

CLAM PASS PARK BOARDWALK REPAIRS CONSTRUCTION SPECIFICATIONS

CS-1.0 SUBMITTALS

CS-1.1 Work Plan

Prior to commencement of WORK the CONTRACTOR shall submit to the COUNTY and ENGINEER for approval, a WORK plan and schedule to cover all specified operations. The WORK plan shall include, but not be limited to, the means and methods to be employed to accomplish: construction access, staging, and restoration; stabilization of existing structures; pile replacement or pile jacket installation (alternate); stringer, stringer tie, and block replacement; utility support replacement; pile wraps; handrail and post replacement; hardware replacement; material disposal; site restoration; best management practices; storm emergency plan; health and safety plan; environmental protection plan; pollution control plan; required shop drawings; and required manufacturers' specifications and certifications. The WORK Plan shall also include the Progress Schedule, Schedule of Values, Construction Sequence, and Order of WORK. The COUNTY and ENGINEER shall review the WORK Plan and the CONTRACTOR shall make necessary revisions prior to acceptance of the WORK Plan.

CS-1.2 Notification of Discovery of Historical or Cultural Sites

The CONTRACTOR shall immediately notify the COUNTY and ENGINEER if any artifact, treasure trove, or other objects of antiquity that have scientific, cultural, or historical value, or are of interest to the public, are discovered, located, and/or recovered.

CS-2.0 ORDER OF WORK

CS-2.1 Site Utilization Parameters

The CONTRACTOR shall accommodate the following site utilization parameters in their construction sequence throughout the CONTRACT Time.

- (1) Facility shall remain open to general public and to commercial services.
- (2) The CONTRACTOR shall control activities to minimize interfering with commercial services.
- (3) The CONTRACTOR shall cooperate fully with the COUNTY and commercial services.
- (4) It is acknowledged that short term temporary closure of the boardwalk may be necessary during the course of the WORK for equipment and material transport, pile replacement, and stringer replacement. The CONTRACTOR shall provide a minimum of two business day's written notice to the COUNTY and ENGINEER specific to temporary closure of the boardwalk. The COUNTY shall coordinate with the commercial services for such temporary closures.

CS-2.2 Sequence

In general, the Order of WORK shall be as follows. Any changes in the Order of WORK shall be approved by the COUNTY and ENGINEER prior to initiation of the specific WORK activity.

- (1) Complete pre-construction submittals and notifications

- (2) Mobilize
- (3) Prepare construction access and staging area
- (4) Implement best management practices
- (5) Perform boardwalk repairs
- (6) Restore site
- (7) Demobilize

CS-2.3 Time of Operations

The CONTRACTOR is allowed to conduct work activities during daylight hours Monday through Friday, excluding weekends and Holidays, at CONTRACTOR's discretion, provided that CONTRACTOR complies with all applicable labor laws. The CONTRACTOR may request in writing with minimum 2 day notice to the COUNTY to conduct work on weekends. The COUNTY will review each request individually.

CS-3.0 SCHEDULE OF VALUES

CS-3.1 Mobilization and Demobilization

The cost of mobilization and demobilization including construction access and restoration of construction access and staging area is included in this CONTRACT. Costs for all appropriate costs in connection therewith or incidental thereto this WORK shall be included in the applicable CONTRACT lump sum price for Bid Item "Mobilization and Demobilization."

CS-3.2 Pile Replacement

All costs for WORK specified in connection with stabilization of existing structures, demolition, disposal of the construction debris at an approved off-site location, disassembly of boardwalk structure, installation of new piles, reassembly of boardwalk structure, and environmental protection measures; and, all other appropriate costs in connection therewith or incidental thereto this WORK shall be included in the applicable CONTRACT unit price for Base Bid Item "Pile Replacement."

Replace pile, treat with a fungicide and wrap with a polyethylene backed tape with a butyl rubber adhesive to retard future deterioration. The tape would be applied to the piles to seal out oxygen, one of the basic requirements of fungi to grow. To assist in minimizing future pile decay, clean all debris and deteriorated wood out of the tops of the piles, apply a fungicide to the interior of the pile, and fill the remaining void with epoxy flush with the top of the clamps.

CS-3.3 Pile Treatment

All costs for WORK specified in connection with treating existing piles with fungicide, treating existing pile tops, and environmental protection measures; and, all other appropriate costs in connection therewith or incidental thereto this WORK shall be included in the applicable CONTRACT lump sum price for Base Bid Item "Pile Treatment."

