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ROADSIDE ENVIRONMENTAL UNIT

PLANTING

SEASONAL LIMITATIONS

The initial planting and replacement of plants shall be done from October 15 thru March 31. **See Standard Specifications Sections 1060 - Landscape Development Materials and 1670 - Planting.**

TREE PROTECTION FENCE

General: "Tree Protection Fence" consists of furnishing, installing, maintaining, and removing wood or steel post, wood slat fence or orange poly-barricade fence fabric and signs at locations shown on the plans and as directed by the Engineer in the field and in accordance with the special provisions included herein. Tree protection fence will be installed after the slope-stake line is staked and prior to all other work.

Materials: Use *wood posts* that are nominal 4" x 4" (102 mm x 102 mm), length as required, structural light framing, grade No. 2, Southern Pine or *steel posts* that are a minimum of 1 3/8" (35 mm) wide measured parallel to the fence, with a weight of 1.25 lb./ft. (1.9 kg/m) of length. Post must have a means for retaining wire in desired position without displacement. Use of steel posts will be required in any area where the tree protection fence is in close proximity to the tree's trunk or any major roots.

Use orange polyethylene or polypropylene prefabricated barricade type fence fabric that is a minimum of 48 inches (1220 mm) high and approved by the Engineer or wood slat prefabricated sand or snow fence that is a minimum of 48 inches (1220 mm) high and that conforms to the following requirements. The fabric will be constructed of wood slats and twisted wire cables. Vertical slats will be 3/8" to 3/4" (10 to 20 mm) thick and from 1 1/4" to 2" (32 to 51 mm) wide and shall comprise 33% to 50% of the surface area. Slats will be connected by means of a two line twisted cable for each foot of fabric height or fraction thereof. The twisted cable will be a minimum of 13 gauge (2.32 mm) galvanized wire.

Treat wood posts and wood slat fence fabric with a preservative in accordance with Section 1082-3 of the Standard Specifications.

Use a durable, weatherproof lightweight material to fabricate 'Tree Protection Area' signs. Signs will be a minimum of five square feet (0.46 square meter) and lettering will be a minimum of two inches (51 mm) tall and text will be clearly legible. Each sign will contain the following wording

Installation: Erect fence to conform to the general contour of the ground. Do not remove existing plant material or perform any grading unless indicated on the plans or directed by the

Engineer. Avoid soil compaction within tree protection area; do not use heavy equipment and stay outside the perimeter of the tree protection area where possible.

Install posts and maintain in a vertical position. Post may be hand set or set with a post driver. If hand set tamp backfill material thoroughly. Power driven wood posts may be sharpened to a dull point. Remove and replace posts damaged by power driving prior to final acceptance. At the direction of the Engineer use steel post instead of wood post when installing fence in close proximity to a tree's trunk or any major roots.

Stretch orange poly-barricade fence fabric or wood slat fence fabric taut and attach to post with appropriate means according to post type used. In sections where signs will be located, if orange poly-barricade fence fabric is used reinforce top of fabric by weaving a 12 gauge (2.68 mm) galvanized wire in the fabric and firmly attach to a post at each end of the section. Attach signs to fence fabric at all four corners using appropriate method for fence fabric and sign material that is chosen. Locate signs every one hundred feet, at all corners, changes in direction and as directed by the Engineer.

Maintenance: Maintain tree protection fence with required signs in good condition, fully upright with no loose attachments or missing links for the duration of the project. Signs must be visible and legible throughout the duration of the contract. ***The Engineer must approve in writing, prior to entering the tree protection area, access for the contractor and subcontractor for anything other than routine vegetation maintenance and liter pick-up.*** Approval must be made for each access occurrence.

Removal: As a last item of work after rest area construction and all related work is complete, and at the direction of the Engineer, remove the tree protection fence, backfill post holes and remove, and properly dispose of fence materials off the construction site. While performing this work do not use heavy equipment and stay on the outside perimeter of the tree protection area where possible to avoid soil compaction within root zone.

Method of Measurement: Tree protection fence to be paid for will be the actual number of linear feet (meter) installed in place and accepted.

Basis of Payment: The quantity of tree protection fence will be paid for at the contract unit price per linear foot (meter). Such payment will be full compensation for the work as described above, including but not limited to furnishing, installing, maintaining and removing the tree protection fence and signs.

Payment will be made under:

Tree Protection Fence.....LF

MULCH FOR PLANTING

Mulch for planting shall consist of pine bark mini-nuggets. All mulch and the work associated in placing the mulch during planting shall conform to article 1060-11 of the Standard Specifications.

Mulch for Planting: Mulch will be double shredded hardwood bark from a single source unless otherwise approved by the Engineer. **Submit sample for approval prior to placement.** Install mulch to a finished depth of 4 inches, rake and compact to create a uniform finish.

Measurement and Payment will be made under:

Standard Specifications for Roads and Structures.....Sec.1670-17

WATER FOR PLANTING

Water for Planting: Water for Planting will be applied in accordance with the standard specifications. Water for Planting will be furnished as described herein. It is anticipated that installation of the landscape planting and sod, and therefore watering of plant materials and sod, will occur after the site water system has been installed, connected and is functional. Consequently the water for this project will be provided to the contractor through the on site water system. Should a problem occur with the on site water system the contractor will be required to furnish water from an alternative source with no additional compensation to the contractor. All applicable sections of Section 1060, 'Landscape Development Materials' and Section 1670, 'Planting' of the Standard Specifications will apply.

Measurement anPayment will be made under:

Standard Specifications for Roads and Structures.....Sec.1670-17

TOPSOIL

General: The work covered by this provision shall consist of furnishing and placing topsoil (approximately 4 inches) within the rest area sites for filling or raising areas within seeding and mulching areas and adjacent to sidewalk locations to provide proper surface drainage; backfilling around buildings, sidewalks, picnicking facilities, etc., to bring to proposed finish grades as indicated on the plans and as directed by the Engineer.

a. Material

Topsoil shall consist of a sandy loam, silt loam or clay loam which contains a reasonable amount of humus material. Topsoil shall be of good texture, loose and friable and shall be representative of topsoils in the general vicinity. It shall be reasonably free from sod, hard lumps, subsoil, large roots, rocks and gravel, noxious weed seeds and/or toxic substitutes or other material which would be harmful to plant growth. All topsoil shall be approved by the Engineer when delivered to the job site, whether or not the source of topsoil has been previously approved.

b. Construction

The Contractor shall cut and satisfactorily dispose of weeds or other unacceptable vegetative growth to receive topsoil The existing soil shall then be loosened by scarifying, harrowing, or discing to a depth of five inches; however, care shall be exercised by the Contractor to minimize disturbance of roots of trees and to prevent disturbance of existing water, sewer and electrical utilities which are to remain. Topsoil shall then be placed an spread evenly to the required depth which, after settlement, shall constitute finish grade. Topsoil shall not be placed when the ground is frozen, is excessively wet, nor is in a condition that the soil cannot be worked easily and dressed smoothly.

c. Method of Measurement and Basis of Payment

The quantity of topsoil to be paid for will be the actual number of cubic yards of topsoil which has been placed as specified herein and accepted. The topsoil used on this project will be measured for payment by pit measurement as provided in Subarticle 230-5(B) or by truck measurement as provided by Subarticle 230-5(c), as directed by the Engineer.

The quantity of topsoil, measured as provided for above, will be paid for at the contract unit price per cubic yard "Topsoil". Such price and REST AREA SITE WORK payment will be full compensation or furnishing, placing, all labor, equipment and all incidentals necessary to complete the work satisfactorily.

Payment will be made under:

Topsoil . . . . . Cu. Yd.

LANDSCAPE GRADING

General: Landscape grading consist of fine grading within the rest area site to bring to proposed grades and provide proper drainage, backfilling around buildings, sidewalks, etc. and placement of topsoil within seeding and planting beds as indicated on the grading plans, site plan and as directed by the Engineer.

It is the intent of the Department to utilize the existing topsoil contained within the project limits, if approved, as the final soil layer distributed in the planting areas on this project. The contractor will strip, stockpile, transport, and distribute topsoil in accordance with the plans and specifications, and as directed by the Engineer.

Material: Topsoil will be as specified herein and will be utilized for all fill/backfill operations as directed by the Engineer.

If additional topsoil is needed beyond what can be obtained from the construction site, a sandy loam, silt loam or clay loam topsoil that contains a reasonable amount of humus material will be furnished. Topsoil will be of good texture, loose and friable and will be representative of topsoil in the general vicinity. It will be reasonably free from sod, hard lumps, subsoil, large roots, rocks and gravel, noxious weed seeds and/or toxic substances or other material, which would be harmful to plant growth. Remove stones and other foreign material 3" or larger in diameter.

Topsoil when delivered to the job site will be approved by the Engineer prior to placement, whether or not the source of topsoil has been previously approved.

Fill material to bring building site to finished grade will be as specified in the building specifications under earthwork.

Installation: Place building fill and compact as described in the building specifications. Place topsoil fill and spread evenly to a depth of 18 inches or as directed by the Engineer, which after settlement, constitutes finish grade. Do not place topsoil when the ground is frozen, is excessively wet, or is in a condition that the soil cannot be worked easily and dressed smoothly. Compact fill material under sidewalks/concrete paving to a density equal to or greater than undisturbed soil in the area.

Where fill material is needed within wooded areas, precautionary measures will be taken to prevent damage to trees and the roots of trees to be retained for landscape purposes. When placing or compacting fill material in or adjacent to wooded areas heavy machinery will not be allowed. Equipment for placing fill material will be approved by the Engineer prior to any

grading work.

Compensation: 'Landscape Grading' will be paid for at the contract lump sum price for the work detailed in this section that has been successfully accomplished and accepted. **Building fill will be included as part of the building lump sum payment.** 'Topsoil' will be paid for in the actual number of cubic yards of topsoil placed and accepted. Topsoil will be measured by truck measurement. Each truck will be measured and will have a legible identification mark indicating its capacity. Load each truck to at least its measured capacity at the time it arrives at the point of delivery. The recorded capacity will be adjusted by making a 25 percent deduction to allow for shrinkage, and the adjusted capacity will be the quantity to be paid for. Topsoil stripped, stockpiled and distributed from the rest area site will not qualify for compensation, only topsoil furnished from offsite sources will be compensated.

Such price and payment will be full compensation for furnishing, all labor, equipment and all incidentals necessary to complete the work satisfactorily.

Payment will be made under:

Landscape Grading ..... LS

ESTABLISHMENT PERIOD FOR PLANTING

Establishment Period for Planting: An establishment period will begin after satisfactory installation and acceptance of all of the planting and *will apply only to the woody plant materials: trees, shrubs and ground covers.* All plants must be in an upright healthy condition, planted at the proper depth, mulched areas will be weed free and tidy and any staking or guying that is utilized must be in proper condition prior to beginning the establishment period. During the establishment period the contractor will be responsible for proper care of the plantings in accordance with Section 1670-14 Establishment.

All plants that do not continue to conform to the specifications and quality as approved when they were installed will be unacceptable. The contractor will remove all plants that are determined to be unacceptable from the site within five days of request by the Engineer. Replacements will be installed within the Seasonal Limitations.

Each month during the establishment period a meeting will be held between the Engineer and the Contractor to discuss establishment work required during that period. Additional meetings may be scheduled if deemed necessary by the Engineer. All the required work will be performed in a timely manner and with utmost regard to the safety and convenience of the rest area users. Failure on the part of the contractor to complete the required work in a satisfactory manner will result in the Department having the work performed by others and paid for by the Performance

Bond.

All requirements of Section 1670-14 Establishment will also be applicable during the Establishment Period for Planting. The Establishment Period for Planting will last a minimum of twelve months and extend into the seasonal limitations for planting in order to allow replacement plantings to be installed. See contract times for exact time period and dates.

PICNIC TABLE, TERRAZZO & STEEL

General: The work covered by this section consists of furnishing and constructing as shown on the drawings and herein specified, picnic tables on concrete slabs including all labor, materials, services and incidentals required to complete the work.

Picnic Table (Terrazzo and Steel):

General: Picnic tables shall consist of furnishing and installing tables on concrete slabs, in accordance with the sizes, dimensions and details shown on the plans and as described herein.

