



ATTACHMENT B-1

REVISED STANDARD TECHNICAL SPECIFICATIONS AND OTHER REQUIREMENTS

The following technical specifications cover the work to be performed involving all types of waterway markers involved in this contract. FWC will issue a Purchase Order detailing the services required and the established schedule for completion. Work under this contract will be limited to the work specified in a Work Plan. The Vendor shall complete all construction in accordance with the Work Plan, per the technical specifications and detail drawings.

Unless otherwise stated in the Work Plan, FWC will provide all sign panels, aids to navigation and/or buoys associated with the project (with the exception of hardware associated with buoy installation – such as cable, anchor system, clamps, eyes and thimble as well as the piles, cross members and hardware associated with sign panel installation).

PILES

- **TYPES**

1. **Treated Wood Timber Piles:** Standard treated wood timber piles shall be at least 10” in diameter unless otherwise indicated. For salt or brackish water applications, the timber piles shall be pressure treated with Chromated Copper Arsenate (2.50), and for freshwater applications, the timber piles shall be pressure treated with Chromated Copper Arsenate (0.80), Alkaline Copper Quaternary (0.80), or Ammoniacal Copper Zinc Arsenate (1.0). Piles shall be carefully handled with no sudden dropping, breaking of outer fibers, bruising, or penetration of the surface with tools. Bolt holes shall be bored 1/8” larger than the diameter of the bolt. Any piles which require excessive bending in order to frame properly shall be withdrawn and reinstalled to the proper batter. Piles shall not be installed and then pulled into position. Minor adjustment (less than three degrees to vertical) is allowed after pile installation; however, the Vendor is fully responsible to ensure soil has settled around the pile so that no listing will occur. Piles damaged, not located in the proper location, or driven out of alignment shall be withdrawn and replaced by new piles or shall be cut off at the mud-line and additional piles installed as directed, all without additional cost to the FWC. When installing more than one pile per marker installation, the pile tops shall be cut to equal height (± 1 ”). The maximum permissible deviation for piles out of plumb or off batter shall be two percent of the pile length, and the pile spacing will vary no more than 6” from the spacing specified in the marker details.

2. **Composite Piles:** Composite piles shall be brown in color and at least 8” in diameter unless otherwise indicated in the Work Plan. Piles shall be carefully handled with no sudden dropping, breaking of outer fibers, bruising, or penetration of the surface with tools. Bolt holes shall be bored 1/8” larger than the diameter of the bolt. Any piles which require excessive bending in order to frame properly shall be withdrawn and reinstalled to the proper batter. Piles shall not be installed and then pulled into position. Piles shall not be installed by excavating then backfilling and compacting. Minor adjustment (less than three-degrees to vertical) is allowed after pile installation; however, the Vendor is fully responsible to ensure soil has settled around the pile so that no listing will occur. Piles damaged, not located in the proper location, or driven out of alignment shall be withdrawn and replaced by new piles, if necessary, or shall be cut off at the mud-line and additional piles installed as directed, all without additional cost to the FWC. When installing more than one piling per marker installation, the pile tops shall be cut to equal height (± 1 ”). The maximum permissible deviation for piles out of plumb or off batter shall be two-percent



of the pile length, and the pile spacing will vary no more than 6” from the spacing specified in the marker details.

Composite piles must meet or exceed the deflection of a standard treated timber at least 10” in diameter. Piles shall be strong enough to be driven to the highest level of resistance, and documentation of the manufacturer’s specifications and warranty will be provided to FWC with submittal of Marker Records.

3. **Long Piles:** Piles longer than 25’ may be needed to meet pile installation specifications above due to water depth. There also may be instances where a larger diameter pile than specified above is required for a particular application. In these cases, the Vendor will be reimbursed for the additional cost of piles longer than 25’ or of larger diameter upon certifying that the piles were installed in accordance with the Work Plan and upon submission of the actual invoices. When handling and driving long piles of a high slenderness ratio, the Vendor shall take special precautions to ensure against overstress or leading away from plumb or true position when driving.
4. **4” x 4” Post:** Pressure treated timber 4” x 4” size posts shall be secured within the land surface and affixed with no more than two (2) sign panels generally no larger than 3’ x 4’ (and, perhaps, up to two auxiliary signs). If needed, the posts may require securing into the ground using at least one (1) bag of cement (80#) per post. If the posts are being removed, sign panels and associated materials, as well as any material used to secure the posts into the surface, must also be removed. Any holes will be filled with dirt or sand compatible with the adjacent surface.
5. **Pile Wrap:** Application of high density polyethylene wrap to wooden piles. Wrap shall be a minimum of .030" in thickness. The wrap shall be purchased and installed by the Vendor according to the manufacturer’s recommendations for the specific water depth pile is located covering the pile surface area to include both the mean low and high water lines. Prior to applying wrap to pile, the pile which is soiled with fecal matter, marine residue, mold, mud, or other matter will be thoroughly cleaned. The wrap shall be installed using 1-1/4" stainless steel ring-shank roofing nails every 2" along the seam.

