7 above after cooling.

Some of these repair components are also available in powder form, which is applied in a similar manner to the sticks.

504-3.04 CLEAN-UP. Upon completion and before acceptance of the structure the Contractor shall remove all falsework, and falsework piling down to 2 feet below the finished ground line.

504-3.05 FIELD TESTING. The apron lift systems shall be tested for operation in the presence of the Engineer. Testing shall include the electrical control systems. The Department will furnish all electrical expertise and insure operation of controls.

SECTION 641

EROSION, SEDIMENT, AND POLLUTION CONTROL

641-1.01 DESCRIPTION. Plan, provide, inspect, and maintain control of erosion, sedimentation, water pollution, and hazardous materials contamination.

641-1.02 DEFINITIONS.

1. BMP (Best Management Practices). A wide range of project management practices, schedules, activities, or prohibition of practices, that when used alone or in combination, prevent or reduce erosion, sedimentation, and/or pollution of adjacent water bodies and wetlands. BMP include temporary or permanent structural and non-structural devices and practices. The Department describes common BMPs in its *Alaska Storm Water Pollution Prevention Plan Guide*.

2. HMCP (Hazardous Material Control Plan). The Contractor's detailed plan for prevention of pollution that stems from the use, containment, cleanup, and disposal of hazardous material, including petroleum products generated by construction activities and equipment.

641-1.03 SUBMITTALS. Submit three copies of your HMCP plan to the Engineer for review and approval as appropriate. Sign and deliver the copies to the Engineer no less than 5 calendar days prior to the pre-construction conference.

The Department will review the HMCP submittal within 14 calendar days. Submittals will be returned to you as either requiring modification, or as approved by the Department.

641-2.01 HAZARDOUS MATERIAL CONTROL PLAN (HMCP) REQUIREMENTS. Prepare a HMCP for the handling, storage, cleanup, and disposal of petroleum products and other hazardous substances. (See 40 CFR 117 and 302 for listing of hazardous materials.)

List and give the location of all hazardous materials, including office materials, to be used and/or stored on site, and their estimated quantities. Detail your plan for storing these materials as well as disposing of waste petroleum products and other hazardous materials generated by the project.

Identify the locations where storage, fueling and maintenance activities will take place, describe the maintenance activities, and list all controls to prevent the accidental spillage of oil, petroleum products and other hazardous materials.

Detail your procedures for containment and cleanup of hazardous substances, including a list of the types and quantities of equipment and materials available on site to be used.

Detail your plan for the prevention, containment, cleanup, and disposal of soil and water contaminated by accidental spills. Detail your plan for dealing with unexpected contaminated soil and water encountered during construction.

Specify the line of authority and designate your field representative for spill response and one representative for each subcontractor.

641-3.01 CONSTRUCTION REQUIREMENTS.

Do not begin work on-site until receipt of approved HMCP by the Department.

Post at the construction site:

1. Name and phone number of your local contact person and
2. Locations of HMCP plan available for viewing by the public.

Comply with all requirements of the approved HMCP, and all state and federal regulations that pertain to the handling, storage, clean up, and disposal of petroleum products or other hazardous substances. Contain, clean up, and dispose of all discharges of petroleum products and/or other materials hazardous to the land, air, water, and organic life forms. Perform all fueling operations in a safe and environmentally responsible manner. Comply with the requirements of 18 AAC 75 and AS 46, Oil and Hazardous Substances Pollution Control. Report oil spills as required by federal, state and local law, and as described in your HMCP Plan.

In unanticipated or emergency conditions threaten water quality, take immediate suitable action to preclude erosion and pollution.

Submit amendments to the plans to correct problems identified as a result of any:

1. Storm or other circumstances that threatens water quality, and

2. Inspection that identifies existing or potential problems.