Treat pile with a fungicide and wrap with a polyethylene backed tape with a butyl rubber adhesive to retard future deterioration. The tape would be applied to the piles to seal out oxygen, one of the basic requirements of fungi to grow. To assist in minimizing future pile decay, it is recommended to clean all debris and deteriorated wood out of the tops of the piles, apply a

fungicide to the interior of the pile, and fill the remaining void with epoxy flush with the top of the clamps.

CS-3.4 Stringer Replacement

All costs for WORK specified in connection with stabilization of existing structures, demolition, disposal of the construction debris at an approved off-site location, disassembly of boardwalk structure, installation of new stringers, installation of new blocks, installation of new stringer ties, reassembly of boardwalk structure, and environmental protection measures; and, all other appropriate costs in connection therewith or incidental thereto this WORK shall be included in the applicable CONTRACT unit price for Base Bid Item "Stringer Replacement."

CS-3.5 Stringer Tie Replacement

All costs for WORK specified in connection with stabilization of existing structures, demolition, disposal of the construction debris at an approved off-site location, disassembly of boardwalk structure, installation of new stringer ties, reassembly of boardwalk structure, and environmental protection measures; and, all other appropriate costs in connection therewith or incidental thereto this WORK shall be included in the applicable CONTRACT unit price for Base Bid Item "Stringer Tie Replacement."

CS-3.6 Hand Rails and Posts

All costs for WORK specified in connection with stabilization of existing structures, demolition, disposal of the construction debris at an approved off-site location, disassembly of boardwalk structure, installation of new utility supports, reassembly of boardwalk structure, and environmental protection measures; and, all other appropriate costs in connection therewith or incidental thereto this WORK shall be included in the applicable CONTRACT unit price for Base Bid Item "Hand Rails and Posts."

CS-3.7 Utility Supports

All costs for WORK specified in connection with stabilization of existing structures, demolition, disposal of the construction debris at an approved off-site location, disassembly of boardwalk structure, installation of new utility supports, reassembly of boardwalk structure, and environmental protection measures; and, all other appropriate costs in connection therewith or incidental thereto this WORK shall be included in the applicable CONTRACT unit price for Base Bid Item "Utility Supports."

CS-3.8 Pile Wraps

All costs for WORK specified in connection with installation of new pile wraps and environmental protection measures; and, all other appropriate costs in connection therewith or incidental thereto this WORK shall be included in the applicable CONTRACT unit price for Base Bid Item "Pile Wraps."

CS-3.9 Hardware

All costs for WORK specified in connection with stabilization of existing structures, demolition, disposal of the construction debris at an approved off-site location, disassembly of

boardwalk structure, installation of new utility supports, reassembly of boardwalk structure, and environmental protection measures; and, all other appropriate costs in connection therewith or incidental thereto this WORK shall be included in the applicable CONTRACT lump sum price for Base Bid Item "Hardware."

CS-3.10 Bid Alternate: Pile Jackets

All costs for WORK specified in connection with installation of new pile jackets and environmental protection measures; and, all other appropriate costs in connection therewith or incidental thereto this WORK shall be included in the applicable CONTRACT unit price for Alternate Bid Item "Pile Jackets."

CS-3.11 Naples Grande Entrance Repair

Replace and Construct the boardwalk area near bent #167 from the entrance to Naples Grande to the asphalt trail connecting to the Clam Pass Boardwalk using the Boardwalk Typical Sections drawing. Replace (4) 4 x 16 PT piles. Replace decking with 3 x 8 Bedford fiber force plastic decking to match as close as possible. Maximum length available is 16' so decking will need to be spliced in some areas. Replace, stringers, ties, blocks, posts, supports, decking, wrap and all hardware associated with the boardwalk.

CS-3.12 Allowance Bid Items

If during the course of the WORK the CONTRACTOR identifies a deteriorated structural component including but not limited to piles, stringers, stringer ties, utility supports, hand rails, and posts, they shall record these components in the daily report. The CONTRACTOR shall notify the COUNTY and ENGINEER so that an inspection can be made and the Allowance Bid Items be utilized to accommodate increases in quantities above the Base Bid quantities. All additional WORK so authorized shall be performed at the applicable unit prices as those in the Base Bid Units.