- **INSTALLATION STANDARDS**

1. **Pile Marking:** Prior to moving the piles from the upland staging area to the waterway, the piles shall be marked as follows: Mark lines, not to exceed 6-inches long by 1-inch wide along the circumference of the pile. The lines shall be neatly marked every five feet, starting from the embedment tip. Neatly label each line 0’, 5’, 10’ etcetera with 4- inch high numerals. Lines and labels shall be marked utilizing indelible ink or waterproof paint. Prior to transporting marked piles onto the waterway, notify FWC for their inspection.
2. **Pile Driving Equipment:** Pile-driving equipment shall be of a size and type to deliver consistently effective dynamic energy suitable for the type and capacity of the piles to be driving and the material into which they are to be driven. If using composite piles, installation shall be in accordance with manufacturer’s specifications.



- 3. Pile Driving:** Punching or drilling holes will be allowed when necessary to permit piles to pass through those strata and reach required penetration. Blasting of holes for the piles is not permitted. The Vendor shall drive all piles continuously and without voluntary interruption. After driving and back-driving, the Vendor shall cut piles at the cutoff grade line, and the surplus material shall be removed from the work site. Any piles requiring excessive bending in order to frame properly shall be withdrawn and redriven to the proper batter. Driving batter piles vertically and then pulling them into position is not permitted. Piles shall not be installed by excavating then backfilling and compacting. Minor adjustment (less than 3° to vertical) is allowed after pile installation; however, the Vendor is fully responsible to ensure soil has settled around the pile so that no listing will occur. Piles damaged, not located in the proper location, or driven out of alignment shall be withdrawn and replaced by new piles or shall be cut off at the mudline and additional piles installed as directed, all without additional cost to the FWC.

As indicated in the details, piles shall penetrate at least eight (8) feet of sand and/or shell, or at least 10 feet or more of mud, as appropriate, to support the marker. If rock is encountered, pre-drilling of the pile hole and/or a pile shoe may be required at no additional cost to the FWC. If an auguring or punching method is deemed necessary to install a pile into rock or hard substrate, the method must first be approved by the FWC. If these methods require grouting, the materials and methodology must also be approved by the FWC. Piles shall not be connected or joined together to lengthen.

Unless otherwise indicated in the Work Plan, all installations include sign panel(s), cross members, pile cap(s) and reflective white tape. Sign or pile assemblies not completed at the end of each work day must be marked and made visible to day and nighttime waterway traffic with at least one reflective tape band. However, no more than two (2) pile assemblies (single or double) may be left unfinished at the end of each work day.

The Vendor is to verify water depths and bottom types at all work locations and note in the Marker Records. Depth information (if provided) is approximate and does not reflect tidal fluctuations.

- 4. Unforeseen Physical Conditions:** Vendor shall promptly notify Commission in writing of any subsurface or latent physical conditions at the site materially different from those previously indicated by Commission. In the event that rock is encountered, Vendor shall provide suitable evidence in the form of test pile information, SPT boring or similar standard tests. If Commission finds that the results of such surveys or tests indicate that there are subsurface or latent physical conditions which differ materially from those intended in the Contract Documents, and which could not reasonably have been anticipated by the Vendor, a Change Order shall be issued incorporating the necessary revisions.
- 5. Pile Caps:** Unless otherwise indicated, marker installations identified in the Work Plan, whether new or modified, are required to be capped with plastic pointed black caps attached with a minimum of four (4) 1.5" stainless steel screws (or FWC pre-approved equivalent) and be even with the top edge of the sign to $\pm 6"$. The cap shall fit the pile naturally without having to modify



the pile cap in any fashion to forcefully fit the pile diameter (e.g. splitting a cap to fit a larger diameter pile than the cap was designed to fit).

6. **Reflective Tape on Piles:** The Vendor shall supply two (2) 6” wide bands of 3M diamond grade white very high intensity prismatic reflective tape with pressure sensitive backing and place them around each pile with a minimum of a 1” lap (the entire 6” width of the tape), with the first band installed 6” from the bottom of the sign and the second band 8” below the bottom of the first band. If the tape is delaminated, must be replaced. If any tape is to be applied to existing piles, the old tape shall be completely removed, appropriately disposed of and replaced with new reflective tape. For wood piles, all tape shall be firmly secured with a minimum of four (4) stainless steel staples at least 3/8” in length. For cement or composite piles, tape shall be applied with 3” lap using the adhesive backing.

