

## **Technical Specifications**

## SECTION 01010

### SUMMARY OF WORK

#### PART 1 GENERAL

##### **1.01 Location of Work**

- A. The Colin's Park pier and Day Dock repair project is located at the west end of University Blvd in Colin's Park and over the Halifax River. The park is located at 100 University Blvd, Daytona Beach, FL 32118.

##### **1.02 Scope of Work**

- A. Furnish all labor, materials, equipment and incidentals required to re-construct the City of Daytona Beach Colin's Park pier and day dock as shown on the drawings and as specified herein.
  
- B. The Work includes, but is not necessarily limited to, the following:
  - 1. Construction of approximately 60 linear feet of the 6 ft wide north/south day dock.
  - 2. Remove and replace the southern 20 linear feet of the sloping north/south access pier.
  - 3. The installation of lighting and electrical components as shown on drawings.
  - 4. Inspect existing north/south pier pilings for structural integrity, wrap any replacement pilings.
  - 5. Installation and maintenance of floating turbidity barriers.
  - 6. Repair any damaged guardrail.
  - 7. Replace any missing lamp post access covers.
  - 8. Site cleanup.
  - 9. All permits.
  - 10. Indemnification.

##### **1.03 Work Sequence**

- A. The Contractor's sequence of work may be of their choosing in order to complete the Work in the Contract Time while accommodating other contractors on site. Completion dates of the various stages shall be in accordance with the approved construction schedule submitted by the Contractor. Immediately bring any potential unexpected delays to the City's representative attention and adjustments to time will be considered.

##### **1.04 Contractor's Use of Premises**

- A. Contractor shall have complete use of the premises for the performance of the Work except those areas designated on the Drawings to be protected and/or not disturbed during construction.
- B. Contractor shall limit the use of the premises for his/her Work and for storage to allow for:
  - 1. Owner occupancy
  - 2. Public use.
- C. Coordinate use of premises with Owner.
- D. Contractor shall assume full responsibility for security of all his/her and his/her subcontractors materials and equipment stored on the site.
- E. If directed by the Owner, move any stored items which interfere with operations of Owner or other contractors.
- F. Obtain and pay for use of additional storage or work areas if needed to perform the Work.

**1.05 Contractor Shall Secure and Pay For**

Government Fees and Licenses and City permits.

**1.06 Contractor Shall Comply With**

Codes, ordinances, rules, regulations, orders and other legal requirements of public authorities that bear on performance of work.

## SECTION 01150

### MEASUREMENT AND PAYMENT

#### PART 1 GENERAL

##### **1.01 Scope of Work**

- A. The following explanation of the Measurement and Payment of the bid form items is made for information and guidance. The omission of reference to any item in this description shall not, however, alter the intent of the bid form or relieve the Contractor of the necessity of furnishing such as a part of the contract.
- B. The quantities set forth in the Bid Form are approximate and are given to establish a uniform basis for the comparison of bids. The Owner reserves the right to increase or decrease the quantities of any class or portion of the work during the progress of construction in accordance with the terms of the Contract.

##### **1.02 Engineer's Estimate of Quantities**

- A. The Engineer's estimated quantities for unit bid prices, as listed in the Bid Form, are approximate only and are included solely for the purpose of comparison of bids. The Owner does not expressly or by implication agree that the nature of the materials encountered below the surface of the ground or the actual quantities of material encountered or required will correspond therewith and reserves the right to increase or decrease any quantity or to eliminate any quantity as Owner may deem necessary. Contractor will not be entitled to any adjustment in a unit bid price as a result of any change in an estimated quantity and agrees to accept the aforesaid unit bid prices as complete and total compensation for any additions or deductions caused by a variation in quantities as a result of more accurate measurement, or by any changes or alterations in the Work ordered by the Owner, and for use in the computation of the value of the work performed for progress payments.

#### PART 2 PAY ITEMS

##### **2.01 Survey: As-Built Survey (Item 5-7)**

###### A. Measurement and Payment

- 1. Upon completion of the project, a Professional Surveyor will provide a signed and sealed As-Built survey. Payment will be made on a lump sum basis after As-built survey acceptance.

##### **2.02 Mobilization/Demobilization (Item 101-1)**

###### A. Measurement and Payment

- 1. Payment for mobilization/demobilization will be made on a lump sum basis prorated throughout the duration of the project. Fifty percent (60%) of the lump sum amount will be paid for Contractor mobilization in the first payment request

and the remaining fifty percent (50%) of the lump sum amount will be paid for Contractor demobilization in the final payment request. Such payment shall be full compensation for selling and delivering to the Owner all necessary materials, equipment, supplies including installation of all materials, equipment, supplies. All other labor, permit fees, taxes, mobilization, demobilization, performance and payment bond premiums, insurance, general and administration and other miscellaneous costs, overhead and profit for the project complete except for those costs specifically included in other bid items listed in the Schedule of Bid Items.

### **2.03 Sediment (Turbidity) Control (Item 104-11)**

#### **A. Measurement and Payment**

1. Measurement and payment for Sediment (Turbidity) Control will be made on Linear Foot basis. Work includes but not limited to the implementation of turbidity control around the work area. If a temporary upland storage area is utilized, silt fencing will be necessary to inhibit sediment migration. The measures shall consist of monitoring, inspecting, reporting, and maintaining sediment and turbidity control measures. During an inspection if a deficiency is discovered such deficiency should be corrected immediately. Keep project site within compliance of the Florida Department of Environmental Protection and the Department of the Army Jacksonville Districts Corps of Engineers permits.

### **2.04 Wooden Pier and Day Dock, Including all hardware & Railing Construction (Item 470)**

#### **A. Measurement**

1. Measurement for payment for P.T. Pine Wooden Pier and Day Dock will be on a square foot basis.

#### **B. Payment**

1. Payment will be square foot based compensation for construction of the boardwalk, joist, stringers, walers, beams, cross members, hardware, connectors, ties and railings as specified in the Plans and in the Specifications. Included in this item is the equipment, materials and labor necessary to complete all tasks to meet City acceptance.