CS-4.0 WORK AREA

CS-4.1 Limits of Construction

Areas in the vicinity of the project area may contain sensitive environmental habitats such as seagrass beds, mangroves, and oyster beds. The CONTRACTOR shall avoid these habitats and is responsible for environmental protection. All WORK must be confined to the CONTRACTOR's WORK area defined as the footprint of the existing boardwalk and existing cleared areas immediately adjacent thereto. No mechanical equipment may be used to disturb the sensitive environmental habitat or cause rutting in the surrounding soils. All construction areas shall be restored to pre-construction conditions, or better as part of demobilization.

CS-4.2 Security

The CONTRACTOR is permitted to exclude the public from their active WORK area as necessary to perform the WORK and to operate in accordance with the General Conditions and these Specifications. Enforcement shall be the CONTRACTOR's responsibility at no additional

cost to the COUNTY. The enforcement shall be coordinated with local enforcement agencies and will be subject to approval of the COUNTY.

CS-4.3 Construction Access

The temporary construction access and staging areas for the WORK shall be provided to the CONTRACTOR by the COUNTY at the existing parking lot for the Clam Pass Park. The areas will be defined at the pre-construction meeting. Procurement of any additional access routes for ingress and egress to the construction area shall be obtained by and at the expense of the CONTRACTOR. The CONTRACTOR shall confine their plant, equipment, materials, and operations of personnel to areas permitted by law, ordinances, permits and the requirements of the CONTRACT Documents, and shall not unreasonably encumber the premises with plant, equipment, and materials. The CONTRACTOR must control noise and must control wind-blown sand, silt and dust while using the accesses. The CONTRACTOR is responsible for preparation and restoration of the access areas. The CONTRACTOR is required to submit a construction access and staging plan including restoration measures prior to their usage. The costs for, but not limited to, earthwork, grading, signage, fencing, walls, guardrails, curbing, paving, stairways, and vegetation removal and reinstallation, along with removal and installation of any other facilities are included in the lump sum price for Bid Item "Mobilization and Demobilization". Disposal of any cleared vegetation, debris and rubbish shall be in a manner acceptable to the COUNTY and ENGINEER.

CS-4.4 Protection of Existing Facilities

During all phases of the WORK including but not limited to staging, construction access, structural repairs, structural replacement, and site restoration, the CONTRACTOR shall implement best management practices to protect and stabilize the existing facilities within and adjacent to the Work Area and to prevent damage thereto by the CONTRACTOR's operations. Where existing facilities are damaged, they shall be immediately repaired in conformance with the best construction standards of practice.

CS-5.0 PILE REPLACEMENT (BASE BID)

CS-5.1 General

The CONTRACTOR shall replace the designated piles in accordance with the CONTRACT Plans and these Specifications. The CONTRACTOR must stabilize the existing structures. The CONTRACTOR shall disassemble the minimum number of structural components to perform the pile replacement. The CONTRACTOR must temporarily support the existing structures to support normal Park operations throughout duration of pile replacement.

CS-5.2. References

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

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 25

1991 Round Timber Piles

ASTM D 1143

1981 (R 1987) Piles Under Static Axial
Compressive Load

AMERICAN WOOD-PRESERVERS' ASSOCIATION (AWPA)

AWPA C1

1990 All Timber Products – Pressure Treatment

AWPA C3

1990 Piles, Pressure Treatment

AWPA M4

1990 Care of Pressure-Treated Wood Products

AWPA M6

1988 Brands used on Forest Products

AWPA MP-4

1998 Marine Piling Pressure Treated With
Waterborne Preservatives for Use on Marine Waters

CS-5.3 Submittals

The CONTRACTOR shall submit the following Manufacturer's Catalog Data: driving equipment, driving helmet, pile shoes, and cushion block; and certificates: driving hammer and timber piles.

CS-5.4 Quality Assurance

The CONTRACTOR shall be responsible for the quality of treated wood products. The CONTRACTOR shall provide the COUNTY and ENGINEER with the inspection report of an independent inspection agency, approved by the COUNTY and ENGINEER, that offers products that comply with applicable AWPA standards. The AWPA MP-4 or the Quality Mark of an equivalent inspection organization on each pile will be accepted, in lieu of inspection reports, as evidence of compliance with applicable AWPA treatment standards. The CONTRACTOR shall store piles in accordance with AWPA M4.