- **PILES - DAMAGE AND REMOVAL**

1. **Damaged or Displaced Piles:** Piles that are cracked, split, or otherwise damaged beyond repair must be removed and replaced with new piles in accordance with these specifications, unless otherwise directed in Work Plan. Piles that have been moved from vertical position and are not damaged must be straightened to an upright position. A pile that remains loose after straightening may indicate that the portion of the pile located beneath the water surface has been damaged or decayed and will require removal and/or replacement. Any damage observed on a pile that was to be straightened to an upright position shall be reported in the Marker Records.
2. **Pile Removal:** Steel, timber, composite or concrete piles shall be removed by the Vendor at the locations indicated in the Work Plan. Wood piles are typically 10” diameter, and composite piles are typically 8” – 10” in diameter. If they exist, steel and concrete pile diameters will be obtained by FWC and described in the Work Plan, however, it can be assumed they have been drilled or jetted into the bottom. The Vendor shall make every effort to remove each pile in its entirety by pulling or using a jet pump. Should the Vendor be unable to remove a pile, it may be cut, but the cut must occur at or below the mud line. If removal by cutting is required, the Vendor shall record the location and certify that the pile was cut at or below the mud line.

SIGN PANELS

Sign panels must be installed as indicated on the waterway marker details with piles to be shortened as dictated by the normal mean high watermark in the area of installation unless otherwise specified in the Work Plan. The bottom of all sign panels must be a minimum of six (6) feet above the mean high water level and shall not exceed nine (9) feet above the mean high water level. Sign panels do not have pre-drilled holes. The Vendor shall not degrade the message area or reflective surfaces of the sign panels when drilling holes or split the ends of the cross members on the backs of panels. The Vendor will replace, at its own expense, any sign panel that it damages during the delivery and installation process.

Most sign panels will be installed back-to-back on opposite sides of a pile.



Sign panels and private aid to navigation panels are constructed of .125 gauge, 5052-H38 aluminum, or higher, and will be produced using industry specifications for chemically treated aluminum to accommodate the marine environment and diamond grade reflective sheeting. FWC will supply the Vendor with layout renderings of the sign panels and private aids to navigation associated with each project.

- **TYPES**

1. **Panel sizes:** Sign panels will typically be 3' x 4', 4' x 6' or 5' x 7', and auxiliary sign panels will typically be 1' x 4' , 1' x 6' or 1' x 7'.
2. **Vertical Flip Sign Panels:** The 3' x 4' flip signs shall include a 24" x 36" center flip panel; 4' x 6' flip signs shall include a 48" x 36" center flip panel; 5' x 7' flip signs shall include a 42" x 60" center flip panel.
3. **Horizontal Flip Sign Panels:** The 3' x 4' flip signs shall include a 18" x 48" center flip panel; 4' x 6' flip signs shall include a 24" x 72" center flip panel; 5' x 7' flip signs shall include a 30" x 84" center flip panel.
4. **Private Aids to Navigation (channel markers/day beacons):** Red and green channel markers will meet or exceed the U. S. Coast Guard requirements found in Title 33, Code of Federal Regulations and will be used to mark a channel on navigable waters. Private Aids to Navigation panels are typically manufactured in the following sizes:
 - a. Red channel markers: 36" equilateral triangle
 - b. Red channel markers: 48" equilateral triangle
 - c. Green channel markers: 24" x 24" square
 - d. Green channel markers: 36" x 36" square

- **INSTALLATION STANDARDS**

1. **Cross Member Installation, Removal and Replacement:** Unless otherwise indicated in the Work Plan, all sign panel installations must include cross member support as shown on the waterway marker details. Cross members are typically either 2" x 4" or 4" x 4" lumber, either pressure treated or plastic/composite, and additional 2" x 4" spacers may be required for specific sign installations. The use of plastic/composite lumber must be pre-approved by FWC, and the lumber must meet or exceed the deflection of a standard treated timber and be guaranteed by the manufacturer. In cases where existing cross members and associated hardware are damaged or missing, the Vendor will be required to install new cross members. This scope of work assumes that mounting hardware will be re-usable. Any hardware deemed un-useable must be replaced by the Vendor, and FWC will reimburse the Vendor for the actual cost of hardware upon submission of the actual invoice.