A picnic table shall include table site preparation, grading, concrete footing and concrete floor slab, a welded tubular steel frame with a terrazzo table top and aluminum seats for benches, all hardware required for assembly and other incidentals as necessary for a complete installation in accordance with detail drawings.

The Engineer reserves the right to inspect the frames and tops at the place of manufacture in accordance with Article 106-6 of the Standard Specifications.

The locations of all tables are tentatively shown on the site plan; however, exact locations, elevation, orientation, etc., will be determined on the site by the Engineer.

Submittal: Submit color chart (four copies) on epoxy glaze coatings for color selection by the Engineer for table bench seats and steel frames.

Materials and Construction

Table Site Preparation: After table sites are located and staked by the Engineer, the Contractor shall perform necessary clearing and grubbing in accordance with Section 200 "Clearing and Grubbing" of the Standard Specifications.

Grading: Picnic table concrete slab sub grade shall be graded level with drainage swale cut on high side and filling on low side as shown on detail drawings. Additional embankment material, borrow excavation, if required for raising table elevation and backfilling, topsoil, around concrete slab are covered elsewhere in proposal.

Concrete and Steel: Class "B" concrete shall be used in all table footings and floor slabs. All concrete and all structural and reinforcing steel shall comply with applicable portions of Section 825 and 1000 "Incidental Concrete Construction - General"; Section 1070 "Reinforcing Steel"; and Section 1072 "Structural Steel"; of the Standard Specifications.

Benches: Aluminum seats for picnic tables shall be nominal size 2" x 10", aluminum.

Terrazzo Tops: Terrazzo tabletops shall conform to the following specifications:

1. Scope. Provide pre-cast terrazzo tops for picnic tables. Include inserts and bolts as indicated on drawings.

2. Materials.

   A. Portland Cement. Portland Cement shall comply with all applicable requirements of Section 1024, "Materials for Portland Cement Concrete," of the Standard Specifications.

   B. Sand. Sand shall be clean and free from organic matter and shall meet the requirements of 4S mortar sand, from Table 1005-1, "Aggregate Gradation," of the Standard Specifications.

   C. Marble Chips. Of size, colors and kinds required by the color plate as specified herein; chips to have abrasive hardness not less than 13 as determined by method described in National Bureau of Standard BMS Report No. 98.

   D. Terrazzo Sealing Solution. Shall produce a waterproof film on surface; seal moisture in terrazzo and shall not be damaged by cleaning solution; shall not yellow terrazzo or leave tacky finish on surface after buffing.

   E. Terrazzo Cleaning Solution. A neutral chemical cleaner that will not change color of terrazzo or damage it in any way.

3. Terrazzo Composition and Colors.

   A. Terrazzo tops shall be of colors and composition as shown in Terrazzo Plant Catalog of the National Terrazzo and Mosaic Association, Inc. Mix terrazzo in accordance with formulas and specifications for Plate 129.

4. Production of Tops.

   A. Mix chips so that the finish surface has 80 percent aggregate showing.

   B. Perform initial and final grinding with abrasive grit stone of proper size to obtain

the finish specified. After curing terrazzo topping, by keeping damp for 6 days (or less if it has set enough to grind without loosening of chips), grind surfaces with electric machine. After initial grinding or rubbing, grout surfaces with neat Portland Cement paste of creamy consistency, filling all voids; use Portland Cement and coloring corresponding to existing topping for grouting. Let grout remain on surfaces until final grinding, but not less than 2 days.

C. Final grinding shall produce surface of same color and texture as Plate 129 as specified in Item 3 above. Surfaces shall be smooth and free from imperfections. In no case shall terrazzo show a wave exceeding 1/16" when tested with straight edge.

5. Cleaning and Sealing Terrazzo.

A. After final grinding, apply cleaning solution to terrazzo in accordance with the manufacturer's directions. After surfaces are dry, wash and rinse terrazzo and apply a coat of sealing solution. Buff terrazzo with electric machine and leave in clean finished condition.

6. Installation of Table Tops.

A. Bolt in place, without binding.

B. Clean tops of grease, dirt, etc., and apply two (2) additional coats of sealing solution, buff with electric machine and leave in clean finished condition.

C. Leave top in good condition. No chipped tops or edges and cracked slabs will be accepted.

7. Painting of Table, Steel Frame.
Exterior Steel.

1 coat factory priming exterior rust resistant metal primer.
2 coats of epoxy glaze coating, gloss finish.

NOTE: Painter shall spot check a small area with a second coat to determine if primer "lifts off". If it does, obtain from the paint factory a second coater that will not lift from the priming coat actually used by the factory.

Compensation

The work of furnishing and installing picnic tables, when completed and accepted, will be paid for at the contract unit price for each "Picnic Table, Terrazzo and Steel", such unit price to be considered full payment for each table, including but not limited to, all labor, materials, and any other incidentals necessary or required to complete the work.

Payment will be made under:

Picnic Table, Terrazzo and Steel ..... EA

PICNIC SHELTERS, SINGLE PICNIC TABLE

General: The work covered by this section consists of furnishing and constructing as shown on the drawings and herein specified, picnic shelters complete with single picnic table including all labor, materials, services and incidentals required to complete the work.

Picnic tables shall be as described under "Picnic Tables, Terrazzo and Steel".

Concrete and Steel: Class "B" concrete shall be used in all footings and floor slabs. All concrete and all structural and reinforcing steel shall comply with applicable portions of Section 825 "Incidental Concrete Construction - General"; Section 1070 "Reinforcing Steel"; and Section 1072 "Structural Steel" of the Standard Specifications.

Include all fasteners, anchors, ties, gusset plates, etc., as required. Thru bolts shall be 1/2 inches in diameter, length as required, hot-dip galvanized steel. Install with steel galvanized washers under both bolt head and nut, except for gusset plates; galvanizing shall conform with applicable requirements of Section 1076 of the Standard Specifications.

Carpentry and Millwork: See drawings and details for location and quantity of both rough and finish carpentry.

Grading of all lumber, plywood and trim shall conform to the association under whose rules it is graded. Moisture content shall not exceed 18 percent for framing lumber and 12 percent for millwork and trim.

All lumber in contact with concrete or masonry, and/or soil shall be treated with water borne pentachlorophenol or CCA (Chromated Copper Arsenate) in accordance with standards of the American Wood Preserver's Association. Minimum retention shall be 0.25 pcf for material 2 inches and smaller and 0.40 pcf for materials greater than 2 inches.

All lumber and millwork shall be stored in a manner that will keep it dry and well ventilated, well off the ground, and adequately covered.

Carpentry and millwork materials shall be as follows:

All timbers, rafters and fascia shall be full size, rough- cut No. 1 southern yellow pine, thru-bolted where shown on drawings and securely spiked together at all other joints. Stain all timbers, rafters, fascia and underside of roof decking. The Engineer from samples furnished by the contractor will select color.

Coat section of treated wood columns in footing with asphalt paint as shown on drawings.

Roof decking shall be single tongue and groove, 2 inches by 6 inches with vee joints on face side, kiln-dried No. 1 southern yellow pine. Double spike each member at every rafter.

Installation: Framing rafters and fascia shall be cut square on bearings, closely fitted, accurately set to required lines and levels, and rigidly secured in place.

Moisture Protection:

1. Roofing and Related Items. See drawings and details for quantities, etc.

2. Roofing Felt. 15# asphalt-saturated felt conforming to ASTM D-226.

3. Metal Roofing shall be the same brand, color, and type as those approved for the rest area service building.

   Lay one layer of 15# roofing felt to sheathing, lapping horizontally 6 inches, prior to placing metal roof (or as recommended by the engineer)

   Furnish and install, where shown on drawings, all items of flashing and caulking as required to properly and completely weatherproof the building. Flashing, drips, etc., shall be galvanized steel, 26 ga. or aluminum, .019-inch sheeting, unless otherwise shown on drawings. Caulking shall be installed in accordance with manufacturer's specifications. Use Dap "Flex seal", Dow Corning "790", or Pecora GC-9 "Synthacalk", or approved equal.

Compensation

The work of furnishing and installing picnic shelters with tables, when completed and accepted, will be paid for at the contract unit price for each "Picnic Shelter, Single Picnic Table", such unit price to be considered full payment for each individual shelter with table, including but not limited to, all labor, materials, and any other incidentals necessary or required to complete the work.

Payment will be made under:

Picnic Shelter, Single Picnic Table . . . . . EA

CONCRETE PATIO TABLE

General: The work covered by this section consists of furnishing and Installing as shown on the drawings and herein specified, Round pre-cast concrete /terrazzo picnic table on concrete sidewalk in the plaza area at the Northbound Site . including all labor, materials, services and incidentals required to complete the work. (Provide model TF3125 by Wausau Tile or equal)

Compensation
The work of furnishing and installing "Concrete Patio Tables", when completed and accepted, will be paid for at the contract unit price for Each , such unit price to be considered full payment for each individual table, including but not limited to, all labor, materials, and any other incidentals necessary or required to complete the work.

Basis of Payment

Concrete Patio Table . . . . . EA

WASTE CONTAINER

General: Waste container shall be furnished and installed on 4"- 5'x5'concrete pad in accordance with detail plans and shall be located as shown on the plans or as directed by the Engineer.
Waste container unit shall be the product of a manufacturer regularly engaged in the design and manufacture of precast exposed aggregate waste containers. (See Waste Container Detail Plan Sheet for size, design, material, etc.) Finish color shall be "Blue-gray" hood and "Blue-gray" body. Provide model TF30(A-2-color) by Wausau Tile Submit six (6) copies of shop drawings or submittal data to Engineer for approval.

Method of Measurement

The quantity of waste container units to be paid for shall be the actual number of Waste Container units with foundation slabs, complete in place and accepted

Basis of Payment

Waste container, measured as provided above, shall be paid for at the contract unit price each for each "Waste Container (Precast conc.)". Such price and payment will be full compensation for the work of furnishing and installing the waste container, including but not limited to, furnishing all labor, materials, tools, equipment and all incidentals necessary to complete the work.

Payment will be made under:

Waste Container (Precast conc.). . . . . EA

3/4 INCH POST-TYPE YARD HYDRANT

General: The work covered by this item shall consist of furnishing, connecting and installing 3/4 inch post-type yard hydrants complete with 4" x 5'x 5' concrete pad, valve(s), and waste drainage to catch basin as shown on the plans and as specified herein.

The Contractor shall supply six (6) copies of shop drawings and specifications for the post-type yard hydrant proposed to furnish, for approval by the Engineer.

Materials and Construction

Post-type yard hydrants shall be a non-freeze proof design for a minimum burial depth of 30 inches. (Note: Each hydrant shall have a screw on vacuum break at the nozzle).

Gate valve, valve box, and pipe shall be provided to complete the installation of yard hydrant.

The locations for post-type yard hydrants as shown on the plans are substantially correct; however, the exact location will be established by the Engineer.

Details showing dimensions, mounting height, foundation slab, pipe sizes, waste drainage and other items are as shown on the plans.

Sterilizing and Flushing 3/4 Inch Post-Type Yard Hydrants

Sterilizing and flushing as specified for "Water Line Construction" shall be done as part of the work of completing 3/4 inch post type yard hydrants.

Method of Measurement

The quantity of post type yard hydrants to be paid for will be the actual number of 3/4 inch post type yard hydrants with 4"x5'x5' concrete pad ,Gate valve, valve box, and water supply pipe and waste drainage piping to catch basin ,complete in place and accepted.

Basis of Payment

3/4 inch Post-Type Yard Hydrants measured as provided above will be paid for at the contract unit price each for "3/4 Inch Post-Type Yard Hydrants", including but not limited to, furnishing all labor, materials, tools, equipment, and all other incidentals necessary to complete the work.

Payment will be made under:

3/4 Inch Post-Type Yard Hydrant . . . . . EA

BENCH WITH STONE BASE

General: The work covered by this item shall consist of furnishing and installing combination wood and stone masonry benches benches as shown on the plans and described herein.

Stone construction for bench base shall conform to all applicable requirements of section 830 of the Standard Specifications, pertaining to "Masonry Construction - General".

Stone shall be the same as specified for the building and retaining walls in this project. in bench seat assembly shall be recycled plastic(gray color) sized as shown on the plans.

