

Escambia County Dune Matrix Enhancement Project – Perdido Key Technical Specifications

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Table of Contents

1.0 SCHEDULE	2
2.0 WORK AREAS & ACCESS	2
3.0 LAYOUT OF THE WORK	3
4.0 PLANT MATERIALS, HANDLING, & INSTALLATION	3
5.0 PLANTINGS – GULF SHORELINE (DUNE)	5
6.0 PLANTINGS – RIVER ROAD	6
7.0 HYDRATING GEL & FERTILIZATION	8
8.0 WARRANTY, SUCCESS CRITERIA, & REPLANTING	8
9.0 SAND FENCING	9
10.0 POST AND ROPE	10
11.0 SIGNAGE	11
12.0 PAYMENT	12
13.0 REPORTING REQUIREMENTS	14
14.0 ENVIRONMENTAL PROTECTION	15
15.0 PUBLIC SAFETY & CONFLICTS WITH OTHER CONTRACTORS	16
16.0 PROPERTY DAMAGE	17

1.0 SCHEDULE

1.1 WORK PLAN. As part of the bid, the Bidder shall submit a detailed Work Plan. At a minimum it must include a schedule of fieldwork activity, the species distribution, seed or plant source and soil additives to be used, personnel and equipment to be used for the work, and how this work force will be supervised, including the qualifications of the supervisor(s). Work Plans must be complete, reasonable and feasible using the resources proposed. The Contractor will be required to provide written documentation with the Work Plan as to the source of the planting units delivered under this bid. Documentation shall include collection permits or contracts from a State, the U.S. Department of Agriculture, or other comparable documents.

1.2 All authorized dune revegetation segments of work shall be installed, all equipment removed from the beach and work areas, and all beach construction activity completed by the date stipulated to in the Contract.

1.3 Work shall not commence prior to receipt of a written Notice to Proceed from the County. Contractor shall provide Escambia County Project Manager with 72-hours' notice prior to initiation of field work.

1.4 Work is permitted to proceed seven days per week, during daylight hours (sunrise to 1 hour after sunset), and subject to the provisions of **Section 14.0**, Environmental Protection, below.

1.5 Work shall be performed on a continuous basis from start to finish without interruption, with the exception of inclement weather and/or acts of God. Contractor shall provide a schedule of field work activity in the Work Plan submitted with the bid.

1.6 Excepting unforeseen weather events, the Contractor shall notify the Escambia County Project Manager and the Engineer at least 48 hours prior to suspending work, and at least 3 work days prior to requested inspections for any planting areas (see Contract Drawings). The County, the Santa Rosa Island Authority, and the Florida Department of Environmental Protection reserve the right to examine the work at any time.

1.7 The Contractor shall specifically notify the Engineer and the County at least 3 work days prior to the application of any maintenance irrigation or fertilization, if employed.

2.0 WORK AREAS & ACCESS

2.1 The Work, as depicted in the Contract Drawings, includes vegetation enhancement at Perdido Key in Escambia County, FL, along the Gulf of America shoreline, and at the River Road site (bid option).

2.2 Staging Areas. The Contractor's Staging Areas are identified in the Contract Drawings. The Contractor shall maintain these and all work areas in an organized, tidy and secure fashion and shall take all reasonable measures to minimize the area utilized for such activity. Temporary stockpiling of construction materials upon the beach is not permitted except for immediate (same-day) planting or installation. The Contractor is responsible for daily cleanup of litter and construction debris associated with their work.

2.3 Beach Access. Access corridors to the work areas are identified in the Contract Drawings. Access shall be limited to these areas unless otherwise approved by the County in writing. Access

and construction-related activity elsewhere along the beach shall be minimized or structured so as to avoid impacts to existing dune and back-beach vegetation. The Contractor is responsible for restoring to pre-work conditions any damage to the dunes and dune vegetation caused by the Contractor's activities.

2.4 Additional Staging / Access. Contractor may propose additional access and staging areas to the County for approval. The contractor must provide proof of written agreement by the parcel owner(s) in the request for approval.

3.0 LAYOUT OF THE WORK

3.1 Plantings shall be installed in accordance with the approved planting plan, which is anticipated to be in general accordance with the dimensions, lines and limits, and quantities depicted in the Contract Drawings.

3.2 The specific locations of vegetated reaches, including beach access lanes shall be field-verified by the Contractor and approved by the County or County's Representative.

3.3 The County reserves the right to suspend work at any time when location, layout, and/or limit marks established by the Contractor are not reasonably adequate to define the work or to permit checking of the work.

3.4 Lay-out for Approval. The Contractor shall lay out the locations of planting, post and rope, sand fencing, and/or signage by Planting Area, for approval by the County, prior to beginning work. At a minimum, this lay-out shall include flagging or stakes that indicate the locations of the work limits. The Contractor shall demonstrate the method by which the spacing for each vegetation type will be determined for planting.