2. **Plastic/Composite Lumber:** The use of plastic or fiberglass-reinforced lumber and decking material that meets or exceeds the deflection, strength and duration of standard treated timber and is guaranteed by the manufacturer is allowable as specified in the marker details and when pre-approved in writing by FWC.
3. **Hardware/Fasteners:** Unless otherwise specified, all sign panels shall be drilled and fastened by full penetration of each pile/post by two (2) type 316 stainless steel through bolts or threaded rod, which must pass through each sign panel, the cross members and the pile/post and shall not extend more than 1" or less than ½" beyond a type 316 stainless steel hex-nut, stainless steel lock washer, and stainless steel flat washers. A nylon shoulder washer will be used to eliminate any contact between the stainless steel fasteners and the aluminum sign panels to prevent or minimize bimetallic corrosion. After a nut has been secured to a bolt or threaded rod, the last two or three threads of the bolt or rod must be bent in a manner to render the threads resistant to vandalism. Consideration should be given to ensuring that damage is not so significant as to render the hardware unusable should repairs need to be made in the future.
4. **Sign Panels – 3' x 4':** All installations of 3' x 4' sign panels shall be mounted on one (1) pile. A 4" x 4" cross member shall be installed at the top and a 2" x 4" cross member shall be installed at the bottom on the back of all sign panels so the panel will be slanted out in accordance with the marker details.
5. **Sign Panels – 4' x 6' or 5' x 7':** All installations of 4' x 6' and 5' x 7' sign panels shall be mounted on two (2) piles. 4" x 4" cross members shall be installed at the top and bottom of all sign panels and 2" x 4" spacers will be installed at the top of each sign panel so the panel will be slanted out in accordance with the marker details.
6. **Horizontal and Vertical Flip Sign Panels:** All installations of 3' x 4' flip sign panels shall be mounted and centered on a single pile. All installations of 4' x 6' and 5' x 7' flip sign panels shall be mounted on two (2) piles. A flip sign includes a full sized main sign panel and a flip panel of half the height or length of the main panel. One edge of the flip panel is attached to the middle of the main panel with two (2) ½" stainless steel U-bolts no greater than 4" wide supplied by the Vendor. Each flip panel shall have a 3/8" diameter hole drilled into the lower outer corner and must align with a hole drilled into the bottom right and left corners of the main panel. The Vendor shall supply one (1) ICG Extra Heavy Duty Cable Tie (NCT 215) to secure the main and flip panels together to display the appropriate seasonal message. If requested, the Vendor may be required to repair and/or maintain flip sign markers which have FWC-owned locks installed. The Vendor will coordinate with the Project Manager, or designated agent, for information on how to obtain any key or combinations necessary to unlock existing locks. Each side of the flip panel will be constructed of the same gauge aluminum as the main panel and will be similar in style with regards to reflective sheeting, black block lettering, border, and geometric symbol. The Vendor shall install the flip sign panels in a manner to ensure the lettering, border and symbols line up properly when the sign panel is flipped in either direction and displays the current regulatory message at the time the work is completed for that particular location.



7. **Auxiliary Signs (1' x 4', 1' x 6' or 1' x 7')**: All installations of auxiliary sign panels shall be mounted as indicated in the marker details. Sign panels shall be drilled and fastened as stated above in the Hardware/Fasteners section. 2" x 4" cross members shall be installed at both the top and bottom of auxiliary sign panels.
8. **Bridge or Other Structures**: Sign panels installed to composite pile and/or wood timber bridge fenders or other similar type of structures (such as fishing piers) will be attached per the specifications as stated above in the Hardware/Fasteners section. Sign panels installed on bridge piles will be attached with adjustable stainless steel straps – no drilling in bridge piles is permitted unless specified in the Work Plan. Sign panels shall be installed well above the mean high water surface as specified in the Work Plan.

- **SIGN PANELS – DAMAGE AND REMOVAL**

1. **Sign Panel Removal**: This work involves the removal of a sign panel from an existing structure and may include the removal of associated hardware and cross members as specified in the Work Plan.
2. **Bridge Structures**: When sign panels are removed from concrete structures, including bridges, any recess caused by a bolt hole shall be repaired with a type F2 or type I epoxy based mortar for use on vertical concrete surfaces applied in accordance with the manufacturer's recommendations. The epoxy-based mortar shall be pre-approved by FWC and must meet the Florida Department of Transportation's Qualified Products List Specification 926 F-2, which can be found at the following link:
<http://www2.dot.state.fl.us/SpecificationsEstimates/ProductEvaluation/QPL/QPLItems.aspx?QPLTitle=Specification%20926%20Epoxy%20Compounds&QPLDesc=Epoxy%20Compound%20Type%20F-2&QPLNum=S926>

BUOYS

- **TYPES**

1. **9" Diameter x 61" High Buoy**: These buoys are 9" diameter can buoys equipped with a swivel eye and a 3" wide reflective high intensity orange band around both the top and bottom.
2. **12" – 14" Diameter Can Buoy**: These buoys are 12" to 14" diameter can buoys with a 28" diameter collar. The buoys are equipped with a swivel eye and a 3" wide reflective high intensity orange band around both the top and bottom.
3. **12" – 14" Diameter Fast Water Can Buoy**: These buoys are 12" to 14" diameter buoys with a 28" diameter collar designed for fast water applications. These buoys are equipped with a side-mounted swivel eye and a 3" wide reflective high intensity orange band around both the top and bottom.