CS-5.5 Products

The CONTRACTOR shall provide Douglas Fir or Southern Pine clean-peeled piles conforming to ASTM D 25. Minimum butt circumference measured at 3 feet from the butt shall be 37 inches (12-inch diameter). Piles shall be in one piece. Splices will not be permitted. Each treated pile shall be branded by the producer, in accordance with AWPA M6. The piles shall be treated by the full-cell pressure process in accordance with AWPA C1 and AWPA C3 for marine piling with waterborne preservatives chromated copper arsenate (CCA).

All hardware shall be in accordance with CS-17 "Hardware."

CS-5.6 Installation

The CONTRACTOR shall inspect the piles when delivered and when in the leads immediately before driving. The piles shall be cut at cutoff grade with pneumatic tools by sawing or other approved method. Where required, the CONTRACTOR shall provide bolt holes that will ensure a driving fit. The piles shall be installed such that there is a minimum of 40% pile penetration or 6 feet, whichever is greater.

CS-5.6.1 Driving Piles

When driving piles, the CONTRACTOR shall operate the hammer at the manufacturer's rated speed, drive the piles without interruption indicated tip elevation to reach a driving resistance and minimum depth of penetration in accordance with the manufacturer's schedule, drive piles with same hammer, cushion, or cap block, and using the same operating conditions as test piles. If, in driving, it is found that a pile is not of sufficient length to give the capacity specified, the CONTRACTOR shall notify the COUNTY and ENGINEER, who will determine the corrective procedure to be followed.

CS-5.6.2 Driving Equipment

The CONTRACTOR shall select and use a pile hammer of sufficient weight and energy to install the specified pile without damage into the soils as indicated, and place driving helmet, or cap and cushion block combination capable of protecting the head of the pile between tip of pile and the ram to prevent impact damage to pile. If the block is damaged, split, highly compressed, charred or burned, or has become spongy or deteriorated; the CONTRACTOR shall replace it with a new block. The helmet or block shall uniformly transmit energy to pile with a minimum loss of energy.

CS-5.6.3 Tolerances in Driving Bearing Piles

At the cutoff elevation, the butts shall be within 6 inches of the location indicated. Manipulation to move the pile into position shall be permitted only within the aforementioned tolerance to return the pile to the design location. However, the piles shall not be manipulated more than 1.5 percent of the exposed length above the ground mudline surface. A variation of not more than ¼ inch per foot of pile length from the vertical for plumb piles shall be permitted. The CONTRACTOR shall remove and replace with new piles those damaged, misplaced, driven below the design cutoff, or driven out of alignment, or out of plumb; or provide additional piles, driven as directed.

CS-5.7 Jetting of Piles

The CONTRACTOR may use water jets in installing the piles.

CS-5.8 Protection of Piles

The CONTRACTOR shall square the heads and tips of piles to the driving axis, laterally support the piles during driving, and not unduly restrain piles from rotation in the leads. Swinging leads shall not be permitted. Where pile orientation is essential, the CONTRACTOR shall take precautionary measures to maintain the orientation during driving. The CONTRACTOR shall handle, protect, and field treat piles in accordance with AWWA M4.

CS-5.9 Pile Top Protection

In accordance with AWWA M4, immediately after new pile tops are cut off, the CONTRACTOR shall protect the new pile tops with several heavy applications of the same preservative used to treat the piles, or else copper naphthenate solutions containing a minimum of 2 percent copper metal may be used with treated products.

CS-5.10 Pile Inspection

When the COUNTY and ENGINEER'S inspections result in product rejection, the CONTRACTOR shall promptly segregate and remove the rejected material from the site.

CS-6.0 PILE JACKETS (ALTERNATE BID)

If the COUNTY elects to award the alternate bid, the CONTRACTOR shall install pile jackets on the designated piles in accordance with the CONTRACT Plans and these Specifications. In this Alternate Bid, all existing piles to be jacketed must first be treated with the fungicide treatment in accordance with these Specifications.

The CONTRACTOR must stabilize the existing structures. The CONTRACTOR shall install the jacket the length of the pile extending from the bottom of the clamp down to one foot below the existing mudline with the Denso Series 400 Seashield Jacket with one layer of C-grid 450 and 550 epoxy grout. The CONTRACTOR shall comply with all written recommendations of the manufacturer regarding application of this system. The CONTRACTOR shall notify the ENGINEER after pile preparation is complete. The ENGINEER must approve the pile prior to installation of the jacket. The full length of the jacket shall be wrapped with Denso Butyl 35 Tape. The tape shall spirally overlap each turn by 55% in accordance with manufacturer's specifications.

