

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Quality assurance and control of installation.
- B. References.
- C. Inspection and testing laboratory.

1.02 QUALITY ASSURANCE / CONTROL OF INSTALLATION

- A. Quality control is the responsibility of the Contractor. He shall appoint an individual as the quality control monitor and shall inform the Engineer, in writing, of the name of this individual. The Engineer, or his representative, shall represent the Owner and have the right to enter the job site and inspect all installations for conformance with the Specifications.
- B. Monitor quality control over suppliers, manufacturers, products, services, site conditions and workmanship to provide work of specified quality in accordance with the Contract.
- C. Comply fully with manufacturers' instructions, including each step in sequence.
- D. Should manufacturer's instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- E. Comply with specified standards as a minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- F. Perform work by persons qualified to produce workmanship or specified quality.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

1.03 REFERENCES

- A. Should specified referenced standards conflict with Contract Documents, request clarification from Engineer before proceeding.
- B. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.04 INSPECTION AND TESTING LABORATORY SERVICES

- A. If needed, the Owner will appoint and pay for the services of an independent firm to perform inspections and testing as required by the contract documents or the Engineer.
- B. The independent firm will perform inspections, tests, and other services specified in individual specification sections and as required by the Engineer.
- C. Reports will be submitted by the independent firm to the Engineer, in duplicate, indicating observations and results of tests and indicating compliance or noncompliance with Contract Documents.
- D. Contractor shall cooperate with independent firm: furnish samples of materials, design mix, equipment, tools, storage and assistance as requested.
- E. Notify Engineer and independent firm 24 hours prior to expected time for operations requiring services.
- F. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.
- G. Re-testing required where initial tests reveal non-conformance to specified requirements shall be performed by the Engineer and paid for by the Contractor.

END OF SECTION

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Contractor shall take every reasonable precaution throughout construction to prevent the erosion of soil and the sedimentation of streams, rivers, lakes, reservoirs, other water impoundments, ground surfaces, or other property as required by State and Local regulations including the S.C. Stormwater Management and Sediment Reduction Act. Work covered by this section includes all construction at the Project site.

1.02. RELATED SECTIONS

N/A

1.03 RELATED WORK

- A. At the pre-construction meeting, The Contractor shall present methods for construction and applicable erosion and sediment control for Engineer's review and approval. Contractor shall, upon suspension or completion of land-disturbing activities, provide protection for permanently impacted areas. Permanent vegetation shall be established at the earliest practicable time. Temporary and permanent erosion control measures shall be coordinated to assure economical, effective, and continuous erosion and siltation control throughout the construction and post construction period.

1.04 REGULATORY REQUIREMENTS

- A. Contractor shall be responsible for prevention of damage to properties outside the construction limits from siltation due to construction of the project. The Contractor will assume all responsibilities for the affected property for correction of any damages, which may occur. Erosion control measures shall be performed by the Contractor, conforming to the requirements of, and in accordance with, plans approved by applicable state and local agencies, and in accordance with the erosion control portion of the construction drawings and these specifications. Should the Contractor pump water from trenches during construction, appropriate erosion and siltation preventative measures (check dams, silt basins, seeding, etc.) shall be taken prior to discharge of pumped water into any natural water body. See Part 3 - Execution for more information.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Open mesh biodegradable mulching cloth.
- B. Tack shall be with emulsified asphalt.
- C. Silt fence shall consist of non-biodegradable filter fabric (Trevira, Mirafi, etc.). Silt fence shall be supported by wood or metal posts with max. spacing of 10 ft apart. If support post spacing is greater than 6 ft. apart, silt fence must be wired to galvanized wire mesh fencing.
- D. Check dams shall be constructed and maintained as directed in the drawings.

PART 3 - EXECUTION

3.01 CLEARING

- A. Prior to commencement of construction, silt fence shall be installed and maintained around all areas to be cleared and grubbed. Contractor shall be responsible for daily inspection and maintenance of all erosion control devices and facilities. Clearing and grubbing shall be scheduled and performed in such a manner that subsequent grading operations and remaining erosion control practices can follow immediately thereafter. Excavation, borrow, and embankment operations will be conducted such that cuts and fills will be completed to final grades in a continuous operation. All construction areas not otherwise protected shall be

planted with permanent vegetative cover within 15 working days after completion of active construction or as directed by the Engineer. After proper installation, contractor shall monitor erosion control devices and systems daily, and provide needed maintenance.

3.02 STABILIZING

- A. The angle for graded slopes and fills, other than where specified, shall be no greater than the angle which can be retained by vegetative cover or other adequate erosion control devices or structures. All disturbed areas that are not stable will, within 15 working days of completion of any phase of grading, be planted or otherwise provided with either temporary or permanent ground cover, devices, or structures sufficient to restrain erosion.

3.03 REGULATORY REQUIREMENTS:

- A. The Contractor shall be required to implement applicable aspects of the S.C. Stormwater Management and Sediment Reduction Act and all permit conditions.
- B. Whenever land disturbing activity is undertaken on a tract, a ground cover sufficient to retain erosion must be planted or otherwise provided within 15 working days on that portion of the tract upon which further active construction is not being undertaken.
- C. If any clearing or earthwork is to be suspended for any reason whatsoever for longer than 15 calendar days, the areas involved shall be seeded with vegetative cover or otherwise protected against excessive erosion during the suspension period. Suspension of work in any area of operation does not relieve the Contractor of the responsibility for the control of erosion in the area. If erosion does occur prior to establishment of vegetative cover, Contractor shall replace and replant.
- D. Contractor shall report all regulatory visits and initiatives to Engineer immediately. Contractor will not provide information to any regulatory representative or body unless authorized by the Engineer.
- E. Contractor shall take all precautions to avoid disturbance of any kind in wetlands and in buffers as indicated on the plans. Only areas designated on the plans for construction in the buffers may be impacted by clearing. Contractor will be responsible for the repair and restoration of any areas disturbed and any penalties incurred due to such disturbance.