4. Private Aids to Navigation (channel markers/day beacons):

- a. **Green (Can):** These buoys are similar to the 12” – 14” diameter can buoys but are green in color and have a flat top. The buoys are equipped with a mooring eye and a 3” wide reflective high intensity green band around the top.
- b. **Red (Nun):** These buoys are similar to the green can buoys above, except they are red in color with a cone-shaped top. The buoys are equipped with a mooring eye and a 3” wide reflective high intensity red band around the top.

The Commission will provide details on numbering and placement of any private aids to navigation buoys in the Work Plan.

• INSTALLATION STANDARDS

The mooring and anchor system will be used in combination and is dependent upon water depth, tidal fluctuations, current and type of substrate.

1. **Mooring Systems:** The mooring system to be used for buoy installations will be specified in the Work Plan and the installation specifications are illustrated in the marker details.
 - a. **Traditional Buoy Mooring System:** Total cable length shall be left to the Vendor’s discretion to ensure that tidal fluctuations do not fatigue the connective system. The Vendor shall utilize stainless steel hardware for saltwater or freshwater installation (shackle, thimble, clamps, and either ¼” stainless steel cable or ¼” stainless steel chain). To reduce friction, 1” blue (Goodyear) pliovic hose, or equivalent, shall be used to cover the cable and the anchor connections.
 - b. **“Elastic” Mooring Systems:** There will be applications where the preferred buoy mooring will include an elastic system to further reduce fatigue on the buoy and anchor connections. Typically, an elastic mooring system will utilize StormSoft, Hazelett, or a pre-approved equivalent for buoy down lines.
 - c. **Chain/Elastic Mooring System:** There are applications where this combination system will be preferred by FWC. Total chain length shall be left up to the discretion of the Project Manager, or designated agent. The Vendor shall utilize stainless steel hardware for all installations (shackle, thimble, clamps, and ¼” stainless steel chain). To reduce friction, 1” blue (Goodyear) pliovic hose, or equivalent, shall be used to cover the cable and the anchor connections. ¼” stainless steel chain will then be attached to Stormsoft, Hazelett or equivalent system which will then be attached to the specified anchoring system.

NOTE: All connections requiring the use of rope will utilize three-strand nylon rope. The unraveled ends of the rope will be heated or taped to prevent further unraveling, and eye splices will be woven with a minimum of four tucks of each strand. FWC will provide additional details on rope splicing, if needed



2. Anchoring Systems:

- a. **Helical Disk Embedment Anchor:** A helical disk embedment anchor shall be used in sand or mud substrate at least four (4) feet in depth. Helical anchors will be galvanized, have a minimum length of five (5) feet and will consist of a minimum 6” helical disk size and a 1¼” shaft diameter. The anchor shall be embedded within the substrate to a point where the eye is exposed above the substrate. Embedment anchors must withstand 500 pounds of resisting force, and extensions may be required in order to achieve that level of force.
- b. **Heavy Weight Disk Embedment Anchors:** A heavy weight disk embedment anchor shall be used in locations where substrate/sediment shifting is anticipated. Weighted disk anchors consist of a series of 50-pound barbell weights and are installed with the anchor weights embedded into the substrate. Should sediment wash away, the disk weights will remain in position on the water bottom. Heavy weight disk anchors shall be used when an embedment anchor system is prohibited or if mud/muck conditions are not conducive to the use of helical embedment anchoring.
- c. **Deadweight Anchors:** Such an anchor shall be constructed of cement with embedded ½” stainless steel eye and a minimum total weight of 100 pounds.

3. **Buoy Wraps:** The Vendor may be enlisted to complete a Work Plan which requires the application of vinyl wraps to quickly and cost-effectively rehabilitate aging or faded buoys. The wraps will be supplied by FWC and will be installed by the Vendor according to the manufacturer’s recommendations. Wraps are constructed of heavy (approx. 10 oz.) vinyl and have specific regulatory symbols and wording. Prior to applying wraps, buoys which are soiled with fecal matter, marine residue, mold, mud, or other matter will be thoroughly cleaned.
4. **Lubricant Application:** The Vendor may be enlisted to purchase and apply Inox Lanox MX4 lubricant or equivalent to new buoys, as specified in a Work Plan. The lubricant will be applied in accordance with the manufacturer’s recommendations. When the application of lubricant is specified in a Work Plan, the Vendor will be reimbursed for the cost of the lubricant upon certifying that it was applied in accordance with the Work Plan and upon submission of actual invoice.

- **REMOVAL**

If specified in a Work Plan, the Vendor shall remove buoys, anchor systems and/or associated hardware.

OTHER MARKER RELATED ACTIVITIES

- **SEASONAL MARKER ACTIVITIES**



1. **Buoys:** Bi-annually, buoys are installed or removed using an existing anchor system currently in place at various locations of the state in order to post seasonal regulatory zones. Buoys are to be installed pursuant to the specifications and removed as detailed in the Work Plan.
2. **Signs:** Bi-annually, sign panels are flipped at various locations of the state in order to post seasonal regulatory zones.

