

Florence County Government

Procurement Department

September 28, 2016

ADDENDUM NO.1- CONSTRUCTION OF A SHELTER WITH RESTROOMS FACILITY AT LAKE CITY PARK PROJECT – 273 North Church Street, Lake City, SC (BID NO. 08-16/17)

The following changes shall be incorporated into the plans and specifications dated September 2, 2016 and shall hereby become part of the contract documents. Original items of the Request for Proposal and information on the drawings not herein modified, amended, voided or suspended shall remain in effect.

IN CASE OF CONFLICT BETWEEN DRAWINGS, SPECIFICATIONS AND THIS ADDENDUM, THIS ADDENDUM SHALL GOVERN. THIS ADDENDUM SUPERCEDES ALL PREVIOUS DRAWINGS, SPECIFICATIONS, AND INSTRUCTIONS PERTAINING TO THESE ITEMS.

<u>GENERAL</u>

- 1. The following information is being provided in relation to questions/discussions arising from the non-mandatory pre-proposal meeting held September 15, 2016 in Lake City:
 - a. The 5% local preference provision up to \$10,000.00 shall apply to this project.
- 2. The bid sheet has been revised to reflect the changes described below and is attached to this addendum. Please use the attached revised bid sheet when you submit your bid. The following additions are hereby added to invitation to bid no. 08-16/17:
 - a. BID ALTERNATE ONE: Deduct for using solid decking in lieu of locking decking.
 - b. BID ALTERNATE TWO: Deduct to delete all masonry work from the building; including low brick, fireplace, and precast walls.
- 3. BUSINESS LICENSE REQUIREMENT:
 - a. It is required that all contractors and all subcontractors awarded a contract agreement with the City of Lake City, SC either secure a business license or update their current business license for the contract amount for any work that is to be done inside the city limits. The successful contractor and all subcontractors shall be

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required to contact Mr. William Hall (whall@cityoflakecity.org) of the City of Lake City at 843 374-5421 prior to commencement of work.

4. TIME OF COMPLETION/LIQUIDATED DAMAGES:

- a. The time limit that is set for this project has been extended to One and Eighty (180) calendar days from the dated indicated on the Notice to Proceed letter that will be issued by the County. In order to ensure a sincere and reasonable effort on the Contractor's part to accomplish the work in a timely fashion, delay damages due to inconveniences to the owner for work not being accomplished on time will be at the rate of one hundred fifty dollars (\$150.00) per day. The Contractor should realize that delays due to bad weather, materials, and such, not under the control of the Contractor will be considered by the Engineer for time extension.
- 5. BID BOND (SURETY) REQUIREMENT:

Bid Surety acts to protect the County from delays and expenses incurred in the lengthy competitive sealed bidding and competitive sealed bid processes, and provides the County with some financial assurance that should the bidder be awarded the project, the successful bidder will enter into the contract with the County. The successful bidder forfeits its Bid Surety in the event it cannot perform the work required by the invitations-for-bid or request-for-bids.

For all responses submitted with estimated project costs exceeding thirty thousand dollars (\$30,000.00), Bid Surety in the amount of at least five percent (5%) of the proposed project costs must be submitted with the response. Failure to satisfy this Bid Surety requirement will result in your bid being considered non-responsive and removed from further consideration for award of the subject contract. Bid Surety can be provided as discussed below.

BID SURETY OPTIONS:

Option A:

Bid Surety will not be required from Contractors that have been in business for five (5) consecutive years without filing for bankruptcy. A certificate or statement on business letterhead from the firm stating it meets this gualification will replace the bid surety and must accompany the bid. Bidders not meeting this requirement must furnish Bid Surety as discussed in Option B below.

Option B:

For all bidders not meeting the criteria of "Option A" above, a deposit in the amount of five percent (5%) of the proposed contract price must accompany the bid. These deposits shall take the form of a certified check, cashier's check or a surety bond executed by a corporate surety licensed under the laws of this state. PERSONAL OR COMPANY CHECKS DO NOT MEET THIS REQUIRMENT. The cashier's check or

County Complex 180 N. Irby Street MSC-R, Florence, SC 29501 Telephone (843) 665-3018 Fax: (843) 664-9668 certified check shall be deposited to the County's account if the successful bidder fails to enter into the proposed contract. Bid deposits of unsuccessful bidders will be returned as soon as the contract is awarded.

One of the above requirements must be met and submitted with for your response. Failure to satisfy this Bid Surety requirement will result in your response being considered non-responsive and removed from further consideration for award of the subject project's contract.

6. PAYMENT BOND REQUIREMENT:

A Payment Bond must be submitted to the County by the successful responder ("Contractor") once it has been awarded the contract. Payment Bonds encompass the prime Contractor's obligation to pay subcontractor and others for material and labor used in the project. A Payment Bond guarantees that the Contractor will pay certain bills for labor and materials (including those from subcontractors and suppliers), which are associated with the subject contract. The Payment Bond requirement helps assure that the Contractor provides suitable evidence of its financial condition and ability to complete the project without financial difficulty.

For all contracts submitted with costs exceeding thirty thousand dollars (\$30,000.00), a Payment Bond in the amount of one hundred percent (100%) of the contract price must be submitted by the Contractor with the proposed contract to the County. Failure to satisfy this Payment Bond requirement will result in the Contractor being considered non-responsive and possibly removed from consideration for award of future County contracts. Payment Bond guaranty options are discussed below.

PAYMENT BOND GUARANTY OPTIONS:

For all contracts submitted with costs exceeding thirty thousand dollars (\$30,000.00), a Payment Bond guaranty in the amount of one hundred percent (100%) of the contract price must be submitted by the Contractor with the proposed contract to the County. This Payment Bond requirement can be satisfied utilizing one of the two options below:

(1) Option A:

The Contractor with the executed contract must submit a Payment Bond in the required amount discussed above and executed by a corporate surety licensed under the laws of this state. Contractors not meeting this requirement must furnish an alternative Payment Bond Guaranty as discussed in Option B below.

(2) Option B:

For all Contractors not meeting the criteria of "Option A" above, a deposit in the amount of one hundred percent (100%) of the contract price must be submitted by the Contractor with the proposed contract to the County. This deposit shall take the form of a certified check or a cashier's check deposited with the County. An

County Complex 180 N. Irby Street MSC-R, Florence, SC 29501 Telephone (843) 665-3018 Fax: (843) 664-9668 Page **3** of **7** irrevocable standby letter of credit issued by the bank is an acceptable alternate. **PERSONAL OR COMPANY CHECKS DO NOT MEET THIS REQUIRMENT**. Failure of the Contractor to satisfactorily fulfill its obligations under the subject contract shall result in the forfeiture of this deposit.

One of the above requirements must be met and submitted by the successful Contractor with its proposed contract to the County. Failure to satisfactorily fulfill its obligations under the subject contract shall result in the forfeiture of the Payment Bond guaranty.

<u>Responders failing to enter the proposed contract and also post the required Payment</u> <u>Bond may be subject to Debarment or Suspension, as prescribed under Section 11-102</u> <u>of the Florence County Code, from future consideration for award of contracts.</u>

7. PERFORMANCE BOND REQUIREMENT:

A Performance Bond must be submitted to the County by the successful responder ("Contractor") once it has been awarded the contract. The Performance Bond insures that the project will be completed even if the prime Contractor defaults or abandons the project. A Performance Bond guarantees contract performance by the Contractor, according to the contract specifications, terms and conditions. The Performance Bond requirement helps assure that the Contractor provides suitable evidence of its financial condition and ability to complete the project without financial difficulty.

For all contracts submitted with costs exceeding thirty thousand dollars (\$30,000.00), a Performance Bond in the amount of one hundred percent (100%) of the contract price must be submitted by the Contractor with the proposed contract to the County. Failure to satisfy this Performance Bond requirement will result in the Contractor being considered non-responsive and possibly removed from consideration for award of future County contracts. Performance Bond guaranty options are discussed below.

PERFORMANCE BOND GUARANTY OPTIONS:

For all contracts submitted with costs exceeding thirty thousand dollars (\$30,000.00), a Performance Bond Guaranty in the amount of one hundred percent (100%) of the contract price must be submitted by the Contractor with the proposed contract to the County. This Performance Bond guaranty requirement can be satisfied utilizing one of the two options below:

(1) <u>Option A:</u>

The Contractor with the executed contract must submit a Performance Bond in the required amount discussed above and executed by a corporate surety licensed under the laws of this state. Contractors not meeting this requirement must furnish an alternative Performance Bond Guaranty as discussed in Option B below.

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(2) Option B:

For all Contractors not meeting the criteria of "Option A" above, a deposit in the amount of one hundred percent (100%) of the contract price must be submitted by the Contractor with the proposed contract to the County. This deposit shall take the form of a certified check or a cashier's check deposited with the County. An irrevocable standby letter of credit issued by the bank is an acceptable alternate. **PERSONAL OR COMPANY CHECKS DO NOT MEET THIS REQUIRMENT**. Failure of the Contractor to satisfactorily fulfill its obligations under the subject contract shall result in the forfeiture of this deposit.

One of the above requirements must be met and submitted by the successful Contractor with its proposed contract to the County. Failure to satisfactorily fulfill its obligations under the subject contract shall result in the forfeiture of the Performance Bond Guaranty.

<u>Responders failing to enter the proposed contract and also post the required</u> <u>Performance Bond may be subject to Debarment or Suspension, as prescribed under</u> <u>Section 11-102 of the Florence County Code, from future consideration for award of</u> <u>contracts.</u>

8. INSURANCE REQUIREMENT:

The contractor shall agree to hold harmless, indemnify and defend Florence County, its agents and employees from any claims for property damage or personal injury (including death resulting therefrom). Such claims include, but are not limited to, actual, consequential, incidental or punitive damages. The contractor shall agree to maintain sufficient comprehensive general liability insurance, naming Florence County as additional insured in the amounts of \$1,000,000.00 per occurrence and \$1,000,000.00 per person. Proof of such insurance shall be given to the Florence County Procurement Office by an appropriate certificate-of-insurance issued by the contractor's insurance agent.

Further, the contractor shall agree to insure prior to commencement of work on the project (job), all subcontractors, agents, assigns or employees of prime contractor and subcontractor shall agree to hold harmless, indemnify and defend the Florence County, South Carolina, its agents and employees from any claims for property damage or personal injury (including death resulting therefrom). Such claims include but are not limited to, actual, consequential, incidental or punitive damages. Further, prior to commencement of work on the project (job), the contractor shall insure that all subcontractors, agents or assigns of the contractor, maintain sufficient comprehensive general liability insurance, naming the Florence County, South Carolina, as additional insured, in the amounts of \$1,000,000.00 per occurrence and \$1,000,000.00 per person. Proof of such insurance shall be given to the Procurement Officer by an appropriate certificate-of-insurance issued by applicable entity's insurance agent.

With regards to comprehensive general liability insurance, claims may be made during or after the term or terms of the contract agreement.

Vehicle liability insurance with minimum combined single limits of \$1,000,000.00 per occurrence shall be maintained by the contractor.

The contractor shall obtain and maintain, during the life of the contract agreement, workers' compensation and employer's liability insurance for all employees to be engaged in services on this project under this agreement in an amount not less than the minimum allowed by South Carolina law, and in case any such services are sublet, the contractor shall require the subcontractor(s) similarly to provide workers' compensation and employer's liability insurance for all of the subcontractor's employees to be engaged in services.

CONTRACTOR QUESTIONS

Refer to the attached email response to a bidder's questions regarding wood decking and wood trusses.

DRAWING REVISIONS

1. SHEET S1.0 GENERAL NOTES & DETAILS:

Add note, "17. 2x8 T&G ROOF DECKING TO HAVE V EDGE".

2. SHEET S2.0 FOUNDATION PLAN:

Revise Footing Schedule F3 Footing Size to read "4'-0" x 4'-0" x 2'-0"".

3. ALL ARCHITECTURAL SHEETS:

Revise note "COMPOSITE WD ROOF SHEATHING, SEE STRUCTURAL" to read "WD ROOF SHEATHING, SEE STRUCTURAL".

4. Sheet E3.0 – ELECTRICAL LIGHTING PLAN:

Revise Lighting Symbols Fixtures Table, Add the attached prior approved light fixture substitutions.

PROJECT MANUAL REVISIONS

- 1. Section 074113 Metal Roofing
 - a. Paragraph 2.3.B.1 Manufacturers
 - b. Add "e. CMP, Construction Metal Products, Inc." as a prior approved manufacturer.