PART 4 - CONSTRUCTION PHASE

4.01 PRACTICES:

- A. Dumping soil or sediment into any streambed or watercourse will not be allowed.
- B. Maintain an undisturbed vegetative buffer where possible between a natural watercourse and trenching and grading operations.
- C. Avoid equipment crossings of streams, creeks, and ditches where practicable.

PART 5 - SEDIMENT CONTROL FEATURES

5.01 GENERAL

- A. All devices for sediment control shall (silt fences) be constructed at locations required to prevent erosion and sediment transport prior to beginning any excavation on the site. All devices shall be properly installed and maintained in place by the Contractor until a structure, vegetative cover, or paving makes the device no longer necessary.

5.02 DESIGN APPLICATIONS

- A. Mulch shall be used for temporary stabilization of areas subject to excessive erosion, and for protection of seed beds after planting, where required.
- B. Silt fences shall be used at the edge of excavation cuts or at base of slopes to restrict movement of sediment beyond the site limits.

- C. Temporary berms, when used, shall be seeded and mulched or tacked immediately following their construction. Hydraulic methods or other approved methods (SCDOT specifications) may be used.
- D. Where required, establish vegetative cover on all areas disturbed by the work.

5.02 MAINTENANCE

- A. The Contractor shall be responsible for maintaining all temporary and permanent erosion control measures in functioning order. Temporary structures shall be maintained until such time as vegetation is firmly established, and grassed areas shall be maintained until completion of the project. Areas which fail to show at least 75% coverage of grass or which are damaged by erosion shall be immediately repaired.

5.03 REMOVAL OF SEDIMENT CONTROL DEVICES

- A. All drainage structures and erosion control devices shall be left in place until the grass is established and the Engineer has approved such removal. Seed areas around devices and mulch after removing or filling temporary control devices. Contractor shall continue inspection and maintenance of such items until the project has been completed and accepted by the Owner.

END OF SECTION

SECTION 06001 – CAST IN PLACE CONCRETE

PART 1 - GENERAL

1.01 DESCRIPTION

The work under this section includes all cast-in-place concrete work required of every description shown or specified. Included are the: concrete abutment for the groundout dock, groundout dock pad and the handicap parking areas. All concrete for the project shall be ready-mix. Ready-mixed concrete is defined as Portland cement concrete produced regularly by commercial establishment and delivered to the purchaser in a plastic state.

PART 2 - PRODUCTS

2.01 MATERIALS

All materials incorporated in the concrete shall conform to the requirements and specifications herein. Contractor shall submit to Engineer the design mix for approval at the pre-construction meeting or before beginning any construction work.

1. Pervious Concrete: Concrete used for the handicap car and trailer parking areas shall be pervious concrete.
2. Structural Concrete: Concrete used for the groundout dock abutment and groundout pad shall be structural concrete.

2.02 PORTLAND CEMENT

All Portland Cement shall be of American manufacture which at the time it is incorporated in the mixture shall conform to requirements of ASTM C150 / C150M, **Type II**. The cement shall be the product of a mill, which has been in successful operation for at least five years. No high early strength mix will be allowed.

1. Structural Concrete: All concrete used in the concrete abutment shall be 4,000 psi, and shall meet all requirements as specified in Section 06001.

2.03 COMPRESSIVE STRENGTH TESTS

Compressive strength tests shall be performed in accordance with ASTM C39; one set of cylinders (per ASTM C31) for each day's pour exceeding 5 cu. yd. plus additional sets for each 50 cu. yd. exceeding the first 50 cu. yd. of each concrete class. One specimen tested at 7 days, 2 specimens tested at 28 days and one held in reserve.

2.04 CONCRETE TEMPERATURE

Concrete Temperature shall be measured as specified in ASTM C1064; One test for each set of compressive-strength specimens.

2.05 FINE AGGREGATE

Fine Aggregate shall conform to ASTM Designation C33.

2.06 COARSE AGGREGATE

Coarse aggregate shall be a crushed stone or gravel conforming to ASTM Designation C33, unless otherwise provided herein.

2.07 WATER

Water for work shall be fresh, clear, and free from oil, acid, alkali or organic matter. Water shall be added to the concrete mix after delivery to the site only through the approval of the Owners Representative.

2.08 ADMIXTURES

The use of any admixture in the concrete mix is subject to the approval of the Engineer and shall be approved in writing when Section 2.01 is complied with.

2.09 AIR CONTENT

The concrete mixture shall have an air content by volume of concrete of 4-1/2 percent, plus or minus 1-1/2 percent, based on measurements made immediately after discharge from the mixer. Air content shall be determined in accordance with ASTM C173 or ASTM C231.

2.10 REINFORCING STEEL

Reinforcing Steel shall be deformed billet steel, clean and free of rust, conforming to latest ASTM designation, for Grade 60 steel. The steel shall be epoxy-coated. In addition to the reinforcing indicated on the plans, the Contractor shall furnish all necessary support bars, tie bars, etc., required for properly supporting and spacing the bars in the forms. The reinforcement will be subject to certified lab testing and field inspection for rust, shape, and dimensions.