All bolts, screws, washers, and channel shall be galvanized and conform to all applicable requirements of Section 1076 of the Standard Specifications. Touch-up all breaks in galvanizing, such as holes, end cuts, etc. with zinc rich paint prior to assembling bench.

Method of Measurements and Basis of Payment

Benches as described above and as shown on the plans shall be paid for at the contract unit price each for "Bench with Stone Base", complete in place and accepted. Such price shall be full compensation for all labor, materials, tools, equipment, and all other incidentals necessary to complete the work.

Payment will be made under:

Bench with Stone Base . . . . . EA

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LANDSCAPE STORM DRAINAGE

Scope: Applicable parts of the supplementary General Conditions and the Standard Specifications govern work under this division, which includes all labor, materials, equipment and services necessary for the proper completion of storm drainage, and related work indicated on the drawings or in the specifications in general as follows:

- Storm drainage system from building downspouts to Cistern Tank as shown on Adapters at each building downspout.
- Drain lines from yard hydrants and drinking fountains.
- Cleanouts in drain lines.
- Landscape drainage junction boxes.

Materials:

a. Masonry and concrete material and application - See Divisions "Concrete" and "Masonry".

b. Pipe: For storm drainage pipe from building downspout adapters to catch basin, use PVC/ABS-DWV meeting requirements of ASTM D-2661, Schedule 40 with solvent cement for fittings complying ASTM D-2235, ASTM D-2665-87.

c. Building downspout to drain pipe adapter: Use metal downspout conversion unit to adapt from rectangular downspout to drain as shown on drawings. (Note: Adapters to be incidental to drainpipe installation).

d. Cleanouts: Cleanouts shall be of the proper shape, length and degree of bend to fit the conditions. Cleanouts shall be set at locations as indicated on the plans but not more than 50 feet apart. Cleanout plugs shall be minimum of 4", with finish elevation at proposed finish grades for lawns, cleanouts in sidewalks shall be brass stem and cap mounted flush with sidewalk.

Installation:

a. The trench (es) shall be excavated to a sufficient width to receive pipe and allow for tamping equipment and to the depth established by the Engineer.

b. Pipe sections and fittings shall be joined together in accordance with manufacturer's recommendations.

c. Where the pipe foundation material is found to be of poor supporting value or of rock the foundation shall be conditioned by removing the existing foundation material by undercutting one foot or to a depth as directed by the Engineer, and

backfilling with either a suitable local material or foundation condition material consisting of crushed stone or gravel or a combination of sand and crushed stone approved by the Engineer as being suitable for the purpose intended. The selection of the type of backfill to be used for foundation conditioning will be made by the Engineer.

d. After the pipe has been laid, the backfill material shall be carefully placed so that the pipe will not be disturbed by the backfilling operation. All earth backfill materials shall be approved by the Engineer and firmly tamped in 6 inch layers to a density equal to that of the surrounding undisturbed soil.

e. The drains shall be connected to existing or proposed drainage structures as shown on the plans or as directed by the Engineer.

f. The contractor shall maintain all drainage installations in a condition such that they will function continuously from the time the pipe is installed until the project is accepted.

Compensation:

Storm drainage installation will be paid for per linear foot listed below in the size shown below, installed to include all fittings, downspout, adapters, trench foundation material, and cleanouts as specified herein, shown on the plans and as directed by the Engineer.

Payment will be made under:

Drainage system from all building roof downspouts to Cistern Tank as shown on plans are considered part of the...lump sum price for.." Construction of Rest Area Building "

Yard inlet drains & piping to catch basins for around the buildings as shown on plans are considered part of the...lump sum price for.." Construction of Rest Area Building "

Yard Hydrant Drain piping (2" sch 80 pvc) to catch basins as shown on plans are considered part of the Pay Item ....."3/4" Post Type Yard Hydrant "

PVC ENCASEMENT PIPE

General: The work covered by this provision shall consist of furnishing and installing encasement pipe as shown on the plans, under drives and sidewalks before they are poured (open cut).

Material: The encasement or conduit shall be rigid SCH 80 PVC (Polyvinyl Chloride) heavy wall, U.L. approved for underground use without concrete encasement per U.L. 651 "Rigid Non-

Metallic Conduit or Encasement".

Installation: Excavate, place encasement pipe, and backfill so that encasement is in line with piping. Backfill shall be compacted to 95% where beneath walks, drives or other concrete pads.

Method of Measurement and Basis of Payment

Measurement and payment for PVC encasement pipe shall be at the contract unit price per linear foot for "3" PVC encasement" as installed, and will be full compensation for all work covered by this section.

Payment Will Be Made Under:

3" PVC Encasement Pipe.....LF

SITE WATER DISTRIBUTION SYSTEM

Description: The work covered by these provisions consists of constructing various utilities within the rest areas as required by the plans and provisions herein or directed by the Engineer. The Contractor shall furnish all materials, labor, equipment, and incidentals necessary to complete the proposed utility work.
General Construction Requirements

Specifications: The proposed utility construction shall meet the applicable requirements of the N. C. Department of Transportation's "Standard Specifications for Roads and Structures" dated July 2006 and the following provisions:

Plumbing Ordinances: All plumbing work in connection with the water distribution system installation shall be done in accordance with local and State ordinances, and shall be subject to inspection by the particular County Health Authorities or by authorities of the Sanitary Engineering Section, Division of Health Services, Department of Human Resources and/or authorities of the Water quality Section's, Division of Environmental Management, Department of Natural Resources and Community Development.

Trenches and Backfill for Utility Pipe Line Construction:

The utility excavations shall be made and the pipes shall be laid in accordance with Section 300 of the Standard Specifications and as specified herein.

Clearing and Grading: The Contractor shall limit his clearing to only that absolutely necessary to construct the water system (lines for distribution, etc.).

General: The Contractor shall furnish and install all material for the water distribution system

within the rest area as shown on the Site Development drawings and as specified herein, consisting of water lines, fittings, gate valves, stop and drain valves and valve boxes. Also included shall be water line tests, sterilization and flushing of the entire water system and all other items not specifically mentioned but necessary to complete the work.

Type of pipe material to use in the water line distribution system shall be PVC Schedule 40.

Polyvinyl Chloride Water Pipe: PVC water pipe shall be schedule 40 with a minimum of 200 psi pressure rating, and sized as shown on the plans. The pipe, when used for conveying drinking water, shall meet the requirements of the National Sanitation Foundation Seal of approval for potable water.

Gate Valves: Gate valves in the water system where shown on the plans shall be bronze, non-rising stem type, with body conforming to ASTM B62; stem shall be of best silicon brass and the threads conforming to ANSI B2.1.

Valve Boxes: Valve boxes shall be of cast iron, constructed to all applicable requirements of of the Standard Specifications. Valve box assembly shall be constructed in three sections: bottom, top, and cap. Top section of valve box assembly shall be adjustable for height and variances. Install valve box with cap flush with the proposed finished grade. Place three inches of crushed stone (No. 67 aggregate as specified in Section 905 of the Standard Specifications) under valve and bottom section as shown on the drawings. Valve box shall have precast concrete protection ring around lid permeter.

Construction

Piping shall consist of 3/4 inch thru 3 inch pipe which shall be installed as shown on the plans. Pipe fittings needed to complete the work and not individually noted herein shall be considered part of the work of 3/4 inch thru 3 inch pipe.

The limits of clearing for installing water lines shall be held to a maximum of 6 feet, except in critical areas where greater limits may be established by the Engineer. Trees and shrubs which are damaged shall be repaired and/or removed in accordance with applicable provisions of of the Standard Specifications.

All PVC pipe must be installed according to manufacturer's recommendations. Pipe shall be cut square, burrs removed from cut end, cleaned and dried. Apply cement to pipe and fitting with rapid and thorough coverage, assemble parts quickly, using 1/8 to 1/4 turning motion. Hold in place for two minutes to offset tendency to move out of fittings.

Pipe shall be laid in a snaking manner to allow for expansion and contraction, and in such a way to avoid bumps, boulders, and holes which might result in stress on the pipe.

Provide ductile iron fittings and concrete thrust blocks at all changes in piping direction.

If, at any time before completion of the contract, any broken pipe or any defects are found in the lines or in any of their fittings or appurtenances, they shall be replaced or corrected. All pipe, fittings and appurtenances shall be carefully examined for defects before placing and any found defective shall not be used.

The pipe trenches shall be conditioned by removing the existing foundation material by undercutting one foot or to a depth as directed by the Engineer, and backfilling with either a suitable local material or foundation condition material consisting of crushed stone or gravel or a combination of sand and crushed stone approved by the Engineer as being suitable for the purpose intended. The selection of the type of backfill to be used for foundation conditioning will be made by the Engineer. **(Note: Foundation material is 6" around pipe incidental to water line installation).**

Pipe shall not be laid upon a foundation into which frost has penetrated, or at any time, that in the opinion of the Engineer, there is danger of the formation of ice or frost at the bottom of the excavation. The Engineer may at his discretion allow construction of the pipe line to continue under freezing conditions provided the Contractor promptly backfills the trench as directed.

PVC pipe shall have its location marked by using a detectable marking tape, installed 18 to 24 inches below finished grade. Such tape shall be as approved by the Engineer.

The proposed pipe shall be laid in trenches not less than 36 inches in depth below the finished grade. After the installation of pipe has been tested, inspected, and approved by the Engineer, it shall be promptly backfilled and compacted to a density equal to that of the surrounding undisturbed soil.

The locations for water lines and valves with valve boxes, as shown on the plans, are substantially correct; however, the exact location will be established by the Engineer.

Water Line Test: Prior to backfilling the Contractor shall test all water lines in the water system for eight (8) hours under a water pressure of 150 PSIG. Leaks shall be repaired by tightening the joint or by remaking the joint if the tightening fails to stop the leak.

Sterilizing and Flushing Piping System:

All water piping shall be sterilized with chlorine concentration. All lines shall be filled with water and chlorine concentration so that an overall chlorine residual to the water of at least 100 ppm will result. During the filling all trapped air through yard hydrants, valves, etc., shall be released. After the lines have been filled with water and chlorine, the pipe system shall be valved off and the chlorinated water allowed to remain in the system for a 24-hour period. At the end of this period, the chlorine residual count should be at least 10 ppm. The lines shall then be thoroughly flushed to insure the removal of all sediment, pipe seals, etc. This process shall be

subject to inspection and/or supervision by the local Health Authorities.

Method of Measurement and Basis of Payment

The work of furnishing and installing 3/4-inch thru 1-inch water lines as described above when completed, tested, and accepted will be paid for at the contract unit price per linear foot measured in place. Gate valves and boxes shall be paid for at the contract unit price per each for "Gate Valve and Box" in the sizes shown below complete in place and accepted Payment will be made under:

3/4" PVC. Water Pipe, SCH 80 .....LF
1" PVC. Water Pipe, SCH 80 ..... LF
3/4" Gate Valve and Box ..... EA
1" Gate Valve and Box .....EA

PAYMENT FOR THE INSTALLATION OF WATER LINES FROM THE TOWN WATER METER TO SERVE EACH BUILDING (REST AREA /VISITOR/VENDING) SHALL BE INCLUDED IN THE "LUMP SUMP " COST FOR THE "REST AREA BUILDING CONSTRUCTION PAY ITEM. (see Architectural Specification Manual)

6" CONCRETE REINFORCED PAD - CLASS A CONCRETE

General: The work covered by this item shall consist of furnishing and constructing 6" concrete reinforced pad in accordance with the dimensions as shown in the drawings and as described herein.

6" Concrete reinforced pad construction shall conform to all applicable requirements of Section 848 (Sidewalks and Driveways) of the Standard Specifications.

6" concrete reinforced pad shall conform to all applicable requirements of Section 1070-3 (welded wire fabric) of the Standard Specifications and ASTM A-185.

Method of Measurement

The quantity of 6" concrete reinforced pad to be paid for shall be the actual number of square yards of 6" concrete reinforced pad, measured complete in place and accepted.

Basis of Payment

The quantity measures as provided above, shall be paid for at the contract unit price per square

yard for "6" Concrete Reinforced Pad" complete in place and accepted, which price and payment shall be full compensation for furnishing and installing, and for all labor, equipment, tools and incidentals necessary to complete the work.