4.0 PLANT MATERIALS, HANDLING, & INSTALLATION

4.1 Planting Unit Source. The source material for all planting units delivered under this bid must be limited to seeds and propagated plants collected from the Gulf Coast of Florida or Alabama. All plants must be entirely suitable for the site and use intended. The Contractor will be required to provide written documentation with the Work Plan as to the source of the planting units delivered under this bid. Documentation shall include collection permits or contracts from a State, the U.S. Department of Agriculture, or other comparable documents. Bids submitted without this documentation will not be considered.

4.2 Micropropagation. Planting units grown from approved sources via micropropagation techniques may be accepted under this bid. Plants produced from cuttings or the division of larger plants may be used if the material derives from Gulf Coast of Florida or Alabama resources and meets all of the specifications for seed-produced planting units. However, planting units derived from micropropagation techniques shall not exceed 25% of the total number of planting units delivered under this bid. In the Work Plan, the Contractor shall identify the number of planting units by species grown via micropropagation techniques.

4.3 Inspections. If requested by the County, the Contractor shall provide the County with access to all nursery operations in the manner and time frame requested by the County for the purpose of performing compliance inspection(s) of the propagation and production methods being employed by the Contractor.

4.4 Planting Species. Various plant species are specified herein for the enhancement project. The Contractor may recommend other species for approval by the County, with documentation that species are appropriate for the site. No other plant species will be accepted as substitutes under this bid unless approved in writing by the County. The Contractor shall provide the County with a detailed description of the proposed planting scheme. This description shall be included in the Work Plan submitted with the Contractor's Bid.

4.5 Plant Condition. Potted plants shall have a fully developed root ball that is consistent with the size of the specified container, but is not root-bound, at the time of delivery. All planting units provided under this bid shall have moist, vigorous root systems free of rot, disease, or discoloration at the time of delivery and installation. Plants shall exhibit a healthy, well-distributed root system which extensively penetrates the soil such that 90% of the soil mass remains intact when the plant is removed from the container. Plants shall meet the minimum requirements outlined in Florida Grades and Standards for Nursery Plants (2022), as applicable. Plants shall be sound, healthy, well-branched and shaped within normal habit of growth, of proper color, and densely foliated when in leaf. They shall be free of disease and insect pests, eggs or larvae. Planting units not meeting these plant condition specifications will be rejected by the County. Planting units rejected under this plant condition specification will not be considered as delivered to the site and therefore not eligible for payments under the unit cost schedules which apply to planting units.

4.6 Preparation, Handling, and Storage. The root ball shall be properly moistened to prevent desiccation. All planting units shall be handled, packed, transported, and stored at the installation site in such a manner as to ensure protection against desiccation, thermal stress, disease or physical damage. The County will inspect plant material at the beginning of each day. Planting units deemed to have been improperly handled, packed, transported, and/or stored will be rejected by the County upon inspection and replaced by the contractor at no additional costs to the County.

4.7 Installation. Installation shall be by hand labor and tools (spades and shovels, etc.). Hand-operated, single-operator small gas-powered equipment may be utilized.

4.8 Irrigation. The Contractor will be responsible for the provision of all irrigation water required. Freshwater (potable only) shall be provided by the Contractor and applied to the planting zones using a non-scouring spray applicator. The Contractor shall make all necessary arrangements with the appropriate local agencies if the use of local hydrants in the area is desired. The Contractor will be allowed to "water-in" (initially irrigate) all newly installed planting units according to a Contractor-prepared and Owner-approved irrigation schedule to be included in the Work Plan.

4.8.1 Maintenance Irrigation. The Contractor will be allowed to maintenance-irrigate the installed planting units according to a Contractor-prepared and Owner-approved irrigation schedule. Maintenance irrigation is recommended for the River Road site. The irrigation schedule will include a detailed description of the anticipated number of irrigation events, the equipment, the labor, the irrigation methodology and the planting unit physical condition(s) which signal the need for maintenance irrigation. The Contractor will be responsible for all aspects of the maintenance irrigation including compliance with all environmental permitting regulations, requirements and conditions stated in the permit(s) which address maintenance irrigation and installation activities.

5.0 PLANTINGS – GULF SHORELINE (DUNE)

5.1 Plant Species

5.1.1 Dune Grasses. The dune grasses shall include sea oats (*Uniola paniculata*) with coastal panic grass (*Panicum amarum*) and/or Gulf bluestem (*Schizachyrium maritimum*).

5.1.2 Diversity Groundcover. Contractor shall include at least three of the following, in relatively equal abundance:

- Beach elder (*Iva imbricata*)
- Beach morning glory (*Ipomoea imperati*)
- Railroad vine (*Ipomoea pes-caprae*)
- Cucumber leaf dune sunflower (*Helianthus debilis* spp. *cucumerifolius*)
- Sea purslane (*Sesuvium portulacastrum*)
- Seabeach Evening Primrose (*Oenothera humifusa*)

5.2 Plant Size.

5.2.1 Dune Grasses. The delivered unit shall be not less than nine (9) inches in height, as measured from the top of the root ball to the apical meristem. All dune grass plant materials grown in multi-well trays (liners) and prepared for installation to the site shall be viable plant materials with at least 2 emergent stems, for which the roots should fill the entire volume of the liner. Dune grass plants shall be “1-inch” or “2-inch” units, having root ball volumes of at least 30 cubic centimeters.