PART 3 - EXECUTION

3.01 STORAGE OF REINFORCEMENT STEEL

Reinforcing steel shall be stored in a manner that will avoid excessive rusting or coating by grease, oil, dirt and other objectionable materials. Storage shall be in separate piles or racks at least 6 inches above ground, so as to avoid confusion or loss of identification after bundles are broken.

3.02 PLACING REINFORCEMENT

Metal reinforcement before being placed shall be free from rust, scale, or other coatings that will destroy or reduce the bond. Reinforcement shall be formed to the dimensions indicated on the plans. Cold bends shall be made around a pin having a diameter of four or more times the least dimensions of the bar. Hot bends not permitted. Metal reinforcement shall be accurately placed and secured, and shall be supported by concrete or metal chairs or spacers, or metal hangers of a design approved by the Owners representative. Reinforcement shall be placed in strict accordance with the manual of Standard Practice-Concrete Reinforcing Steel Institute, latest revision.

3.03 CONCRETE PLACEMENT

The construction of forms, the operation of depositing and placing concrete, and concrete finishing shall all be conducted so as to form a compact, dense, impervious surface of uniform texture throughout, and smooth face on all surfaces exposed to view. If, in the opinion of the Owners representative, any construction operation is not suitable to obtain the above finished result, he may require the Contractor to use any method or methods which will produce structures true to shape and dimensions, conforming to the above requirements and the following methods of obtaining the finished result.

1. Contractor shall not place concrete prior to inspection and approval of Owner's Representative.

3.04 FORM WORK

All concrete shall be formed unless indicated or directed otherwise. Forms shall conform to the shape, lines and dimensions of the member as called for on the plans. Forms shall be set with the upper edge true to line and grade

with an allowable tolerance of 1/8 inch in any 10-foot section. Chamfer all exposed edges as indicated on the plans. Forms shall be substantial and properly tight to prevent leakage of mortar and they shall be properly braced and tied together so as to maintain position and shape and ensure safety to workmen and passersby. Temporary openings shall be provided where necessary to facilitate cleaning and inspection immediately before depositing concrete.

3.05 REINFORCEMENT

Reinforcing steel shall be in strict accordance with the manual of Standard Practice-Concrete Reinforcing Steel Institute, (latest revision). All intersections of reinforcement shall have proper lap and be wired together. Only epoxy-coated reinforcement bar shall be used.

3.06 SLUMP

Slump of concrete when placed shall be not less than 3 inches nor more than 5 inches. Slump shall be tested on site by a certified testing agency on each truckload. Test results to be submitted to the Owners Representative. Slump tests shall be performed as specified in ASTM C143; one test at point of discharge for each day's pour of each type of concrete.

3.07 REMOVAL OF WATER

Water shall be removed from excavations before concrete is deposited, unless otherwise directed by the Owners Representative. Any flow of water into the excavation shall be diverted through proper side drains to a pump, or be removed by other approved methods which will avoid washing of freshly deposited concrete or contamination from sea water. Water vent pipes and drains shall be filled by grouting or otherwise through the pouring of the concrete affected.

3.08 INSPECTION

Inspection and approval by the Owners Representative of all form work and in-place reinforcing steel must be obtained before placing concrete. Owners Representative shall require one day (24 hours) advance notice of proposed concrete placement. Such approval will in no manner relieve the Contractor of his obligation to produce the finished work as required by the plans and specifications.

3.09 PLACING OF CONCRETE

Placing of concrete shall be done only in the presence of the Owners Representative and in daylight unless an adequate lighting system is approved by the Owners Representative. All equipment for transporting the concrete shall be cleaned and all debris shall be removed from the places to be occupied by the concrete. Forms and base shall be thoroughly wetted with freshwater (no salt water allowed) or oiled. Chutes, troughs, or pipes shall be used in placing concrete so that the ingredients are not separated. Concrete shall be handled from the mixer to the place of final deposit as rapidly as practical by methods, which will prevent the separation or loss of the ingredients. It shall be deposited as nearly as practical in its final position to avoid rehandling or flowing. Mechanical vibrators of an approved type shall be used to produce proper contact of concrete with reinforcing steel and forms. Continuous spading of concrete in thin sections shall be used where required. Depositing of concrete shall be continuous. When concreting is once started, it shall be carried on as a continuous operation until the placing of the section is completed. Under no circumstances shall concrete that has partially set be deposited in the work.

3.10 PROTECTION FROM COLD

No concrete shall be placed at or below a temperature of 40 degrees F, or whenever, in the opinion of the Owners Representative, atmospheric temperature will probably fall below this limit within 24 hours after placing concrete. Concrete placed in forms shall have a temperature of not less than 70 degrees F for not less than 4 days after placing. The use of salts, chemicals, or the foreign materials in the mix to lower the freezing point of the concrete is prohibited.

3.11 PROTECTION FROM HEAT

Concrete shall not be placed in weather above 90° F unless approved by the Engineer , and ice is used to retard temperature increase during placement and curing.

3.12 METHODS OF CURING

Curing shall be accomplished by methods approved by the Owners Representative for a period of 7 days. Curing shall be started as soon after placing and finishing as free water has disappeared from the surface of the concrete.