Payment will be made under:

6" Concrete Reinforced Pad . . . . . SY

STORAGE BUILDING

General: This item of work shall consist of construction within the rest area site, one utility building as located on the plans. Construction will consist of site preparations, materials, equipment, labor, tools and miscellaneous accessories for a complete and functioning building in accordance with the provisions herein and as shown on the drawings.

Shop Drawings:

Where required, the Contractor shall submit to the Engineer shop drawings and catalog cuts required for the work. Shop drawings and catalog cuts shall be submitted in six (6) copies in such time as to cause no delay to the work. The Engineer will review the shop drawings, noting desired corrections, and return two (2) copies to the Contractor. Approval of shop drawings by the Engineer shall not be construed as relieving the Contractor from responsibility for compliance with terms or designs of the contract documents nor from responsibility for errors of any sort in the shop drawings, unless such lack of compliance or errors first have been called in writing to the attention of the Engineer by the Contractor.

Materials and Equipment:

All materials shall be new and of quality specified and approved for use. Workmanship shall at all times be of a grade accepted as a best practice of the particular trade involved, and as stipulated in written standards of recognized organizations or institutes of the prospective trades except as exceeded or qualified by the specifications.

The Contractor shall obtain written approval from the Engineer for the use of substitute materials claimed as equal to those specified. Such approvals must be obtained as soon after contract awards as possible and before materials are ordered. Applications for approvals shall be made by the Contractor and not by sub-contractors or material men.

Protection of Work:

No fires of any kind will be allowed inside or around the operations during the course of

construction without permission from the Engineer.

The Contractor shall protect all trees and shrubs designated on the plans or by the Engineer to remain within the construction limits for utility building. All trenches, excavations, or other hazards in the vicinity of the work shall be well barricaded and properly lighted at night as directed by the Engineer.

Codes and Standards:

Wherever reference is given to codes, or standard specifications, or other data published by regulating agencies or accepted organizations, including but not limited to National Electrical Codes, N. C. State Building Codes, Federal Specifications, ASTM Specifications, the North Carolina Occupations Safety and Health Standards for the Construction Industry, N. C. Department of Labor, various Institute Specifications, and the like, it shall be understood that such reference is to the latest edition including addenda published prior to the date of the contract documents.

Cleaning Up:

Before final acceptance of the building, the Contractor shall completely clean the building, including floor, hardware, fixtures, etc. and completely prepare the building for use by the Department of Transportation.

Guarantee and Warranties:

The Contractor shall furnish the Engineer prior to acceptance of the project all standard warranties and guarantees from the manufacturers on all material and equipment as specified herein or as directed by the Engineer.

A. SITE PREPARATION

Temporary Barrier Fence (if applicable): The Contractor shall construct prior to beginning construction a temporary barrier/protection fence around the construction site as directed by the Engineer. All work, material storage, etc., shall be within the fenced area.

Temporary fence may be constructed with 2 x 4 post or steel post 1 3/4" wide with projections for fastening wire. Fence fabric may be woven wire 39 inch high with #10 gauge top and bottom strand and #12 1/2 mesh; or 36 inch high 2 x 4 welded wire with #12 1/2 wire throughout, post length, bury depth and spacing as shown on plans. Fence opening for access will be at the Contractor's option; however the opening must be kept closed by the Contractor.
Clearing and Grubbing: After building is located and elevation established as shown on

plans by the Contractor and approved by the Engineer, the Contractor shall perform clearing, grubbing, stump removal and adding of approved fill material; excess materials are to be disposed of by the Contractor in an approved dump/landfill site, or as directed by the Engineer.

Excavation and Grading: Building site shall be rough graded by removing root mat, filling and compacting with approved embankment/borrow material to obtain building subgrade elevation. Embankment/borrow to be furnished by the Contractor.

The necessary excavating for footings/floor slab shall be done after placement and compaction of embankment. Excavating for footing shall extend down to solid ground with a minimum of 16 inches below proposed finished floor grade. All excavated material in excess of the amount required for finish grading (including all sod and root mat) shall be removed by the Contractor and disposed of by him at appropriate locations according to local regulations and county standards.

Construct finished grade around building beginning at a distance of 6 inches below finished floor. Slope grade away from building at 5 percent maximum and 2 percent minimum for a distance of 10 feet or as shown on drawings. (Coordinate with surrounding sidewalk construction, covered elsewhere in the provisions).

Soil Poisoning: Perform soil poisoning in accordance with applicable requirements of Section .0500 Wood-Destroying Insect, Chapter 34 Structural Pest Control of the N. C. Administrative Code. The work includes procurement of chemicals and their application so as to provide protection against wood destroying organisms.

Chemicals and concentrations used must be on approved list of the Division of Structural Pest Control, N. C. Department of Agriculture. Treatment shall be applied by a North Carolina licensed operator.

B. CONCRETE

Concrete and Steel: Class "A" concrete (3000 p.s.i. with slump not to exceed 4" for vibrated concrete) shall be used in footings and floor slab.

The concrete slab floor shall be 6 inches thick, reinforced with 6 inches by 6 inches, 10/10 welded wire mesh. Subgrade shall consist of undisturbed soil or a thoroughly compacted earth fill, well-drained and leveled to proper grade. A 4-inch layer of coarse gravel or crushed stone shall be placed over subgrades, screened to a true and level surface and thoroughly tamped. Vapor barrier, consisting of 6 mil. polyethylene membrane shall be placed after tamping.

Concrete floor slab shall be poured to proper grade and leveled with a straight edge. After floating, the concrete shall be brought to a lightly brushed finish.

C. CARPENTRY AND MILLWORK

See drawings and details for location and quantity of both rough and finish carpentry.

Grading of all lumber, plywood and trim shall conform to the association under whose rules it is graded. Moisture content shall not exceed 18 percent for framing lumber and 12 percent for millwork and trim.

All lumber in contact with concrete or masonry, and/or soil shall be treated with water borne pentachlorophenol or CCA (Chromated Copper Arsenate) in accordance with standards of the American Wood Preserver's Association. Minimum retention shall be 0.20 pcf for material 2 inches and smaller and 0.40 pcf for materials greater than 2 inches.

All lumber and millwork shall be stored in a manner that will keep it dry and well-ventilated, well off the ground, and adequately covered.

Framing and Members: No. 2 North Carolina Pine, Spruce Fir or better, sized four sides.

Roof Sheathing: 5/8-inch thick, Grade C-D Plywood, with exterior glue, identified with DFPA grade trademark of the American Plywood Association.

Exterior Siding: To be the same as specified for the main service building.

Door Frames: 16 gauge Pre-hung metal door frames.

Exterior and Interior Trim: Western Red Cedar, standard or better grade under WCLA rules. Furnish and install as shown on drawings.

Wall Sheathing: 1/2-inch fiberboard 4 feet by 8 feet sheets, treated to prevent absorption and decay.

Soffits: 3/8-inch exterior grade fir plywood, rough sawn texture without grooves (T1-11). Finish to be same as main rest area service building exterior.

Interior Wall and Ceiling and Porch Ceiling Finish: 3/8-inch exterior grade fir plywood, rough sawn texture without grooves (T1-11). Finish to be same as main rest area service building exterior.

Doors: Commercial grade 1-3/4" insulated steel, pre-hung doors. Steel panels, front and back to be minimum 18 gauge, steel. Furnish flush type for double doors; install doors in a workmanlike manner. (Doors to include thresholds - 1/2" maximum height).

Metal doors and frames shall be painted as follows:

First Coat - Metal Primer
Second Coat - Alkyd Exterior Satin Finish (To match Main Rest Area Service Building)
Third Coat - Alkyd Exterior Satin Finish (To match Main Rest Area Service Building)

(Note: Inside of doors to be painted same as outside color).

Garage Door: Commercial grade insulated and finished aluminum garage door with lock and factory baked on enamel finish.

Rough Hardware: Provide and install all rough hardware, metal fasteners, nails, bolts, etc., in sufficient sizes and quantities to rigidly secure members in place.

Fastening, nailing, and stapling requirements shall conform to Table 1704 and 1705, Fastening Schedule, North Carolina State Building Code, latest edition.

Installation: Framing shall be cut square on bearings, closely fitted, accurately set to required lines and levels, and rigidly secured in place. Wood blocking is to be provided of the size and shape required for securing trim. Set blocking true to line, level or plumb, well secured in place and in accordance with all applicable provisions of the North Carolina State Building Code, latest edition.

Roof sheathing shall be installed with face grain across supports. Space panels 1/16 inch apart. All joints shall be made over wood bearing surfaces with joints staggered. Nail at 6 inches o.c. along panel edges and 12 inches o.c. at intermediate supports.

Building Insulation: Insulation shall be Kraft-faced blanket-type fiberglass, with R-value of 19 in ceiling and R-11 in walls. Install flat against framing members, Kraft face inside without buckles or wrinkles. Staple in place, 6 inches on center.

Finish: Paint all exterior siding, trim and soffits: first coat, oil base primer and two (2) finish coats of exterior latex acrylic paint. (Color to match the proposed main service building as approved by the Engineer). (Paint to be applied by brush or roller only).

Paint all interior walls, shelves cornices, bases and ceilings: First coat, oil based primer and two (2) finish coats of exterior latex acrylic paint. Color to be off white. (Paint to be applied by brush or roller only).

D. MOISTURE PROTECTION

Roofing Felt: 15# asphalt-saturated felt conforming to ASTM D-226.

Metal Roof: shall be the same brand, color, and type as approved for the main rest area service building.

Lay one layer of 15# roofing felt to sheathing, lapping horizontally 6 inches, prior to placing metal roof (or as directed by the engineer)

Furnish and install, where shown on drawings, all items of flashing and caulking as required to properly and completely weatherproof the building.

Flashing, drips, etc., shall be galvanized steel, 26 ga. or aluminum, .019 inch sheeting.

Caulking: Caulking shall be installed in accordance with manufacturer's specifications. Use Dap "Flexseal", Dow Corning "790", or Pecora GC-9 "Synthacalk", or equal.

E. FINISH HARDWARE AND ACCESSORIES

Furnish and install, where shown on drawings and as specified herein, all finish hardware and accessories. Items included in this section shall be installed in accordance with manufacturer's specifications and be in proper working order at completion of job. Protect from paint, scratches, dents, etc., during construction. At completion of job, turn over all installation tools, keys and instructions to the Engineer.

Hinge: Butts, 1-1/2 pairs per door 4-1/2 inches by 4-1/2 inches, NRP, paint grade (USP) finish. Regular weight, ball bearing, wrought steel with security stud, use Stanley, Hager, McKinney or approval equal.

Locksets: bored type, heavy duty with US 26D finish conforming to Federal Specifications FF-H 106 Type 161. Storeroom type lockset with latch bolt by knob inside and key operated from outside; latch bolt to be hard drawn solid brass, 7/8 inch by 5/8 inch, 1/2 inch throw, ball type knob. Furnish Sargent 7G04 BL; Russwin 452 Harvard; Yale 5405 CO; or approved equal. Key locksets on double doors alike. Lock set on single door to be separate lockset. (Note: key locksets the same both sides of the road).

Deadbolt Lock:

In addition to regular locksets, furnish deadbolt lock for each door, as follows, mortise cylinders in heavy-duty housing with 1" throw bolt and roller pins to prevent backsawing. Furnish Yale, Schlage, Sargent or approved equal. Key deadbolt lockset the same as regular lockset. (Note: key all locksets the same both sides of the road).

F. ELECTRICAL

A electric service line from the main building to the utility building is specified in the roadway lighting plans, electric work in the utility building pay item shall consist of installing electrical wiring within the utility building see drawings (site layout plan) for location and electrical wiring (conduit, conductors, fixtures, panel, etc.) for the utility building. All materials shall bear the label of the Underwriter's Laboratory and shall be new and of the quality specified. All work shall be in accordance with the N. C. Building Code (latest edition) and the National Electric Code (latest edition). (All work shall be performed by a N. C. licensed electrician).

NOTE: Contractor to notify the N. C. Department of Insurance - State Electrical Inspector (phone 919-733-3901) before and during the time when electrical work is performed and Contractor is required to obtain a certificate of certification.

Conductors: Conductors shall be the size as stated on the plans or as specified herein and shall be standard copper, 600 volts with Type (THW) or (THWN) insulation for interior wiring.