5.2.2 Diversity Groundcover. Diversity / groundcover species plants shall be “2-inch” or “4-inch” units, having root ball volumes of at least 96 cubic centimeters. For purposes of this specification, the plant material in each liner constitutes one dune planting unit, regardless of the number of viable stems in the liner.

5.3 Planting Unit Depth.

5.3.1 Dune Grasses. All dune grass planting units shall be installed at a minimum depth of six (6) inches, as measured from the top of the root ball to the sand surface.

5.3.2 Diversity Groundcover. The diversity species shall be planted a maximum depth not to exceed fifty percent (50%) of the length of the shoot of the plant, which is measured from the top of the root ball to the apical meristem.

5.3.3 Compliance. Planting units which are out of specification with regard to the provisions of this planting unit depth specification may be planted solely at the Contractor’s risk, and will be subject to all basic provisions of the survival criteria and warranty provisions of this contract.

5.4 Plant Unit Spacing. Within the planting zone, plant units shall be spaced on 18-inch centers (see Contract Drawings for typical planting plan view).

5.5 Planting Plan. As noted in the Contract Drawings, the Gulfward 15 ft of the planting width shall be exclusively sea oats. The planting areas landward thereof shall be a mixture of 50% dune

grasses (panic grass and/or Gulf bluestem) and 50% diversity / groundcover. The diversity / groundcover plantings shall be installed in clumps of individual species rather than interplanted with the dune grass species. The intent is to create a seaward edge of vegetation that is aligned with the shoreline and to fill in vegetation gaps landward thereof.

5.6 Pedestrian Pathways. Well-established foot paths shall be given a 10-ft no planting width. All walkovers shall be avoided by 5 ft to either side of the structure.

5.7 Layout for Approval. The Contractor shall lay out the locations of planting prior to beginning work. The Contractor shall indicate the seaward and landward limits, at not more than 100-ft centers (closer at transitions). Likewise, the locations of the alongshore limits, including gaps for walkovers and beach access lanes shall be indicated by flagging or stakes.

5.8 Baseline. The Contract Drawings indicate baseline stationing along the beach at 100-ft intervals, which shall be used to indicate the Work Zones and to reference the project's alongshore layout and other features of the work. The baseline is for alongshore reference and is not anticipated to represent the cross-shore limits of the work; (i.e., from which the landward or seaward edges of the planting will be measured).

6.0 PLANTINGS – RIVER ROAD

6.1 Plant Species

6.1.1 Trees. For the tree quantities specified in the Contract Drawings, the Contractor shall provide at least two (2) of the following tree species for the restoration at River Road:

- Sand Live Oak (*Quercus geminata*)
- Myrtle Oak (*Quercus myrtifolia*)
- Sand Pine (*Pinus clausa*)
- Yaupon Holly (*Ilex vomitoria*)
- Slash pine (*Pinus elliottii*)

6.1.2 Shrubs. For the shrub quantities specified in the Contract Drawings, the Contractor shall provide at least two (2) of the following, in relatively equal abundance:

- Beach Rosemary (*Ceratiola ericoides*)
- Florida Rosemary (*Conradina canescens*)
- Woody Goldenrod (*Chrysoma pauciflosculosa*)
- Atlantic St Johns Wort (*Hypericum tenuifolium*)
- Wax Myrtle (*Myrica cerifera*)

6.1.3 Herbaceous / Groundcover : For the herbaceous / groundcover quantities specified in the Contract Drawings, the Contractor shall provide at least three (3) of the following, in relatively equal abundance:

- Gopher Apple (*Licania michauxii*)
- Squareflower (*Paronychia erecta*)
- Goldenaster (*Chrysopsis spp.*)
- Sea purslane (*Sesuvium portulacastrum*)
- Seabeach Evening Primrose (*Oenothera humifusa*)
- Coastal Groundcherry (*Physalis angustifolia*)

6.2 Plant Size.

6.2.1 Trees. Trees shall be containerized and three (3) gallons in size.

6.2.2 Shrubs. Shrubs shall be containerized and one (1) gallon in size.

6.2.3 Herbaceous / Groundcover. Herbaceous / groundcover species plants shall be “2-inch” or “4-inch” units, having root ball volumes of at least 96 cubic centimeters. For purposes of this specification, the plant material in each liner constitutes one dune planting unit, regardless of the number of viable stems in the liner.

6.3 Planting Unit Depth. Planting units which are out of specification with regard to the provisions of this planting unit depth specification may be planted solely at the Contractor’s risk, and will be subject to all basic provisions of the survival criteria and warranty provisions of this contract.

6.3.1 Trees and Shrubs. Trees and shrubs shall be installed so that the top of the root ball is flush or slightly below the ground.

6.3.2 Herbaceous / Groundcover. The herbaceous / groundcover species shall be installed at a maximum depth not to exceed fifty percent (50%) of the length of the shoot of the plant, which is measured from the top of the root ball to the apical meristem.