### **2.05 Lighting - F&I per Plan (Including Electrical) (Item 715)**

#### **A. Measurement and Payment**

1. Measurement and payment for the Lighting will be made on a Lump Sum basis. Work includes but not limited to the permitting, procurement, preparation, electrical components, conduit, conduit installation, connections, poles, wiring, fixtures, securing and installation of the lighting as specified on the Drawings and in the Specifications and replace six missing existing lamp post access covers.

## **2.06 Educational Signs (Item 1)**

### A. Measurement and Payment

1. Measurement and payment shall be for the Furnishing and Installation of the Education Signs on a Lump Sum Basis as required per the Department of the Army Jacksonville Districts Corps of Engineers permit in linear feet.

## **2.07 Monofilament Recycling Bins (Item 2)**

### A. Measurement and Payment

1. Measurement and payment shall be for the Furnishing and Installation of the Monofilament Recycling Bins on a Lump Sum Basis as required per the Department of the Army Jacksonville Districts Corps of Engineers permit in linear feet.

## **2.08 Mooring Cleats (Item 3)**

### A. Measurement

1. Measurement for payment for Furnishing and Installing 10" Heavy Duty 316 Stainless Steel mooring cleats on the day dock.

### B. Payment

1. Payment will be for each mooring cleat furnished and installed. Included in this item is the equipment, materials and labor necessary to complete all tasks to meet City acceptance.

END OF SECTION

## Section 01300

### SUBMITTALS

#### PART 1 GENERAL

##### 1.01 Description of Requirements

- A. The types of submittals controlled by these general requirements include shop drawings, product data, samples and miscellaneous work-related submittals. The individual submittal requirements are specified in applicable sections for each unit of work.
- B. Unless otherwise noted, each item of submittal shall be submitted to the City for review prior to construction or installation.
  - 1. The City's review is for general conformance with the design concept and Contract Documents.
- C. Definitions: The work-related submittals of this section, in addition to the definitions of the General Conditions and elsewhere in the contract documents, are defined as follows:
  - 1. Shop drawings include custom-prepared data of all forms including drawings, diagrams, performance curves, data sheets, schedules, templates, patterns, reports, calculations, instructions, measurements and similar information not in standard printed form applicable to other projects.
  - 2. Product data include standard printed information on materials, products and systems; not custom-prepared for this project, other than the designation of selections from available choices.
  - 3. Operational and Maintenance manuals for project components, may need to contact manufacture for information, for example the required resealing of the treated timber.
  - 4. Samples include both fabricated and un-fabricated physical examples of materials, products and work; both as complete units and as smaller portions of units of work; either for limited visual inspection or (where indicated) for more detailed testing and analysis.
  - 5. Miscellaneous submittals related directly to the work (non-administrative) include warranties, guarantees, maintenance agreements, workmanship bonds, project photographs/videos, survey data and reports, physical work records, statements of applicability, quality testing and certifying reports, copies of industry standards, record drawings, operating and maintenance materials, overrun stock, security/protection/safety keys and similar information, devices and materials applicable to the work and not defined as shop drawings, product data or samples.

**SECTION 104**  
**PREVENTION, CONTROL, AND ABATEMENT OF**  
**EROSION AND WATER POLLUTION**

**104-1 Description.**

Provide erosion control measures on the project and in areas outside the right-of-way where work is accomplished in conjunction with the project, so as to prevent pollution of water, detrimental effects to public or private property adjacent to the project right-of-way and damage to work on the project. Construct and maintain temporary erosion control features or, where practical, construct and maintain permanent erosion control features as shown in the Plans or as may be directed by the Engineer.

**104-2 General.**

Coordinate the installation of temporary erosion control features with the construction of the permanent erosion control features to the extent necessary to ensure economical, effective, and continuous control of erosion and water pollution throughout the life of the Contract.

Due to unanticipated conditions, the Engineer may direct the use of control features or methods other than those included in the original Contract. In such event, the Department will pay for this additional work as unforeseeable work.

**104-3 Control of Contractor's Operations Which May Result in Water Pollution.**

Prevent pollution of streams, canals, lakes, reservoirs, and other water impoundments with fuels, oils, bitumens, calcium chloride, or other harmful materials. Also, conduct and schedule operations to avoid or otherwise minimize pollution or siltation of such water impoundments, and to avoid interference with movement of migratory fish. Do not dump any residue from dust collectors or washers into any live stream.

Restrict construction operations in rivers, streams, lakes, tidal waters, reservoirs, canals, and other water impoundments to those areas where it is necessary to perform filling or excavation to accomplish the work shown in the Plans and to those areas which must be entered to construct temporary or permanent structures. As soon as conditions permit, promptly clear rivers, streams, and impoundments of all obstructions placed therein or caused by construction operations.

Do not frequently ford live streams with construction equipment. Wherever an appreciable number of stream crossings are necessary at any one location, use a temporary bridge or other structure.

Except as necessary for construction, do not deposit excavated material in rivers, streams, canals, or impoundments, or in a position close enough thereto, to be washed away by high water or runoff.

Where pumps are used to remove highly turbid waters from enclosed construction areas such as cofferdams or forms, treat the water by one or more of the following methods prior to discharge into State waters: pumping into grassed swales or appropriate vegetated areas or sediment basins, or confined by an appropriate enclosure such as turbidity barriers when other methods are not considered appropriate.

Do not disturb lands or waters outside the limits of construction as staked, except as authorized by the Engineer.