Conduit and Conduit Fittings: Interior conduit to be EMT sizes as shown on the plans or as specified herein. EMT shall be manufactured with no visible seam. Fittings for EMT shall be hexagonal, compression type, all steel.

Wiring Alternate: (Branch-circuit wiring) at the Contractor's option, the interior branch circuit wiring may be with type N.M. cable in lieu of E.M.T. conduit and Type THW or THWN conductors. When nonmetallic sheathed cable (N.M.) is furnished, conductors shall be copper, 600 volts and installation shall be in accordance with N.E.C. Article 336 (N.E.C) - Nonmetallic Sheathed Cable.

Panelboards: The proposed main circuit breaker panel shall be a 100 Ampere recessed flush mount enclosure 120/240 volts, single phase, 3 wire, contractor shall match panel to existing service if necessary) solid neutrals, copper buses, with 50 ampere main circuit breaker and shall contain a minimum of 12 single pole spaces. (Panelboard shall be U.L. approved as manufactured by Square "D", General Electric, or approved equal). Branch circuits from this panelboard shall be installed as shown on the plans. Circuit breakers shall be thermal magnetic, quick make and quick break. Service entrance equipment and branch circuit wiring shall be properly grounded in accordance with N.E.C. Furnish 20 amp. single pole GFI breakers where shown on plans.

Switches: Wall switches shall be single pole, 20 amp at 120/277 volts A-C rating. All outside switches are to be waterproof.

Convenience Outlet: Convenience outlets shall be 20 amp, duplex, 125 volts A-C rating, of the grounding type and for back wiring.

Lighting Fixtures: Interior lighting fixtures surface mounted type, shall be 40W fluorescent, 2 tubes with acrylic lens and super premium ballast. Furnish Lithonia - LR-240, Cresent - NLT240A, Benjamin - CD-7244-4 or equal.

Exterior Light Fixture: Provide surface mount wall light Model #3737 with mounting box Model #9037 by Kenall Lighting or equal.

G. CLEANING UP

A. Before final acceptance of the building, the Contractor shall completely clean the building, including hardware, fixtures, masonry and clean all floors, touch up paint, and completely prepare the building for use.

B. All construction debris and excess building material shall be removed from the project site and disposed of properly. Grounds around the building are to be rough graded and remove all debris, concrete, rocks, wood, roots, etc., around building site, and prepare the site for seeding and site sidewalk construction.

H. METHOD OF MEASUREMENT AND BASIS OF PAYMENT
(Utility Building)

The work of furnishing and constructing the utility building including when completed and accepted, will be paid for at the contract lump sum price for "Utility Storage Building" such price to be considered as full payment for this work, including, but not limited to, furnishing all labor, materials, and any other incidentals necessary or required to complete the work.

Payment will be made under:

Storage Building. . . . . .Each

LANDSCAPE LIGHTING SYSTEM

The Contractor shall provide all materials and labor to install the low-voltage landscape accent lighting system and entrance sign light.

120 Volt Electric Service: Connection to 120 V circuit, for low voltage lighting system and noted transformer, is via 'plug-in' pre-installed GFC exterior outlet on buildings. Wire run for

120 V entrance sign light shall be completed by licensed electrician, as detailed on landscape development entrance sign and roadway lighting plan, and installed per manufacturer instructions. Contractor shall install field circuit wiring for low voltage lighting system to the specifications noted on the plans. In the event alterations are made during final adjustments, contractor shall under no circumstances exceed the following amperage ratings of any low voltage wiring. In the event the amperage ratings exceed below ratings, then a new wire shall be run to split up the load on the circuit.

Wire Gauge: Max. Amp Load

- #18-2: **4 amps,**
- #16-2: **7 amps,**
- #12-2: **14 amps,**
- #10-2: **22 amps,**
- #8-2: **25 amps**

Contractor shall install spider splice wire junction boxes in all splice locations. Splices shall be placed in planting beds and areas not subject to damage from maintenance equipment. All installed fixtures shall come pre-wired with 25 foot #16-2 tin coated No-Ox® marine grade lead wire as part of the fixture (factory installed). All field splices shall be made with 20 amperage rated Teflon filled waterproof wire nut splices. No grease filled direct burial splices are acceptable. Wire splices shall use only King Teflon filled 20 amperage rated direct burial wire nut wire splice. #61335 and #61135. Other acceptable splice techniques include soldering and crimping. All connections must be UL approved for the application. Contractor shall take operating amperage readings on the primary when done with the installation and record the readings on the inside of transformer cover on the sticker provided with a fine point permanent marker.

Electrical Junction Box / Spider Splice and Record Tag: Provide and install electrical junction box/ Spider Splice in locations shown on the plans. The below grade box shall be NEMA rated for underground use and sized to house all wiring and record tags. Contractor shall include within each Junction Box / Spider Splice a tag noting each as built wire run to and from the box.. The tag shall be constructed of non-degradable waterproof material. Notation on each tag can be stamped and/or written in legible waterproof ink.. As-built records shall indicate off-grade information, the wire run number, transformer number, lamp installed, and the individual numbered fixture on the wire run and total fixtures on the wire runs. The As-Built Record Tags will insure that the long-term maintenance of the system is carried out following the original design of the system.

12 Volt Transformer: Provide and install a 12-volt (600 watt) U.L. listed transformer. Transformer shall be mounted following specifications in the transformer stand detail drawing. Transformer installation shall include Romex strain relief connectors on all secondary wiring entering the transformer. Should contractor choose to install hard pipe conduit, a valve box shall

be placed directly under transformer where hard pipe conduit will terminate. Valve box will allow slack wire collection point to allow future servicing and cleaner installation. Transformer cabinet shall be constructed of stainless steel with manufacturer applied black powder coating

Transformer shall include quick connect feature to allow the quick installation of a photo cell or 20' remote photo cell if required at a later date. Transformer shall include plug point for timer or x-10 unit for on/off control. Transformer shall include 125 Amperage rated terminal block secondary field wiring connection point. No wire nut secondary wiring connections shall be allowed at the transformer. All internal transformer wiring shall be 140°C rated high temperature tin-coated wire. No internal wiring less than 140°C tin-coated shall be allowed. Transformer shall be capable of loading 100% of the load of the transformer on any of the secondary field taps 12V thru 15V. Transformer shall have voltage taps of 12V, 13V, 14V, & 15V. The 600 watt transformers shall incorporate secondary magnetic circuit breaker protection. Any transformers from 900 to 1500 watts shall incorporate both primary and secondary circuit breaker protection. Transformer shall be fully potted with 180°C rated encapsulant to fully protect winding from environmental degradation. No vented and exposed single dipped epoxy coated transformer windings are acceptable. Transformer shall have drop-down removable wiring compartment for ease of installation. Mount transformer box to noted location on exterior of building and as directed/approved by the Engineer.

Fixtures: Contractor shall provide and install specified fixtures, lamps, stakes and mount as noted on the landscape lighting plans. Contractor shall install sealed front-glass covered MR 16 lamps in all fixtures where required. No uncovered MR16 lamps shall be allowed. All wattages and beam spreads as detailed on the lighting design. Final adjustment of the system is the responsibility of the contractor at the discretion the Engineer. Final adjustment will be done at no additional expense to the client. All lamps shall operate in the acceptable range of between 10.8 to 12 volts. Ideal operating voltage is 11.5 volts. Contractor is required to submit in writing all final field operating voltages at the splice locations to architect prior to completion of the project. If required, contractor shall demonstrate in the field the operating voltages of the system to the the Engineer.

General: Contractor shall take amperage readings on all secondary field circuit wires when done with the installation and record the readings on the inside of the transformer cover on the sticker provided with a fine point permanent marker. Contractor shall bury all secondary wires *" depth from surface. Contractor shall sleeve all wires entering planting beds from turf or under walks within pre-installed 3" PVC. Review landscape plans, and confirm with the Engineer, on exact locations of sleeves . Contractor shall leave all excess fixture wire at the fixture to allow easy field adjustment of the fixture if required.

Method of Measurement and Basis of Payment
(Landscape Lighting System)

The work of furnishing and installing landscape lighting system when completed and accepted,

will be paid for at the contract Lump Sum price "Landscape Lighting" for individual northbound lane (NBL) and southbound lane (SBL) facility. Such price to be considered as full payment for this work, including, but not limited to, furnishing all labor, materials, and any other incidentals necessary or required to complete the work.

Payment will be made under:

- **Landscape Lighting (NBL) ..... Lump Sum (LS)**
- **Landscape Lighting (SBL) ..... Lump Sum (LS)**

STAIRWAYS (CONCRETE)

General: The work covered by this item shall consist of furnishing and constructing reinforced concrete steps in accordance with the dimensions as shown on the plans and on the details and as described herein.

Reinforced Concrete step construction shall conform to all applicable requirements of the Standard Specifications.

Payment will be made under:

Concrete Steps ..... CY

HANDRAIL ON STEPS

General: The work covered by this item shall consist of furnishing and constructing handrails on stairs in accordance with the stairway details and as specified herein.

Materials: Handrail shall be constructed of Schedule 40 -1-1/2" Aluminum pipe, with clear brushed anodized finish, Submit sample or submittal data to Engineer for approval pipe that is to be bent or welded in fabrication shall meet the requirements of ASTM A53 for standard weight pipe. Standards for welding shall meet those requirements defined in the Standard Specification for Roadway Structures – Section 1072-20.

Installation: Handrails shall be erected as shown on the details, straight and true to line.

Method of Measurement

The quantity of handrail on stairs to be paid for shall be the actual number of linear feet of handrail, measured along the bottom rail, erected, complete in place and accepted.

Basis of Payment

The quantity, measured as provided above, shall be paid for at the contract unit price per linear foot for "Handrail on Steps" complete in place and accepted. Such price and payment shall be full compensation for furnishing and installing, fabricating, transporting, erecting and painting, and for all labor, equipment, tools and incidentals necessary to complete the work.

Payment will be made under:

Handrail on Steps ..... LF

PATIO HANDRAIL (Northbound Lane)

General: The work covered by this item shall consist of furnishing and constructing handrails on around patio at the northbound Visitor Center Building in accordance with the architectural details for the handrail specified for the green roof on the Southbound Visitor Center Building and as specified herein.

Materials: Handrail shall be constructed of 1-1/2" sq. alum. tube guardrail system w/ horizontally strung stainless steel cable rails spaced @ 4" O.C. vertically. Finish aluminum tube frame w/KYNAR 500 (Same as specified for the southbound lane building)

Installation: Handrails shall be erected as shown on the plans, straight and true to line.

Method of Measurement

The quantity of "Patio handrail (Northbound Lane)" to be paid for shall be Lump Sum erected , complete in place and accepted.

Basis of Payment

The quantity, measured as provided above, shall be paid for at the contract lump sum price

Payment will be made under:

Patio Handrail (Nouthbound Lane) ..... Lump Sum

CONCRETE SIDEWALKS

General: The sidewalks indicated on the plans shall be 4" concrete. The sidewalks and patio

shall be as specified in Section 848 and as shown on the plans.

Scoring patterns shall be as shown on plans or as directed by the Engineer in field, and as specified in Section 825-10. Control joints indicated on plans shall be as specified for Grooved Contraction Joints.

Method of Measurement and Basis of Payment

The quantities of sidewalk to be paid for will be the actual number of square yards measured along the surface which have been completed and accepted. The quantity of sidewalk measured as indicated above, will be paid for at the contract unit price per square yard for "4" Concrete Sidewalk". There will be no additional compensation for control and expansion joints.

Measurement and Payment will be made under:

Standard Specifications for Roads and Structures.....Sec. 848-4

STONE WALLS

General: The work covered by this section shall consist of furnishing and constructing the Stone Walls, as shown on the plans and details and as described herein.

The Engineer according to site conditions may adjust the height and length. Verify exact dimensions before proceeding.

Materials: Concrete shall be Class "A" and meet the requirements of Section 1000 of the Standard Specifications. Reinforcing steel shall meet the requirements of Section 1070. Concrete block shall be "Ivany Block" specifically manufactured for reinforced masonry wall construction. The 4" Stone Veneer shall be a Tennessee Ashlar Blue/Gray fieldstone. The Stone capping shall be a 2" thick dimensional Bluestone with a Rock faced edge on the outside edges. The Bluestone capping shall be 20" wide and cut in 6-8' sections. Stone height shall vary from 3" to 9" and length shall vary from approximately 4" to 18". Mason shall place stone randomly with dry stacked joints. See sheet L14 for details. Stone Veneer samples shall be submitted to the Engineer for approval prior to any placement. Use Type S mortar. Ties shall be 3/16" diameter wire, 7 1/2" anchor with 3 1/4" tie min. Use Heckman Double Eye-Rod Anchor/Tie No. 263, Homann and Banard Adjustable Wall Tie No. 600, or National No. 915. Backfill shall be Class I Select as described in Section 1016.