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- c. Add "f. MRS 2000, Metal Roofing Systems, Inc." as a prior approved manufacturer.
- d. Add "g. Drexel Metals, Inc." as a prior approved manufacturer.
- 2. Section 084523 Fiberglass Sandwich Panel Assemblies
 - a. Paragraph 2.1A Manufacturers
 - b. Add "3. Extech Exterior Technologies Series 3400" as a prior approved manufacturer.
- 3. Section 312000 Earthmoving
 - a. Revised sections dealing with unsuitable soils.
- 4. Report of Subsurface Exploration
 - Refer to the attached "Report of Subsurface Soil Exploration and Geotechnical Engineering Evaluation" for Lake City Park, prepared by ECS, dated September 22, 2016.

Attachments: Contractor Question Email Responses.pdf Light Fixture Substitutions.pdf 312000 Earth Moving.pdf 38-1527 Lake City Park.pdf 08-16-17 Bid Sheet.pdf

PLEASE ACKNOWLEDGE THIS ADDENDUM BY SIGNING BELOW AND SUBMIT IT WITH YOUR BID.

I have read and acknowledged this addendum for bid no. 08-16/17.

Authorized Signature

Printed Name

Date

Company Name

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SECTION 312000 - EARTH MOVING

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS
 - A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
 - B. "Report of Subsurface Soil Exploration and Geotechnical Engineering Evaluation" for Lake City Park, ECS Project No.: 38:1527, prepared by ECS for Florence County Complex, dated September 22, 2016.
- 1.2 SUMMARY
 - A. This Section includes the following:
 - 1. Preparing subgrades for slabs-on-grade, walks, pavements, lawns and grasses, and exterior plants.
 - 2. Excavating and backfilling for buildings and structures.
 - 3. Drainage course for slabs-on-grade.
 - 4. Subbase course for concrete pavements.
 - 5. Subbase course for asphalt paving.
 - 6. Subsurface drainage backfill for walls and trenches.
 - 7. Excavating and backfilling for utility trenches.
 - 8. Excavating and backfilling trenches for buried mechanical and electrical utilities and pits for buried utility structures.
 - B. Related Sections include the following:
 - 1. Division 31 Section "Site Clearing" for temporary erosion and sedimentation control measures, site stripping, grubbing, stripping and stockpiling topsoil, and removal of above- and below-grade improvements and utilities.

1.3 UNIT PRICES

- A. The Unit Prices for this section shall be measured by cross section.
 - 1. The contractor shall employ a land surveyor, registered in the State of North Carolina, acceptable to the Designer and University, to measure and seal all cross section calculations.
- B. Removal and offsite disposal of unsuitable soil. Measure shall be by cross section of excavation. Unit price shall include removal, transportation, all offsite disposal costs, and measurement. Also included is replacement with equal volume of imported engineered fill, which will include purchase, transportation, placement and compaction.
- C. Basis of Payment: Payment shall be made at the contract unit price per cubic yard. This unit price shall include full compensation for all materials, equipment, labor, tools and incidentals necessary to complete the item regardless of the depth encountered, only the material authorized by Geotechnical Engineer and Engineer shall be paid for. The price includes

disposal of unsuitable material off of job site. Material used to replace "undercut" areas shall be obtained from approved off site borrow source or suitable on site material.

- 1.4 DEFINITIONS
 - A. Backfill: Soil material or controlled low-strength material used to fill an excavation.
 - 1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
 - 2. Final Backfill: Backfill placed over initial backfill to fill a trench.
 - B. Base Course: Course placed between the subbase course and hot-mix asphalt paving.
 - C. Bedding Course: Course placed over the excavated subgrade in a trench before laying pipe.
 - D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.
 - E. Drainage Course: Course supporting the slab-on-grade that also minimizes upward capillary flow of pore water.
 - F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
 - Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Engineer. Authorized additional excavation and replacement material will be paid for according to Contract provisions for unit prices and changes in the Work.
 - 2. Bulk Excavation: Excavation more than 10 feet (3 m) in width and more than 30 feet (9 m) in length.
 - 3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Engineer. Unauthorized excavation, as well as remedial work directed by Engineer, shall be without additional compensation.
 - G. Fill: Soil materials used to raise existing grades.
 - H. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
 - I. Subbase Course: Course placed between the subgrade and base course for hot-mix asphalt pavement, or course placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.
 - J. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.
 - K. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.
- 1.5 SUBMITTALS
 - A. Product Data: For the following:



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- 1. Each type of plastic warning tape.
- 2. Geotextile.
- 3. Controlled low-strength material, including design mixture.
- B. Samples: 12-by-12-inch (300-by-300-mm) Sample of subdrainage geotextile.
- C. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:
 - 1. Classification according to ASTM D 2487 of each on-site and borrow soil material proposed for fill and backfill.
 - 2. Laboratory compaction curve according to ASTM D 1557 for each on-site and borrow soil material proposed for fill and backfill.
- D. Preexcavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by earthwork operations. Submit before earthwork begins.

1.6 QUALITY ASSURANCE

- A. Geotechnical Testing Agency Qualifications: An independent testing agency qualified according to ASTM E 329 to conduct soil materials testing, as documented according to ASTM D 3740 and ASTM E 548.
- B. Preexcavation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1.7 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Engineer and then only after arranging to provide temporary utility services according to requirements indicated.
 - 1. Notify Engineer not less than two days in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without Engineer's written permission.
 - 3. Contact utility-locator service for area where Project is located before excavating.
- B. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.

PART 2 - PRODUCTS

- 2.1 SOIL MATERIALS
 - A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
 - B. Satisfactory Soils: ASTM D 2487 Soil Classification Groups SC, SW, SM, and ML some CL, or a combination of these groups; low-plasticity (Liquid Limit less than 40 and Plasticity Index less than 20); maximum dry density of at least 95 pounds per cubic foot as determined by a Standard Proctor compaction test, ASTM D 698; free of rock or gravel larger than 3 inches (75 mm) in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter. Soils with classification GP and SP may require mixing or soil amendment as determined by the

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onsite Geotechnical Engineer for use. Acceptable moisture content shall be -3 to +2 percent of optimum as determined by Standard Proctor test.

- 1. Unsatisfactory Soils: Unsatisfactory Soils: ASTM D 2487 soil classification groups GW, GM, GC, MH, CH, OL, OH, and PT or a combination of these group symbols. Suitability of soils shall be determined by onsite Geotechnical Testing Agency. Unsuitable soil shall be so classified by structure, content, unit weight less than 90 lbs., plastic soils, etc. Soils too wet or too dry will not be considered unsuitable if useable at optimum moisture. Unsuitable soil is only defined below subgrade elevations.
- C. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.
- D. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 95 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.
- E. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve, free of organic matter and other deleterious materials, have a Liquid Limit (LL) and a Plasticity Index (PI) less than 40 and 20, respectively, and have a standard Proctor (ASTM D 698) maximum dry density of at least 95 pounds per cubic foot (pcf).
- F. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch (25-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.
- G. Drainage Course: Narrowly graded mixture of washed crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch (37.5-mm) sieve and 0 to 5 percent passing a No. 8 (2.36-mm) sieve.
- H. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch (25-mm) sieve and 0 to 5 percent passing a No. 4 (4.75-mm) sieve.
- I. Sand: ASTM C 33; fine aggregate, natural, or manufactured sand.
- J. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.
- K. Backfill and Fill: Satisfactory soil materials.

2.2 GEOTEXTILES

- A. Subsurface Drainage Geotextile: Nonwoven needle-punched geotextile, manufactured for subsurface drainage applications, made from polyolefins or polyesters; with elongation greater than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:
 - 1. Survivability: Class 2; AASHTO M 288.
 - 2. Grab Tensile Strength: 157 lbf (700 N); ASTM D 4632.
 - 3. Sewn Seam Strength: 142 lbf (630 N); ASTM D 4632.

 Lake City Park

 STEWART

 Shelter Construction Documents (Phase 4)

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- 4. Tear Strength: 56 lbf (250 N); ASTM D 4533.
- 5. Puncture Strength: 56 lbf (250 N); ASTM D 4833.
- 6. Apparent Opening Size: No. 40 (0.425-mm) sieve, maximum; ASTM D 4751.
- 7. Permittivity: 0.5 per second, minimum; ASTM D 4491.
- 8. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.

2.3 CONTROLLED LOW-STRENGTH MATERIAL

- A. Controlled Low-Strength Material: Low-density, self-compacting, flowable concrete material as follows:
 - 1. Portland Cement: ASTM C 150, Type I, II or III.
 - 2. Fly Ash: ASTM C 618, Class C or F.
 - 3. Normal-Weight Aggregate: ASTM C 33, 3/8-inch (9-mm) nominal maximum aggregate size.
 - 4. Foaming Agent: ASTM C 869.
 - 5. Water: ASTM C 94/C 94M.
 - 6. Air-Entraining Admixture: ASTM C 260.
- B. Produce conventional-weight, controlled low-strength material with 80-psi (550-kPa) compressive strength when tested according to ASTM C 495.

2.4 ACCESSORIES

- A. Detectable Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches (750 mm) deep; colored as follows:
 - 1. Red: Electric.
 - 2. Yellow: Gas, oil, steam, and dangerous materials.
 - 3. Orange: Telephone and other communications.
 - 4. Blue: Water systems.
 - 5. Green: Sewer systems.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- B. Preparation of subgrade for earthwork operations including removal of vegetation, topsoil, debris, obstructions, and other soft, unsuitable, or deleterious materials from ground surface as specified in Division 31 Section "Site Clearing."
- C. Protect and maintain erosion and sedimentation controls, which are specified in Division 31 Section "Site Clearing," during earthwork operations.
- D. Provide protective insulating materials to protect subgrades and foundation soils against freezing temperatures or frost.

3.2 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
 - 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
 - 2. Install a dewatering system, specified in Division 31 Section "Dewatering," to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.

3.3 EXPLOSIVES

- A. Explosives: Do not use explosives.
- 3.4 EXCAVATION, GENERAL
 - A. Classified Excavation: Excavate to subgrade elevations. Material to be excavated will be classified as satisfactory or unsatisfactory soil. Do not excavate unsatisfactory soil until it has been classified and cross sectioned by Testing Agency. The Contract Sum will be adjusted for unsatisfactory soil excavation according to unit prices included in the Contract Documents. Changes in the Contract time may be authorized for unsatisfactory soil excavation.

3.5 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch (25 mm). If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
 - 1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
 - Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch (25 mm). Do not disturb bottom of excavations intended as bearing surfaces.
- B. Foundation concrete should be placed the same day that foundations are excavated. If the excavation must remain open overnight, or if rainfall becomes imminent while the bearing soils are exposed, a 1- to 3-inch thick "mud mat" of "lean" concrete may be placed on the bearing surface to protect the bearing soils. The mud mat shall not be placed until the bearing soils have been tested for adequate bearing capacity. Foundations undercut should be backfilled with engineered fill. If lean concrete is placed within the undercut zone, the foundation footprint does not require oversizing. However, if soil or ABC stone is used in lieu of lean concrete, the foundation footprint should be oversized on a 1V:1H scale.

3.6 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.7 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
 - 1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.
- B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches (300 mm) higher than top of pipe or conduit, unless otherwise indicated.
 - 1. Clearance: As indicated.
- C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.
 - 1. For pipes and conduit less than 6 inches (150 mm) in nominal diameter and flatbottomed, multiple-duct conduit units, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
 - 2. For pipes and conduit 6 inches (150 mm) or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe circumference. Fill depressions with tamped sand backfill.
 - 3. Excavate trenches 6 inches (150 mm) deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.
- D. Trench Bottoms: Excavate trenches 4 inches (100 mm) deeper than bottom of pipe elevation to allow for bedding course. Hand excavate for bell of pipe.
 - 1. Excavate trenches 6 inches (150 mm) deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

3.8 SUBGRADE INSPECTION

- A. Notify Testing Agency when excavations have reached required subgrade.
- B. If Testing Agency determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
- C. Proof-roll subgrade below the building slabs and pavements with a loaded, tandem axle dump truck or similar pneumatic-tired construction equipment weighing at least 10 tons, to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
 - 1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph (5 km/h).
 - 2. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Testing Agency, and replace with compacted engineered fill, as directed.

- X12040
- 3. Proof-rolling shall be performed under the observation of the Testing Agency.
- D. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
- E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Engineer, without additional compensation.