- **BIRD NEST TRIMMING/REMOVAL**

In coordination with FWC, the Vendor may be requested through a Work Plan to trim or remove an inactive osprey nest from a waterway marker. FWC will secure all required authorizations and provide the Vendor with documentation of those authorizations and the FWC policies pertaining to osprey nest removals. Additional information on nest removal can be found at <http://myfwc.com/media/290143/OspreyPolicies2010.pdf>.

- **BIRD DETERRENT DEVICES**

Nesting and resting birds cause damage to waterway markers while their nests and/or droppings oftentimes obstruct the sign panel message from view. Bird roost inhibitors, such as polycarbonate or steel “bird spikes,” may be secured (using nails, screws and/or adhesive) to the top of marker cross members or buoys to deter birds from nesting or resting. As part of a Work Plan, the Vendor may be asked to install bird deterrent devices to the entire length of the top marker cross member or the tops of buoys. Deterrent devices will be installed in accordance with the manufacturer’s recommendations. The Vendor may be required to purchase bird deterrent devices of a specific type for a project, and FWC will compensate the Vendor on a cost-reimbursement basis upon submission of the actual invoice. The Vendor is responsible to provide any adhesive or other fasteners, as applicable, and provide all other materials and equipment needed for construction and/or installation of bird deterrent devices.

- **TAPE APPLICATION**

When specified in the work plan, tape application includes applying corrective tape to correct sign panel messages, permits or rule numbers. Tape will be provided to the Vendor by FWC. Prior to applying tape, sign panels will be thoroughly cleaned before applying tape. Tape will be applied so that it matches orientation of sign panel message and is not to be applied in such a manner that it obstructs other verbiage or symbols on the sign panel.

- **ANNUAL/BI-ANNUAL INSPECTION**

Work Plans may include a request for the Vendor to establish an inspection schedule for each marker owned and/or managed by FWC within a given geographic area. This may include any or all markers under management of FWC, such as private aids to navigation, piles, sign panels and buoys. “Inspection” includes a thorough check of all marker hardware (assessing for wear, checking the buoy connection to the down line or chain, and replacing hardware, as needed) and performing basic maintenance according to the specifications identified in the Work Plan. The Vendor shall complete and submit Marker Records which identify the results of the inspection and all work performed to help FWC determine future needs for marker replacement.



- **CLEANING OF MARKERS**

Markers which are soiled with fecal matter, marine residue, marine growth, mold, mud, other matter or graffiti will be cleaned as requested in the Work Plan. The Vendor may use a high pressure washer and/or appropriate cleaning compounds. The Vendor shall use methods that will not damage reflective sign panels, tape, fasteners, piles, or other marker elements. Any chemicals, soaps, or other materials must be free of phosphates, ammonia, sodium hypochlorite, chlorinated solvents, petroleum distillates, or lye. Cleaners must also be biodegradable and must be safe for the marine environment in accordance with state regulations. The materials used shall not be abrasive or in any way damage, mar, or reduce the reflectivity of the marker. The Vendor will document, in the Marker Records, the cleaning compound(s) used and the manufacturer's certification demonstrating conformance with the requirements of this specification.

When soiling persists following washing and rinsing, the Vendor shall repeat the cleaning process. If pressure washing systems are used, the Vendor shall protect reflective coverings and other elements which could be damaged or become dislodged during cleaning. If a subsequent cleaning process fails to remove soiling, the Vendor shall note this along with the cleaning equipment and methods used in the Marker Records so an assessment can be made as to potential marker replacement. Any damage caused by cleaning methods employed by the Vendor shall be repaired at no cost to FWC.

- **LANTERNS**

The Vendor may be assigned to install, replace, maintain, inspect or repair solar flashing beacons used on aids to navigation owned and/or managed by FWC. The lanterns will be provided by FWC and will be fully integrated, self-contained, waterproof solar LED marine lantern and battery systems appropriate for application in the particular project. This work includes ensuring that each lantern is set to the appropriate flash pattern as directed by FWC.

- **FLOOD ZONE MARKERS**

There are a limited number of waterway markers owned by FWC which post regulated areas during flood stage. These markers may incorporate a solar powered flashing beacon assembly and an electronic switch. The Vendor may be tasked with installation, maintenance or repair of these markers, which often use longer piles to accommodate flood stage water levels. Any required replacement light assemblies and switches will either be provided by FWC or the Vendor may be asked to purchase the light assemblies and switches of a specific type for a project. In this scenario, FWC will compensate the Vendor on a cost reimbursement basis upon submission of the original invoice.

GENERAL REQUIREMENTS

- **DISPOSAL OF REMOVED ITEMS**

All items removed must be properly disposed of in compliance with all federal, state and local laws and ordinances, and the items and method of disposal will be identified in the Marker Records.