3.12 STANDARD FINISH

Unless specified on the drawings, Standard Finish shall be given to all concrete not ordinarily exposed to view unless shown otherwise. The surface of the concrete shall not vary more than 1/4 inch when measured from a 5-foot template. All fins and other projections shall be removed carefully, and all abrupt irregularities shall be leveled.

3.13 NON-SKID FINISH

Non-Skid finish shall be used on the top surfaces of all concrete shown and in accordance with the drawings. The scored surface shall be produced by brooming with a fiber-bristle brush in a direction transverse to that of the traffic.

3.14 EXPANSION JOINTS

Expansion joints shall be incorporated at the following locations: between the end of the concrete abutment and the beginning of the concrete groundout pad, and at the end of the access ramp pad (top of access ramp #4). Expansion joints shall be 1/2" thick. The 1/2" space shall be fitted with neoprene (or other approved expansion joint material). Contractor shall clean the surface of the joint and fill with (gray) Sealtight GARDOX joint sealer as manufactured by W.R. Meadows or equal only as approved by the Engineer.

3.15 CONTROL JOINTS

The control joints shall be formed in the fresh concrete by cutting a groove in the top portion of the slab to a depth of 1/3 of the slab thickness. Joints shall be at maximum 10 ft. spacing along the length of the groundout pad, or as described on the plans. Joints shall be cut within 24 hours of the concrete pour. Joints can be installed into concrete using a power-driven saw with diamond or carborundum blades, or may be formed in the concrete before set.

END OF SECTION 06001

SECTION 06005 – PRESTRESSED CONCRETE PILING

PART 1 - GENERAL

1.01 SCOPE:

The scope of work covered under this section shall include supplying and installing the prestressed concrete piles for the floating groundout dock and fixed pier as shown on the Drawings.

PART 2 - PRODUCTS

2.01 MATERIALS AND REQUIREMENTS:

Prestressed piles shall be manufactured and supplied to applicable sections of the "GUIDE SPECIFICATION FOR PRECAST, PRESTRESSED CONCRETE" as published in the PCI Design Handbook - Fifth Edition or latest issue, unless modified herein:

A. Modifications to GUIDE SPECIFICATIONS referenced in 2.01 above:

1. Delete 1.01 B, C
2. Use 5 years in 1.02 B
3. Delete 1.03.A.1.c, d, e and f
4. 2.01.G.1 use 270
5. 2.02.A use 5000 psi (minimum)
6. 2.02.B use 3500 psi
7. Delete 2.03.D

B. Pile performance specification:

Groundout Dock - 14" square prestressed concrete pile with minimum 96 kip-ft bending moment capacity, no tension allowed, and with load capacity on all 4 sides.

Fixed Pier - 12" square prestressed concrete pile with minimum 50 kip-ft bending moment capacity, no tension allowed, and with load capacity on all 4 sides.

- C. Prestress piles for floating groundout dock shall be driven to a top elevation of +21.5' Mean Low Water (MLW) (See plans for further specifications).
- D. Prestressed concrete piles shall have a written warranty for three (3) years after installation and acceptance by the Owner.
- E. Prestressed concrete pile manufacturer shall submit shop drawings and engineering design calculations for piles to the Engineer for review and approval at least 30 days prior to commencing fabrication. All shop drawings submitted must be stamped with the seal of a qualified licensed South Carolina Professional Engineer.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Handling: Inspect piles in the leads, and where the pile is impaired if permitted by the Engineer repair the piles, unless the pile is damaged to such extent that it is rejected. Laterally support pile orientation is essential, take special care to maintain the orientation during driving. Take special care in supporting battered piles to prevent excess bending stresses in the pile.
- B. Driving Piles: Drive without interruption to the tip elevation as indicated on the Drawings. If a pile reaches refusal before the specified pile tip elevation is reached, notify the Engineer immediately who will dictate the procedure to be followed.
- C. Driving Equipment:
 - 1. Pile Hammers: Air-, steam-, or diesel-powered of a type approved by the Engineer. The hammer furnished shall have a capacity at least equal to the hammer manufacturer's recommendation for the total weight of pile and character of subsurface material to be encountered. Operate diesel-powered hammers throughout the entire driving period at the rate recommended by the manufacturers. Maintain sufficient pressure at the hammers so that:
 - a. For double-acting hammer, the number of blows per minute during and at the completion of driving of a pile is equal approximately to that at which the hammer is rated.
 - b. For single-acting hammer, there is a full upward stroke of the ram.
 - c. For differential-type hammer, there is a slight rise of the hammer base during each upward stroke.
 - 2. Driving Helmets and Cushion Blocks: Use a driving helmet or cap and a cushion block or cap block approved by the Engineer to prevent impact damage to the pile. The helmet or cap and cushion-block combination shall protect the head of the pile, minimize energy absorption, and transmit hammer energy uniformly and consistently during the entire driving period. The driving helmet or cap shall fit snugly on top of the pile so that energy transmitted to the pile is uniformly distributed over the entire surface of the pile head. The cushion block may be solid or laminated softwood block, with grain parallel to the pile axis, and enclosed in a close-fitting steel housing. Use blocks of suitable thickness for the length of pile to be driven and the character of subsurface material. Generally, thicker blocks are required for longer piles and softer subsurface material. Replace cushion block if it has been damaged, split, highly compressed, charred, or burned, or has become spongy or deteriorated. Do not use small wood blocks, wood chips, rope or other material as substitutes.
 - 3. Protection of Piles: Use driving caps or rings and followers to protect the heads of the piles, to provide uniform distribution of hammer energy, and to reduce absorption of the energy of the blow to a minimum. Driving caps may be a solid hardwood block, with grain parallel to the pile axis, enclosed in a close-fitting steel housing. Do not use wood chips, small wood blocks, rope, or other material. Pile shall be laterally supported during driving, but shall not be unduly restrained from rotation in the leads. Where pile orientation is essential, special care shall be taken to maintain orientation during driving.