Installation: Excavate and pour reinforced concrete footing, build reinforced block wall, and lay stone veneer and coping as shown on the drawings. Place reinforcing steel as described in

Section 425. Use one metal tie per every two square foot of surface area to bound the stone veneer to the block wall. Allow the masonry to cure a minimum of 7 days prior to placing backfill.

An experienced stone mason with a minimum of 7 years of practice shall be required to construct the stone walls. Mason must submit references and samples of built work prior to beginning work. A sample wall with approximately 20 square feet of veneer surface area and a minimum of 5 linear feet of capping shall be required prior to progressing with remaining walls. The sample wall shall be a separate wall or incorporated into proposed walls as shown on plans. The sample wall shall be approved prior to proceeding with the installation.

Method of Measurement

The quantity of Stone Wall, will be the actual number of linear feet constructed and accepted.

Basis of Payment

Payment as described above will be full compensation for all work covered by this section including but not limited to footing excavation, furnishing and installing reinforcing steel, concrete, block, stone veneer, foundation drain, backfill, and other incidental material; and all labor and equipment necessary to complete the work.

Payment will be made under:

Stone Wall ..... LF

COBBLESTONE PAVERS

General: The work covered by this section shall consist of furnishing and installing the Cobblestone Pavers in accordance with dimensions and finishes as shown on the plans, the details, and as described herein.

Materials and Construction

Stone shall be "Pavestone-Adirondack" – 2 /3/8" Thick , 51/2" Wide , with varying lengths Color : Fieldstone Blend of Gray/Earthtone Edging shall be installed as noted on the plans and details. Edging shall be placed in line and plumb with proposed grades and sidewalks. Contractor shall be an experienced contractor with installing landscape edging. Contractor shall supply references and samples to engineer prior to construction.

Method of Measurement and Basis of Payment

The work of furnishing and installing Cobblestone Pavers as shown on the plans or as approved by the Engineer, when completed and accepted, will be paid for at the unit price per square feet for "cobblestone pavers". Such price and payment will be full compensation for all work covered by this special provision; including but not limited to furnishing transport, all labor, materials, equipment, excavation and grading, and any other incidentals necessary to complete the work.

Payment will be made under:

Cobblestone Pavers .....SF

PLACEMENT OF BOULDERS

General: The work covered in this item shall include the contractor stockpiling and installing existing boulders used in landscape during construction. Stockpiling shall be at the locations on site as designated by the Engineer.

Boulders shall be placed at locations shown on plans or as designated by the Engineer at appropriate stages of construction. Contractor shall supply to the Engineer a staging plan showing the time frame of installment of stones and how he will not damage any existing and proposed hardscape (i.e. Roadway, sidewalks…)

The sizes of boulders range 5' to 25'. On the plans the boulders are categorized into three groups:

Small Boulders – 5-10' (Approximately 12 boulders)
Medium Boulders - 10-20' (Approximately 12 boulders)
Large Boulders – 20-25' (Approximately 13 boulders)

See the Site Plan (sht. L3) and the Planting Plans (shts. L6 & L6A-L6D)

Care shall be taken during both stockpiling and placement to prevent chipping, cracking or scarring of surfaces. Smaller boulders shall be installed as shown on the details – sheet L8 and L15. Larger boulders shall be placed in such a way so that they will be immovable and will not roll.

Method of Measurement and Basis of Payment

Collection / Stockpiling of boulders and placement of boulders as designated on plans and as directed by Engineer will be paid for at the contract lump sum price for "Placement of Boulders".

Such price and payment will be full compensation for all work covered by this Special Provision and details; including but not limited to furnishing all labor and equipment necessary or required to complete the work.

Payment will be made under:

Boulder Placement ..... Each

Placement of Field Stone.....CY

PARK STOVE

General: Outdoor Park Stoves shall be furnished and constructed on concrete foundations in accordance with details in the plans and shall be located as shown on the plans or as directed by the Engineer.

Outdoor Park Stoves shall be the product of a manufacturer regularly engaged in the design and manufacture of Park Stoves. Submit six (6) copies of shop drawings or submittal data to Engineer for approval.(See Park Stove Detail Sheet for size, design, material, etc.).

Method of Measurement

The quantity of stoves to be paid for shall be the actual number of Outdoor Park Stoves with foundation slabs, complete in place and accepted.

Basis of Payment

Stoves, measured as provided above, shall be paid for at the contract unit price each for Outdoor Park Stoves. Such price and payment will be full compensation for the work of "Outdoor Park Stove," including but not limited to, furnishing all labor, materials, tools, equipment and all incidentals necessary to complete the work. Payment will be made under:

Payment will be made under:

Outdoor Park Stove ..... Each

LANDSCAPE METAL EDGING

General: The work covered by this item shall consist of furnishing and installing the metal landscape edging in accordance with the dimensions and finishes as shown on the plans, the

details, and as described herein.

Landscape Metal edging construction shall conform to all applicable specifications for the product used.

Method of Measurement and Basis of Payment:

The work of installing landscape metal edging as shown on the plans or as approved by the Engineer, when completed and accepted, will be paid for at the unit price per linear foot for "Landscape Metal Edging". Such price and payment will be full compensation for all work covered by this special provision; including but not limited to furnishing all labor, materials, and equipment and any other incidentals necessary or required to complete the work.

Payment will be made under:

Steel Landscape Edging ..... Linear Foot

STONE ENTRANCE SIGN BASE

General: The work covered by this item shall consist of furnishing and constructing concrete and stone entrance sign base in accordance with the dimensions and finishes as shown on the plans, the details, and as specified for stone wall construction as specified elsewhere herein.

Method of Measurement and Basis of Payment:

The work constructing Stone Entrance Sign Base as shown on the plans and as approved by the Engineer, when completed and accepted, will be paid for at the unit price per "Each" for "Stone Entrance Sign Base". Such price and payment will be full compensation for all work covered by this special provision; including but not limited to furnishing all labor, materials, and equipment and any other incidentals necessary or required to complete the work.

Payment will be made under:

Stone Entrance Sign Base ..... Each

SPECIAL REST AREA SIGNAGE

General: The work covered by this item shall consist of furnishing and installing the Signage in

accordance with the dimensions and finishes as shown on the plans, the details, and as described herein.

Signage: The signage shall be sandblasted redwood. The fabricator shall be an experienced sign maker with a minimum of 7 years of sandblasted redwood fabrication. Fabricator shall present examples and references of work done within the past 3 years.

Fabricator shall produce artwork as indicated on the plans along with font choices for selection and approval prior to constructing sign. This includes a full-scale mock up of the sign with dimensions indicated and colors for approval prior to producing.

Fabricator's instructions for mounting along with all hardware shall be furnished with each sign. Final decisions for colors shall be made when full scale mock up is presented to ensure visibility and readability.

Method of Measurement and Basis of Payment:

The work of selecting an experienced fabricator and constructing the landscape signage as shown on the plans or as approved by the Engineer, when completed and accepted, will be paid for at the unit price per lump sum for "Landscape Signage". Such price and payment will be full compensation for all work covered by this special provision; including but not limited to furnishing all labor, materials, equipment for installation, coordination with engineers and sign fabricators for artwork review and any other incidentals necessary or required to complete the work.

Payment will be made under:

Special Rest Area Signage (NBL) . . . . . Lump Sum

Special Rest Area Signage (SBL) . . . . . .Lump Sum

SPLIT RAIL FENCING

General: The work covered by this special provision consist of furnishing and installing the split rail fencing as shown on the plans or as directed by the Engineer.

Materials: The split rail fencing shall have a total of two rails. Fence posts and rails shall be locust- wood post and cedar- wood rails. They shall be free of major defects or chips or splinter pieces that may cause injury to pedestrians. Post and rails shall be straight and true to line and grade.

Installation: Fence shall be erected as shown on the plans and according to manufacture's recommended installation. Post installation shall be set in a concrete collar with an aggregate

base set plum. Rails shall be straight and true to line and grade. Installer shall be an experienced fence builder .

Method of Measurement

The quantity of split rail fencing will be the actual number of linear feet measured along the top rails between post (Approximately 8') which has been satisfactorily installed and accepted.

Basis of Payment

The quantity of split rail fencing, measured as specified above, will be paid for at the contract unit price per linear foot for "Split Rail Fencing". There will be no separate pay item for post or concrete footings. Such prices and payments will be full compensation for furnishing and installing the split rail fencing; including and not limited to all materials, labor, and equipment necessary to satisfactorily complete the work.

Payment will be made under:

Wood Split Rail Fence ..... Linear Feet

6' WOOD FENCE

General: The work covered by this item shall consist of furnishing and installing the board on board wood fence, posts, and concrete piers as shown on the plans and described herein.

Carpentry and Millwork: See drawings and details for location and quantity of both rough and finish carpentry.

Materials: Grading of all lumber and trim shall conform to the association under whose rules it is graded. Moisture content shall not exceed 18 percent for framing lumber and 12 percent for millwork and trim. All lumber in contact with concrete or masonry, and/or soil shall be treated with water borne pentachlorophenol or CCA (Chromated Copper Arsenate) in accordance with standards of the American Wood Preserver's Association. Minimum retention shall be 0.25 pcf for material 2 inches and smaller and 0.40 pcf for materials greater than 2 inches. All lumber and millwork shall be stored in a manner that will keep it dry and well-ventilated, well off the ground, and adequately covered.

Carpentry and millwork materials shall be as follows: All lumber shall be full size, rough- cut No. 1 southern yellow pine, thru-bolted where shown on drawings and securely spiked together at all other joints. Stain/paint to match cedar wood siding on primary building as approved by the Engineer.
All bolts, screws, washers, and channel shall be galvanized and conform to all applicable

requirements of Section 1076 of the Standard Specifications. Touch-up all breaks in galvanizing, such as holes, end cuts, etc. with zinc rich paint prior to assembling bench.
Concrete shall be Class "A" and meet the requirements of Section 1000 of the Standard Specifications.

Installation: Excavate and pour concrete piers as shown on the drawings. Place reinforcing steel anchors, in concrete piers, as described in Section 420-14 and Section 1072. Construction and framing shall be cut and assembled square on bearings, closely fitted, accurately set to required lines and levels, and rigidly secured in place.

Method of Measurements and Basis of Payment

Six foot wood fence as described above and as shown on the plans shall be paid for at the contract unit price per linear meter of "6' Wood Fence", measured from the (vertical) center line of post to post along the wood fence, complete in place and accepted. Such price shall be full compensation for all labor, materials, tools, equipment, and all other incidentals necessary to complete the work.

Payment will be made under:

6' Wood Fence ..... Linear Feet

TAPERED ALUMINUM FLAGPOLE

General: The work covered by this section consists of furnishing and installing 40' Tapered Aluminum Flagpole at locations as shown on the drawings.

Materials: The flagpoles shall be 40' exposed height (44' overall length) standard cone tapered aluminum flagpoles as manufactured by American Flagpole or equal. Provide a ball bearing revolving truck assembly with a 8" gold anodized ball finial. Provide an aluminum flash collar and all components recommended by the manufacturer for a ground-set installation.

Installation: Follow the manufacturer's recommendations concerning ground set mounting for a 80 M.P.H. design a wind load.

Compensation: The Tapered Aluminum Flagpoles will be paid for a the contract unit price for each. Such payment will be full compensation for all work covered by this section including, but not limited to, furnishing and installing the flagpole, flash collar, halyard, cleats, flag snaps, and all parts recommended by the manufacturer for a ground-set installation; and all labor, materials and equipment necessary to complete the work.

Payment will be made under:

Flagpole , Aluminum..... Each

WATER FEATURE (NBL)

GENERAL

DESCRIPTION:

A. Work required under this section consists of construction of the north bound lane (NBL) water feature as shown and
noted on the drawings and as specified herein.
B. Scope of Work included in this section is for the furnishing of all materials, equipment and services necessary for the completion of the described water feature system. The fountain system furnished must meet the design criteria specified in the design description.