Obtain the Engineer's approval for the location of, and method of operation in, borrow pits, material pits, and disposal areas furnished for waste material from the project (other than commercially operated sources) such that erosion during and after completion of the work will not result in probability of detrimental siltation or water pollution.

#### **104-4 Materials for Temporary Erosion Control.**

The Engineer will not require testing of materials used in construction of temporary erosion control features other than as provided for geotextile fabric in 985-3 unless such material is to be incorporated into the completed project. When no testing is required, the Engineer will base acceptance on visual inspection.

The Contractor may use new or used materials for the construction of temporary silt fence, staked turbidity barriers, and floating turbidity barrier not to be incorporated into the completed project, subject to the approval of the Engineer.

#### **104-5 Preconstruction Requirements.**

Prior to the Preconstruction Conference, submit to the Department an Erosion Control Plan meeting the requirements or special conditions of all permits authorizing project construction. If no permits are required or the approved permits do not contain special conditions or specifically address erosion and water pollution, the project Erosion Control Plan will be governed by 7-1.1, 7-2.2, 7-8.1, 7-8.2, and Section 104.

When a DEP generic permit is issued, the Contractor's Erosion Control Plan shall be prepared to accompany the Department's Stormwater Pollution Prevention Plan (SWPPP). Ensure the Erosion Control Plan includes procedures to control off-site tracking of soil by vehicles and construction equipment and a procedure for cleanup and reporting of non-storm water discharges, such as contaminated groundwater or accidental spills. Do not begin any soil disturbing activities until Department approval of the Contractor's Erosion Control Plan, including required signed certification statements have been submitted to the Department.

Failure to sign and submit any required documents or certification statements will be considered a default of the Contract. Any soil disturbing activities performed without the required signed documents or certification statements may be considered a violation of the DEP Generic Permit.

When the SWPPP is required, prepare the Erosion Control Plan in accordance with the planned sequence of operations and present in a format acceptable to the Department. The Erosion Control Plan shall describe, but not be limited to, the following items or activities:

1. For each phase of construction operations or activities, supply the following information:
  - a. Locations of all erosion control devices
  - b. Types of all erosion control devices
  - c. Estimated time erosion control devices will be in operation
  - d. Monitoring schedules for maintenance of erosion control devices
  - e. Methods of maintaining erosion control devices
  - f. Containment or removal methods for pollutants or hazardous wastes
2. The name and telephone number of the person responsible for monitoring and maintaining the erosion control devices.
3. Submit for approval the Erosion Control Plans meeting paragraphs 3a, 3b, or 3c below:

a. Projects permitted by the Southwest Florida Water Management District (SWFWMD), require the following:

Submit the Erosion Control Plan to the Engineer for review and to the appropriate SWFWMD Office for review and approval. Include the SWFWMD permit number on all submitted data or correspondence.

The Contractor may schedule a meeting with the appropriate SWFWMD Office to discuss his Erosion Control Plan in detail, to expedite the review and approval process. Advise the Engineer of the time and place of any meetings scheduled with SWFWMD.

Do not begin construction activities until the Erosion Control Plan receives written approval from both SWFWMD and the Engineer.

b. Projects permitted by the South Florida Water Management District or the St. Johns River Water Management District, require the following:

Obtain the Engineer's approval of the Erosion Control Plan.

Do not begin construction activities until the Erosion Control Plan receives written approval from the Engineer.

c. Projects authorized by permitting agencies other than the Water Management Districts or projects for which no permits are required require the following:

The Engineer will review and approve the Contractor's Erosion Control Plan.

Do not begin construction activities until the Erosion Control Plan receives written approval from the Engineer.

Comply with the approved Erosion Control Plan.

## **104-6 Construction Requirements.**

**104-6.1 Limitation of Exposure of Erodible Earth:** The Engineer may limit the surface areas of unprotected erodible earth exposed by the construction operation and may direct the Contractor to provide erosion or pollution control measures to prevent contamination of any river, stream, lake, tidal waters, reservoir, canal, or other water impoundments or to prevent detrimental effects on property outside the project right-of-way or damage to the project. Limit the area in which excavation and filling operations are being performed so that it does not exceed the capacity to keep the finish grading, turf, sod, and other such permanent erosion control measures current in accordance with the accepted schedule.

Do not allow the surface area of erodible earth that clearing and grubbing operations or excavation and filling operations expose to exceed 750,000 square feet without specific prior approval by the Engineer. This limitation applies separately to clearing and grubbing operations and excavation and filling operations.

The Engineer may increase or decrease the amount of surface area the Contractor may expose at any one time.

**104-6.2 Incorporation of Erosion and Sediment Control Features:** Incorporate permanent erosion control features into the project at the earliest practical time. Use temporary erosion and sediment control features found in the State of Florida Erosion and Sediment Control Designer and Reviewer Manual (E&SC Manual) to correct conditions that develop during construction which were not foreseen at the time of design, to control erosion and sediment prior to the time it is practical to construct permanent control features, or to provide immediate

temporary control of erosion and sediment that develops during normal construction operations, which are not associated with permanent erosion control features on the project. An electronic version of the E&SC Manual can be found at the following URL:

<http://www.fdot.gov/programmanagement/Implemented/URLinSpecs/Files/FLerosionSedimentManual.pdf>

Install all sediment control devices in a timely manner to ensure the control of sediment and the protection of lakes, streams, gulf or ocean waters, or any wetlands associated therewith and to any adjacent property outside the right-of-way as required.

Complete the installation of sediment control devices prior to the commencement of any earthwork.

After installation of sediment control devices, repair portions of any devices damaged at no expense to the Department. The Engineer may authorize temporary erosion and sediment control features when finished soil layer is specified in the Contract and the limited availability of that material from the grading operations will prevent scheduled progress of the work or damage the permanent erosion control features.