3.9 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi (17.2 MPa), may be used when approved by Testing Agency.
 - 1. Fill unauthorized excavations under other construction or utility pipe as directed by Engineer.
- 3.10 STORAGE OF SOIL MATERIALS
 - A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.
- 3.11 BACKFILL
 - A. Place and compact backfill in excavations promptly, but not before completing the following:
 - 1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
 - 2. Surveying locations of underground utilities for Record Documents.
 - 3. Testing and inspecting underground utilities.
 - 4. Removing concrete formwork.
 - 5. Removing trash and debris.
 - 6. Removing temporary shoring and bracing, and sheeting.
 - 7. Installing permanent or temporary horizontal bracing on horizontally supported walls.
 - B. Place backfill on subgrades free of mud, frost, snow, or ice.
- 3.12 UTILITY TRENCH BACKFILL
 - A. Place backfill on subgrades free of mud, frost, snow, or ice.
 - B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
 - C. Backfill trenches excavated under footings and within 18 inches (450 mm) of bottom of footings with satisfactory soil; fill with concrete to elevation of bottom of footings.

X12040

- D. Provide 4-inch- (100-mm-) thick, concrete-base slab support for piping or conduit less than 30 inches (750 mm) below surface of roadways. After installing and testing, completely encase piping or conduit in a minimum of 4 inches (100 mm) of concrete before backfilling or placing roadway subbase.
- E. Place and compact initial backfill of satisfactory soil, free of particles larger than 1 inch (25 mm) in any dimension, to a height of 12 inches (300 mm) over the utility pipe or conduit.
 - 1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.
- F. Controlled Low-Strength Material: Place initial backfill of controlled low-strength material to a height of 12 inches (300 mm) over the utility pipe or conduit.
- G. Backfill voids with satisfactory soil while installing and removing shoring and bracing.
- H. Place and compact final backfill of satisfactory soil to final subgrade elevation.
- I. Controlled Low-Strength Material: Place final backfill of controlled low-strength material to final subgrade elevation.
- J. Install locating wire directly above utilities. Install and detectable warning tape 12 inches (300 mm) below finished grade, except 6 inches (150 mm) below subgrade under pavements and slabs.
- 3.13 SOIL FILL
 - A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
 - B. Place and compact fill material in layers to required elevations as follows:
 - 1. Under grass and planted areas, use satisfactory soil material or engineered fill.
 - 2. Under walks and pavements, use satisfactory soil material or engineered fill.
 - 3. Under steps and ramps, use engineered fill.
 - 4. Under building slabs, use engineered fill.
 - 5. Under footings and foundations, use engineered fill.
 - C. Place soil fill on subgrades free of mud, frost, snow, or ice.
- 3.14 SOIL MOISTURE CONTROL
 - A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within -3 to +3 percent of optimum moisture content as determined by the standard Proctor test at the time of placement and compaction.
 - 1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
 - 2. Remove and replace, or scarify and air dry otherwise satisfactory soil material that exceeds optimum moisture content by 3 percent and is too wet to compact to specified dry unit weight.

X12040

3.15 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Relatively loose near surface fill soils are present on the site. As such, the near surface fill soils shall be densified in-place by multiple passes with a large vibratory roller after clearing, grubbing, and removal of the surficial materials but prior to placement of new fill or other at-grade construction. Loose subgrade materials that cannot be adequately densified in-place will require undercutting and replacement with new engineered fill.
- B. Place backfill and fill soil materials in layers not more than 8 inches (200 mm) loose depth for material compacted by heavy self-propelled compaction equipment, and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.
- C. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
- D. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698:
 - 1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches (300 mm) of existing subgrade and each layer of backfill or fill soil material at 95 percent. The upper one foot of soil supporting structures and slabs-ongrade should be compacted to a minimum of 98 percent of the maximum dry density obtained in accordance with ASTM D 698.
 - 2. Under walkways, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill soil material at 95 percent.
 - 3. Under lawn or unpaved areas, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill soil material at 85 percent.
 - 4. For utility trenches, compact each layer of initial and final backfill soil material at 95 percent.

3.16 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
 - 1. Provide a smooth transition between adjacent existing grades and new grades.
 - 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
 - 1. Lawn or Unpaved Areas: Plus or minus 1 inch (25 mm).
 - 2. Walks: Plus or minus 1 inch (25 mm).
 - 3. Pavements: Plus or minus 1/2 inch (13 mm).
- C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch (13 mm) when tested with a 10-foot (3-m) straightedge.
- 3.17 DRAINAGE COURSE
 - A. Place drainage course on subgrades free of mud, frost, snow, or ice.

- B. On prepared subgrade, place and compact drainage course under cast-in-place concrete slabson-grade as follows:
 - 1. Install subdrainage geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
 - 2. Place drainage course 6 inches (150 mm) or less in compacted thickness in a single layer.
 - 3. Place drainage course that exceeds 6 inches (150 mm) in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick.
 - 4. Compact each layer of drainage course to required cross sections and thicknesses to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

3.18 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent geotechnical engineering testing agency to perform field quality-control testing.
- B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.
- C. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Engineer.
- D. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:
 - 1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least 1 test for every 1,000 sq. ft. or less of paved area or building slab, but in no case fewer than 3 tests.
 - 2. Other Areas: At subgrade and at each compacted fill and backfill layer, at least 1 test for every 2,500 sq. ft. or less of area to receive engineered fill, but in no case fewer than 3 tests.
 - 3. Trench Backfill: At each compacted initial and final backfill layer, at least 1 test for each 100 feet or less of trench length, but no fewer than 2 tests.
- E. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.

3.19 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

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- 1. Scarify or remove and replace soil material to depth as directed by Engineer; reshape and recompact.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
 - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.
- 3.20 DISPOSAL OF SURPLUS AND WASTE MATERIALS
 - A. Disposal: Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by Engineer.
 - 1. Remove waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

END OF SECTION 31 20 00

J. Sanders Tate

From:hcollins@collinsconsultants.bizSent:Wednesday, September 21, 2016 2:16 PMTo:sid greeneCc:J. Sanders TateSubject:RE: lake city park

Sid,

- 1. Provide a deduct to change from Lock decking to solid. The spices can be Douglas fir or southern pine.
- 2. The species can be Douglas fir or Pine, ARCH Appearance, yes treated.

Harry Collins, PE Collins Consultants, Inc. 840 Shull Street, Suite 220 West Columbia, SC 29169 803-926-8000 803-926-8300 (f) 803-238-9418 (c)

From: sid greene [mailto:sid@hctfmw.com] Sent: Tuesday, September 20, 2016 11:10 AM To: hcollins@collinsconsultants.biz Subject: lake city park

Questions:

- 1. The 2x8 roof decking is it intended to be solid decking or limited? What is the species and is it to be treated?
- 2. The 4x10 timber trusses. What is the species, grade, and is it to be treated?

Sid Greene (president) Hardin Creek Timber Frame & Millwork 371 Daniel Boone Dr Boone, NC 28607 828-264-2464 office 828-266-1205 cell sid@hctfmw.com www.hctfmw.com

J. Sanders Tate

From:	David Jordan <djordan@tscltg.com></djordan@tscltg.com>
Sent:	Wednesday, September 14, 2016 3:18 PM
То:	J. Sanders Tate
Subject:	Restroom Pavilion at Lake City Park
Attachments:	LED1.pdf; LED2.pdf; EMVR.pdf; EXVR.pdf; A.pdf

Sanders,

Re: Request for prior approval

Please consider these light fixtures as equals for the restroom pavilion at Lake City Park.

Туре	<u>Manufacturer</u>	Catalog #
LED1	Williams	96-2-L29/835-PCFR-WET/2-DRV-UNV
LED2	Williams	76-4-232-EB2-UNV
EMVR	Williams	EMER/MR16/CP/WET-GRAY
EXVR	Williams	EXIT/WET/CP-SF-R-WHT-EM
А	Kenall	MLHA5-24-R-MW-PP-1-25L40K-DCC-1-DV-DL-CMB

Thank you,

David Jordan M: 803.513.2239 http://theschneidercompany.com/ Date: Sep 13, 2016

James G. Murphy Co., Inc. P Box 568 Greenville SC 29602 Phone: (864) 271-4470 Fax: (864) 271-4956

Job Name LAKE CITY PARK RESTRROM & PICNIC 116-35827

> Bid Date Oct 4, 2016

Submittal Date Sep 13, 2016

Architect: WATSON TATE SAVORY-22 Submitted by James G. Murphy Co., Inc.

Job Name:

LAKE CITY PARK RESTRROM & PICNIC Architect: WATSON TATE SAVORY-22

Catalog Numbe Notes

Туре

Type: LED1

116-35827

🚺 LITHONIA LIGHTING

FEATURES & SPECIFICATIONS

INTENDED USE —Ideal for use in applications where smart, energy-efficient fixtures are desired. Typical applications include transit, parking garage, awnings, cold storage, food processing, docks, schools, hospitals, carwashes, natatoriums and exterior environments where moisture or dust is a concern. Certain airborne contaminants can diminish integrity of acrylic. <u>Click here for</u> Acrylic Environmental Compatibility table for suitable uses.

CONSTRUCTION — One-piece 5VA rated fiberglass housing with integral perimeter channel utilizes continuous poured-in-place NEMA 4X gasket. Simple two-piece design consists of housing and optical assembly to streamline installation process. Polymericlatches positively attach to housing and keep from becoming a hindrance during install.

OPTICS — Injection-molded, acrylic lens (.080° thick), provides high impact-resistance comparable to 100% DR. F1 rated for outdoor use, lenses resist breaking, yellowing or becoming brittle over time. UV stabilized polycarbonate diffuser available (.080° thick) in clear or frosted for additional impact strength. Polycarbonate lens is recommend for lower mounting heights where vandal protection is desired.

ELECTRICAL — Tool- less one piece optical assembly combines LEDs and lens into one component. Optical assembly easily connects to housing with plug and play harness, eliminating time consuming wiring connections. LED drivers consumes 40 input watts maximum and offers 1% dimming standard.

Integral surge protection tested in accordance with IEEE/ANSI C62.41.2 to industrial standards 6kV/3kA. L85 at 60,000 hours.

INSTALLATION — Two-piece design makes installations faster than ever by simplifying wiring connections. Power connection is easily accommodated through pre-drilled holes at each end, optional wet location fittings available for maximum flexibility.

Stainless steel (#316) surface spring-mounting brackets with bail wires standard (2 included) allow for ceiling, wall or suspended mount.

Swivel stem(provided by others) when pendant mounting. Factory installed junction box option accommodates up to 4X4 sized boxes and includes integrated gasket to maintain wet location listings. Quick Mount Bracket (QMB) ships installed on fixture and is recommended for fastest surface mount installs, ideal for end to end installations or larger jobs.

LISTINGS — CSA Certified to UL and C-UL standards for ambient temperatures ranging from -40°F (-40°C) to 104°F (40°C) (see Operational Data chart for actual temperature rating per lumen package). F1 rating makes luminaire suitable for wet locations without covered ceilings. NEMA 4X rated. IP ratings: IP65 and IP66 rated. 1500 PSI hose-down.

NSF listed for Splash Zone II.

DesignLights Consortium[®] (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at <u>www.designlights.org/QPL</u> to confirm which versions are qualified.

WARRANTY — 5-year limited warranty. Complete warranty terms located at www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

Ambient temperatures that exceed 104°F (40°C) will result in reduced life and will void warranty. Note: Actual performance may differ as a result of end-user environment and application.

All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.

DIMENSIONS



LED Enclosed and Gasketed







INDUSTRIAL

PHOTOMETRICS Please see www.lithopia.com.