The CONTRACTOR shall prepare the tops of the jacketed piles by removing all loose / deteriorated material. The CONTRACTOR shall treat the pile tops with the fungicide in accordance with these Specifications. The CONTRACTOR shall encase the pile top with the 550 epoxy as detailed in the construction plans.

CS-7.0 PILE TREATMENT

CS-7.1 Fungicide Treatment

The CONTRACTOR shall treat all existing piles from the pile top to the existing mudline with a borate gel in accordance with the CONTRACT Plans and these Specifications. The CONTRACTOR shall measure the dimensions and length of pile and calculate amount of fungicide required as described by the manufacturer's label. The CONTRACTOR shall provide the calculations to the COUNTY and ENGINEER prior to the WORK. Drill holes shall extend to the center of the pile and shall be angled downward. The holes shall be drilled spiraling down the pile with three to six inches of height between holes. Drill holes shall be of size as to not significantly decrease the structural strength of the pile. The number of holes shall be determined based upon amount of fungicide required. Inject the proper amount of the product as listed by the label into each hole. The CONTRACTOR shall seal the holes with treated wooden dowel plugs. The diameter of the plugs shall be greater than the diameter of the holes to ensure proper fit. The CONTRACTOR shall remove any excess product from the surface with a damp cloth or sponge.

CS-7.2 Pile Top Treatment

As part of the existing pile treatment, the CONTRACTOR shall prepare the tops of all existing piles by removing all loose / deteriorated material. The CONTRACTOR shall cover the pile tops with a 0.30 mil sheeting manufactured by Perma Pile or approved equal. The sheeting must overlap the clamps a minimum of 3 inches and provide a complete barrier over the timber pile. A minimum of three (3) 1¼ inch-long 304 stainless steel roofing nails each side shall be utilized for attaching the sheeting to the clamps.

CS-8.0 TIMBERWORK

CS-8.1 General

The CONTRACTOR shall perform repairs to the designated timber components in accordance with the CONTRACT Plans and these Specifications. The CONTRACTOR must stabilize the existing structures. The CONTRACTOR shall disassemble the minimum number of structural components to perform the repairs. The CONTRACTOR must temporarily support the existing structures throughout duration of the repairs.

CS-8.2 References

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

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 123	1989 (Rev. A) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 153	1982 (R 1987) Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A 307	1992 Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength

AMERICAN WOOD-PRESERVERS' ASSOCIATION (AWPA)

AWPA C2	1990 Lumber, Timbers, Bridge Ties and Mine Ties, Pressure Treatment
AWPA MLP	1998 Softwood Lumber, Timber and Plywood Pressure Treated for Marine (Salt Water) Exposure
AWPA M4	1990 Care of Pressure-Treated Wood Products
AWPA M6	1998 Brands Used on Forest Products
AWPA P5	1990 Waterborne Preservatives

CS-8.3 Submittals

The CONTRACTOR shall submit the inspection report of an independent inspection agency, for approval by the COUNTY and ENGINEER that offered products complying with applicable AWPA Standards.

The AWPA Quality mark or equivalent quality mark, on each piece will be accepted, in lieu of inspection reports, as evidence of compliance with applicable AWPA treatment standards.

The CONTRACTOR shall field inspect and submit a verification list to the COUNTY and ENGINEER of each treated timber member and each strapped bundle of treated lumber indicating the wording and lettering of the quality control markings, the species and the condition of the wood. The CONTRACTOR shall not incorporate materials damaged in transport from the manufacturer/supplier to the WORK area.

CS-8.4 Delivery and Storage

The CONTRACTOR shall open-stack untreated timber and lumber material on skids at least 12 inches aboveground, in a manner that will prevent warping and allow shedding of water; close-stack treated timber and lumber material in a manner that will prevent long timbers or pre-framed material from sagging or becoming crooked; keep ground under and within five feet of such piles free of weeds, rubbish, and combustible materials; protect materials from weather; handle treated timber with ropes or chain slings without dropping, breaking outer fibers, bruising, or penetrating surface with tools; protect timber and hardware from damage; and shall not use cant dogs, peaveys, hooks, or pike poles.