**104-6.3 Scheduling of Successive Operations:** Schedule operations such that the area of unprotected erodible earth exposed at any one time is not larger than the minimum area necessary for efficient construction operations, and the duration of exposure of uncompleted construction to the elements is as short as practicable.

Schedule and perform clearing and grubbing so that grading operations can follow immediately thereafter. Schedule and perform grading operations so that permanent erosion control features can follow immediately thereafter if conditions on the project permit.

**104-6.4 Details for Temporary Erosion and Sediment Control Features:**

**104-6.4.1 General:** Use temporary erosion, sediment and water pollution control features found in the E&SC Manual. These features consist of, but are not limited to, temporary turf, rolled erosion control products, sediment containment systems, runoff control structures, sediment barriers, inlet protection systems, silt fences, turbidity barriers, and chemical treatment. For design details for some of these items, refer to the Design Standards and E&SC Manual.

**104-6.4.2 Temporary Turf:** The Engineer may designate certain areas of turf or sod constructed in accordance with Section 570 as temporary erosion control features. For areas not defined as sod, constructing temporary turf by seeding only is not an option for temporary erosion control under this Section. The Engineer may waive the turf establishment requirements of Section 570 for areas with temporary turf that will not be a part of the permanent construction.

**104-6.4.3 Runoff Control Structures:** Construct runoff control structures in accordance with the details shown in the Plans, the E&SC Manual, or as may be approved as suitable to adequately perform the intended function.

**104-6.4.4 Sediment Containment Systems:** Construct sediment containment systems in accordance with the details shown in the Plans, the E&SC Manual, or as may be approved as suitable to adequately perform the intended function. Clean out sediment containment systems as necessary in accordance with the Plans or as directed.

**104-6.4.5 Sediment Barriers:** Provide and install sediment barriers according to details shown in the Plans, as directed by the Engineer, or as shown in the E&SC Manual to protect against downstream accumulation of sediment. Sediment Barriers include, but are not limited to synthetic bales, silt fence, fiber logs and geosynthetic barriers. Reusable barriers that

have had sediment deposits removed may be reinstalled on the project as approved by the Engineer.

#### **104-6.4.6 Silt Fence:**

**104-6.4.6.1 General:** Furnish, install, maintain, and remove silt fences, in accordance with the manufacturer's directions, these Specifications, the details as shown in the Plans, the Design Standards, and the E&SC Manual.

**104-6.4.6.2 Materials and Installation:** Use a geotextile fabric made from woven or nonwoven fabric, meeting the physical requirements of Section 985 according to those applications for erosion control.

Choose the type and size of posts, wire mesh reinforcement (if required), and method of installation. Do not use products which have a separate layer of plastic mesh or netting. Provide a durable and effective silt fence that controls sediment comparable to the Design Standards and the E&SC Manual.

Erect silt fence at upland locations, across ditchlines and at temporary locations shown in the Plans or approved by the Engineer where continuous construction activities change the natural contour and drainage runoff. Do not attach silt fence to existing trees unless approved by the Engineer.

**104-6.4.6.3 Inspection and Maintenance:** Inspect all silt fences immediately after each rainfall and at least daily during prolonged rainfall. Immediately correct any deficiencies. In addition, make a daily review of the location of silt fences in areas where construction activities have changed the natural contour and drainage runoff to ensure that the silt fences are properly located for effectiveness. Where deficiencies exist, install additional silt fences as directed by the Engineer.

Remove sediment deposits when the deposit reaches approximately 1/2 of the volume capacity of the silt fence or as directed by the Engineer. Dress any sediment deposits remaining in place after the silt fence is no longer required to conform with the finished grade, and prepare and seed them in accordance with Section 570.

**104-6.4.7 Floating Turbidity Barriers and Staked Turbidity Barriers:** Install, maintain, and remove turbidity barriers to contain turbidity that may occur as the result of dredging, filling, or other construction activities which may cause turbidity to occur in the waters of the State. The Contractor may need to deploy turbidity barriers around isolated areas of concern such as seagrass beds, coral communities, etc. both within as well as outside the right-of-way limits. The Engineer will identify such areas. Place the barriers prior to the commencement of any work that could impact the area of concern. Install the barriers in accordance with the details shown in the Plans or as approved by the Engineer. Ensure that the type barrier used and the deployment and maintenance of the barrier will minimize dispersion of turbid waters from the construction site. The Engineer may approve alternate methods or materials.

Operate turbidity barriers in such a manner to avoid or minimize the degradation of the water quality of the surrounding waters and minimize damage to areas where floating barriers installed.

**104-6.4.8 Inlet Protection System:** Furnish and install inlet protection systems as shown in the Plans, Design Standards and the E&SC Manual.

#### **104-6.4.9 Rolled Erosion Control Products (RECPs):**

**104-6.4.9.1 General:** Install RECPs in locations where temporary protection from erosion is needed. Two situations occur that require artificial coverings. The two situations have differing material requirements, which are described below.

1. Use RECPs composed of natural or synthetic fiber mats, plastic sheeting, or netting as protection against erosion, when directed by the Engineer, during temporary pauses in construction caused by inclement weather or other circumstances. Remove the material when construction resumes.

2. Use RECPs as erosion control blankets, at locations shown in the Plans, to facilitate plant growth while permanent grassing is being established. For the purpose described, use non-toxic, biodegradable, natural or synthetic woven fiber mats. Install erosion control blankets capable of sustaining a maximum design velocity of 6.5 ft/sec as determined from tests performed by Utah State University, Texas Transportation Institute or an independent testing laboratory approved by the Department. Submit to the Engineer, certified test reports from the manufacturer showing that the erosion control blankets meet the requirements of this Specification. Certification must be attested, by a person having legal authority to bind the manufacturing company. Also, furnish two 4 by 8 inch samples for product identification. The manufacturers test records shall be made available to the Department upon request. Leave the material in place, as installed, to biodegrade.