1. The furnishing and installation of materials shall include but not be
limited to the following items:

a. Water supply plumbing, pipes accessories and equipment.
b. Water drains, drainage lines, equipment and all associated materials
c. All associated concrete, paver, cultured stone and associated masonry work.
d. Submersible Pumping Equipment.
e. Liners, bowl and waterproofing materials and equipment.
f. All supplemental river rock.
g. System Controls.
h. Water display nozzle and associated equipment.
i. Utility Service connection and coordication to noted for power, fill water, and sewer.
j. Special Tools.

C. Coordination:

1. The installing Contractor(s) shall coordinate and schedule the contract work
to integrate the fountain equipment into the other project specified work.

QUALITY ASSURANCE:

A. Approved Equipment Supplier:

1. The design shown on the drawings and the specifications listed herein are based on the design data, services, and materials readily available through national suppliers of fountain, pond and

plumbing materials
2. The contractor shall use only use reputable equipment suppliers approved by the Engineer.

B. Fountain Equipment Supplier's design responsibility:

1. The Fountain Equipment Supplier shall be responsible for providing the engineering design data which relates directly to the fountain system. This design shall describe the mechanical (hydraulic) and electrical system. Included in this design will be the appropriate sizing, selecting, and assembling of all fountain equipment and supply lines.

C. Fountain Equipment Supplier's field support:

1. Final start-up and adjustment meeting shall be provided for the proper adjustments to be made to the fountain system to meet the performance levels established. It is also the time to familiarize the maintenance staff of the correct procedures to operate the fountain system equipment. Before final inspection of the water feature all the following items need to be complete:

a. Electrical connections made and tested.

b. Hydraulic piping and fittings complete and tested for leaks, repaired if necessary, and flushed clean.

c. The water reservoir or cistern cleaned and filled to the correct operating depth.

2. Job site visits by NCDOT project engineers and designers can be made during certain construction phases of the project.

1. A pre-construction meeting shall be arranged with the general contractor for the coordination of the trades involved in the fountain construction and installation. This allows for a detailed explanation of the suggested installation techniques and the sequence of the installation.

INDUSTRY STANDARDS AND APPLICABLE CODES:

A. The materials shall be installed in accordance with all applicable provisions of the most recent edition of the following:

ANSI
ASTM
ASSE
ASME
AWWA
CS
NEMA
NSF

UL
NEC
OSHA
NFPA
American National Standards Institute
American Society for Testing and Materials
American Society of Sanitary Engineering
American Society of Mechanical Engineers
American Water Works Association
Commercial Standards
National Electrical Manufactures Association
National Sanitation Foundation
Underwriters Laboratory
National Electric Code
Occupational Safety and Health Act
National Fire Protection Agency

Other state or local code(s) which are applicable.

B. The above referenced guidelines shall be considered minimum standards for the materials or the installation practices applicable for the fountain system.

SHOP DRAWINGS AND SUBMITTALS:

The plumbing and water supply systems noted on the plans shall be considered schematic in design. Final design specifications shall be defined and supplied by the contractor, in keeping with the contact work, noted minimum specifications, and in coordination with all other applicable site work.

A. The contractor shall submit drawings in accordance with the conditions of the Contract Specification section describing the size(s), location(s), and installation details of the interconnecting piping, fountain water management equipment and electrical systems.

1. After the approval review and prior to construction a total of six (6) sets drawings will be provided

to the Engineer for distribution to the respective engineers and installing Contractors.

B. The Landscape Architect may add other drawings during the period of construction as required for
clarification.

C. This specification shall be considered an integral part of the accompanying drawings. Anything omitted from one and embodied in the other is considered essential to the contract and must be furnished by the Contractor.

D. The drawings are essentially diagrammatic and are used only to define the scope of work to be done.

E. Three (3) complete sets of As-Built Drawings in the Operation and Maintenance Manuals shall be provided by the Engineer at the conclusion of the project.

F. All pertinent data on any substitute system(s), including engineering performance calculations on the pumping system(s), drainage, equipment, and electrical system diagrams and schematics shall be provided to Engineer for review and evaluation.

SUBSTITUTIONS:

A. Submittals for equal items shall include the following information where applicable:

1. Operation Design Description.

2. Component materials and finishes.

3. Pump curve(s).

4. Certification of conformance with specified codes and standards.

B. Proposed substitutions for equipment or material must be submitted within ten (30) working days prior to final bid date for consideration as approved equals. Proposals for substitutions shall be made only by the prime bidders in writing to Engineer and sub-contractors shall not make any proposals to the Landscape Architect for substitution.

1. Contractors submitting bids including substitute equipment and / or materials must also submit a bid for the "as specified" equipment and materials at the same time.

2. All substitute bids must provide a written performance guarantee certifying the water display performance and Architect's pre-approval.

3. All equipment supplied to the Contractor shall be supplied by a single fountain equipment supplier unless otherwise approved.

C. Submittals of equal systems or components may be rejected for the following

reasons:

1. If the equipment or material should require any change to the electrical, mechanical, structural, or architectural design.

2. If the dimensions of the equal equipment or material vary from the specified equipment or material and impair accessibility or clearances.

D. Should a substitution be accepted and prove defective or otherwise unsatisfactory within the guarantee period the Contractor shall replace it at no cost to the owner.

SUBMITTALS:

A. Submittals shall include the following:

1. shop drawings and product information for all equipment and materials furnished.

2. Complete Material list.

3. Equipment space layout showing all electrical and mechanical equipment in addition to all piping and conduit.

4. Design Description.

5. Installation details for each piece of equipment being provided.

B. Submittals shall be rejected if they are difficult to read due to poor image, drafting quality, insufficient scale, or missing data.

GUARANTEE:

A. Fountain Equipment Supplier and installing Contractor(s) shall issue a joint guarantee that any equipment with exception of the lighting lamps found defective within one (1) year of the final acceptance shall be replaced at no cost to the Owner.

B. The guarantee does not extend to damage incurred through operation and maintenance by the Owner. The Owner will assume full responsibility for the proper operation and maintenance of the fountain upon final acceptance.

mechanical fountain systems shall be furnished by the Contractor unless otherwise specified.

GENERAL INSTALLATION:

A. Protect all pipes, conduits, equipment and other parts of the work against injury by exposure to the weather while stored, during construction, or after installation.

B. Install and connect all equipment in accordance with manufacturer's instruction and recommendations unless otherwise noted. If specified installation is contrary to the manufacturers instruction cease installation of affected components or systems and notify the Engineer.

C. Accurately locate all in-slab items being cast in concrete and rigidly support them to resist loads during pour.

PIPE INSTALLATION:

A. General installation:

1. Make all pipe runs as direct as possible using a minimum number of fittings.

2. Slope piping toward the pump. If the piping can not be sloped connect a 1-1/2" drain line
and valve (minimum) to the lowest point.

3. Cut pipe and tubing ends square. Remove rough edges and burrs to create a smooth unobstructed flow.

4. Protect all openings in piping during construction to prevent entrance of foreign matter.

5. All connections between dissimilar metals shall be made with dielectric fittings.

Basis of Payment:

Basis of payment for this item of work will be the lump sum price for the installation of the " "Water Feature (NBL)" The above prices and payments will be full compensation for all work covered by this section.

Payment will be made under:

Water Feature (NBL).....Lump Sum

IRRIGATION SYSTEM

General: The Contractor shall provide all materials and labor to install an Irrigation System utilizing spray heads and drip emitters ,The Department has provided plan sheets that designate the turf areas that are to receive spray head irrigation and planted / mulched areas that are to receive drip emitter irrigation. The contractor shall provide a Design Plan shall showing piping , spray head and emitter locations, selecting a pump , controls, Valves and components to operate the system by drawing water from a 6,000 gallon Cistern Tank (tank specified elsewhere) as well as shop drawings and specifications for the pipe , pumps, controls ,irrigation components , system controller ,and appropriate housing for all the components he proposes to furnish, for approval by the Engineer.

The Contractor shall provide all labor, equipment, and materials for the installation of the irrigation system including but not limited to layout, trenching, backfilling, providing and installing pipe, valves, filters, pressure regulators, pump, pressure tank, drip tubing, drains, controller, wiring, boring sleeves.

The Contractor shall be familiar with all state and local regulations and ordinances concerning irrigation systems and obtain permits that are necessary for the installation of the irrigation system.

The Contractor shall lay out work as accurately as possible in accordance with the irrigation Design plan that is to be designed by the contractor and approved by the engineer.

The Contractor shall furnish a transferable certificate of warranty registration and a guarantee of work and materials for a one-year period from date of final acceptance of the system. Final payment for the system shall not be made unless this certification is presented to the Engineer.

The Contractor shall conduct his operations in such a manner to prevent injury to trees, shrubs, and turf or other types of vegetation that are to remain growing. When any such injuries to trees or shrubs occur, broken branches shall be removed and rough edges of scarred areas shaped and made smooth in accordance with generally accepted horticultural practice. All scarred areas and cut surfaces more than one (1) inch in diameter shall then be thoroughly covered with tree paint. Any plants that are damaged to such an extent as to destroy their value for landscape purposes shall be cut and disposed of and replaced in kind by the Contractor at no cost to the Department when so directed by the Engineer.

The Contractor shall be responsible for full and complete coverage of irrigated area and shall make any necessary minor adjustments or as directed by the Engineer at no additional costs. The Contractor shall prepare an "as-built" drawing on a blue-line print which shall include locations of all parts of the irrigation system installed by the Contractor. This may include, but is not limited to all system controllers, valves (automatic and manual), pipe, bores, drip tube, wires, wire splices, and any deviation from the contract bid documents. Two (2) copies of the "as-built" drawing shall be supplied to the Department of Transportation.

The Contractor shall be responsible for training personnel in the operation and maintenance of the irrigation system.

The Contractor shall balance and adjust the various components of the irrigation system as the overall operation of the system is most efficient. This includes synchronization of the controllers, adjustments to pressure valves, and individual station adjustments on the controllers.

Upon completion of the irrigation system installation, the Contractor shall schedule a final inspection with the Engineer. Final acceptance of the irrigation system shall take place upon approval of the Engineer that satisfactory installation is complete.

System Piping

The installation of the system piping shall be in accordance with the manufacturer's instructions and shall proceed from the point of connection of supply for the system. The supply for the system shall be the existing well located on site.

All irrigation pipes shall be installed in accordance with manufacturer's recommendations. Pipe and fittings shall be thoroughly cleaned of dirt, dust, and moisture before application of required solvent or lubricant. All connections between plastic pipe and metal valves or steel pipe shall be made using plastic male adapters. All threads shall be sealed with teflon thread sealing tape.

All automatic remote control valves with PVC ball valves; installed on the inlet side, shall be installed in 12 inch meter boxes to provide for accessibility for maintenance operations. Meter boxes shall be Ametek #170106 approved equal. Valve boxes shall be mounted with lids at the finish grade level. The Contractor shall install all valves in locations that will not conflict with plant locations in the plant beds.

If necessary, any PVC water pipe shall be installed in accordance with the applicable irrigation provisions herein, as shown on the irrigation plans, and/or as directed by the Engineer.

During the progress of the work and until the completion and final acceptance, the pipelines and their appurtenances shall be kept clean throughout. Any obstructions or deposits shall be removed. When work is not in progress, open ends of pipe, fittings, and valves shall be securely closed so that water, earth, or other foreign substances cannot enter.

If, at any time before completion of the contract, any broken pipe or any defects are found in the lines or in any of their fittings or appurtenances, they shall be replaced. All pipe, fittings, and appurtenances shall be carefully examined for defects before placing, and any found defective shall not be used.

The Contractor is herein forewarned as to the possibility of having to vary the depth of pipeline installation to achieve minimum cover specified (whether existing pipelines, conduits, cables, mains, etc. are shown on the plans or not). Pipe and accessories shall be carefully lowered into the trench with suitable equipment. Under no circumstances shall any of the water main materials be dropped or dumped into the trench. All irrigation system main lines shall be installed at a minimum of 18 inches and a maximum of 24 inches below the soil grade. All irrigation system zone lines shall be installed at a minimum of 12 inches and a maximum of 18 inches below the soil grade.