Submitted by James G. Murphy Co., Inc.	Catalog Number:	Type:
Job Name: LAKE CITY PARK RESTRROM & PICNIC Architect: WATSON TATE SAVORY-22	DMW2 L24 3000LM ACL MD MVOLT GZ1 30K 80CRI Notes:	LED1

DMW2 LED Wet Location

Series	Length	Nominal lumens	Diffuser	Distribution	Voltage	Driver	Color temperature	Color rendering Index
DMW2 LED wet location	L24 24"	2000LM 2,000 lumens 3000LM 3,000 lumens 4000LM 4,000 lumens	ACL Acrylic AFL Frosted acrylic PCL Polycarbonate PFL Frosted Polycarbonate	MD Medium distribution WD Wide distribution	MV0LT 120-277V 120 120V 208 208V 240 240V 277 277V 347 347V' 480 480V'	GZ1 1% dimmng	30K 3000 K 35K 3500 K 40K 4000 K 50K 5000 K	80CRI 80 CRI 90CRI 90 CRI

Options					
SF DF PS1050	Single fusing ^{2,3} Double fusing ^{2,4} Emergency LED battery pack for 0°C and up	CS88 CS88L12	6' Brad Harrison 16/3 cord and straight blade plug set, NEMA 4X rated ^{2,7} 12' Brad Harrison 16/3 cord and straight	MSI10XAWL10M DSCXAWL	Xpoint wireless integral motion sensor, On/ Off operation for motion sensing, override Off due to daylight ^{2:6}
PMP4X	(1400 lumens) ^{2,5} Pendant monopoint with NEMA4X fitting ^{6,7}	C588R	blade plug set, NEMA 4X rated ^{2,7} Brad Harrison receptacle for use with	MSI10NWL	Low mount 360 integral motion sensor, wet location, On/Off operation ^{2,10}
WLFEND WI FFND2	Wet location fitting (one fitting out end) ^{7,8} Wet location fitting (fittings out both ends) ^{7,8}	NOM	CS88 cord set, NEMA 4X rated ⁷ Nom certified	MSI102L3VWL	Low mount 360 integral motion sensor, wet location, High/Low operation (3 level) ^{2,10}
WLFEND4X	Wet location fitting maintains NEMA4x rating (one fitting out end) ^{7,8}	TPS	TorxT10 tamper-resistant screws	MSI10NWL DSCNWŁ	low mount 360 integral motion sensor, wet location , On/Off operation for motion
WLFEND24X	Wet location fitting maintains NEMA4X rating(fittings out both ends) ^{7,8}	5152		XAD	sensing, override Off due to daylight ^{2,10} XPoint wireless relay ^{2,7,11}
JSB	Junction box snap-bracket ^{6,7,3}				
QMB	Quick-mount ceiling bracket				
CS89	6' white cord, 16/3, no plug, wet location'				
CS89L12	12' white cord, 16/3, no plug, wet location ⁷				

Accessories: Order as	separate catalog number.
RK1 T10BIT W/PIN U	Hex-base driver bit, Torx TX10, for tamper-resistant screws with center reject pin
RK1 T10DRV U	Torx TX10 screwdriver for use with tamper-resistant screws with center reject pin
DMW2WLF	Wet location fitting
DMW2QMB	Quick-mount ceiling bracket

Notes

- 1. Utilizes a step down transformer.
- 2. Must specify voltage.
- 3. 120 or 277V.
- 4. 208,240,347, or 480V.
- 120,208,240, or 277V. Not available with cord, XAD, JSB, or PMP4X options. Maximum ambient temperature 25°C.
- 6. Factory installed only. Not field installable.
- 7. Not available with PS1050.
- 8. Not available with cordsets or sensors.
- Not intended for wall mounting. Voids IP65 rating and NSF listing.
- 10. Not available with XAD. Maximum ambient temperature 35°C.
- 11. Minimum ambient temperature -20°C.

Submitted by James G. Murphy Co., Inc.		Catalog Number:	Type:
Job Nar	NE:	DMW2 L24 3000LM ACL MD MVOLT	LED1
LAKE CITY	PARK RESTRROM & PICNIC	GZ1 30K 80CRI	
Architect: V	VATSON TATE SAVORY-22	Notes:	

DMW2 LED Wet Location

PERATIONAL DATA	August Market					
DMW2, 80CRI Medium	Wattage	Ambient Temperature	Color Temp	Nominal Lumens Frosted Acylic, 80CRI	Nominal Lumens Clear Acylic, 80CRI	Comparable Light Source
			30K	2419	2419	
2000/ M	10	20°C to 40°C	35K	2481	2556	1.2370
ZUUULIM	18	-20°C to 40°C	40K	2536	2612	1-3218 lamp
			50K	2661	2740	
	27	-20°C to 40°C	30K	3483	3587	2-32T8 lamps
			35K	2572	3680	
SUUULIM			40K	3651	3761	
			50K	3831	3946	
			30K	4631	4770	
4000114	40		35K	4751	4893	3-32T8 Lamps
4000LM	40	-40 ([0 40"(40K	4855	5001	2-54T5H0 lamp
			50K	5094	5247	

OPTIONS AND ACCESSORIES

The DMW2 Series fixture offers numerous options for almost every electrical and optical component, including a long list of field-installable accessories.

SMB Surface mounting bracket (ships standard with fixture)



QMB Quick mounting bracket field installable option order as DMW2QMB



JSB Junction mounting bracket (factory installed only) (Not intended for wall mounting.) Voids IP65 rating.)



PMP4X Pendant monopoint (factory installed only)

Submitted by James G. Murphy Co., Inc.		Catalog Number:	Type:
J	ob Name:	DMW2 L24 3000LM ACL MD MVOLT	LED1
LA	AKE CITY PARK RESTRROM & PICNIC	GZ1 30K 80CRI	
Ar	chitect: WATSON TATE SAVORY-22	Notes:	

DMW2 LED Wet Location

OPTIONS AND ACCESSORIES

The DMW2 Series fixture offers numerous options for almost every electrical and optical component, including a long list of field-installable accessories.

SBOR - WET LOCATION Motion Sensor (see <u>www.sensorswitch.com</u> for additional information)

- 360° coverage
- On/Off dim
- Photocell optional
- IP66 rated
- · Photocell and 0-10VDC dimming options.

Fixture sensor nomenclature	SBOR sensor nomenclature
For shortest lead times use one	of the following SBOR configurations
MSITONWL	SBOR 10 OEX EB3 WH
MSI102L3VWL	SBOR 10 OEX D EB3 WH 3V
MSI10NWL DSCNWL	SBOR 10 OEX P EB3 WH



MOTION SENSOR

ORDERING INFORMATION Lead times will vary depending on options selected. Consult with your sales representative. Example: MSI10NWL Series Lens option Dimming Maximum dim level **Environmental factors** MS Passive infrared occupancy 10 Low mount, 360° 0n\off ٥V 0ff N WL Wet location sensor 2LXX Bi level range¹ 1V 1 VDC СХХ Continous dim range¹ 2٧ 2 VDC XA Xpoint wireless signal to external system 3₩ 3 VDC 4V 4 VDC 5V 5 VDC

PHOTOCELL

ORDER	RING INFORMATION Lead times will vary depending	on options selected. Consult with your sales representative.	Example: DSCNW
Series		Dimming	Environmental factors
DSC	Passive infrared occupancy sensor w/photocell	N On'off 2LXX Bi level rangë ¹ CXX Continous dim range ¹ XA Xpoint wireless signal to external system	WL Wet location

Notes

1 XX denotes dimming range.(Ex. 3V, 4V, etc.)



NL: Dhe Lithonia Way: Conyers, GA 30012 Phone: 800-315-4963 www.lithonia.com

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Job Name:

LAKE CITY PARK RESTRROM & PICNIC Architect: WATSON TATE SAVORY-22

Catalog Number: Z 2 54T5HO 120 GEB10PS

X

Notes:

Catalog Number Notes

Туре

One-Lamp T8

116-35827



FEATURES & SPECIFICATIONS

INTENDED USE — The industry's next generation in linear direct fluorescent products. This new compact, low-profile design offers our customers unique product features which improve the overall installation process and appearance while reducing labor cost, making it the most versatile solution for commercial, retail, manufacturing, warehouse, and cove and display applications.

CONSTRUCTION --- Compact designed channel and cover are formed from code-gauge cold-rolled steel. Innovative T8 two-lamp back plate offers compact design and additional socket protection. Locking lamp holder tracks bolsters strength of the overall strip construction while creating improved lamp stability. Design includes T8 socket, featu plates allow for quick attachm

Designed to accommodate a wi strengthens the overall constru designed, patent-pending char tachment without pinching win

Finish: High-gloss, baked white ensures superior paint adhesion gray (SMG) and galvanized (GA

OPTICS — Reflector options in figurations. Consult factory for

ELECTRICAL — Thermally pro tions. AWN, TFN or THHN wire u

INSTALLATION ---- Patented-p and faster row mounting; inclue

LISTINGS — UL Listed, CUL temperature.

WARRANTY --- 1-year limited

www.acuitybrands.com/Custo Actual performance may differ

Note: Specifications subject to

Reflector (see page 3 for ordering

nomencla-ture)