**104-6.4.10 Chemical Treatment:** Provide chemical treatment in accordance with the E&SC Manual. Chemical treatment may be used to clarify turbid or sediment laden water that does not yet meet state water quality standards or as an amendment to other erosion prevention and sediment control products to aid in their performance. The contractor must provide all of the required toxicity testing information in accordance with the E&SC Manual to the Engineer for review and acceptance prior to using any chemical treatment on the project site.

**104-6.5 Removal of Temporary Erosion Control Features:** In general, remove or incorporate into the soil any temporary erosion control features existing at the time of construction of the permanent erosion control features in an area of the project in such a manner that no detrimental effect will result. The Engineer may direct that temporary features be left in place.

#### **104-7 Maintenance of Erosion and Sediment Control Features.**

**104-7.1 General:** Provide routine maintenance of permanent and temporary erosion and sediment control features, at no expense to the Department, until the project is complete and accepted. If reconstruction of such erosion and sediment control features is necessary due to the Contractor's negligence or carelessness or, in the case of temporary erosion and sediment control features, failure by the Contractor to install permanent erosion control features as scheduled, the Contractor shall replace such erosion control features at no expense to the Department. If reconstruction of permanent or temporary erosion and sediment control features is necessary due to factors beyond the control of the Contractor, the Department will pay for replacement under the appropriate Contract pay item or items.

Inspect all erosion and sediment control features at least once every seven calendar days and within 24 hours of the end of a storm of 0.50 inches or greater. Maintain all erosion control features as required in the Stormwater Pollution Prevention Plan, Contractor's Erosion Control Plan and as specified in the State of Florida Department of Environmental

Protection Generic Permit for Stormwater Discharge from Large and Small Construction Activities.

#### **104-8 Protection During Suspension of Contract Time.**

If it is necessary to suspend the construction operations for any appreciable length of time, shape the top of the earthwork in such a manner to permit runoff of rainwater, and construct earth berms along the top edges of embankments to intercept runoff water. Provide temporary slope drains to carry runoff from cuts and embankments that are in the vicinity of rivers, streams, canals, lakes, and impoundments. Locate slope drains at intervals of approximately 500 feet, and stabilize them by paving or by covering with waterproof materials. Should such preventive measures fail, immediately take such other action as necessary to effectively prevent erosion and siltation. The Engineer may direct the Contractor to perform, during such suspensions of operations, any other erosion and sediment control work deemed necessary.

#### **104-9 Method of Measurement.**

When separate items for temporary erosion control features are included in the Contract, the quantities to be paid for will be:

1. the area, in square yards, of rolled erosion control products;
2. the length, in feet, of runoff control structures, measured along the surface of the work constructed;
3. the number of sediment containment systems constructed and accepted;
4. the number of sediment containment system cleanouts accomplished and accepted
5. the length, in feet, of sediment barriers;
6. the length, in feet, of floating turbidity barrier;
7. the length, in feet, of staked turbidity barrier;
8. the number of inlet protection systems;
9. the area, in square yards, of chemical treatment.
10. the number of floc logs or drums of product for chemical treatment.

Upon acceptance by the Engineer, the quantity of floating turbidity barriers, sediment barriers, staked turbidity barriers, and inlet protection devices will be paid for regardless of whether materials are new, used, or relocated from a previous installation on the project.

#### **104-10 Basis of Payment.**

Prices and payments will be full compensation for all work specified in this Section, including construction and routine maintenance of temporary erosion control features.

Any additional costs resulting from compliance with the requirements of this Section, other than construction, routine maintenance, and removal of temporary erosion control features, will be included in the Contract unit prices for the item or items to which such costs are related. The work of performance turf designated as a temporary erosion control feature in accordance with 104-6.4.2 will be paid for under the appropriate pay items specified in the Contract Documents.

Separate payment will not be made for the cost of constructing temporary earth berms along the edges of the roadways to prevent erosion during grading and subsequent operations. The Contractor shall include these costs in the Contract prices for grading items.

Additional temporary erosion control features constructed as directed by the Engineer will be paid for as unforeseeable work.

In case of repeated failure on the part of the Contractor to control erosion, pollution, or siltation, the Engineer reserves the right to employ outside assistance or to use the Department's own forces to provide the necessary corrective measures. Any such costs incurred, including engineering costs, will be charged to the Contractor and appropriate deductions made from the monthly progress estimate.

Payment will be made under:

- Item No. 104- 1- Artificial Coverings/ Rolled Erosion Control Products - per square yard.
- Item No. 104- 6- Slope Drains (Temporary)/ Runoff Control Structures - per foot.
- Item No. 104- 7- Sediment Basins/ Containment Systems - each.
- Item No. 104- 9- Sediment Basin/ Containment system Cleanouts - each.
- Item No. 104- 10- Sediment Barriers – per foot
- Item No. 104- 11- Floating Turbidity Barrier - per foot.
- Item No. 104- 12- Staked Turbidity Barrier - per foot.
- Item No. 104- 18 Inlet Protection System – each.
- Item No. 104- 19 Chemical Treatment – per square yard.
- Item No. 104 – 20 Chemical Treatment (floc logs, drums of product) - each.

**SECTION 470  
TIMBER STRUCTURES**

**470-1 Description.**

Furnish and erect treated timber into various structures.

**470-2 Materials.**

Meet the following requirements:

Timber.....Section 952

Preservative.....Section 955

Use timber as specified in the Plans.

**470-3 Timber Handling.**

Handle treated timber with rope slings, without sudden dropping, breaking of outer fibers, bruising, or penetration of the surface with tools. Do not use cant dogs, hooks, or pike poles.

**470-4 Cutting and Framing.**

Before treatment, cut and frame all timbers which are shown by the Plans to be furnished in special lengths or framed to detailed dimensions. Limit the cutting of treated timber to minor fitting which might be necessary and that is authorized by the Engineer. For all places where the surface is broken, by cutting or otherwise, thoroughly coat with the preservatives and by the methods specified in AWP A M4.