- **PRE-CONSTRUCTION/SCHEDULING MEETING**

The Vendor and FWC will coordinate to conduct a pre-construction meeting to establish a working understanding among the parties as to lines of communication, the construction plan, state/federal permit conditions, work schedules, environmental conditions, equipment, specifications, procedures for potential additional work, procedures for processing invoices and marker records. The Vendor may be requested to bring a detailed construction schedule, with start and end dates, to the meeting.

- **ADDITIONAL WORK**

While the Vendor is engaged in work associated with a Work Plan, FWC may require additional installation projects, needed repairs, and/or disposals within the same geographic area. Any additional work shall only take place once a quote from the Vendor has been received in writing and approved by FWC Project Manager. Only additional installations, repairs, and/or disposals requested by the FWC will be authorized for payment. Any modifications or deviations from the original Work Plan, including when the Vendor discovers in the field that work not specified in the Work Plan is required, must be brought to the attention of the Project Manager, or designated agent, as soon as possible for pre-approval by FWC prior to work being performed.

- **DELIVERY, STORAGE AND HANDLING OF MATERIALS**

The Vendor shall contact FWC to coordinate shipping and delivery of sign panels and/or buoys and any other identified equipment being provided by FWC as specified in the Work Plan. The items will typically be shipped directly to the Vendor or to an agreed-upon alternative site for that particular project. FWC will provide the Vendor with a detailed list and description of all items to be shipped, and the Vendor will inspect the items to ensure they are accurate and received in good condition. The Vendor will notify FWC of any problems in writing within five (5) business days of receipt. Once received and verified to be in good condition, the Vendor will be responsible for transporting markers and all necessary equipment to project/work site. The Vendor is responsible for locating and securing a staging area (if necessary) to store and protect materials in preparation for and during construction activities. The Vendor is also responsible for the purchase, delivery, storage, and handling of piles and other materials necessary to complete the project which are not provided by FWC.

- **MARKER LOCATIONS**

For the installation of new waterway markers (piles and buoys), the Vendor will locate positions using a Wide Area Augmentation System (WAAS) enabled digital global positioning system (DGPS) referenced to World Geodetic System 1984 (WGS84) map datum. The actual position of installed markers shall be within two (2) meters (6 feet) of the location designated by FWC on the maps and/or marker plan. Any discrepancies between the coordinates of the marker location provided on the marker plan and/or the maps shall be reported to FWC prior to installation. Extra caution should be exercised in the event markers are required to be installed close to or within the Intracoastal Waterway (ICW) right-of-way. FWC should be contacted if concerns arise about potential obstructions to navigation.

- **MOBILIZATION AND DEMOBILIZATION**

The Vendor will occupy the work site(s) with all equipment, personnel and supplies and prepare appropriate staging area(s) for material stockpiling and access to the work site(s). The Vendor will



complete all assigned work under this contract and remove all of its equipment, supplies, and other materials involved in this project from the work site(s) once project is complete.

- **SUPPORT FOR FWC'S REPRESENTATIVE**

The Vendor will allow FWC representative(s) or designee(s) on its work vessel or other work platform at each project area/work site to observe work or conduct inspections, as needed.

- **UTILITIES**

The Vendor shall perform all work necessary to coordinate the location, disconnection, relocation, and/or protection, as needed, of all existing underground, aboveground, and overhead utilities within the areas covered by a Work Plan prior to commencement of work. All expenses incurred for the coordination with utility companies and agencies shall be at no cost to FWC. The Vendor must contact Sunshine One Call of Florida, Inc.(1-800-432-4770) prior to the commencement of construction on all new or relocated waterway markers.

- **PERMITTING**

FWC will be responsible for obtaining any local, state and federal permits required for a Work Plan. The Vendor will be provided copies of any permits and conditions prior to commencement of construction activities. The Vendor must keep copies of all permits a work site.

- **MARKER RECORDS**

Utilizing the Work Plan, the Vendor will collect additional information relative to the marker installation and/or removal, inspection and any maintenance information at the time the work is done. The additional marker information collected includes, at a minimum, the following: date, type of anchor and down line system, method of pile installation, depth of pile penetration, water depth, current tide, substrate, problems encountered, modifications in the work plan and any other details relative to the marker work performed. The Vendor shall submit to FWC this additional information collected for each marker within 30 business days of the project completion. The Vendor will provide all required manufacturer's specifications and warranty information with the submittal of the marker records. The Vendor must provide FWC with coordinates in degree and decimal minutes (example: N30° 07.980', W81° 27.675') for all markers installed, repaired, inspected or maintained. The Vendor may be required to provide digital photographs of each marker and marker installation. The photographs must be clear, legible, and identified with the Work Plan marker reference number.