Ζ

Z Compact strip For tandem double-length unit, add prefix T. Example: TZ

Series

ORDERING INFORMATION

	contacts. mp	ioveu easy s	пари юск ег	nu	1		Low-Pr	ofile T5/T8 Stripligh
8 lamp lengths. Cha ows for the use of th ers a secure fit desig	innel offers th ne new Z sprir gn, allowing f	e gripper bac ng hanger (se for easy acce	k feature whi ee back). New ss and quick a	ch ly t- Two-Lamp	18	· Aris		7
h (white standard). stance. Other chann	. Five-stage in Iel paint finish	on-phosphat 1 options: bla	e pretreatme ck (MB), smol	nt ke				Linear Lamp 1 or 2 Lamp
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ing, Class P, HPF, no ut, rated for require	n-PCB, UL list d temperature	ed. Suitable es.	for damp loc	a- Two-Lamp T	5			
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implete warranty to s/Terms and con end-user environm out notice.	erms located ditions.aspx nent and appl onfigure prod	at lication. lucts using st	andard opti	T8 Length: 24 72 T5 Length: 22 68 Width: 2- Depth: 1- ons (shown in bolc	4 (61.0) ,36 (* ! (182.9) or 9 !-3/8 (56.8), !-3/8(173.6) 1/8 (5.4) 1/2 (3.8) I.)	91.4), 48 (121.9) 6 (243.8) 34-1/8 (86.7), 46 (116.8) or 92 (233.6) All dimension	(5.3) (5.3) (3.7) (3.7) (3.7) (3.7) (3.7) (3.7) (3.7) (3.7) (3.7) (3.7) (3.7)	eters) unless otherwise noted. Z 1 32 MVOLT GEB10IS
54T5H	0 1	MVOL	T GE	B10PS				
Lamp type		Voltage	Ballast		Options			
17 17W 25 25W 32 32W 14T5 14W 21T5 21W 24T5H0 24W 28T5 28W 39T5H0 39W 54T5H0 54W	T8 (24") T8 (36") T8 (48") T5 (22") T5 (34") T5 H0 (22") T5 H0 (22") T5 H0 (34") T5 H0 (46")	120 277 347 MVOLT Others available	GEB10IS GEB10RS GEB10PS	T8 electronic ballast, <10% THD, instant start (T8 only) T8 electronic ballast, <10% THD, rapid start ¹ Electronic ballast, <10% THD, programmed start	GLR GMF PLR EL55 EL65	Internal fast-blow fuse (add X for external) ² Internal slow-blow fuse (add X for external) ² Plug in wiring, specify number of branch circuits and hot wires (A-black, B-Red, C-Blue, AB or AC) Emergency battery pack (nominal 390-700 lumens); consult factory for additional battery packs ^{2,3,4} Emergency battery pack (nomi-	TILW CSA NOM MSI MSI360 MSE360LBZ	Tandem in-line wiring CSA Certified NOM Certified Aisle motion sensor ^{2, 3} 360° motion sensor ^{2, 3} 360° motion sensor; for mounting within row or at end of row ^{2, 3, 4}
	8 lamp lengths. Cha was for the use of th ers a secure fit design tars a secure fit design tars a secure fit design rapertured designs ared versions. ing, Class P, HPF, no ut, rated for require eroint" row conne- rd, Ideal for surface Certified to Canad implete warranty t s/Terms and con end-user environn out notice. intest lead times, c 54T5H Lamp type 17 17W 25 25W 32 32W 14T5 14W 21T5 21W 24T5H0 24W 28T5 28W 39T5H0 39W 54T5H0 54W	8 lamp lengths. Channel offers th was for the use of the new Z sprir ers a secure fit design, allowing 1 h (white standard). Five-stage in stance. Other channel paint finisf r apertured designs in both symu- ared versions. ing, Class P, HPF, non-PCB, UL list ut, rated for required temperatur 2-point" row connector locks cha- rd. Ideal for surface-mount or sus Certified to Canadian Standard: implete warranty terms located syTerms and conditions.aspx end-user environment and appi put notice. 17 17W T8 (24") 25 25W T8 (36") 32 32W T8 (48") 14T5 14W T5 (22") 21T5 21W T5 (34") 24T5HO 24W T5 HO (22") 28T5 28W T5 HO (34") 54T5HO 54W T5 HO (34") 54T5HO 54W T5 HO (46")	8 lamp lengths. Channel offers the gripper back was for the use of the new 2 spring hanger (se ars a secure fit design, allowing for easy access h (white standard). Five-stage iron-phosphat stance. Other channel paint finish options: bla r apertured designs in both symmetric and as ured versions. ing, Class P, HPF, non-PCB, UL listed. Suitable ut, rated for required temperatures. e-point" row connector locks channel togethe rd. Ideal for surface-mount or suspended. Certified to Canadian Standards. Listed for implete warranty terms located at s/Terms and conditions.aspx end-user environment and application. but notice. overtest lead times, configure products using st 54T5H0 MVOL Lamp type Voltage 17 17W T8 (24") 25 25W T8 (36") 277 32 32W T8 (48") 14T5 14W T5 (22") 21T5 21W T5 (34") 24T5H0 24W T5 H0 (22") 28T5 28W T5 (46") 39T5H0 39W T5 H0 (34") 54T5H0 54W T5 H0 (46")	8 lamp lengths. Channel offers the gripper back feature whi was for the use of the new 2 spring hanger (see back). New ers a secure fit design, allowing for easy access and quick a h (white standard). Five-stage iron-phosphate pretreatment stance. Other channel paint finish options: black (MB), smol r apertured designs in both symmetric and asymmetric con- ared versions. ing, Class P, HPF, non-PCB, UL listed. Suitable for damp loca ut, rated for required temperatures. 2-point" row connector locks channel together for straighter rd. Ideal for surface-mount or suspended. Certified to Canadian Standards. Listed for 25° C ambier implete warranty terms located at <u>s/Terms</u> and <u>conditions.aspx</u> end-user environment and application. but notice. 54T5HO MVOLT GE Lamp type Voltage Ballast 17 17W T8 (24") 120 GEB10IS 25 25W T8 (36") 277 32 32W T8 (48") 347 14T5 14W T5 (22") MVOLT 21T5 21W T5 (34") 24W T5 HO (22") 28T5 28W T5 HO (34") 28T5 28W T5 HO (34") S4T5HO 54W T5 HO (46") Bull D	8 lamp lengths. Channel offers the gripper back feature which wis for the use of the new Z spring hanger (see back). Newly ers a secure fit design, allowing for easy access and quick at- h (white standard). Five-stage iron-phosphate pretreatment stance. Other channel paint finish options: black (MB), smoke r apertured designs in both symmetric and asymmetric con- urd versions. ing. Class P, HPF, non-PCB, UL listed. Suitable for damp loca- ur, rated for required temperatures. e-point" row connector locks channel together for straighter rd. Ideal for surface-mount or suspended. Certified to Canadian Standards. Listed for 25° C ambient implete warranty terms located at s/Terms and conditions. aspx end-user environment and application. vut notice. Detth: tortest lead times, configure products using standard options (shown in bole 54T5HO MVOLT GEB10IS T8 leectronic ballast, ≤10% THD, instant start (T8 only) 447 17 17W T8 (24") 120 25 25W T8 (36") 277 32 32W T8 H0 (22") 247 217 17W T8 (24")	8 lamp lengths. Channel offers the gripper back feature which wis for the use of the new Z spring hanger (see back). Newly ers a secure fit design, allowing for easy access and quick at- h (white standard). Five-stage iron-phosphate pretreatment stance. Other channel paint finish options: black (MB), smoke r apertured designs in both symmetric and asymmetric con- ured versions. ing. Class P, HPF, non-PCB, UL listed. Suitable for damp loca- ut, rated for required temperatures. 2-point" row connector locks channel together for straighter rd. Ideal for surface-mount or suspended. Certified to Canadian Standards. Listed for 25° C ambient implete warranty terms located at s/Terms and conditions.aspx end-user environment and application. put notice. Depth: 1-1/2 (3.8) ortest lead times, configure products using standard options (shown in bold.) 54T5HO MVOLT GEB10PS Lamp type 17 17W T8 (24") 25 25W T8 (36") 277 32 32W T8 (48") 447 4475 14W T5 (22") WOLT 25 25W T8 (36") 277 32 32W T8 (48") 447 4475 14W T5 (22") WOLT GEB10PS Ballast 0 ptions 17 17W T8 (24") 28 15 24W T5 HO (22") 28 15 28W T5 (46") 39 375HO 39W T5 HO (34") 54T5HO 0 UP UE 0 UP UIT 0 EL55 0 UP UE 0 UP UIT 0 UP UI	8 lamp lengths. Channel offers the gripper back feature which wis for the use of the new 2 spring hanger (see back). Newly ars a secure fit design, allowing for easy access and quick at h (white standard). Five-stage iron-phosphate pretreatment stance. Other channel paint finish options: black (MB), smoke Two-Lamp T8 h (white standard). Five-stage iron-phosphate pretreatment stance. Other channel paint finish options: black (MB), smoke Two-Lamp T8 r apertured designs in both symmetric and asymmetric conned versions. Two-Lamp T5 ing, Class P, HPF, non-PCB, UL listed. Suitable for damp locative, rade for required temperatures. Two-Lamp T5 -point' row connector locks channel together for straighter rd. Ideal for surface-mount or suspended. Specifications Certified to Canadian Standards. Listed for 25° C ambient implete warranty terms located at s/Terms. and conditions.aspx Ts Length: 24 (61.0), 36 (91.4), 48 (121.9) rg Lamp type Voltage Balhast Specifications 17 17W T8 (24'') 120 GEB 10PS GEB 10PS 17 17W T8 (24'') 120 GEB 10PS GEB 10PS GLR Internal fast-blow fuse (add X for external)? 17 17W T8 (24'') 120 GEB 10PS GLR Internal fast-blow fuse (add X for external)? 17 17W T8 (24'') 120 GEB 10PS GLR internal fast-blow fuse (add X for externa	Blam lengths. Channel offers the gripper back feature which wrs for the use of the new 2 spring hanger (see back). Newly rs a secure fit design, allowing for easy access and quick at- h (white standard). Five-stage iron-phosphate pretreatment stance. Other channel paint finish options: black (MB), smoke Two-Lamp 18 Two-Lamp 18 Two-Lamp 18 Two-Lamp 18 Two-Lamp 18 Two-tamp 18 Two-Lamp 18 Two-tamp 18 Two-tamp 18 Two-tamp 19 Two-tamp 19 Two-tamp 19 Two-tamp 19

	Accessories: Order as separate catalog number.	Field Insta	llable Reflectors	Sand Sand	
5Q_	Swivel-stem hanger (specify length in 2" increments)	For T8 fixt	tures only	For T5 fixtu	ires only
ZSPRG	Tong and T-grid hanger (for 15/16" T-grid)	Z8SMR48	Symmetric reflector, 48" white ⁵	Z5SMR46	Symmetric reflector, 46" white5
4C36	Hanger chain, 36"	Z8ASR48	Asymmetric reflector, 48" white ⁵	Z5ASR46	Asymmetric reflector, 46" white
ZACVH	Adjustable aircraft cable with hook	Z8SMR36	Symmetric reflector, 36" white ^s	Z5SMR34	Symmetric reflector, 34" white
NGZ48	48" wireguard, white ⁵	Z8ASR36	Asymmetric reflector, 36" white ⁵	Z5ASR34	Asymmetric reflector, 34" white
NGZ8SMR48	48" wireguard, white, for symmetric reflectors	Z8SMR24	Symmetric reflector, 24" white	Z5SMR22	Symmetric reflector, 22" white
VGZ8ASR48	48" wireguard, white, for asymmetric reflector ^s	Z8ASR24	Asymmetric reflector, 24" white	Z5ASR22	Asymmetric reflector, 22" white
/GZ46	46" wireguard, white ⁵				
VGZ5SMR46	46" wireguard, white, for symmetric reflector ^s				
NGZ5ASR46	46" wireguard, white, for asymmetric reflector ^s				
			Notes	I	3 Not available with CSA Certified.
			1 For 347V.		4 Available with 4' and 8' lengths on

2

Specify voltage (available 120/277V). 5

.78 bf (low)

INDUSTRIAL

Order two for tandem double length fixtures.



mitted by Ja	mes G. Murphy Co., Inc. Job N LAKE CI Architect	ame: TY PARK RESTRROM & WATSON TATE SAVO	& PICNIC DRY-22	Z 2 54T5H	umb O 12	er: 0 GEB10PS	Type: LED2
				Notes.			116-35827
Z	T8 / T5 Striplight						
R	EFLECTORS						
Z55.	MR Two Lamps o	ZSAS	R One Lamp	- , 0		SMR One La 2-1/8 2-3/4 (7.0)	amp ASR One Lamp $2^{-1/8}$ (5,1) (5,1) (7,0)
Z851	MR One Lamp •	ZBAS	R Two Lamps	Co.	1	5-1/8 (15.5) — SMR Two Lam 2-1/8 (53.4)	ps ASR Two Lamps
							2 (5) (7,0) (2,4) (5) (7,0) (7,
			1 2			5	Specifications
OR	RDERING INFORMATION F	or shortest lead times, configure pro	ducts using bolde	l options.		,	All dimensions are inches (centimeters) Example: Z5SMR46A
Sei	ries/Length/Vistribution	length	Distribution		(blank)	White	
25 25 28 28	SASR Asymmetric reflector, T5 SSMR Symmetric reflector, T5 SASR Asymmetric reflector, T8 SSMR Symmetric reflector, T8	ZSASR/ZSSMR only 22 Nominal 22" length 34 Nominal 34" length 46 Nominal 46" length Z8ASR/Z8SMR only 24 24 Nominal 24" length	(blank) Sol A2 ASF A4 ASF A5 SMI A8 SMI P Per	d with 2% uplight with 4% uplight t with 5% uplight t with 8% uplight orated	(Drank) MB GALV SKGY SSR	Writte Matte black Galvanized Smoke gray Specular finish ałuminum (95% reflectance)



48 Nominal 48" length

An**SAcuity**Brands Company

INDUSTRIAL:

One Lithonia Way Convers. GA 30012 Phone: 803-315-4963 Fax: 770-929-8789 www.filtionia.com © 2009-2014 Acuity Brane's Lighting, Inc. All rights reserved. Rev. 03/05/14

Z-T8-T5



Submitted by James G. Murphy Co., Inc.

Job Name: LAKE CITY PARK RESTRROM & PICNIC Architect: WATSON TATE SAVORY-22

Catalog Number: 24T5HO/4F/830/DIR

Notes:

116-35827

Type:

T5 24W HO 4FT. DIR TITANIUM LED SERIES



SPECIFICATIONS**

Product Model	57836 24T5HO/4F/830/DIB	57837 24T5HO/4F/835/DIB	57838 24T5HO/4F/840/DIB	57839 24T5H0/4F/850/DIR
Туре	T5	Т5	Т5	15
Base	Mini Bi-Pin G5	Mini Bi-Pin G5	Mini Bi-Pin G5	Mini Bi-Pin G5
Power (W)	24	24	24	24
Voltage - Frequency	120-277V 50-60Hz	120-277V 50-60Hz	120-277V 50-60Hz	120-277V 50-60Hz
Color Temp. (ANSI)	Warm White 3000K	Neutral White 3500K	Cool White 4000K	Daylight 5000K
CRI (Ra)	80	80	80)	80
Typical lumens (lm)	3000	3000	3050	3200
Efficacy (LPW)	107	107	109	114
Light Emitting Area	270°	270°	270°	270°
Beam Angle	120°	120°	120°	120°
Dimmable	Yes	Yes	Yes	Yes
Power Factor	0.9	0.9	0.9	6,0
THD	<20%	<20%	<20%	<20%
Rated Lifetime - L70 (hrs.)	50,000	50,000	50,000	50,000
Dia. x MOL	0.67"x45.79" (17x1183mm)	0.67"x45.79" (17x1163mm)	0.67"x45.79" (17x1163mm)	0.67"x45.79" (17x1163mm
Weight (lb. / g)	0.36lb. / 185g	0.36lb. / 165g	0.36lb. / 165g	0.36lb. / 165g

NSTANT ST	ART BALLAST	PERFORMAN	CE		
		3000K	3500K	4000K	5000K
Bare Lamp (W)	System (W)	Lumens	Lumens	Lumens	Lumens
24	28	3000	3000	3050	3200

PROGRAM START BALLAST PERFORMANCE

24	28	3400	3450	3500	3550
re Lamp (W)	System (W)	Lumens	Lumens	Lumens	Lumens
		3000K	3500K	4000K	5000K

sting Method: Above system power is ha pove data is indicative only.

Suitable for use in rotely enclosed foctures
** Specification data is preliminary and may be subject to change
*** Suitable for damp locations. Not for use where directly exposed to the weather or water

Submitted by James G. Murphy Co., Inc

Job Name:

LAKE CITY PARK RESTRROM & PICNIC Architect: WATSON TATE SAVORY-22

Catalog Number: INDX618 LP05VS

Type:

EMVR

116-35827

Catalog Numbe

Notes

Notes:

Туре

LITHONIA LIGHTING FEATURES & SPECIFICATIONS INTENDED USE ---- Provides minimum of 90 minutes of illumination for rated wattage upon loss of AC power. Unique design for heavy and demanding industrial applications such as manufacturing plants, refineries,

chemical plants, wastewater treatment facilities, food processing facilities, breweries, loading docks, and other applications subject to wash-down or industrial conditions. Superior performance lamp heads are ideal for higher mounting heights. CONSTRUCTION --- U.S. Patent No. D505,222 - Design patent. Rugged, heavy-duty, polycarbonate clear

housing lens and polycarbonate housing are sealed, gasketed, and corrosion-resistant. Unique vertical orientation is perfect for mounting to a pole, column, wall, I-beam or unistrut. Install with epoxy-coated, corrosion-resistant, 12-gauge steel mounting bracket shipped standard. Conduit entry points located on both sides of unit. U.S. Patent No. 6,135,624 - mounting bracket utility patent. Maintenance is easy with hinged front cover, printed circuit board mounting shelf and battery belt.