6.4 Plant Unit Spacing. Within the planting zone, the average spacing (on center) shall be as follows: 10 ft for trees, 2 ft for shrubs, and 2 ft for herbaceous / groundcover. See Contract Drawings for typical planting plan view. Plant spacing should be representative of adjacent vegetated areas. The spacing between adjacent plant units should be between 1 ft and 4 ft.

6.5 Planting Plan. Plantings shall be installed in a density and pattern that mimics the adjacent existing vegetation. The intent is to create “pollinator blocks” that combine multiple species to provide clustered areas of forage and nectar resources. Plantings shall be planted in a randomized rather than a grid pattern.

6.6 Layout for Approval. The Contractor shall lay out the locations of planting prior to beginning work. The Contractor shall indicate the planting limits, including the boundary of the adjacent walking trail at not more than 10-ft centers (closer at transitions).

7.0 HYDRATING GEL & FERTILIZATION

7.1 A pre-hydrating water gel, such as Stockosorb®, or equivalent, shall be used for all planting units per gel manufacturer specifications. Hydrating gel shall be properly hydrated per manufacturer specification. Approximately 2.5 grams of slow release (90-day) pelletized Osmocote®, or approved equivalent, fertilizer shall be added to hydrated gel material per plant unit. A minimum of three (3) fluid oz. of hydrated gel/fertilizer mixture shall be placed beneath or within the root zone of each planting unit during installation. Required amounts of fertilizer may vary for the different types of planting units chosen and shall be placed in accordance with standard industry practice for each planting unit type and species, subject to approval by the County and the Engineer. Contractor shall specify the brand name and manufacturer of the proposed hydrating gel, and the manufacturer and N:P:K ratio of proposed fertilizer in the Work Plan submitted with the bid. The cost of pre-hydrating gel and fertilizer shall be included in the unit cost of the plant items noted in the Contract.

8.0 WARRANTY, SUCCESS CRITERIA, & REPLANTING

8.1 Initial Planting Unit Survival. Planting units that do not survive for a minimum of 10 days after installation will be rejected and not be considered eligible for payment. New planting units, within specification, will be installed by the Contractor in the areas which do not survive 10 days. The Contractor will be responsible for installing the new replacement planting units within 5 days of notification by the County that an area of initial planting units did not survive for 10 days. The replacement planting units will be considered eligible for payment as original planting units only after they have survived a minimum of 10 days from installation.

8.2 Warranty Period. Sand fencing, post and rope, and plantings will be assessed by the County approximately 180 days following the date of Substantial Completion. Due consideration will be given by the County for force majeure, including extreme storm events.

8.3 Fencing. During the warranty period, the Contractor shall warrant the erected sand fencing and post and rope against deterioration and decay, beyond that determined by the Owner to be reasonable given the location and exposure of the work site.

8.4 Planting Survival. The success of each planting area depicted in the Construction Drawings will be assessed by the County approximately 180 days following the date of completion of the entire planting unit installation using (1) whole-site survival rate and (2) planting unit survival pattern (Gulf shoreline only). The planting effort shall be deemed a success if the described criteria are met at the 80% level.

8.4.1 Whole-Zone Survival Rate. A minimum survival rate of 80% of all planting units installed over each Planting Area as a whole shall be achieved. This measure will be evaluated in three randomly selected quadrats per area (1 meter x 1 meter in dimension). Plants will be considered to be surviving if they show clearly vigorous rhizomes and white, turgid roots, even in the absence of vital above-ground growth.

8.4.2 Survival Pattern (Gulf Shoreline only). For each Planting Area, a minimum of 80% of the width perpendicular to the shoreline shall be occupied by surviving planting units at all locations.

8.5 Replanting of Planting Units. If any of the above success criteria are not met, as determined by the County, the Contractor shall replant non-conforming units with viable, and within specification, planting units of the same type in all areas considered to be deficient according to the planting unit success criteria.

The replanting of planting units will be the sole responsibility of the Contractor and be completed at no additional cost to the County. All original warranty and survival provisions and requirements shall apply to replanted planting units, subject to the County's discretion.

8.6 Warranty Period Site Inspections. The Contractor may, at his sole discretion, make interim visits to the site during the warranty period to assess the conditions of the installed plants and assess the need for interim irrigation or plant replacement. The Contractor is highly encouraged to perform maintenance irrigation for the plantings at the River Road site. The date of any visit shall be coordinated with the County, and any interim warranty actions to be taken by the Contractor, if elected, shall be approved by the County and the Engineer.

9.0 SAND FENCING

9.1 General. Spacing and orientation for the sand fencing segments are depicted in the Contract Drawings. Note that the sand fencing layout at the River Road site is significantly different than that of the Gulf shoreline.

9.1.1 Gulf Shoreline. Sand fencing shall be installed in and amongst the new vegetation to limit encroachment on the dry recreational beach space. Well-established foot paths shall be given a 10-ft no fencing width. All walkovers shall be avoided by 5 ft, to either side of the structure. As noted in the Contract Drawings, the sand fencing shall be installed at an angle relative to the shoreline to capture wind-blown sand. The gap distance between fence panels shall be 6 ft, measured in the alongshore direction.