3.02 TOLERANCES IN DRIVING:

Drive piles in floating docks to allow movement during entire tide cycle. Piles shall not be forced into position. Redrive piles that have heaved in excess of 4". Piles shall be checked for heaving by use of a level line stretched between piles. Piles shall be marked at the end of the workday with a temporary painted mark along the level line.

3.03 JETTING OF PILES:

Jetting will be permitted only by written approval of the Owner's Representative.

3.04 RECORDS:

Keep a complete and accurate record of each pile incorporated into the permanent structure. The record shall indicate the pile location, size, original length, (ground elevation), tip elevation, top elevation, penetration in blows per foot, hammer data including make and size, and any unusual pile behavior or circumstances experienced during driving such as re-driving, heaving, weaving, obstructions, spudding, stops, and others which may occur. Forms for recording pile driving data will be furnished by the Contractor after prior approval by the Engineer. Upon completion, turn records over to the Engineer. Contractor shall notify the Engineer at least 48 hours prior to time for pile driving operations to commence so that the Engineer can plan to be on site for observation.

END OF SECTION 06005

SECTION 07001 – LUMBER & TIMBER (COVERED PIERHEAD)

PART 1 – GENERAL

NOTES:

- 1.) ALL COVERED PIERHEAD TIMBER MEMBERS SHALL COMPLY WITH THE REQUIRED PRESERVATIVE TREATMENT SPECIFICATIONS FOR CA (COPPER AZOLE) AS REFERENCED HEREIN.

1.01 DESCRIPTION OF WORK

- A. The Contractor shall furnish and install all equipment, materials and appurtenances, and furnish all tools, labor and supervision necessary to construct the work with all appurtenant construction and special equipment as indicated on the Drawings including, but not limited to, the following:
 1. Installation of Timberwork including roof columns, roof headers, roof joists and roof bracing.
 2. Installation of all hardware/fasteners including bolts, nuts, washers, plates, nails, cables, and appurtenant accessories.

1.02 REFERENCE DOCUMENTS

The latest revision of publications listed below form a part of this specification, to the extent referenced. The publications are referred to in the text by the basic designation only.

- A. Federal Specifications (Fed. Spec.):
 1. RR-W-410C Wire Rope and Strand
- B. Military Specifications (Mil. Spec.):
 1. DOD-P-21035A Paint, High Zinc Dust Content, Galvanizing Repair
- C. U.S. Department of Commerce Product Standards (PS):
 1. 56-73 Structural Glued Laminated Timber
- D. American National Standard Institute (ANSI) Standards
 1. B18.2.1-81 Square and Hex Bolts and Screws
 2. 18.22.1-65 Plain Washers
- E. American Society for Testing and Materials (ASTM) Publications:
 1. A 123-78 Zinc (Hot-Galvanized) Coatings on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars, and Strip
 2. A 153-82 Zinc Coating (Hot-Dip) on Iron and Steel Hardware Fasteners
 3. A 307-83 Carbon Steel Externally Threaded Standard Fasteners
 4. A 36-81a Standard Specification for Structural Steel
- F. American Welding Society (AWS) Publication
 1. D1.1-83 Structural Welding Code, Steel
- G. American Wood-Preservers' Association (AWPA) Publication:
 1. Standard U1:
 2. Category UC3B.
 3. Category UC4B.
 4. Category UC4C.
 5. Category UC4A
 6. AWPA Standard T1.
 7. M2-00 Standard for Inspection of Wood Products Treated with Preservatives
 8. M4-99 Care of Preservative-Treated Wood Products
- H. American Wood Preservers Institute (AWPI) Publications:
 1. AWPI-S1-LR Shore, Beach and Marina
 2. AWPI-S3-LF Bulkheads: Design & Construction-Part II
 3. AWPI-S4-LR Bulkheads: Design & Construction-Part III
 4. AWPI-S5-LR Bulkheads: Hardware and Fasteners

1.03 SUBMITTALS

- A. Certified Test Reports: Contractor shall submit grade and treatment certificates for lumber, timber and fasteners to the Engineer for review/approval prior to construction:
1. Plant Inspection: Timbers bearing the quality mark, of an approved agency (SPIB,TP) in accordance with the specified standards, will be acceptable for preservative treatment. The Owner's Representative reserves the right to conduct plant inspection of the treating process at his discretion. Notify the Owner's Representative at least 2 weeks prior to treatment, stating where preservative treatment will be done. The Owner's Representative shall have access to all parts of the plant during inspection of the treating process.
 2. Shop Drawings: Submit to the Owner's Representative, detailed plans of all treated timber showing the dimensions of all timbers which are cut, framed, or bored complete with splice and joint fastening details for approval prior to fabrication.