OPTICS - U.S. Patent No.6, 193, 395 - Jamp head utility patent. Available with SW linear pattern LED Jamps from 6V to 12V. Standard lamp is 18W incandescent for 24V. Composite lamps feature unique field adjustable beam spread (by turning lamp bezel).

ELECTRICAL — Dual voltage input capacity (120/277V).

Brownout protection is a standard feature of self-diagnostics. AC/LVD reset prevents battery damage from deep discharge.

Current limiting charger.

Thermal protection prevents overheating and charger failure.

Thermal compensation provides optimum charge voltage relative to ambient temperature.

Battery: Sealed, maintenance-free, lead-acid (SLA) battery with capacity of 100W for 90 minutes of emergency operation of 6V, 12V or 24V units. Premium and Ultimate options offer high-temperature batteries (INDX618, INDX1236, INDX12100 only). UL listed from 32° F to 131° F (0° C to 55° C) (Premium) or -40° F to 131° F (-40° C to 55° C) (Ultimate)

Low-voltage disconnect prevents excessively deep discharge that can permanently damage battery.

Diagnostics: (US Patent No. 6,502,044). Single multi-color LED indicator displays two-state charging, test activation and three-state diagnostic status. Test switch provides manual activation of 30-second diagnositc testing for on-demand visual inspection. Self-diagnostic testing for five minutes every 30 days and 30 mins every 6 months. Diagnostic evaluation of LED light source, AC to DC transfer, charging and battery condition. Continuously monitors AC functionality. Load-learning capability self-calibrates to DC load at first test, enabling it to detect a lamp failure on future tests. It may be recalibrated at any time by holding down the test switch for 15 seconds.

INSTALLATION ---- Wall and pole mounting standard (12-gauge steel mounting bracket included). Other mounting options available for ceiling mount or I-Beam mounting (see accessories).

ORDERING INFORMATION For shortest lead times, configure product using standard options (shown in bold).

ORDERING INFORMA	TION For si	hortest lead times, configure produc	t using standard options (shown is	in bold). Example: INDX618
INDX12100		H20	12	ULT
Series	Housing color	Lamp type (2 heads)		Options
6 Volts INDX618 18W ¹ INDX654 54W ² INDX6100 100W 12 Volts 1 INDX1236 36W ² INDX1254 54W ² INDX1250 100W ³ INDX12125 125W 24 Volts 100W ³	(blank) Gray W White	LT24 LED LP05VS Linear pattern SW voltage-sensing 6V to 12V (not available with 24V) <u>6 Volts</u> <u>PAR36 Composite</u> H2006 20W/6V halogen	12 Volts PAR36 Composite H2012 20W/12V halogen PAR36 Sealed-Beam H35125 35W/12V halogen H50125 50W/12V halogen 24 Volts PAR36 Composite (blank) 18W/24V incand. H2024 20W/24V halogen PAR36 Sealed-Beam	 (blank) UL listed to 4X standards. For 50° F to 104° F (10° C to 40° C). XTRA Extra package features remote test and time delay. UL listed for 50° F to 104° F (10° C to 40°C). SEL Select package features self-diagnostics, time delay, and audible failure indication. UL listed for 50° F to 104° F (10° C to 40° C). PREM Premium package features self-diagnostics, time delay, and audible failure indication. UL listed for 50° F to 104° F (10° C to 40° C). PREM Premium package features high-temperature ni-cad battery (INDX1236 only) or high-temperature lead-acid battery (INDX12100 only), self-diagnostics, time delay, audible failure indication. UL listed for 32° F to 131° F (0° C to 55° C). ULT Ultimate package features heater, thermostat and battery blanket with a high temperature ni-cad battery (INDX12100 only), self-diagnostics, time delay, and audible failure indication. UL listed for -40° F to 131° F (-40° C to 55° C).
114DA24100 100W			N5024S 50W/24V incand.	

	Accessories: Order as separate catalog number
ELA RTT	Remote test transmitter (for use with XTRA package, remote test option) (see spec sheet <u>ELA-RTT-BS</u>)
ELA WG4/8	Wireguard (see spec sheet ELA WG)
ELA BS	Banding Strap (see spec sheet <u>ELA-RTT-BS</u>)
ELA INDX (M1	Ceiling mount kit for INDX6186
ELA INDX CM2	Ceiling mount kit for INDX654/1236/12546

NOTES

Ceiling-mount installations require ELA INDX CM1. 1

Ceiling-mount installations require ELA INDX CM2 mounting kits. 2

3 INDX12100 available with either the PREM or ULT package only

Must order a Remote transmitter (ELA RTT) sold separately. One per job required.

Only available on INDX618, INDX1236 and INDX12100. 5

For use with standard, XTRA, or SEL only. See spec sheet ELA-IND-PM-CM-RHB-R3. 6

EMERGENCY





INDX

6, 12 or 24 Volts

LISTINGS — UL Listed. Meets UL 924, ULSO, NFPA 101 (current Life Safety Code), NFPA 70-NEC, and OSHA illumination standards. Wet, NEMA 4, 4X rated. IP66 and NSF Listed. Meets all applicable FCC requirements. ies.) Complete warranty terms located at:

www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx Note: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25°C. Specifications subject to change without notice.

Submitted by James G. Murphy Co., Inc. Job Name:

Catalog Number: INDX618 LP05VS Notes:

116-35827

EMVR

Type:

INDX INDURA® NEMA 4X Emergency Lighting Units, 6/12/24 Volts

LAKE CITY PARK RESTRROM & PICNIC Architect: WATSON TATE SAVORY-22

SPECIFICATIONS

		ELI	CTRICAL:	Primary G	ircuit			
Туре	Volts	AC Input Amps ¹	Watts	Output Volts	1-1/2 hrs.	2 hrs.	3 hrs.	4 hrs.
MBW210	120	120 .093 19.56		10	1) 5			
INDAGIO	277	.041	19.11	0	18	13.5	9	0
INDYGEA	120	.171	20.64	,	54	40	17	- 20
110/034	277	.073	20.78	0	54	40	27	20
(NOV6100	120	.144	20.52	(100	75	50	27.6
INDAGIOG	277	.062	20.22	0	100	75	50	37.5
INDV1226	120 .174	.174	18.24	12	36	77	10	17
11407 1230	277	.078	17.73	1Z	30	27	18	15
INDY1354	120	.174	20.88	17	E A	10	37	٥٢
1140412.04	277	.078	21.61	12	24	40	21	20
INDV12100	120	.160	20.88	13	100	75	50	27.6
1110712100	277	.072	20.55	12	100	د/	υC	37.5
INDY 17175	120	.160	20.88	12	175	02	63	46
INDA 12 12 3	277	.072	20.55	12	125	- 23	02	40
INDY24100	120	.33	39.6	24	100	76	50	27
110/24100	277	.15	41.55	24	100	(۱	20	5/

MOUNTING

All dimensions are inches (centimeters). Shipping weight: INDX618 - 16 lbs. (7.3 kgs) INDX1254 - 20 lbs. (9.1 kgs) INDX654 - 20 lbs. (9.1 kgs) INDX12100 - 36.5 lbs. (16.6 kgs) INDX6100 - 28 lbs. (12.7 kgs) INDX12125 - 30 lbs. (13.6 kgs) INDX1236 - 20 lbs. (9.1 kgs) INDX24100 - 30 lbs. (13.6 kgs)



PHOTOMETRICS

PERFORMANCE DIAGRAMS

Center-to-center

spacing* yields 28'.

6'

and the second s	Lamp	12' Mounting Height Spacings	14' Mounting Height Spacings	16' Mounting Height Spacings	18' Mounting Height Spacings	20' Mounting Height Spacings
	LPOSVS	35'*	30'	28'	23'	21'

* Reference INDX LPOSVS (LT24) (LEFT, AIMED IN-30 DEG) and INDX LPOSVS (LT24) (RIGHT, AIMED IN-30 DEG) ies files. **All spacings shown for traditional lamp sources use medium distributions. For additional spacing information, see the complete list of INDX ies files.

BATTERY

		High-Tempe	rature Nickel-Cadi	mium
Voltage	Shelf life ²	Typical life ³	Maintenance ⁴	Optimum Temperature ^s
6/12	3 yrs.	7-9 yrs.	none	32º-131°F (0º-55°C)
		Le	ad-Acid (SLA)	
Voltage	Shelf life ²	Typical life ³	Maintenance ⁴	Optimum Temperature ^s
6/12/24	1 yr.	3-5 yrs.	none	50°-104°F (-10-40°C)
		High-Tempe	rature Lead-Acid	(SLA)
Voltage	Shelf life ²	Typical life ³	Maintenance ⁴	Optimum Temperature ^s
6/12/24	1 yr.	5-7 yrs.	none	32°-131°F (0°-55°C)

NOTES:

Add 0.3 amps, 31W for models with ULT option. At 77°F (25°C).

Based on normal room temperatures and conditions. 3

- based on normal room temperatures and conditions. All life safety equipment, including emergency lighting for path of egress must be maintained, serviced, and tested in accordance with all National Fire Protection Association (NFPA) and local codes. Failure to perform the required maintenance, service, or testing could jeopardize the safety of occupants and will void all warranties. Optimum ambient temperature range where unit will provide rated capacity for 90 minutes. Higher and lower temperatures affect life and capacity. 5











FLOOI

INDX LPO5VS Linear distribution

A LITHONIA LIGHTING

An ScullyBrands Company

EMERGENCY One Lithonia Way Convers, 6A 30012 Phone: 600-334-8694 Fax: 770-931-8141 www.lithonia.com ©2004-2015 Acuity Brands Lighting, inc. All rights reserved. Rev. 07/28/15

MOX

*NOTE: Meets Life Safety Code standard

minimum illuminance of 0.1 FC and average

illuminance of 1.0 FC. Assumes space of 200'L x 200'W, mounting height: 16', ceiling height: 30', and reflectances: 10/10/10. Analysis based on independently tested photometrics.

Submitted by James G. Murphy Co., Inc

Job Name:

LAKE CITY PARK RESTRROM & PICNIC Architect: WATSON TATE SAVORY-22

Catalog Number: LV S W 2 R 120/277 EL N UM



Catalog Numbe Notes

Туре

Notes:

Type: **EXVR**

EXTREME

All-Conditions Exits

LV EL N

LED LAMPS EMERGENCY

NEMA 4X Rating Available

116-35827



FEATURES & SPECIFICATIONS

INTENDED USE — Suitable for cold weather (down to -40°C with CW option), wet location (4X option), security/prisons and high-abuse applications.

CONSTRUCTION — Durable cast-aluminum construction – rugged housing walls are .250 to .525" thick. NEMA 4X option is available for wet and hose-down applications.

Clear, UV-stable polycarbonate cover is .130" thick to prevent cracking or breaking. Cover is secured with four stainless steel Torx T20, tamper-proof screws with center pin.

Polycarbonate faceplate incorporates universal directional chevron knockouts that are concealed and easily removed and replaced.

Universal mount (UM) option available - top, back, end mounting or conduit entry. (canopy provided) Letters 6" high with 3/4" stroke, with 100 ft viewing distance rating, based upon UL924 standards.

U.S. Patent No. 5,611,163 and D383,501.

OPTICS ---- Lamp is constructed using new LED technology. Provides perfectly uniform illumination.

The typical life of the exit LED lamp is 10 years. Single-face exit uses one LED lamp; double-face exit uses two LED lamps. Low energy consumption --- red lamp consumes 3.3 watts (120V) [6.7 watts (120V) with CSA option]; green lamp consumes 1.7 watts (120V).

ELECTRICAL — Sealed, maintenance-free nickel-cadmium battery delivers 90 minutes capacity to lamp (30 minutes with CSA option). Constant-current series charger, automatic recharge after battery discharge. Vandal-resistant magnetic test switch (magnet included) and LED indicator mounted on bottom of housing provide a safe, easy means for testing. Manual test switch also provided inside housing.

Polarized battery connector simplifies installation and maintenance; prevents charger damage from improper connection.

Brownout protection.

Low voltage disconnect allows battery connection before AC power is applied and prevents battery damage from deep discharge

Self-diagnostics (optional). Automatically tests once a month for five minutes and once every six months for 30 minutes. Bi-color LED status indicator, test and service required.