9.1.2 River Road. Sand fencing shall be installed along the outside edge of the new plantings to provide a barrier from the existing walking trail. The typical gap distance between fence panels shall be 1 ft, with a tolerance of +/- 3 inches.

9.2 Materials.

9.2.1 Post. Posts shall be made of untreated pine or equivalent. Posts shall be 2" x 4" (nominal) and six (6) feet in length.

9.2.2 Wood slats. Wood slats shall be poplar, spruce, southern yellow pine, aspen, or heart cypress. Wood slats shall be 3/8" thick by 1 1/2" wide and four (4) feet in length.

9.2.3 Wire. Wire shall be thirteen (13) gauge galvanized steel.

9.2.4 Fence. Wood slats shall be woven together with five (5) strands of wire. The slats shall be spaced 2 1/4" apart (+/- 1/4"). The section shall be eight (8) feet in length.

9.3 Layout. Prior to installation, the Contractor shall demonstrate the installation technique to be applied for installing the sand fencing and maintaining proper spacing, as defined in the Contract Drawings. At the option of the County, the Contractor shall clearly mark those areas where abrupt transitions in the line of installation may occur. In those instances, 1 inch by 2 inch by 4 foot wood

stakes with 20 inches of flagging ribbon shall be used. The Contractor shall track and remove all stakes installed as a part of this work.

9.4 Installation. Sand fencing shall be installed in accordance with the Contract Drawings, these Specifications and Requirements, and the manufacturer's written recommendations

9.4.1 Prior to installation, the Contractor shall clear any debris in the area, and shall rake the sand to form a reasonably uniform and even surface between post locations.

9.4.2 Posts shall be set plumb, accurately spaced, aligned, and placed to a uniform height before the wire and slat fencing are attached. All posts shall be set to the minimum depth shown on the Contract Drawings. At the option of the Contractor, posts may be driven into place, provided that the method of driving does not damage the post. Holes for posts set by hand shall be backfilled and thoroughly compacted in layers not exceeding six (6) inches in depth, and in such manner that the post will be securely held in place.

9.4.3 Wire and slat fencing shall be continuous between the posts.

9.4.4 The wire and slat fence material shall be cut to the required length as necessary, and the ends of each pair of wires after cutting shall be twisted to secure the two end slats and then curled using a pair of pliers, then bent down along the slat, so that they are not hazardous to persons on the beach.

9.4.5 Each section of sand fence shall be pulled taut between the two end posts and secured with staples nailed over the end of the fence section to provide a smooth uniform appearance free from sag. The fence shall be secured to the post with sufficient staples to ensure tautness and no sag in the fence.

10.0 POST AND ROPE

10.1 General. Spacing and orientation for the post and rope segments are depicted in the Contract Drawings. Well-established foot paths shall be given a 10-ft no fencing width. All walkovers shall be avoided by 5 ft, to either side of the structure.

10.2 Materials.

10.2.1 Post. Posts shall be made of eastern red cedar, western red cedar, northern white cedar, or other wood species having natural resistance to wood-destroying organisms, and strength greater than or equal to the above-listed species, as approved by the County and the Engineer. Posts shall be three (3) to four (4) inches in diameter and seven (7) feet in length.

10.2.2 Rope. Rope shall be 1" jute or hemp rope in natural color (not dyed).

10.3 Layout. Prior to installation, the Contractor shall demonstrate the installation technique to be applied for installing the post and rope and maintaining proper spacing, as defined in the Contract Drawings. At the option of the County, the Contractor shall clearly mark those areas where abrupt transitions in the line of installation may occur. In those instances, 1 inch by 2 inch by 4-foot wood stakes with 20 inches of flagging ribbon shall be used. The Contractor shall track and remove all stakes installed as a part of this work.

10.4 Installation. Post and rope shall be installed in accordance with the Contract Drawings, these Specifications and Requirements, and the manufacturer's written recommendations.

10.4.1 Posts shall have at least 2.5 feet of embedment.

10.4.2 Posts shall be installed every fifteen (15) feet and connected by rope.

10.4.3 Posts shall be set plumb, accurately spaced, aligned, and placed to a uniform height before the rope is attached. At the option of the Contractor, posts may be driven into place, provided that the method of driving does not damage the post. Holes for posts set by hand shall be backfilled and thoroughly compacted in layers not exceeding six (6) inches in depth, and in such manner that the post will be securely held in place.

10.4.4 Holes for rope, 2 holes per post, shall be drilled after the post has been set in place.

10.4.5 Rope between posts shall be tied tight and stay a minimum of three (3) feet above the ground surface at all times.

10.4.6 Rope shall be continuous (non-spliced) between posts. Individual ropes shall not span more than one adjacent post. A "stopper knot" or similar knot shall be tied in the rope on either side of each post. Ropes shall not share the same hole in a post. No connection components will be permitted.