1.04 DELIVERY AND STORAGE

Close-stack treated timber and lumber material in a manner that will prevent long timbers or preframed material from sagging or becoming crooked. Keep ground underneath and within 5 feet of all such lumber free of weeds, rubbish, and combustible materials. Protect materials from weather using suitable coverings. Handle treated timber with ropes or chain slings without dropping, breaking outer fibers, bruising, or penetrating the surface with tools. Do not use cant dogs, peaveys, hooks, or pike poles. Protect hardware from corrosion.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Lumber and Timbers:
1. Solid Sawn: For members of thickness less than 3", moisture content shall be 19%. For members of thickness larger than 3", moisture content shall be 25%. All solid-sawn lumber and timber for decking, posts, and handrails shall be No. 1, KDAT or S-dry Southern Pine, and identified by the grade mark of a recognized association or independent inspection agency using the specific grading requirements of the association recognized as covering the species used. The association or independent inspection agency shall be certified by the Board of Review, American Lumber Standards Committee, to grade the species used.

All roof components shall be **NO. 1** or better, KDAT to 19% or 25% - as applicable.

2. Preservative Treatment: Fabricate lumber and timbers as completely as practicable before preservative treatment. Preservative treat all timberwork for the roof system framing members shall have a minimum Copper Azole (CA) treatment of 0.31 lbs./cf in accordance with AWPA.
 - a. Pressure treatment shall conform to AWPA Publication (Latest Revision) for softwood lumber, timber and plywood pressure treated for Marine Saltwater Exposure.
- B. Hardware shall include bolts with necessary nuts and washers, timber connectors, drift pins, dowels, nails, screws, spikes, and other metal fastenings. Bolt and nuts shall be galvanized, or stainless steel alloy type 316 as indicated on the drawings and shall conform to ASTM A307. Washers shall be stainless steel alloy type 316 plate or cut washers, or galvanized as indicated on the drawings. Provide bolts with washers under nut and head. Timber connectors and other metal fastenings shall be of the type and size shown. Nails shall be hardend deformed, stainless steel type 316 - ring shank nails. No nail guns shall be used. Where called for or as dictated by performance/conditions during material installation and assembly, pre-drill pilot holes 1/16 inches less than nail diameter to prevent splitting of members. Necessity of pre-drilling to be determined at the time of installation/assembly/construction. Contractor shall pre-drill holes for nail at the direction of the Engineer.
1. Zinc-Coating: Coat all steel specified or indicated to be zinc-coated or galvanized by the hot-dip process (H.D.G.) in accordance with ASTM A-123 and ASTM A-153, as applicable.

PART 3 - EXECUTION

3.01 CONSTRUCTION

- A. Protective Equipment: Provide personal protective equipment for all persons fabricating, field treating, or handling materials preservative treated with Chlorinated Copper Arsenate (CCA), and/or Copper Azole (CA) as applicable.
- B. Fabrication and Erection:
 - 1. Framing: Cut and frame all lumber and timber so that joints will have fit over contact surface. Secure timbers and piles in alignment. No shimming will be permitted in making joints. Open joints are unacceptable. Bore holes for bolts with a bit 1/16 inch larger in diameter than the rod or bolt. Bore holes for lag screws in two parts. Lead hole for the shank shall have the same diameter as the shank. Lead hole for the threaded portion shall have a diameter equal to approximately two-thirds of the spikes with a bit of the same diameter or smallest dimensions of the spike to prevent splitting. Counterbore for countersinking wherever smooth faces are indicated or specified.
 - 2. Framed Bents: Do not cut off tops of driven piles without authorization of the Owner's Representative. Pile cut offs shall be sealed with a marine sealant – to be approved by the Engineer prior to purchase and application.
 - 3. Bracing: Align bents before bracing is placed. Provide bracing of sufficient length to provide a minimum distance of 8 inches between the outside bolt and the end of the brace when possible. Bracing and girts shall bear firmly against piles or timber to which secured. Place fillers to avoid bending the bracing more than one inch out of line when bracing bolts or the fastening are drawn up tight. Built-up fillers will not be permitted. Each filler shall be a single piece of treated lumber like that in the brace with width of not less than 6 inches and a length of not less than 12 inches. Bolt ends of bracing through the pile post, or cap with a bolt of the size as indicated on the drawings. Open cuts on timber below decking shall be treated with an approved marine sealant; to be approved by the Engineer.
 - 4. Fastening: Use hot dipped galvanized or stainless steel alloy type 316 plate or cut waters, or "Dock Washers", as indicated on the drawings of the size and type to match each bolt under all bolt heads and nuts in contact with wood. Vertical bolts shall have nuts on the lower end. Where bolts are used to fasten timber to timber or timber to aluminum, bolt members together when they are installed and retighten immediately prior to final acceptance of the contract. All bolts shall have sufficient additional threading to provide at least 1/2 inch for future retightening.
- C. Field Treatment:
 - 1. Timber Work: Field treat all cuts and holes in treated piles or timbers, and all abrasions with copper naphthenate in accordance with AWWA M4 (latest edition), and then seal with an approved marine sealant. Trim all cuts and abrasions before field treatment. Paint all depressions or openings around bolt holes, joints, or daps including recesses formed by counterboring timber with copper naphthenate, and seal with an approved marine sealant in accordance with AWWA M4 (latest edition). After the bolt or screw is in place, fill with hot pitch or a bitumastic compound.
 - 2. Galvanized Surfaces: Repair and recoat zinc coating which has been damaged to such an extent as to expose the base metal. No rethreading of galvanized bolts will be allowed. Thoroughly clean the damaged area by wire brushing and remove all traces of welding flux and loose or cracked zinc coating prior to painting. Paint cleaned area with two coats of zinc oxide-zinc dust paint conforming to Mil. Spec. DOD-P-21035. Compound paint with a suitable vehicle in the ratio of one part zinc oxide to four parts zinc dust by weight.