**470-5 Bolt Holes.**

The Contractor may drill holes in the field. For timbers originally treated with pentachlorophenol, creosote, creosote solutions, or waterborne preservatives, field treat all cuts, abrasions, bolt holes, and recesses that occur after treatment with two liberal applications of a compatible preservative in accordance with the requirements specified in AWP A Standard M4, Standard for the Care of Pressure-Treated Wood Products.

**470-6 Pile Caps.**

Ensure that pile caps have full even bearing on all piles in the bent, and secure them to each pile by a 3/4 inch diameter drift bolt extending at least 9 inches into the pile. Where so shown in the Plans, cover the tops and ends of pile caps with 10 ounce, minimum weight, copper sheet meeting the requirements of ASTM B370.

**470-7 Floors.**

Attach the planks to each joist or nailing strip with at least two 8 inch nails for 3 inch planks, or two 10 inch nails for 4 inch planks. Use nails that are at least 1/4 inch in diameter. For treated timber floors where a bituminous wearing surface is to be applied, lay the planks with the best side up and with adjacent edges in contact. Grade the planks as to thickness before laying, and lay the planks so that no two adjacent planks vary in thickness more than 1/8 inch. Cut the floor to straight lines along the side of the roadway and walkway.



**470-8 Framing.**

Cut and frame truss and bent timbers to a close fit in such manner that they will have even bearing over the entire contact surface of the joint. Do not perform blocking or shimming of any kind in making the joints. The Engineer will not accept open joints.

**470-9 Holes for Bolts, Dowels, Rods, and Lag Screws.**

Bore holes to the diameters shown in the following table:

Hole use	Hole diameter
Drift Bolts and Dowels	1/16 inch less in diameter than the bolt or dowel to be used
Machine Bolts	same diameter as the bolt
Rods	1/16 inch greater in diameter than the rod
Lag Screws	not larger than the body of the screw at the base of the thread

**470-10 Stringers.**

The Contractor may use butt joints for outside stringers, but shall frame interior stringers to bear over the full width of floor beam or cap at each end. Separate the ends at least 1/2 inch to allow circulation of air, and securely fasten the ends to the timber on which they rest.

**470-11 Railings.**

Construct railings of treated dressed lumber.

**470-12 Hardware.**

**470-12.1 General:** Use hardware, including bolts, drift pins, dowels, rods, nuts, washers, spikes, nails and all similar incidental metal items, necessary to complete the work in accordance with the details shown in the Plans. Use common wire nails as commercially manufactured. Use ogee washers of cast or malleable iron. The Contractor may use other hardware of steel, iron, or any similar material ordinarily used in the manufacture of such articles.

**470-12.2 CCA, ACQ-D, and CA-C, Treated Timber Structures:** Use the fasteners and connectors as described in the following table:

Environmental condition where structure will be located	Fasteners	Connectors
Permanent wood foundations and/or where salt spray if prevalent	304 or 316 Stainless Steel	304 or 316 Stainless Steel
Structures that will be exposed to standing water or rainwater	304 or 316 Stainless Steel	304 or 316 Stainless Steel
Structures that will be situated indoors and remain dry in service	304 or 316 Stainless Steel Hot-dipped galvanized fasteners meeting ASTM A-153 requirements	304 or 316 Stainless Steel Hot-dipped galvanized connectors meeting the requirements of ASTM A-653 Class G185 sheet or better

Do not use aluminum in direct contact with treated wood.

**470-12.3 Bolts:** Use bolts of the sizes shown in the Plans with square heads and nuts and with screw threads that make close fits in the nuts. Upon completion of the installation, check all nuts for tightness, and cut off protruding bolt ends so that not more than 1/4 inch extends beyond the nut.

**470-12.4 Inspection:** The Engineer will inspect the hardware for quality of manufacture and accuracy of size prior to use on wood structures.

**470-13 Countersinking.**

Perform countersinking wherever the heads of screws or bolts would otherwise interfere with the assembly of the work. Fill recesses formed by countersinking with hot asphalt.

**470-14 Method of Measurement.**

**470-14.1 General:** The quantity to be paid for will be the plan quantity, in feet board measure, of such timber actually incorporated in and forming a part of the completed structure.

**470-14.2 Method of Calculation:** For calculating the quantity of timber, the width and thickness will be taken as the actual sizes shown in the Plans or ordered by the Engineer. Where special sizing is required, the width and thickness to be used will be that of the smallest commercial size from which the special piece could be cut. Lengths to be used in the calculations will be the overall lengths of the pieces as shown in the Plans, except that, where the lengths actually incorporated in the structure are less than the lengths shown in the Plans, the lengths actually incorporated will be used in the calculations. Deductions will not be made for copes, scarfs, or crownings.

**470-15 Basis of Payment.**

Prices and payments will be full compensation for all the work specified in this Section, including all copper covering over pile heads, caps, etc., as shown in the Plans, all hardware except such plates, lag screws, and other metal parts as may be shown in the Plans to be paid for as structural steel and all paint materials and all excavation, painting, and incidentals necessary to complete the work.

Payment will be made under:

Item No. 470- 1- Treated Structural Timber - per Thousand Board Measure.

## TIMBER PRODUCTS AND MATERIALS

### SECTION 951 INSPECTION OF TIMBER PRODUCTS

#### **951-1 Control of Quality.**

All timber products manufactured for incorporation into the work shall be produced by a producer/treater approved by the Department for such production. Obtain timber products from a plant that is currently on the Department's Production Facility Listing. Producers seeking inclusion on the list shall meet the requirements of Section 105. If approval is withdrawn by the Department during production for a construction project, it is the Contractor's responsibility to obtain another approved producer/treater to produce the timber products, or await reestablishment of approval of the disapproved producer/treater. Cost or delays associated with producer/treater approval or disapproval shall be borne by the Contractor.