11.0 SIGNAGE

11.1 General. The Contractor shall procure, assemble, and install signs, as depicted in the Contract Drawings and as described herein. In addition, the Contractor shall supply additional aluminum signs to the County, for future maintenance. The Contractor shall fabricate and install all signage and components in accordance with all pertinent codes and regulations. The County shall approve the final number of signs (units) to be installed prior to being ordered by the Contractor.

11.2 Materials

11.2.1 Posts. Posts for signs shall comply with all pertinent codes and regulations. Cross section of posts shall be four (4) inches by four (4) inches (nominal) and 12 ft in length. The following types of wood shall be acceptable: eastern red cedar, western red cedar, northern white cedar, Aspen (*Populus tremuloides*) or southern pine. If southern pine is used, post shall be pressure-treated with non-CCA wood preservatives in accordance with American Wood Protection Association (AWPA) Standards U1, Use Category 4B(UC4B). Inspection at the wood preserving plant shall be in accordance with AWPA M2. Wooden posts shall be sound and free from decay, splits, and excessive knots or clusters of knots. Seasoning checks not affecting serviceability will be permitted.

11.2.2 Signs.

11.2.2.1 Design. Preliminary design details are provided in the Contract Drawings and these Specifications. The final sign design details and materials shall be approved by the County prior to purchase and installation.

11.2.2.2 Dimensions. Signs shall be made of aluminum and have rounded edges, with an edge radius of 1.5 inches. Signs shall be non-reflective with a non-gloss finish and resistant to fading. Signs shall comply with Standard Highway Signs and Markings, Manual on Uniform Traffic Control Devices. Sign blanks shall be fabricated from aluminum sheet with a uniform thickness of 0.080 inches. Dimensions of sign blanks shall be twelve (12) inches horizontal by eighteen (18) inches vertical.

11.2.2.3 Defects. Sign blanks shall be cut clean without any burrs, nicks, or irregularities of any kind. The edges of the blanks shall be clean and smooth. Where the curvature of each radius joins the straight edge, there shall be a clean transition without noticeable interruptions such as offsets, nicks, projections, deflections, or other abrupt interruptions of lineation.

11.2.2.4 Surface. The surfaces shall be absolutely flat without bends, scratches, indentations, abrasions, or roughness of any kind. Surfaces shall be clean and show no evidence of chemical action or tarnish.

11.2.2.5 Colors & Background. The text shall be black on a white background. Refer to the Contract Drawings for design detail.

11.2.2.6 Border. The sign border shall be black and 0.625 inches in thickness.

11.2.2.7 Bolts, Brackets, Nuts, Washers. All bolts, nuts, and washers shall be 304 alloy stainless steel, free from rust. The Contractor shall install all bolts, brackets, and fasteners in strict accordance with the manufacturer's specifications, with straight, plumb, and level alignment.

11.3 Layout. The approximate location of each sign is depicted in the Contract Drawings. The location of each sign shall be field verified by the Contractor and approved by the County prior to installation. Signs shall be oriented to allow for optimum visibility to pedestrians walking along the Gulf shoreline (signs shall face north and south) or along the walking trail at River Road, unless otherwise specified by the County.

11.4 Installation.

11.4.1 Signs. Two aluminum signs shall be attached to each post. Aluminum signs shall be installed such that they are flush with the top of the post.

11.4.2 Posts. Post shall be set plumb and to the minimum depth shown on the Contract Drawings. Care shall be taken not to damage the post. Posts may be driven into place. If holes for posts are set by hand, they shall be backfilled and thoroughly compacted in layers not exceeding six (6) inches in depth and in such manner that the post will be securely held in place. The pile shall be installed with a variation of not more than $\frac{1}{4}$ " per foot of pile from vertical.

12.0 PAYMENT

12.1 Number of Units & Adjustment of Quantities. The Contractor shall provide all units required for the project, as noted in the Contract. Site conditions may dictate adjustments to the number of units for the work. The final Contract quantities actually installed and accepted may vary from the Bid estimated quantities by $\pm 20\%$. The unit price costs noted in the Contract will be used to either

add or deduct cost amounts for the project. The County will determine the final number of units eligible for payment.

12.2 Plant Units. The Contractor shall install dune vegetation as described herein and depicted in the Contract Drawings. Payment for labor; equipment; acquisition, transport, and delivery of plant materials; installation; irrigation, including any maintenance activities; fertilizer, including any maintenance activities; and all appropriate costs in connection therewith or incidental thereto for dune vegetation planting units shall be paid for at the unit prices listed in the Contract (see “Sea Oats”, “Panic Grass / Gulf Bluestem”, “Diversity Groundcover”, “Trees”, “Shrubs”, and “Herbaceous / Groundcover”). Payment shall be in accordance with the unit prices specified in the Contract, and shall be based upon the physical number of accepted, viable individual plants installed in accordance with the contract requirements. Plants not meeting the minimum size requirements noted herein may be rejected. No additional payment shall be made for re-planting or other activities required to conform to the warranty provisions herein.