3.02 DESIGN LOADS

ROOF (ON PIER):

Live load: 10 psf
dead load: actual material weights per asce 7-10

WIND LOAD DESIGN VALUES (IBC-2012/ASCE 7-10)

Wind velocity (v): 140 mph (3-sec gust)

building rick cat: i
exposure cat: open

END OF SECTION 07001

SECTION 08002 – ALUMINUM BOARDWALK DECK UNITS AND ACCESSORIES

PART 1 - GENERAL

1.01 SCOPE

The work covered under this section shall consist of manufacturing and/or supplying of the aluminum-framed fixed pier deck sections, aluminum handrail, and other marine hardware and accessories as may be shown or enumerated on the plans. All materials to be manufactured or distributed by CMI/Gator Dock & Marine, Ravens Marine, or a supplier pre-approved by the Engineer.

1.02 GENERAL

The installing contractor shall be a qualified Marine Contractor or General Contractor licensed by the State of South Carolina. Contractor shall secure and pay for the required local building or construction permits/licenses. The aluminum fixed pier deck manufacturer/supplier shall be approved by the Engineer and shall have a minimum of 5 years continuous experience in commercial pier and dock fabrication and may be required to submit a list of previous experience on similar projects. If required, the previous experience record will be submitted to the Owner or his designated representative ten working days prior to bid opening. To ensure that all specified criteria have been met when supplying other than the specified items, the Contractor may be required to submit the following with his bid or before award of the contract:

- A. Dimensional layout of fixed pier deck sections, handrail attachment brackets, etc., and fastening systems to be furnished under this Contract.
- B. Engineering calculations showing compliance with the design criteria specified herein. All calculations will be stamped with the seal of a qualified professional engineer licensed in the state of South Carolina. Computations shall include as a minimum, the following:
 - 1. Compliance with combined live and dead load requirements considering both bending and deflection.
- C. Typical sections or details of the following:
 - 1. Aluminum fixed pier deck sections, aluminum handrail, and aluminum channel split pile caps.
 - 2. Fastening system.

PART 2 - PRODUCTS

The following requirements are a minimum and must be met by each aluminum fixed pier deck fabricator in accordance with the requirements of aforementioned section entitled GENERAL. Alternate approval must be in writing from the Engineer a minimum of two weeks prior to bid opening.

2.01 MATERIALS

- A. Metal for fixed pier deck and all miscellaneous structures shall be 6061-T6 aluminum alloy. All aluminum shapes, sections, and members shall be extruded in accordance with the requirements of applicable sections of Federal Specifications QQ-A-200.
- B. Stainless steel bolts, nuts, washers, and screws shall be type 316.
- C. All composite lumber for fixed pier decking, handrail top cap and upper rail shall be Tamko "Evergrain", Cape Cod Grey color.

2.02 DESIGN REQUIREMENTS - ACCESSORIES

- A. The wood decking and fixed pier deck structure shall be designed to withstand a vertical LIVE LOAD of 90 PSF (pounds per square foot) **plus** dead load (DL) as determined by the fixed pier deck unit fabricator. Allowable deflection with combined DL + LL shall be L/240 where "L" is the free-span between support members/pile bents in inches.
- B. Anchoring devices shall be of sufficient number to restrain a minimum uniform lateral force of 250 pounds per linear foot applied along the entire length of the fixed pier deck and 75 pounds per square foot uplift.

C. Aluminum handrail attachment shall be designed to meet the following minimum load requirements for support of handrail system:

1. A 50 lb. load applied horizontally at the top rail and a simultaneous load of 100 PLF applied vertically downward at the top rail.
2. A 200 lb. concentrated load applied at any point in any direction at the top of the rail.
3. A 200 lb. concentrated horizontal load applied on a 1 SF area at any point in the system, including intermediate rails or other elements serving this purpose.
4. The above loads do not have to be applied simultaneously, except where specified, but should be applied to produce maximum stress in all the components.
5. Handrails shall also comply with the latest revisions and requirements of the International Building Code including horizontal and vertical loads, and minimum and maximum distances and spacing.

2.03 FABRICATION REQUIREMENTS - ACCESSORIES

- A. All fastening devices shall be bolted or welded to the decks in locations and according to the details shown on the plans and/or shop drawings.
- B. Any potentially corrosive installation of dissimilar materials; (aluminum-to-other metal, aluminum-to-treated lumber/timber, etc.) shall be properly insulated to minimize or eliminate corrosion in a marine environment.

2.04 FABRICATION REQUIREMENTS - STRUCTURES

Aluminum fixed pier deck sections shall be shop-fit and match-bolted in the shop and sequentially numbered prior to shipment.

2.05 SUBMITTALS

Four (4) sets of shop drawings shall be submitted to the Engineer. No fabrication will commence until Engineer has approved shop drawings. Allow 7 working days after shop drawing submittal for Engineer's comments or approval.

2.06 WARRANTY

Aluminum fixed pier deck units, and all aluminum structural components and accessories shall have a warranty on all materials for three (3) years after acceptance by the Owners representative.