The producer/treater of timber products shall exercise quality control through an approved Producer Quality Control (QC) Plan conforming to Section 105. Products produced under this QC Plan will not relieve the Contractor of his responsibility for unsuitable materials or workmanship, which might become apparent at the job site, nor of the necessity of his replacing any material which might be determined upon subsequent inspection to be unsuitable.

#### **951-2 Preparations Prior to Requesting Inspection.**

Prior to the requested time of inspection for approval of a producer/treater, the authorities of the treating plant shall become knowledgeable with the most current requirements of the Department's Specifications as appropriate to his production/treatment. The producer/treater shall make his facility totally accessible to appropriate Department's inspection personnel. Such access for inspection shall include, but not be limited to, all physical artifacts and processes, materials records and copies of certified shipping documents (such as a treatment certification, a treating report, and an assay report). All calls for inspections shall be made at least two weeks in advance.

Upon approval of a producer/treater facility, the Department will inspect the facility periodically for continued approval.

#### **951-3 Certification.**

Each order/shipment to the job site must be accompanied with a notarized certification indicating compliance to the appropriate specifications. The certification shall include: the project/order number, charge numbers, and assay retention results. The producer/treater shall maintain all pertinent documents for a period of three years. Each timber product must also have a preapproved producer/treater identification mark on every item delivered to the job site.

**SECTION 952  
STRUCTURAL TIMBER**

**952-1 General Specifications for All Structural Timber.**

This Section specifies the requirements for pine timber to be used as structural members in the Department's work, including untreated timber as well as timber to be treated. All such timber shall be manufactured and graded in accordance with the current edition of the Standard Grading Rules for Southern Pine Timber, of the Southern Pine Inspection Bureau. The timber shall meet the requirements of No. 1 grade or as otherwise specified in the Plans.

**952-2 Timber for Other Specific Uses.**

**952-2.1 Specification Grade:** For timber to be used for columns, sills, wheelguards, bulkhead, sheeting, bracing, fender wales, or any other purpose for which the grade is not specified otherwise, the specification grade shall be as follows:

Nominal Thickness	Nominal Width	Grade
1 to 1.5 inches	2 inches and wider	No. 1 Boards
2 to 4 inches	2 inches and wider	No. 1 Dimension
5 inches and larger	5 inches and larger	No. 2 Timbers

**952-2.2 Permissible Knot Sizes for Fender Wales:** For timber used as fender wales, the maximum permissible size of knot (at any point on any face) shall be as follows:

For nominal width of face of 10 - 3-3/4 inches.

For nominal width of face of 12 - 4-1/2 inches.

**952-3 Untreated Pine Timber - Specific Requirement for Heartwood.**

In addition to meeting all of the requirements of 952-1 and 952-2, pine timber which is to be used as untreated timber will be required to show at least 85% of heartwood on any girth.

**SECTION 953  
TIMBER PILING  
(INCLUDING TIMBER SHEET PILING)**

**953-1 General.**

Piles shall be of timber which will stand the driving for which they are intended. They shall be sound and solid. Piling cut from southern pine shall contain at least 30% of summer wood.

Cypress piles used for purposes other than as foundation piling shall have, at the butt, a diameter of red or black heart of at least 12 inches.

Douglas fir used for timber piling shall be Pacific Coast Douglas Fir.

Piles shall be cut above the ground swell, shall have a form taper, and shall not vary more than plus or minus 6 inches from the specified length.

Specific requirements for timber sheet piles are contained in 953-6.

**953-2 Diameter of Butt and Tip.**

For round piles the minimum butt diameter shall be 12 inches, measured at a section 3 feet from the end.

For piles up to 50 feet in length, the minimum tip diameter shall be 8 inches. For lengths in excess of 50 feet, a graduated reduction in tip diameter at the rate of 1 inch for each 10 feet of length in excess of 50 feet will be permitted. This reduction will correspond to 7 inch tips for 60 foot piles and 6 inch tips for 70 foot pile; at which length these allowable reductions shall cease. As an exception to the above, when so shown in the Plans, 7 inch diameter tips on timber piles less than 60 feet in length will be accepted. No piles shall have tips less than 6 inches in diameter. The maximum diameter at the cut-offs shall be 20 inches.

**953-3 Straightness Requirements.**

A straight line drawn from the center of the butt to the center of the tip shall not, at any point, fall further away from the center of the pile than a distance equal to 1% of the length of the pile.

The surface of the pile shall not contain kinks greater than 1 inch in 5 feet, as measured by a straightedge.

**953-4 Peeling and Trimming.**

The pile shall be peeled soon after cutting. In the operation of removing the bark from the pile, not more than three annual rings of the solid wood shall be removed. All knots shall be trimmed close to the body of the pile.

**953-5 Permissible Knots and Other Defects.**

The diameter of sound knots shall not exceed one-third of the diameter of the pile at the point where the knot occurs.

In these Specifications, a sound knot shall be defined as a knot which is solid across its face, is as hard as the surrounding wood and shows no indication of decay. It may vary in color from red to black and may contain a pith hole not more than 1/4 inch in diameter.

An unsound knot may or may not be as hard as the surrounding wood, but contains decay, and will be allowed only in accordance with the restrictions in ASTM D25.

Any defect, or combination of defects, which would be more injurious than the maximum allowable knot will not be acceptable.

Turpentine cuts will be allowed on all timber piles provided that no single cut shall exceed one-half of the circumference of the pile, and that the length of the cut shall not be more than 15% of the length of the pile. Piles to be used as outside piles in timber bents shall not have more than one turpentine cut.