12.3 Sand Fence. The Contractor shall acquire and install sand fencing as described herein and depicted in the Contract Drawings. Payment for labor; equipment; acquisition, transport, and delivery of sand fence materials; installation; and all appropriate costs in connection therewith or incidental thereto for sand fencing shall be paid for at the unit price per foot listed in the Contract for “Sand Fence”. Acceptance of the Work and payment will be determined from inspection of installed sand fencing by the County. No additional payment will be made for maintenance activities required to conform to the warranty provisions herein. Progress payments may be made for sand fencing based upon the units installed and accepted during each month.

12.4 Post and Rope. The Contractor shall acquire and install post and rope as described herein and depicted in the Contract Drawings. Payment for labor; equipment; acquisition, transport, and delivery of materials; installation; and all appropriate costs in connection therewith or incidental thereto for post and rope shall be paid for at the unit price per foot listed in the Contract for “Post and Rope”. The quantity eligible for payment will be measured along the length of the installed fence. Acceptance of the Work and payment will be determined from inspection of installed post and rope by the County. Progress payments may be made for post and rope based upon the units installed and accepted during each month.

12.5 Signs - Installed. The Contractor shall acquire and install signs as described herein and depicted in the Contract Drawings. Payment for site preparation, labor, materials, equipment, and all appropriate costs in connection therewith or incidental thereto for sign procurement and installation shall be included in the contract unit prices listed in the contract for “Signs - Installed” under Base Bid - Gulf Shoreline and Bid Option – River Road. Acceptance of the Work and payment will be determined from inspection of installed signs by the County.

12.6 Extra Signs (Uninstalled). The Contractor shall acquire and supply signs as described herein and depicted in the Contract Drawings. Payment for materials and all appropriate costs in connection therewith or incidental thereto for sign procurement shall be included in the contract unit price listed in the contract for “Extra Signs - Uninstalled” under Base Bid - Gulf Shoreline and Bid Option – River Road. Acceptance of the Work and payment will be determined from inspection of signs by the County.

13.0 REPORTING REQUIREMENTS

13.1 Weekly Progress Meetings. The Contractor shall attend progress meetings to be held at approximately weekly intervals with the County, Engineer, and the Engineer's representative, to discuss project issues such as safety, production, and environmental protection.

13.2 Submittals.

13.2.1 Work Plan. As part of the bid, the Bidder shall submit a detailed Work Plan. At a minimum it must include a schedule of fieldwork activity, the species distribution, type of hydrating gel to be used (specify the brand name and manufacturer), type of fertilizer to be used (specify the brand name, manufacturer, and N:P:K ratio), personnel and equipment to be used for the work, and how this work force will be supervised, including the qualifications of the supervisor(s). Work Plans must be complete, reasonable and feasible using the resources proposed.

13.2.2 Source of Planting Units. As part of the bid, the Bidder will be required to provide written documentation as to the source of the planting units delivered under this bid. Documentation shall include collection permits or contracts from a State, the U.S. Department of Agriculture, or other comparable documents. The Contractor shall identify the number of planting units by species grown via micropropagation techniques.

13.2.3 Updated Schedule. Prior to construction, the Contractor shall submit for approval an updated construction schedule, indicating the dates of commencement and completion at each site. The schedule shall specify the timeframes for each work element (e.g., installation of vegetation, post and rope, and signs.)

13.2.4 Planting Plan – Gulf Shoreline. Prior to construction, the Contractor shall submit for approval the proposed planting plan for the Gulf shoreline. The plan shall be in accordance with the Contract Drawings.

13.2.5 Planting Plan – River Road (Bid Option). Prior to construction, the Contractor shall submit for approval the proposed planting plan, including a typical example of the proposed layout, for the River Road site. The plan shall be in accordance with the Contract Drawings.

13.2.6 Sign Design Draft. Prior to sign fabrication and purchase, the Contractor shall submit, for approval by the County, the proposed design and materials. The plan shall be in accordance with the Contract Drawings and these specifications.

13.2.7 Irrigation Schedule. The irrigation schedule will include a detailed description of the anticipated number of irrigation events, the equipment, the labor, the irrigation methodology and the planting unit physical condition(s) which signal the need for maintenance irrigation. The Contractor will be responsible for all aspects of the maintenance irrigation including compliance with all environmental permitting regulations, requirements and conditions stated in the permit(s) which address maintenance irrigation and installation activities.

13.2.8 Draft Daily Report. At least five (5) days prior to the commencement of work, the Contractor shall submit a draft daily report for review by the County and the Engineer. The County may require additional information after reviewing the draft report submittal.

13.2.9 Daily Report. Contractor shall prepare a daily progress report for submittal by electronic mail to the County and the Engineer. At a minimum, the daily report shall include:

- Project name
- Contractor's contact information
- Summary of the weather conditions
- Clear description of the alongshore limits of work for that week (e.g. referenced to baseline station numbers depicted in the Contract Drawings, if applicable)
- Number of crew members present on the jobsite that day, including supervisors
- Pay estimate of the number of plants installed that day
- Pay estimate of the cumulative number of plants installed to date
- Number of plant trays ('flats') used for installation that day, including an estimate of the number of missing cells within each flat
- Description of any environmental directives (shorebird areas to avoid) and sea turtle nest clearance (daily during season, May 1 – October 31)
- Note any visitors to the site, including, but not limited to, personnel from the USACE, FDEP, County, Santa Rosa Island Authority, and Engineer.
- Certification statement by the Contractor and the Contractor's signature verifying the information submitted on each report

13.2.10 Replanting Records. The Contractor shall submit to the County and the Engineer records of any and all replanting activities. Such documentation shall be provided within three (3) days of the activity.