END OF SECTION 08002

SECTION 08004 – ALUMINUM FLOATING DOCKS AND ACCESSORIES

PART 1 - GENERAL

1.01 SCOPE

The work covered under this section shall consist of manufacturing and/or supplying of the floating groundout dock units, pile guides, cleats, fendering, and other marine hardware and accessories as may be shown or enumerated on the Plans. All materials to be manufactured or distributed by CMI/GatorDock & GatorBridge, Ravens Marine, or a pre-approved supplier by the Engineer.

1.02. GENERAL

The installing contractor shall be a qualified Marine Contractor or General Contractor licensed by the State of South Carolina. He shall secure the required local building or construction permits. The manufacturer/supplier shall be approved and shall have a minimum of 5 years continuous experience in commercial pier and dock fabrication and may be required to submit a list of previous experience on similar projects. If required, the previous experience record will be submitted to the Owner or his designated representative ten working days prior to bid opening. To ensure that all specified criteria have been met when supplying other than the specified items, the Contractor may be required to submit the following with his bid or before award of the contract:

- A. Dimensional layout of floating docks and anchorage systems to be furnished under this Contract.
- B. Engineering calculations showing compliance with the design criteria specified herein. All calculations will be stamped with the seal of a qualified licensed South Carolina Professional Engineer. Computations shall include as a minimum, the following:
 - 1. Compliance with combined live and dead load requirements considering both bending and deflection.
 - 2. Compliance with freeboard requirements under specified load conditions.
- C. Typical sections or details of the following:
 - 1. Floating docks, including flotation.
 - 2. Anchorage system.
 - 3. Cleats.
 - 4. Fendering.
 - 5. Pile guides.

PART 2 - PRODUCTS

The following requirements are a minimum and must be met by each dock fabricator in accordance with the requirements of aforementioned section entitled GENERAL. Alternate approval must be in writing from the Engineer a minimum of two weeks prior to bid opening.

2.01 MATERIALS

- A. Metal for dock structures shall be 6061-T6 aluminum alloy. Metal for decking shall be 6063-T6 aluminum alloy. Both 6061-T6 and 6063-T6 shall be extruded in accordance with the requirements of applicable sections of Federal Specifications QQ-A-200.
- B. Minimum dock fendering shall be 2"x10" pressure treated southern yellow pine fendering. See Part 3 below for additional information.
- C. Stainless steel bolts, nuts, washers, hinge pins, screws, and other connectors shall be type 316 stainless steel.
- D. Floats shall consist of corlix aluminum pontoons or aluminum fabricated box (pan type) floats with 2 pcf density closed cell polyurethane.

- E. Bearing pads for pile guides shall be UHMW polyurethane with black ultra-violet light inhibitor added.
- F. Floating docks and accessories shall have a warranty on all materials for three (3) years after acceptance by the Engineer.
- G. An aluminum groundout cage or groundout aluminum channel shall be used on the groundout floating dock to prevent damage to the dock floatation.

2.02. DESIGN REQUIREMENTS - ACCESSORIES

- A. The decking and dock unit structural framing members shall be designed to withstand a combined dead load and live load of 90 pounds per square foot. Allowable deflection shall be $L/240$ where "L" is the freespan between cross members in inches.
- B. Hinged or bolted floating dock module connectors shall be able to withstand a load of 3000 pounds applied to the full connector.
- C. Anchoring devices for floating docks shall allow free movement of the dock, while minimizing damage due to normal dock movement caused by tides, boat wakes, water fluctuation and seasonal winds. Anchoring devices shall be of sufficient number to restrain a minimum uniform lateral force of 150 pounds per linear foot applied along the entire length of the dock.

2.03. DESIGN REQUIREMENTS - STRUCTURES

- A. For floatation, docks shall be designed to withstand a minimum uniform live load of 30 pounds per square foot applied vertically.
- B. The floatation shall be sized and located to satisfy all of the following conditions:
 - 1. Minimum freeboard of 18 inches (maximum 22 inches) under dead load only.
 - 2. Minimum freeboard of 12 inches under combined dead load and live load.
 - 3. Minimum freeboard of 12 inches under dead load plus concentrated live load of 400 pounds applied vertically at any location on the dock surface.

PART 3 - EXECUTION

3.01 FABRICATION REQUIREMENTS - ACCESSORIES

- A. Where southern yellow pine timber fendering is used, the minimum size member shall be 2 x 10", secured with two (2) 1/2" type 316 stainless steel bolts at minimum spacing of 3'0" o.c., countersunk below the wearing surface of the exposed side.
- B. Anchoring devices, including pile guides, shall be bolted to the docks in locations and according to the details shown on the plans or shop drawings.
- C. Any potentially corrosive installation of dissimilar materials shall be properly insulated to minimize or eliminate corrosion in a marine environment.
- D. Hinge mount extrusions shall be welded to the frame of the dock with a continuous fillet weld unless otherwise shown on the plans.

3.02 FABRICATION REQUIREMENTS – DOCK STRUCTURES

- A. Docks shall be sequentially numbered with welded hinge mount extensions that are matched in the shop, prior to shipment. Cleats and other accessories shall be welded or bolted as shown in the plans.
- B. Dock manufacturer shall be responsible for ensuring that the dock units are designed and manufactured to minimally withstand Dead Loads and Live Loads as specified on Plans and in Technical Specifications, and all applicable wind, wave, and current loads for the project site.

3.03 WARRANTY

Aluminum floating dock units and accessories shall have a written warranty on all materials for three (3) years after installation and acceptance by the Owner.

END OF SECTION 08004