CS-8.5 Materials

The CONTRACTOR shall provide solid sawn lumber and timbers of stress-rated Southern Pine or Fir-Larch, with the following minimum allowable design stresses:

- $F_b = 1,400$ psi
- $F_v = 120$ psi
- $F_t = 1,200$ psi
- $F_c = 400$ psi

Lumber and timber shall be identified by the grade mark of a recognized association or independent inspection agency using the specific grading requirements of an 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. The CONTRACTOR shall use commercial grade lumber for secondary members such as decking, joists, and railings. Preservative treatment shall be with waterborne preservative chromated copper arsenate (CCA) in accordance with AWP A C2 and AWP A C3 as follows:

<u>Timbers</u>	<u>Retention (pcf)</u>
Knee and cross braces	2.5
Clamps and stringers	0.6
Decking and handrails	0.4

Each piece of treated timber or lumber shall be branded, by the manufacturer, in accordance with AWP A M6. The CONTRACTOR shall be responsible for the quality of treated wood products.

All hardware shall be in accordance with CS-17 "Hardware."

CS-8.6 Construction

The CONTRACTOR shall cut, bevel, and face timbers prior to plant preservative treatment and provide protective equipment for personnel fabricating, field treating, or handling materials treated with creosote or water-borne salts.

CS-8.6.1 Framing

The CONTRACTOR shall cut and frame lumber and timber so that joints will fit over contact surface, and secure timbers and piles in alignment. Open joints are unacceptable. Shimming is not allowed. The CONTRACTOR shall bore holes for drift pins and dowels with a bit 1/16 inch less in diameter than the pin or dowel, bore holes for truss rods or bolts with a bit 1/16 inch larger in diameter than rod or bolt, bore holes for lag screws in two parts, make lead hole for shank the same diameter as shank, make lead hole for the threaded portion approximately two-thirds of the shank diameter, bore holes in small timbers for bolt or wire spikes with a bit of the same diameter or smallest dimension of the spike to prevent splitting, and counterbore for countersinking wherever smooth faces are specified.

CS-8.6.2 Bracing

The CONTRACTOR shall align bents before bracing is placed, and provide bracing of sufficient length to provide a minimum distance of 8 inches between outside bolt and end of brace. Bracing and girths shall bear firmly against piles or timber to which secured. The CONTRACTOR shall place fillers to avoid bending the bracing more than one inch out of line when bracing bolts or other fastenings are drawn up tight. Built-up fillers will not be permitted. The CONTRACTOR shall make filler a single piece of the same treated lumber as that in the brace, with a width of at least 6 inches and a length of at least 12 inches; bolt ends of bracing through pile, post, or cap with a bolt of at least the indicated diameter; and bolt or spike intermediate intersections as indicated.

CS-8.6.3 Clamps

The CONTRACTOR shall place clamps on both sides of piles at an elevation that will match the existing elevation of the deck planks; secure clamps with two through bolts, each pile; and align and treat the ends of the clamps according to section CS-8.6.10 Field Treatment.

CS-8.6.4 Stringers

The CONTRACTOR shall place the crown up and, if possible, the better edge of deck stringers down. The tops of stringers shall not vary from a plane more than will permit bearing of the deck on stringers. The CONTRACTOR shall lap stringers to take bearing over full width of span between bents. Between stringers, the CONTRACTOR shall install solid-bridging at the mid-point of each span and fasten as indicated on the CONTRACT Plans.

CS-8.6.5 Stringer Ties

The CONTRACTOR shall install new stringer ties in the sizes, dimensions, and locations as shown on the CONTRACT Plans and in accordance with these Specifications.

CS-8.6.6 Blocks

New blocks shall be installed when the stringers are replaced. The new blocks shall be cut to ensure a tight fit.

CS-8.6.7 Decking

The CONTRACTOR shall make the decking of a single thickness of the plank supported by stringers or joists. Unless otherwise indicated, the CONTRACTOR shall lay the plank to match existing deck plank spacing. The CONTRACTOR shall screw each plank to each joint or stringer with at least two screws, provide screws at least 2½ inches greater than the thickness of the plank, place screws at least 2½ inches from edges of the plank, cut ends of planks parallel to center line of pier, and grade planks as to thickness and lay so that adjacent planks vary less than 1/16 inch.

CS-8.6.8 Hand Rails and Posts

For those designated to be replaced, the CONTRACTOR shall install new hand rails and posts in the sizes, dimensions, and locations as shown on the CONTRACT Plans and in accordance with these Specifications. For those designated to be repaired, the CONTRACTOR shall utilize the existing timber components to repair the existing hand rails and posts in the sizes, dimensions, and locations as shown on the CONTRACT Plans and in accordance with these Specifications.