13.2.11 Pay Applications. The Contractor shall prepare and submit the applications for payment, as specified in the Contract.

14.0 ENVIRONMENTAL PROTECTION

14.1 General. The Contractor shall conduct his activities in a manner so as to minimize or avoid disturbance to existing environmental resources along the work area. The Contractor shall comply with all marine turtle, shorebird, and beach mouse protection requirements as specified by the permits. The Contractor and all subcontractors are responsible for becoming intimately familiar with these requirements and their potential impacts on implementing the scope of services. The regulations, requirements and conditions concerning sea turtles and other environmental resources are considered a part of the Contract and shall be complied with by the Contractor and Subcontractor(s). All Contractor and Subcontractor(s) personnel involved in this project are to be made fully aware of the sea turtle protection and environmental permit requirements, and the measures that the Contractor will take to comply with these requirements.

14.2 Fuel Dispensing. The Contractor shall not dispense fuel on the dune or sand beach. Contractor shall take all reasonable precautions to prevent contamination of the ground with fuel. Should any spilling of fuel occur, the Contractor shall immediately recover the contaminated ground and dispose of it offsite at an approved facility. In this event, the Contractor should notify the County immediately, document the incident with photographs, and estimate the volume of the spill.

14.3 Daily Surveys for Marine Turtle Nests (Gulf Shoreline only). Beginning May 1, the County or County-designated representative shall conduct early-morning, daily surveys of the beach along the work area, prior to 9:00AM. The Contractor shall contact the designated turtle nest monitoring personnel each morning prior to commencing any vehicular activity on the beach. The marine turtle monitor will communicate the location of any nests that were detected, if any. Contractor shall certify that such communication was made each day and shall note the results of that communication in the daily report. Throughout the construction period, if the Contractor finds an unmarked nest, the Contractor shall avoid the nest zone as identified below and shall contact the County and/or designated turtle nest monitoring personnel immediately. Nests that interfere with the Contractor's uncompleted work shall not be relocated. Nests that are discovered shall be clearly marked by the County/turtle monitor with stakes and flagging that indicate a 3-ft radius surrounding the nest. The Contractor shall avoid all construction activity within a 10-ft distance of any and all marked nests. Irrigation and/or Fertilization is not permitted within 10-ft of any marked nest, or upslope of any marked nest.

14.4 Work Lighting. Lighting of the beach or work areas is not permitted.

14.5 Beach Driving. The Contractor is specifically advised that vehicle driving or parking on the beach is not permitted, excepting lightweight ATV-style vehicles with tires exerting pressures on the ground of 10 psi or less. The Contractor is advised that the beach along the work area is comprised of soft sand, and will require appropriate vehicle types. Operation of any vehicles on the beach shall be in accordance with Environmental Protection requirements. Vehicles used by the Contractor on the sandy beach south of the primary dune shall not exceed 6 mph. The Contractor shall not park or drive vehicles along the crest or upland of the dunes. Contractor shall contact the County for approval prior to any beach driving.

14.6 All temporary alteration of the beach topography (e.g., tire ruts and other vehicles tracks) landward of the mean high-water line, shall be filled or leveled to the natural beach profile by the end of the work day. No equipment or materials may be stored on the beach during turtle nesting season (May 1 through October 31).

14.7 Shorebirds. Heavily occupied shorebird habitat will be marked by County or designated representative and shall be avoided by the Contractor.

14.8 Payment. Unless otherwise noted, no separate or direct payment will be made for the items covered by this section of the specifications and all costs thereof shall be considered incident to and included in the total Contract price.

15.0 PUBLIC SAFETY & CONFLICTS WITH OTHER CONTRACTORS

15.1 Public Safety – The Contractor shall protect the safety of the general public utilizing the beach during construction, as well as residents and guests recreating along the shoreline within and adjacent to the proposed installation areas. The Contractor shall direct to the County all concerns or issues relating to potential conflicts between work activities and residents or beach-goers.

15.2 The Contractor is advised construction work by other contractors may be conducted at the same time. The Contractor shall direct to the County all concerns or issues relating to potential conflicts between work activities of the contractors engaged by the County at the work site.

16.0 PROPERTY DAMAGE.

Damage to property caused by the Contractor's fault or negligence in conducting the subject work shall be promptly repaired to pre-project conditions, acceptable to the County, at no additional expense to the County. In the event that the Contractor fails to undertake satisfactory reparations, the County will undertake same, and deduct the reasonable cost of these repairs from the amount otherwise payable to the Contractor. The Contractor is responsible for restoring to the pre-work conditions any damage to the dunes and dune vegetation caused by the Contractor's activities.