- **PRODUCT WARRANTIES**

The Vendor's warranty information shall be provided upon submission of the Marker Records. All materials utilized by the Vendor to complete each project shall be sold to the Commission with the Vendor's standard manufacturer's warranty and standard commercial parts warranty.

- **INSPECTION OF THE WORK**

FWC or its designated representative(s) shall, within ten (10) business days of completion of a Work Plan, conduct an on-site inspection of all work performed. Upon approval, the Vendor will submit an invoice for the entire project to FWC, unless arrangements are made for partial payments as agreed upon and approved by FWC prior to commencement of the project.



- **METHOD OF PAYMENT**

Payment will typically be a combination of lump fee schedule and cost-reimbursement for any given work. It is anticipated that services will be compensated on a fee schedule basis as specified in the Work Plan and in accordance with the rates supplied by the Vendor on their submitted price sheet.

- **ADHERENCE TO PERMIT CONDITIONS**

FWC will obtain permits from regulatory agencies for each Work Plan and provide copies of permits to the Vendor. The Vendor shall establish and maintain quality control for environmental protection as set forth in the permits. If any activities associated with a Work Plan cannot be performed without affecting environmental quality, work shall cease and the Project Manager, or designated agent, will be notified immediately by phone and email communication (no later than the morning of the following business day). Any actual or potential incident related to a failure to comply with laws, regulations and ordinances shall be reported to the Project Manager, or designated agent, and the corrective action taken shall be noted in the Marker Records

ENVIRONMENTAL PROTECTION

This section covers the prevention of environmental damage as a result of operations under this contract. For the purpose of this specification, environmental damage is defined as the presence of hazardous, physical, chemical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances; affect other species, biological communities, or ecosystems; or degrade the quality of the environment for aesthetic, cultural, and/or historic purposes. The control of environmental damage requires consideration of land, water, and air, and includes management of visual aesthetics, noise, solid waste, radiant energy and radioactive materials, as well as other pollutants.

- **PROTECTION OF WATER RESOURCES**

The Vendor shall keep construction activities under surveillance, management, and control to avoid pollution of surface water, ground water and wetlands. The Vendor shall plan his operation and perform all work necessary to minimize adverse impact or violation of the water quality standards. Special management techniques, as set forth below, shall be implemented to control water pollution by the listed construction activities covered under a Work Plan between FWC and the Vendor. The Vendor's construction methods shall protect wetland and surface water areas from damage due to mechanical grading, erosion, sedimentation and turbid discharges. There shall be no storage or stockpiling of equipment, tools, or materials within wetlands or along the shoreline within the littoral zone, unless specifically authorized.

- **MONITORING WATER AREAS**

The monitoring of water areas affected by construction activities shall be the responsibility of the Vendor.

- **TURBIDITY**

The Vendor shall conduct operations in a manner to minimize turbidity and shall conform to all water quality standards as prescribed by Chapter 62-302, Florida Administrative Code and the Florida Department of Environmental Protection (DEP).



- **PROTECTION OF FISH AND WILDLIFE**

The Vendor shall keep construction activities under surveillance, management, and control to minimize interference with, disturbance to, and damage of fish and wildlife. In the event that a threatened or endangered species is harmed as a result of construction activities, the Vendor shall cease all work and immediately notify the Project Manager, or designated agent, by phone and email communication. The Vendor shall instruct all personnel associated with the project of the potential presence of manatees and the need to avoid impacts to the natural resources (such as seagrass, coral).

1. **Civil and Criminal Penalties:** All construction personnel shall be advised that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act of 1972, the Endangered Species Act of 1973, and the Florida Manatee Sanctuary Act. The Vendor may be held responsible for any manatee harmed, harassed or killed as a result of construction activities.
2. **Standard Manatee Conditions for In-Water Work** can be found at:
http://www.myfwc.com/media/415448/Manatee_StdCondIn_waterWork.pdf
3. **Manatee Sighting Reports:** Report injured, dead, harassed or orphaned manatees to FWC by calling 1-888-404-FWCC (3922) or either *FWC or #FWC on a cellular phone. Any injury to a protected species shall be reported immediately to the National Marine Fisheries Service's Protected Resources Division (727-824-5312) and the local authorized sea turtle stranding/rescue organization.
4. All work must occur during daylight hours.

Noise Abatement:

5. All vessels associated with the construction project shall operate at "no wake/idle" speeds at all times while in the construction area and while in water depths where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will preferentially follow deep-water routes (e.g. marked channels) whenever possible.
6. If a protected species is seen within 100 yards of the active daily construction operation or vessel movement, all appropriate precautions shall be implemented to ensure its protection. These precautions shall include cessation of operation of any moving equipment closer than 50 feet of a protected species. Operation of any mechanical construction equipment shall cease immediately if a protected species is seen within a 50-foot radius of the equipment. Activities may not resume until the protected species has departed the project area of its own volition.