INSTALLATION ---- Back mount standard for single face (no canopy), unless universal mount (UM) specified. Conduit entry (1/2" - 14 UNC) included with universal mounting.

Cast-aluminum canopy attaches to 10-gauge steel mounting plate for top or end mounting (not required for back mounting)

Canopy mounting bracket provides 160 lbs. of mounting strength when mounted to suitable structure. Bracket will only fit a 2-gang junction box.

ORDERING INFORMATION For shortest lead times, configure products using bolded options.



White on white w/red letter color



Black on black w/green letter colo

LISTINGS ---- UL Listed (standard). CSA certified or NOM certified (see Options). 4X option is UL Listed to NEMA 4X ratings. Meets UL 924, NFPA 101 (current Life Safety Code), CSA C-860 and C22.2 No. 141 (see Options), NEC and OSHA illumination standards, and State of Minnesota energy-efficient legislation requiring less than 20W consumption. NEMA Premium certified.

WARRANTY — 5-year limited warranty. Complete warranty terms located at: www.acuitybrands.com/CustomerResources/Terms and conditions.aspx Actual performance may differ as a result of end-user environment and application.

Note: Specifications subject to change without notice.

Example: LV S W 1 R 120/277 EL N

LV	s									EL N					
Series	Face type	Faceplate/ housing color		Number of faces		Letter color		Input voltage		Emergency operation		Mounting		Options	
LV	S Stencil	(blank) W WB BW AB AW	Black faceplate on black White on white White on black Black on white Aluminum on black' Aluminum	1 2	Single face Double face ⁷	RG	Red Green'	120/277 120 347	Dual voltage ¹ 120V ³ 347V ³	ELN	Nickel- cadmium battery	(blank) UM	Back mount ⁴ Universal mount	(Blank) F FI DL 4X CW SD CSA NOM	None Flashing emergency operation (45 flashes/min) ^{1,5} Fire alarm flashing interface ^{1,3} UL Listed for damp locations (10°C - 40°C) UL Listed for NEMA 4X ¹ Cold temperature and NEMA 4X wet location battery pack (down to -40°C) ^{1,6} Self-diagnostics ¹ CSA certified NOM certified

Accessories: Order as separate catalog number.

ELA TPS T20 Torx tamperproof bit for T20 center-pin screw **FLA VSA** Stem/Conduit mounting kit (see spec sheet ELA-VSA)

Notes

- Not available with CSA option.
- Available with universal mount only.
- Only available with CSA option. 3
- 4 Back mount standard with single face unless UM is specified. Not available on double face.
- Choice of F or Fl. Not available with both
- 6 Not Energy Star qualified.

EMERGENCY

Submitted by James G. Murphy Co., Inc.	Catalog Number:	Type:
Job Name: LAKE CITY PARK RESTRROM & PICNIC Architect: WATSON TATE SAVORY-22	LV S W 2 R 120/277 EL N UM Notes:	EXVR 116-35827

LV EL N Emergency LED, Extreme

SPECIFICATIONS

ELECTRICA	L		5.									
Primary Circuit												
Туре	Typical LED life'	Supply voltage	Number of lamps ²	Input watts	Max. amps	Cold w amps	eather watts					
Red	10 years	120	1	3.3	.14	.22	18.2					
neu	- roycars	120	2	4.8	.13	.28	29.1					
Red	10 years	277	1	3.3	.13	.26	16.6					
neu -	10 years	231	2	5.2	.13	.31	24.5					
Groop	10 10 255	120	1	2.2	.10	.17	17.0					
Green	TO years	120	2	3.2	.09	.24	27.3					
Green	10 years	777	1	2.5	.10	.19	12.2					
oreen	10 years	277	2	4.0	.10	.27	24.2					
Red w/CSA	10 years	120	1	6.7	.11	-	-					
option	io jeais	120	2	7.8	.11		-					
Red w/CSA	10 years	247	1	6.9 ·	.04	-	-					
option	io years	547	2	8.0	.04	-	-					

RATTERY

DAITERT				
Sealed N	lickel-Cadı	nium		
Туре	Shelf life ³	Typical life ³	Maintenance ⁴	Optimum temperature ^s
STD-DL	3 years	7 - 9 years	none	50°F - 104°F (10°C - 40°C)
CW	3 years	7 - 9 years	none	-40°F - 104°F (-40°C - 40°C)

Notes

- 1 Based on continuous operation. The typical life of the exit LED lamp is 10 years.
- 2 Two-lamp version available with double-face only.
- 3 At 77ºF (25°C).
- 4 All life safety equipment, including emergency lighting for path of egress must be maintained, serviced, and tested in accordance with all National Fire Protection Association (NFPA) and local codes. Failure to perform the required maintenance, service, or testing could jeopardize the safety of occupants and will void all warranties.
- 5 Optimum ambient temperature range where unit will provide capacity for 90 minutes. Higher and lower temperatures affect life and capacity. Consult factory for detailed information.

KEY FEATURES



The typical life of the exit LED lamp is 10 years.



UL approved for damp, NEMA 4X wet or cold locations (see options).

MOUNTING

All dimensions are in inches (centimeters). Shipping weight: 12 lbs. (5.45 kgs.)



Back Mount





NEMA 4X **Mounting Plate**



Housing or canopy mounting bracket should be attached to mounting surface using suitable fastener for type of wall material. All four mounting hole positions should be used, and anchors or screws should have a minimum pullout rating of 160 lbs. Bracket will only fit a 2-gang junction box.



🕼 LITHONIA LIGHTING

An SAcuityBrands Company

EMERGENCY: One Lithonia Way, Convers, 6A 30012 Phone: 800-334-8604 Fax: 770-981-8141 www.lithonia.com 😳 1996-2014 Acuity Brands Lighting, Inc. All rights reserved. Rev. 06/25/14



FLORENCE COUNTY, SOUTH CAROLINA, a Body Politic and Corporate and a Political Subdivision of the State of SC	MAIL TO: Florence County Procurement 180 N. Irby Street City-County Complex MSC-R Florence SC 29501	RENCE CON
SEALED BID #08-16/17 CONSTRUCTION OF A SHELTER WITH RESTROOMS FACILITY AT LAKE CITY PARK PROJECT – 273 North Church Street, Lake City, SC	HAND CARRY TO: Procurement Office, Room B-5 City-County Complex, 180 N. Irby Street Florence, South Carolina 29501	
Bids will be accepted until Tuesday, October 4, 2016 at 10:55 a.m. (EST)	TELEPHONE NO. (843) 665-3018	
Then Publicly Opened at: Florence County Procurement 180 N. Irby Street City-County Complex Room 210-C Florence, SC 29501		
LEGAL COMPANY NAME:	•	
D/B/A IF APPLICABLE:		
MAILING ADDRESS:		
PHYSICAL ADDRESS:		
CITY-STATE-ZIP:		
TELEPHONE NO:	FAX NO:	
FEDERAL ID (TAX ID) NO:		
AUTHORIZED SIGNATURE :		
PRINTED NAME:		
SC CONTRACTOR'S LICENSE # (if appli	cable)	

Total Bid Amount for Construction of a Shelter with Restrooms Facility at Lake City Park Project – 273 North Church Street, Lake City, SC \$_____

Total Bid Amount in Words: _____

BID ALTERNATE ONE: Deduct for using solid decking in lieu of locking decking. (\$_____)

BID ALTERNATE TWO: Deduct to delete all masonry work from the building; including low brick, fireplace, and precast walls. (\$)

UNIT PRICE ONE: Removal and offsite disposal of unsuitable soil. Measure shall be by cross section of excavation. Unit price shall include removal, transportation, all offsite disposal costs, and measurement. Also included is replacement with equal volume of imported engineered fill, which will include purchase, transportation, placement and compaction.

\$____/cubic yard.

The Bidder declares their Bid Response is made without any connection with any other individual that may be submitting a Bid Response to this IFB and their Bid Response, in all respects, is fair and in good faith, without collusion or fraud, with another Bidder, representative or agent.

By submission of a response to this Invitation for Bid, the bidder agrees and certifies, to deliver all required services and perform all required work with the strictest conformance to meet or exceed the scope of services, specifications and minimum requirements contained within this Invitation to Bid.

All pricing is firm and will remain firm for at least one hundred twenty (120) calendar days from the time and date of the IFB submittal and opening. During this period, the Bidder may only withdraw their Bid Response by submitting a written request to Florence County and Florence County approving said written request.

The bidder agrees to abide by all conditions of this bid and verifies that he is authorized to sign this bid for the offerer. The bidder further states that the company affiliated with this bid currently complies with all applicable federal and state laws and directives relative to non discriminatory practices in employment.

The Bidder, in compliance with the Invitation-To-Bid, and having examined the Project Documents, and being familiar with all of the conditions surrounding the proposed project, including the availability of materials, labor, and work site environmental conditions, hereby proposes to furnish all permits, labor, materials, supplies, and equipment and to perform the duties in accordance with the contract documents of which this Bid Form is a part.

The Bidder declares that he has read, understands, and accepts the Vendor Agreements and Instructions to Responders which are part of the bid documents.

The Bidder further proposes and agrees, if this Bid is accepted, to contract with Florence County, to furnish all permits, materials, equipment, tools, apparatus, means of transportation, and labor necessary hereto, and to complete the proposed project in full and complete accordance with the Project Documents, to the full and entire satisfaction of the Owner, at the prices listed in the Bid Schedule. The amounts listed on the Bid Schedule section of this Bid Form also include all costs associated with the compliance of all applicable State laws, local ordinances, and the rules and regulations of all authorities and professional association standards having jurisdiction over the project or the materials used throughout, and they will be deemed to be included in the contract the same as though herein written out in full. Unit prices and/or lump sums are shown in the Bid Schedule section below. In case of error in extension, the Unit Price shall govern rather than the Amount. Where Lump Sum Amounts are bid, the amount for each bid item shall govern rather than the total of any several items.

REPORT OF SUBSURFACE EXPLORATION AND GEOTECHNICAL ENGINEERING EVALUATION

LAKE CITY PARK CHURCH STREET AND SYLVAN STREET LAKE CITY, SOUTH CAROLINA ECS PROJECT NO: 38:1527

> Prepared For FLORENCE COUNTY COMPLEX

> > **Prepared By**



SEPTEMBER 22, 2016



"Setting the Standard for Service"

SC Registered Engineering Firm 3240 NC Registered Engineering Firm F-1078 NC Registered Geologists Firm C-406

September 22, 2016

Ms. Suzanne King Florence County Complex 180 N. Irby St. MSC-R, Rm, B-5 Florence, South Carolina

Re: Report of Subsurface Exploration and Geotechnical Engineering Evaluation Lake City Park Church Street and Sylvan Street Lake City, South Carolina ECS Project No.: 38:1527

Dear Ms. King:

As authorized by your acceptance of our Proposal Number 38-911-P, dated Augusta 30, 2016, ECS Carolinas, LLP (ECS) has completed the subsurface exploration and geotechnical engineering evaluation for the proposed Lake City Park site. This report contains the results of our subsurface exploration, as well as our recommendations regarding the geotechnical design and construction aspects of the project.

We appreciate the opportunity to be of service to you during the design phase of this project and look forward to our continued involvement during the construction phase. If you have any questions concerning the information and recommendations presented in the accompanying report, or if we can be of further assistance, please do not hesitate to contact us.

Sincerely,

ECS CAROLINAS, LLP represented by;

Brenn Hay

Brennan J. Hoy, E.I. Geotechnical Project Manager

Donald L. Anderson, P.E. Principal Geotechnical Engineer

No. 32695

William M. Porter, P.E. M. M. POR Branch Manager South Carolina License No. 32695



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1.0 EXECUTIVE SUMMARY

The project site is located at Church Street and Sylvan Street in Lake City, South Carolina. Based on the information provided, we understand the proposed project will include the construction of a lakeside park with a restroom pavilion/picnic structure, a waterfront plaza overlook, boardwalks, a pedestrian bridge, walking trails, and associated parking and driveways. We understand that the primary purpose of our exploration is to provide foundation recommendations and discuss liquefaction potential for the restroom pavilion/picnic structure and waterfront plaza overlook. Based on the information provided, we understand that the project site was, at one time, a municipal landfill but has not been used for that purpose for approximately 25 years.

Approximately 12 to 17 feet of existing fill was encountered at the ground surface in borings B-1 and B-3. Approximately 10 feet of existing fill was encountered at the ground surface in boring B-2 and extended to the termination depth of the boring. The existing fill encountered in the borings generally consisted of clayey sand (SC) with some landfill debris. The N-values recorded in this soil typically ranged from 2 to 11 blows per foot (bpf) with typical values of 5 to 11 blows per foot (bpf). It is our experience that soil test borings often do not properly or fully characterize existing fills soils, especially in regard to quantities of deleterious debris.