All backfill material shall be free of rock, stones, lumps, or debris. Backfilled trenches shall be compacted to a degree comparable to the adjacent undisturbed material. Trenches shall be tamped mechanically. All disturbed areas shall be dressed off to finish grade. The Contractor shall be responsible for settling of the irrigation trenches for a period of one (1) year from date of final acceptance and refill trenches as needed.

PVC pipe shall be the size as noted on the irrigation plans.

All solvent weld fittings shall have a minimum Schedule 40 PVC rating.

All main line pipe and system zone line pipe shall be PR 200 PVC pipe.

Wiring

Automatic control wiring shall be installed in a common trench with the system piping where feasible. All wiring shall be installed at least 12 inches below finished grade and to the side and below the irrigation piping. The Contractor shall provide looped slack at the valve locations and snake wires in the trench to allow for linear contraction of the wires. Wiring shall be bundled and tied or taped at 10 ft. intervals. The following shall also apply:

All 26.5 VAC control wiring shall be #14 AG, single strand, copper wire with polyethylene UF installation rated for 300 VAC minimum unless otherwise noted. Common wires from controllers shall be white in color while hot wires shall be red in color.

Control wire splices shall be allowed only in runs of 500 feet or more. Splices shall be kept to a minimum and shall be made with approved materials. Concentrations of splices, where necessary, shall be installed in Ametek valve boxes or approved equal.
All 26.5 VAC control wire shall be installed within conduit whenever the wire is

passing through sleeves.

Drip Irrigation Emitters

All drip irrigation emmitters shall be of the size, type, and model numbers as indicated by the irrigation drawings and notes. Spacing of the emitters on this project shall not exceed the manufacturer's maximum recommended spacing. The location of all emitters shall be as shown on the irrigation plans.

½" & ¼" Tubing

All drip irrigation ½" and ¼" tubing shall be the size and type as indicated on the irrigation plans and shall be located as shown in the details. The ½" tubing shall be Rainbird Xeri-Tube 700 or approved equal and the ¼" tubing shall be Rainbird ¼" Vinyl Distribution Tubing or an approved equal. All drip irrigation tubing shall meet the manufacturers recommended specifications.

Ball and Remote Control Valves, Filters, and Pressure Regulators:

The ball and remote control valves, filters, and pressure regulators shall be a part of the Rainbird Control Zone Kit ¾" or approved equal. The kit contains a XBV-075 ball valve, a 75-DVX remote control valve, a RBY-075-200MX in-line filter, a PSI-M30X pressure regulator, and two ¾" schedule 80 nipples. The Control Zone Kit ¾" shall be installed to manufacturers specifications. The location of all valves, filters, and pressure regulators shall be as shown on the irrigation plans.

Dual Program Hybrid Controller

The irrigation system controller shall be a Dual Program Controller with a built in surge protector capable of fully automatic or manual operation of the system. It shall be housed in a weatherproof, key-lock cabinet for outdoor installation.

Backflow Preventer

The backflow preventer shall be installed on the irrigation system main line pipe within 10 (TEN) feet of the well head. It shall be a WILKINS 950-1 inch or an approved equal.

Testing

Upon completion of the irrigation system, the entire system shall be tested for proper operation.

All air will be flushed from the system and the Contractor will check all components for proper operation.

The Contractor shall perform pressure and leakage testing of irrigation lines. The Contractor shall notify the Engineer two (2) days in advance of testing. Testing shall be performed in the presence of the Engineer or his representative. All main line piping shall be flushed of air and placed under the available static pressure or the design pressure, whichever is greater, for a period of six (6) hours. The system piping shall be isolated from the source of supply pressure for the duration of the test. The pressure in the system piping shall be noted every hour and if an excessive pressure drop is noted, the reason(s) shall be determined and repairs effected.

Zone lateral lines shall be inspected while a particular irrigation zone is operating. Each emitter shall be inspected for leaks as will the route of the installed lateral piping.

Basis of Payment:

Basis of payment for this contract will be the lump sum price for the installation of the irrigation system. The above prices and payments will be full compensation for all work covered by this section.

Payment will be made under:

Irrigation System (NBL) .....Lump Sum

Irrigation System (NBL) .....Lump Sum

SODDING

Sodding (Tall Fescue/Bluegrass Mixture)

General: The sodding shall be prepared in accordance with all applicable requirements of Section 1663 of the Standard Specifications and the following provisions:

The Contractor shall obtain a certificate or limited permit issued by The N.C. Department of Agriculture (1-800-206-9333) or (919-733-6932) stating that the sod has been found to be free of injurious plant pests.

Materials:

Only "approved sod" (trade designation) consisting of tall fescue/bluegrass shall be used. The sod, machine cut to the suppliers standard width and length, shall be 5/8 inch (16 mm) minimum

thickness, excluding top growth and thatch, at the time of cutting. Before cutting, the sod shall be uniformly mowed at a height of 2 to 3 inches (52-78 mm). Standard sod sections shall be sufficiently strong to support their own weight and retain their size and shape when suspended vertically from a firm grasp on the upper 10% of the section.

APPROVED TALL FESCUE CULTIVARS:			
ADVENTURE	ADVENTURE II	AMIGO	ANTHEM
APACHE	APACHE II	ARID	BROOKSTONE
BONANZA	BONANZA	CHESAPEAKE	CHIEFTAIN
CORONADO	CROSSFIRE II	DEBUTANTE	DUSTER
FALCON	FALCON II	FINELAWN PETITE	FINELAWN
FINELAWN I	GENESIS	GRANDE	GUARDIAN
HOUNDOG	JAGUAR	JAGUAR III	KENTUCKY 31
KITTY HAWK	MONARCH	MONTAUK	MUSTANG
OLYMPIC	PACER	PIXIE	PYRAMID
REBEL	REBEL JR.	REBELL II	RENEGADE
SAFARI	SHENANDOAH	TITAL	TOMAHAWK
TRAILBLAZER	TRIBUTE	WRANGLER	
APPROVED KENTUCKY BLUEGRASS CULTIVARS:			
KENBLUE	GLADE	ADELPHI	BARON
BRISTOL	CHALLENGER	COLUMBIA	FYLKING
MERIT	PLUSH	RAM I	RUGBY
SYDSPORT	TOUCHDOWN	VANTAGE	

Sod shall be delivered on site within 24 hours of being cut and be covered by acceptable means during delivery. A certificate from the sod producer stating the date and time of sod cutting shall accompany the sod when it arrives at the project site.

Soil Preparation:

Remove litter and other debris. Mow and satisfactorily dispose of weeds or other unacceptable growth on the areas to be sodded.

Prior to beginning preparation of the soil to receive sod, all eroded, uneven and rough areas shall be contour graded and/or filled with soil as directed by the Engineer. The soil shall be scarified or otherwise loosened to a depth of not less than 5 inches (130 mm) with a maximum width of 48 inches (1145 mm). Clods shall be broken and the top 2 to 3 inches (52 to 78 mm) of soil shall be worked into an acceptable soil bed by the use of soil pulverizers, drags, or harrows.

The Contractor shall be responsible for taking sufficient soil samples (at least one sample per

planting area for testing by The Department of Agriculture, Soil Testing Division, to determine the soil pH. Samples shall be taken in the presence of the Engineer. Results shall be received by the Engineer directly from the North Carolina Department of Agriculture and Consumer Services.

Limestone: Based on these results the Contractor shall add limestone, if required, to bring the soil pH to 5.5 to 6.5 (opt. 6.0). The amount of limestone to be applied will be approved by the Engineer prior to application. Application of limestone will be considered incidental to the work of "Sodding" and no direct payment will be made for such.

Sulfur: Based on these results the Contractor shall add sulfur if the pH is greater than 7.0, to bring the soil pH to 5.5 to 6.5 (opt. 6.0). The amount of sulfur to be applied will be approved by the Engineer prior to application. Application of sulfur will be considered incidental to the work of "Sodding" and no direct payment will be made for such.

After soil preparation, lime or sulfur (if necessary), shall be uniformly distributed by mechanical means using a drop type spreader and thoroughly mixed with the top five inches (130 mm) of the soil by discing, harrowing, or other approved methods.

The area shall then be harrowed, dragged, raked, or prepared by other approved methods which will give a lawn type finish. All trash, debris and stones larger than 1-1/2 inch (38 mm) in diameter or other obstructions that could interfere with the placing of the sod shall also be removed. The finished surface shall be moistened with water prior to placing the sod as directed by the Engineer.

Placement:

Sod handling and placement shall be a continuous process of cutting, transporting and installing including repairing seams and voids. Sod shall always be installed within 48 hours after being cut. Sod shall be watered within 2 hours of installation.

Any sod or portions of sod rejected by the Engineer during the initial placement shall be removed from the project and replaced with acceptable sod immediately. The Contractor shall cease any and all other placement of sod on the project until rejected sod has been replaced.

After sod has been placed, and staked where necessary, according to Section 1663, it shall then be rolled or tamped carefully and firmly by means acceptable to the Engineer to ensure proper soil contact. If rolled, roller shall weigh 150#/ft (224kg/m) of roller width. Use of rubber tired equipment to roll shall not be allowed. Metal staples, 12 inches (305 mm) long unless otherwise approved, shall be made of 11 gauge (3.0 mm diameter) new steel wire so as not to bend when pinned or driven through the sod. Extreme care shall be taken to prevent the installed sod from being torn or displaced. After rolling or tamping the sod, it shall be watered uniformly and thoroughly with a minimum of 1 inch of water (5.6 gallons per square yard (25 liters per square

meter) applied immediately after installation of sod. In no case shall the time interval between sod placement and initial watering exceed 2 hours. Water shall be placed to the required quantity through sequential passes to insure proper coverage and to prevent runoff. A minimum of ¼ inch (6.4 mm) should be placed on each pass.

Maintenance:

The Contractor shall be responsible for all watering and other maintenance required to maintain the livability and health of the sod from installation until completion of the 60 day observation period. Additional water shall be applied as needed and as directed by the Engineer to maintain the livability of the sod. Each additional watering event shall be a minimum of 0.5 inch of water (2.8 gallons per square yard (13 liters per square meter)) uniformly applied over the sodded area and may be placed in a series of passes to prevent runoff, with a minimum of ¼ inch (6.4 mm) on each pass.

Any sod or portions of sod rejected by the Engineer after placement but prior to beginning the observation period, shall be removed from the project and replaced with acceptable sod. Satisfactory replacement of sod shall begin within 10 days of notification. Failure to replace and repair damaged or dead sod as directed by the Engineer may result in sanctions under Article 108-7 or Article 108-8.

Observation Period:

The Contractor shall maintain responsibility for the sod for a 60 day observation period beginning upon the satisfactory completion and acceptance of all work required in the plans or as directed by the Engineer. The Contractor shall guarantee the sod under the payment and performance bond, refer to Article 109-10 in the standard specifications.

Upon satisfactory completion of work and acceptance by the Engineer, the 60 day observation period shall begin.

The Contractor shall be responsible for all watering and other maintenance required to maintain the livability of the sod from installation until final acceptance including monitoring the sod to ensure all watering and other maintenance is performed as required.

After the first 30 days of the 60 day observation period, the Contractor and Engineer shall meet to review the project and identify dead or damaged sod to be replaced. The Contractor, at no additional expense to the Department, shall satisfactorily replace any sod that is not in a living and healthy condition as determined by the Engineer. Replacement sod shall be furnished and installed in accordance with the same requirements as for initial sodding operation, except that the amounts of limestone, sulfur, and water may be readjusted as directed by the Engineer. Satisfactory replacement of sod shall begin within 10 days of notification. Failure to replace and repair damaged or dead sod as directed by the Engineer may result in sanctions under Article 108-7 or Article 108-8. Upon completion and acceptance of the sod repairs, the remaining 30

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days of the observation period shall begin.

Acceptance:

At the end of the 60 day observation period, the sod furnished and installed under this contract must be in a living and healthy condition, as determined by the Engineer.

Acceptance of sod will be at the end of the 60 day observation period.

Sodding shall be inspected by the Area Roadside Environmental Engineer to begin and end the 60 day observation period. The sod shall be weed free at time of final acceptance.

Payment:

Measurement and Payment will be made under:

Standard Specifications for Roads and Structures.....Sec.1664-5