CS-8.6.9 Fastening

Vertical bolts shall have nuts on the lower end. Where bolts are used to fasten timber to timber, timber to concrete, or timber to steel, the CONTRACTOR shall bolt members together when they are installed and retighten immediately prior to final acceptance. The CONTRACTOR shall provide bolts having sufficient additional threading to provide at least 3/8 inch per foot thickness of timber for future retightening.

CS-8.6.10 Field Treatment

The CONTRACTOR shall field treat cuts, bevels, notches, refacing and abrasions made in the field in treated piles or timbers in accordance with AWP A M4; trim cuts and abrasions before field treatment; paint depressions or openings around bolt holes, joints, or gaps including recesses formed by counter boring with preservative treatment used for piles or timber; and after the bolt or screw is in place, fill with hot pitch or a bitumastic compound.

CS-9.0 UTILITY SUPPORTS

The CONTRACTOR shall replace the designated utility supports in accordance with the CONTRACT Plans and these Specifications. All timber work shall be completed in accordance with CS-14 "Timberwork." The CONTRACTOR must stabilize the existing structures. The CONTRACTOR shall disassemble the minimum number of components to perform the utility support replacement. The CONTRACTOR must temporarily support the existing utilities throughout duration of utility support replacement.

CS-10.0 PILE WRAPS

The CONTRACTOR shall install new pile wraps on the designated piles in accordance with the CONTRACT Plans and these Specifications. The piles shall be wrapped with a 0.30 mil sheeting manufactured by Perma Pile or approved equal. The sheeting is to prevent preservative treatment from leaching into the environment and to prohibit marine borer attack. The sheeting must overlap a minimum of 6 inches at seams and lap joints and provide a complete barrier to the timber. A minimum of 1¼ inch-long 304 alloy stainless steel ring-shank roofing nails, spaced no greater than 3 inches apart, shall be utilized for attaching the sheeting. The sheeting shall extend from the bottom of the clamp down to one foot below the existing mudline. Vertical seams shall be oriented towards the underside of the boardwalk.

CS-11.0 HARDWARE

The CONTRACTOR shall remove and replace the designated hardware in accordance with the CONTRACT Plans and these Specifications. The CONTRACTOR must temporarily support the existing structures throughout duration of hardware replacement.

The percentage of hardware to be replaced for each section listed on the CONTRACT Plans is an approximation by the ENGINEER of the most corroded and deteriorated hardware. The CONTRACTOR shall inspect the hardware and replace the most corroded and deteriorated hardware equal to the percentage shown on the CONTRACT Plans per each section. The CONTRACTOR shall record in their daily report the total number of hardware replaced per each section to support the quantity in their pay application. In the event the quantity is going to exceed the percentage shown on the CONTRACT Plans, the CONTRACTOR shall notify the COUNTY and ENGINEER so that an accurate count can be made and the Allowance Bid Item "Hardware" be utilized to accommodate such an increase.

The CONTRACTOR shall provide bolts with necessary nuts and washers, timber connectors, drift pins, dowels, nails, screws, spikes, and other fastenings. The bolts and nuts shall conform to ASTM F593. The CONTRACTOR shall provide plate or cut washers where indicated; provide bolts with washers under nut and head; provide timber connectors and other metal fastenings of type and size shown; and provide 304 alloy stainless steel hardware. Decking shall be refastened with 304 alloy stainless steel square head screws.

CS-12.0 ENVIRONMENTAL PROTECTION

CS-12.1 General

For the purpose of this specification, environmental protection is defined as the retention of the environment in its natural state to the greatest possible extent during project construction and to enhance the natural appearance in its final condition. Environmental protection requires consideration of air, water, and land, and involves noise, solid waste-management as well as other pollutants. In order to prevent any environmental pollution arising from the construction activities in the performance of this CONTRACT, the CONTRACTOR and their SUBCONTRACTORS shall comply with all applicable Federal, State and local laws and regulations concerning environmental pollution control and abatement.

CS-12.2 Subcontractors

Compliance with the provisions of this section by SUBCONTRACTORS will be the responsibility of the CONTRACTOR.

CS-12.3 Landscape Protection

The environmental resources within the project boundaries and those affected outside the limits of permanent WORK under this CONTRACT shall be protected during the entire period of this CONTRACT. The CONTRACTOR shall confine their activities to areas defined by the CONTRACT plans and specifications.