**953-6 Timber Sheet Piles.**

Unless a particular species of timber is called for in the Plans, timber sheet piles may consist of any species which will satisfactorily stand driving. They shall be sawn square and shall be free from worm holes, loose knots, wind shakes, decayed or unsound portions, and other defects which might impair the strength or tightness

The piles shall be of the dimensions shown in the Plans and shall be treated in accordance with Section 955.

## **SECTION 954 TIMBER FENCE POSTS AND BRACES**

### **954-1 Types of Timber, and Treating Requirements.**

Timber fence posts and braces shall be of southern yellow pine and shall be treated in accordance with Section 955.

Prior to the treatment, all knots on the posts shall be trimmed close to the body of the post.

### **954-2 Requirements for Cutting.**

Round or sawn posts will be permitted but all posts on a single project shall be the same. Sawn post shall comply with AASHTO M168, have a minimum Fb of 1,350 psi, be grade-stamped by an inspection agency accredited by the American Lumber Standards Committee (ALSC), and shall meet the requirements of 954-6. Round posts shall be cut from sound and solid trees and shall contain no unsound knots. The butt shall be cut at a sufficient distance above the ground swell of the tree that there will be no abrupt change in cross-section of the post.

The butts shall be sawn square. The post tops shall be sawn neatly and at right angles to the vertical axis of the post.

### **954-3 Knots, etc.**

Sound knots will be permitted provided the diameter of the knot does not exceed one-third of the diameter of the piece at the point where it occurs.

Peck (in cypress posts) shall be limited as provided for knots; the area of permissible peck not exceeding the area occupied by permissible knots, and a combination of peck and knots not exceeding the aggregate of knots allowed.

The posts shall be free from decayed wood, rot, and red heart, and of ring shake or season checks which penetrate at any point more than one fourth the diameter of the piece, or are greater than 1/4 inch wide.

### **954-4 Peeling.**

All posts shall be peeled for their full length, and all inner and outer bark removed, except that isolated strips of inner bark which do not exceed 1/2 inch in width or 3 inches in length will be permitted.

### **954-5 Straightness.**

The straightness of the post shall be such that for any 8 foot post (or for any 8 feet of length, for longer posts) a straight line from the center of the tip to the center of the butt (or from center of the cross sections at the extremes of the 8 foot lengths) shall not fall outside the center of the mid-section of the 8 foot length by more than 2 inches.

### **954-6 Dimensions.**

#### **954-6.1 Minimum Lengths Allowable:**

Line posts - 8 feet.

Corner and pull posts - 8 feet, 6 inches.

Braces - As required by the Plans.

(A tolerance of minus 1 inch to plus 2 inches will be allowed in the lengths shown for the posts.)

**954-6.2 Minimum Allowable Cross Section:**

Round line posts - 4 inch diameter.

Round braces, corner and pull posts - 5 inch diameter.

Square line posts - 4 inches by 4 inches.

Square braces, corner and pull posts - 5 inches by 5 inches.

The minimum diameters specified for round posts are applicable before preservative treatment. When the treated post is inspected at the job site a tolerance of 3/8 inch under such diameters will be allowed, to compensate for shrinkage resulting from treatment and storage.



**SECTION 955**  
**TIMBER TREATMENT**  
**(INCLUDING TREATING MATERIALS)**

**955-1 General.**

The work specified in this Section is the treating of structural timber, timber piling and timber posts. The method of treatment for all such timber materials shall be in accordance with AASHTO M 133, or American Wood Protection Association (AWPA) Use Category System (UCS) - U1, with the exceptions and additions as specified herein.

**955-2 Preservative.**

**955-2.1 Salt or Brackish Water Use:** The treating of Southern Yellow Pine (SYP) lumber or timber for use in salt or brackish water environments shall be done with Chromated Copper Arsenate (CCA) in accordance with AWPA U1.

**955-2.2 Above Ground or Ground Contact and Fresh Water Immersion Use:** The treating of SYP lumber and timber for above ground or ground contact and fresh water immersion applications, shall be done with, Ammoniacal Copper Zinc Arsenate (ACZA), Copper Azole (CA), Micronized Copper Azole (MCA), Alkaline Copper Quat (ACQ), Micronized Copper Quat (MCQ), or CCA, with the following exceptions:

Treatment of the wood products of the pedestrian bridges, wood rails at buildings or rest areas, and fence posts shall be done either with CA, MCA, or ACQ.

**955-3 Process.**

All timber and lumber items shall be treated in accordance with AWPA T1.

**955-4 Requirements for Preservative Materials.**

ACQ, CCA, CA, MCA and ACZA shall be in accordance with the appropriate AWPA P Standard. MCA shall be in accordance with the appropriate ICC Evaluation Service (ICC-ES) ESR Report.

**955-5 Requirements for Retention.**

**955-5.1 Piling:** All pilings shall be treated in accordance with AWPA U1.

**955-5.2 Structural Timber and Sheet Piles:** All structural timber and sheet piles shall be treated in accordance with AWPA U1.

**955-5.3 Posts:** All posts shall be treated in accordance with AWPA U1.

**955-5.4 Determination of Retention:** Retention shall be determined by assay performed and certified by the treating company in accordance with the applicable AWPA standards.

**955-6 Penetration Requirements.**

The penetration of the treatment shall be in accordance with AWPA T1.

**955-7 Handling Waterborne Preservative Treated Piling.**

In handling of piles that have been treated with chromated copper arsenate (CCA) or ammoniacal copper zinc arsenate (ACZA), cable slings shall be used. Mechanical grabbers or pointed tools shall not be permitted. Rough or careless handling shall be avoided at all times.

**955-8 Identification of Treating Plants for Round Piling.**

The treating plant shall brand, or place a distinctive permanent mark, on each round pile, approximately 6 feet from the butt end, such that the plant responsible for the treatment can be readily determined at any time during the service life of the piling.