Prior to the beginning of any construction, the CONTRACTOR shall identify all land resources to be preserved within the CONTRACTOR's WORK area. The CONTRACTOR shall not remove, cut, deface, injure, or destroy land resources, including trees, shrubs, vines, grasses, top soil, and land forms without special permission from the COUNTY and ENGINEER. Trees damaged beyond restoration shall be removed and disposed of by the CONTRACTOR in a manner approved by the COUNTY and ENGINEER. Trees that are to be removed because of damage shall be replaced at the CONTRACTOR's expense by nursery-grown trees of the same species or a species approved by the COUNTY and ENGINEER. The size and quality of nursery-grown trees shall also be approved by the COUNTY and ENGINEER. No ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized. Where such special emergency use is permitted, the CONTRACTOR shall provide effective protection for land and vegetation resources at all times.

Prior to any construction the CONTRACTOR shall mark the areas that are not required to accomplish all WORK to be performed under this CONTRACT. Isolated areas within the general WORK area which are to be saved and protected shall also be marked or fenced. The CONTRACTOR shall protect from damage all existing trees designated to remain and protect tree roots from noxious materials in solution caused by run-off or spillage. No materials, trailers, or equipment shall be stored within the drip line of any protected tree. Monuments and markers shall be protected before construction operations commence. Where construction operations are to be conducted during darkness, the markers shall be visible. The CONTRACTOR shall convey to their personnel the purpose of marking and/or protection of all necessary objects.

Trees and their roots, shrubs, vines, grasses, landforms, and other landscape features indicated and defined on the CONTRACT plans to be preserved shall be clearly identified and protected by fencing or any other approved techniques. The CONTRACTOR shall place tree protection fencing before excavation or grading is begun and maintain in place until construction is complete; remove branches of protected trees, if required, to clear for construction and extend pruning operation to restore the natural shape of the entire tree; cut branches or roots, if required, with sharp pruning instruments, (do not break or chop); and repair any damage to tree crowns or roots promptly after damage occurs.

CS-12.4 Location of Storage Facilities

The CONTRACTOR's storage areas required in the performance of the WORK shall be located upon existing cleared portions of the job site or areas to be cleared, and shall require written approval of the COUNTY and ENGINEER. The CONTRACTOR shall not store oil or fuel on-site, or equipment that is not required for the daily construction activities. A metal pan with sides a minimum of four (4) inches high shall be placed under the equipment or adjacent area during refueling. The pan shall have a capacity equal to the capacity of the gas cans used and catch any spills or leaks during the refueling activity. Fuel caught in the pan shall be

contained and either transported off-site or used in the equipment. Under no condition shall the material be discharged on-site or into adjacent waters.

CS-12.5 Post-Construction Cleanup or Obliteration

The CONTRACTOR shall obliterate all signs of construction WORK areas, waste materials, or any other vestiges of construction as directed by COUNTY and ENGINEER. The area will be restored to near natural conditions.

CS-12.6 Spillage

Special measures shall be taken to prevent bilge pumpage or effluent, chemicals, fuels, oils, greases, bituminous materials, waste washing, herbicides and insecticides from entering public waters.

CS-12.7 Disposal

Disposal of any materials, wastes, effluent, trash, garbage, oil, grease, chemicals, etc., in areas adjacent to streams or other waters of the State shall not be permitted. If any waste material is dumped in unauthorized areas, the CONTRACTOR shall remove the material and restore the area to the original condition before being disturbed. If necessary, contaminated ground shall be excavated, disposed of as directed by the COUNTY, and replaced with suitable fill material, compacted and finished with topsoil and planted as required to re-establish vegetation.

CS-12.8 Pollution Control

The CONTRACTOR shall control and conduct such operations and institute maintenance procedures to eliminate pollution of adjacent surface waters caused by either material runoff or discharges of any kind from the construction area (roof drains discharge excepted). No off-site discharge is allowed. The CONTRACTOR shall comply with the provisions of Chapters 253 and 403, Florida Statutes, regarding control of air and water pollution and with all rules and regulations of the Department of Environmental Protection. If non-compliance with the aforementioned Federal, State or Local laws or regulations occurs, the CONTRACTOR shall immediately inform the COUNTY and ENGINEER of proposed corrective action and take such action as may be approved. If the CONTRACTOR fails or refuses to comply promptly, the COUNTY, through the ENGINEER, may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders shall be made the subject of a claim for extension of time or for excess costs or damages by the CONTRACTOR.