Natural, Coastal Plain soils were encountered beneath the existing fill in borings B-1 and B-3 and extended to the termination depths of the borings. The natural soils sampled by the borings generally consisted of clayey sand (SC) and sandy lean clay (CL). N-values recorded in these soils typically ranged from 7 to 57 blows per foot (bpf).

Auger refusal was encountered beneath the natural soils in boring B-1 at a depth of approximately 41.5 feet below the existing ground surface. Refusal is a designation applied to material which cannot be further penetrated by the power auger and is normally indicative of a very hard or very dense material, such as boulders, rock lenses, or the upper surface of bedrock.

Relatively loose near surface fill soils are present on the site. As such, the near surface fill soils should be densified in-place by multiple passes with a large vibratory roller after clearing, grubbing, and removal of the surficial materials but prior to placement of new fill or other at-grade construction. Loose subgrade materials that cannot be adequately densified in-place will require undercutting and replacement with new engineered fill.

Provided the subgrades are prepared as recommended within this report, the proposed restroom pavilion/picnic structure and water plaza overlook can be supported on conventional shallow foundations bearing in approved natural soils or new engineered fill proportioned for a net allowable bearing pressure of 2,000 pounds per square foot (psf). Concrete slabs-on-grade supported by properly prepared subgrades may be designed using a modulus of subgrade reaction of 125 pounds per cubic inch (pci). An IBC seismic Site Class "D" is recommended for the site.

Specific information regarding the subsurface exploration procedures, the site and subsurface conditions at the time of our exploration, and our conclusions and recommendations concerning the geotechnical design and construction aspects of the project are discussed in detail in the subsequent sections of this report. Please note this Executive Summary is an important part of this report but should be considered a "*summary*" only and is not intended to be used exclusive of the entire report. The subsequent sections of this report constitute our findings, conclusions, and recommendations in their entirety.

2.0 PROJECT INFORMATION

The project site is located at Church Street and Sylvan Street in Lake City, South Carolina. Based on the information provided, we understand the proposed project will include the construction of a lakeside park with a restroom pavilion/picnic structure, a waterfront plaza overlook, boardwalks, a pedestrian bridge, walking trails, and associated parking and driveways. We understand that the primary purpose of our exploration is to provide foundation recommendations and discuss liquefaction potential for the restroom pavilion/picnic structure and waterfront plaza overlook. Based on the information provided, we understand that the project site was, at one time, a municipal landfill but has not been used for that purpose for approximately 25 years.

Based on our review of the provided Topographic Survey, existing site elevations range from approximately 60 to 73 feet above mean sea level. Information regarding proposed grades or finished floor elevations was not available. However, we assume the final grades will be at or above existing site grades.

The foundations for the restroom pavilion/picnic structure and waterfront plaza overlook are expected to be shallow spread footings. At the time of this report, no structural loading information was available, but we assume the maximum column footing loads will not exceed 5 kips and the maximum wall footing loads will not exceed 1 kip per linear foot.

3.0 EXPLORATION PROCEDURES

3.1 Soil Test Borings

Three (3) soil test borings were drilled at the site as shown on the Boring Location Plan in the Appendix. Borings B-1 and B-2 were located within the footprint of the proposed pavilion/picnic structure and were extended to depths ranging from approximately 10 to 41.5 feet below the existing ground surface. Boring B-3 was located in the proposed waterfront plaza overlook and was extended to a depth of approximately 20 feet below the existing ground surface. The boring locations were provided by the client and located using GPS technology and existing landmarks as reference. The boring locations indicated on the Boring Location Plan should be considered approximate. Borings logs are included in the Appendix.

The soil test borings were performed using a truck mounted (CME 55) drill rig equipped with an auto-hammer split-spoon driving assembly. The auto-hammer generally delivers more energy downhole to the sampler than the standard cat-head driving assembly, therefore, the recorded standard penetration test (SPT) N-Values are lower than the N₆₀-Values recorded from using the cat-head assembly. Although the differences in energy will vary, it is common to assume the auto hammer delivers about 1.3 times the energy of the cat-head assembly. The N-values recorded in the field using the auto-hammer assembly are reported on the Boring Records in the Appendix.

Representative soil samples were obtained by means of the split-barrel (split-spoon) sampling procedure in accordance with ASTM D 1586. In this procedure, a 2-inch O.D., split-barrel sampler is driven into the soil a distance of 18 inches by a 140-pound hammer falling 30 inches. The number of blows required to drive the sampler through a 12-inch interval is termed the Standard Penetration Test (SPT) N-value and is indicated for each sample on the boring logs. This value can be used as a qualitative indication of the in-place relative density of cohesionless soils. In a less reliable way, it also indicates the consistency of cohesive soils. This indication is qualitative, since many factors can affect the standard penetration resistance value and prevent a direct correlation with drilling crews, equipment and procedures. Split-spoon samples were obtained at 2½-foot intervals within the upper 10 feet of the borings and at 5-foot intervals thereafter.

After recovery, each sample was removed from the sampler and visually classified. Representative portions of each sample were then sealed in air tight containers and brought to our laboratory for visual classification in general accordance with the Unified Soil Classification System (USCS as described in ASTM D 2487).

4.0 SITE AND SUBSURFACE CONDITIONS

4.1 <u>Site Observations</u>

The proposed site is primarily grassed and appears to have been cleared and graded in the past. Additionally, the municipal structures shown on historical aerial photographs have been razed except for the existing pump house located in a low lying area near the middle of the property. An overhead power line is also present near the existing pump house. The north and northeast borders of the property slope down towards the adjacent lake. There appeared to be a construction entrance on the southern edge of the site across from Rodgers Street. The site is bordered by Sylvan Street to the south, North Church Street to the west, and a lake to the north and east.

4.2 Area Geology

The site is located in the Coastal Plain Physiographic Province of South Carolina. The Coastal Plain is composed of seven terraces, each representing a former level of the Atlantic Ocean. Soils in this area generally consist of sedimentary materials transported from other areas by the ocean or rivers. These deposits vary in thickness from a thin veneer along the western edge of the region to more than 10,000 feet near the coast. The sedimentary deposits of the Coastal Plain rest upon consolidated rocks similar to those underlying the Piedmont and Mountain Physiographic Provinces. In general, shallow unconfined groundwater movement within the overlying soils is largely controlled by topographic gradients. Recharge occurs primarily by infiltration along higher elevations and typically discharges into streams or other surface water bodies. The elevation of the shallow water table is transient and can vary greatly with seasonal fluctuations in precipitation.

The natural geology of portions of the site was modified in the past by grading activities resulting in the placement of fill materials (i.e. soils and municipal landfill debris). The quality of man-made fills can vary significantly, and it is often difficult to assess the engineering properties of fill. Furthermore, there is no specific correlation between N-values from standard penetration tests performed in soil test borings and the degree of compaction of existing fill soils. However, a qualitative assessment of existing fills can sometimes be made based on the N-values obtained and observations of the materials sampled in the test borings.

4.3 Subsurface Conditions

4.3.1 Soil Test Borings

Existing Fill: Approximately 12 to 17 feet of existing fill was encountered at the ground surface in borings B-1 and B-3. Approximately 10 feet of existing fill was encountered at the ground surface in boring B-2 and extended to the termination depth of the boring. The existing fill encountered in the borings generally consisted of clayey sand (SC) with some landfill debris. The N-values recorded in this soil typically ranged from 2 to 11 blows per foot (bpf) with typical values of 5 to 11 blows per foot (bpf). It is our experience that soil test borings often do not properly or fully characterize existing fills soils, especially in regard to quantities of deleterious debris.

Natural Soils: Natural, Coastal Plain soils were encountered beneath the existing fill in borings B-1 and B-3 and extended to the termination depths of the borings. The natural soils sampled by the borings generally consisted of clayey sand (SC) and sandy lean clay (CL). N-values recorded in these soils typically ranged from 7 to 57 blows per foot (bpf).

Auger Refusal: Auger refusal was encountered beneath the natural soils in boring B-1 at a depth of approximately 41.5 feet below the existing ground surface. Refusal is a designation applied to material which cannot be further penetrated by the power auger and is normally indicative of a very hard or very dense material, such as boulders, rock lenses, or the upper surface of bedrock.

4.3.2 Groundwater Conditions

Groundwater was encountered in borings B-1 and B-3 at depths ranging from 13.5 to 18.5 feet below the existing ground surface. Groundwater elevations should be expected to vary depending on seasonal fluctuations in precipitation, surface water absorption characteristics, and other factors not readily apparent at the time of our exploration, and may be higher or lower than inferred from the recent test boring data.

5.0 CONCLUSIONS AND RECOMMENDATIONS

As previously noted, existing undocumented fill materials were encountered in the borings performed. Visual examination of the soil samples exhibited limited evidence of extraneous or unsuitable materials, such as municipal landfill debris. However, the presence and depth (up to 17 feet) of these materials presents a problem in quantifying the risk that unsuitable inclusions or low density soils may exist beneath the proposed building footprints. If very loose soils or pockets of organics such as debris, stumps, etc., exist within the fill and are not removed during construction, then localized excessive differential settlements could occur in response to new structural loads and the on-going process of volume change which may still occur in the fill. If such non-uniform settlements occur, then moderate distress could result.

Based on the density of the fill material found in our borings and our experience with similar pregraded sites, we anticipate the fill material was probably placed in a semi-controlled manner and may be suitable for low-rise construction. As such, provided the client is willing to accept the potential risk associated with existing fills, the existing fill may remain in place. However, the existing fill should be further evaluated by proofrolling and Dynamic Cone Penetrometer (DCP) testing on foundation bearing soils at the time of construction. Some undercutting or other subgrade repair may be needed.

5.1 Site and Subgrade Preparation

The first step in preparing the site for the proposed construction should be to remove existing vegetation or topsoil, and other soft, unsuitable, or deleterious material from the existing ground surface.

Relatively loose near surface fill soils are present on the site. As such, the near surface fill soils should be densified in-place by multiple passes with a large vibratory roller after clearing, grubbing, and removal of the surficial materials but prior to placement of new fill or other at-grade construction. Loose subgrade materials that cannot be adequately densified in-place will require undercutting and replacement with new engineered fill.

The prepared subgrade should then be evaluated by an experienced geotechnical engineer or his authorized representative. The evaluation should include proofrolling the subgrade with an approved piece of equipment (such as a loaded dump truck, having an axle weight of at least 10 tons) to identify soft, loose, and yielding areas. Based on the recommendations of the engineer, unsuitable materials encountered during the proofrolling operations should be repaired in-place by additional densification, or be removed and replaced with engineered fill that is placed and compacted in accordance with the recommendations of this report.

The preparation of proposed building subgrades, as well as fill subgrades, should be observed on a full-time basis by a representative of ECS. These observations should be performed by an experienced geotechnical engineer, or his representative, to document that unsuitable materials have been removed and that the prepared subgrade is suitable for support of the proposed construction and/or fills.

Based on the results of the soil test borings, we expect that the soils encountered in the areas explored should generally be excavatable with conventional earth moving equipment such as pans/scrapers, loaders, bulldozers, rubber tired backhoes, etc.

5.2 Engineered Fill

Fill placed for support of the proposed structures, and for backfill of undercut areas and utility lines within expanded structure limits should consist of engineered fill. Engineered fill should be an approved material, free of organic matter and other deleterious materials, and have a Liquid Limit (LL) and a Plasticity Index (PI) less than 40 and 20, respectively. We also recommend that fills within structural areas have a standard Proctor (ASTM D 698) maximum dry density of at least 95 pounds per cubic foot (pcf).

Mass engineered fill placed within the building and pavement areas should be placed in lifts and moisture conditioned to within their working range of optimum moisture content, and compacted to a minimum of 95 percent of their standard Proctor maximum dry density, as determined in accordance with ASTM D 698. The upper one foot of soil supporting structures and slabs-on-grade should be compacted to a minimum of 98 percent of the maximum dry density obtained in accordance with ASTM D 698.

Similarly, isolated non-structural areas of engineered fill, such as trench line backfill, should be placed in lifts not exceeding 6 inches and moisture conditioned as mentioned above. The working range of optimum is typically within approximately 3 percent of the optimum moisture content.

Excavated existing fill may be suitable for re-use as new fill provided it is not too wet or contain detrimental materials, and should be further evaluated for suitability at the time of construction.

Prior to the commencement of fill operations and/or utilization of off-site borrow materials, the contractor should provide representative samples of the soil materials to ECS to assess the material's suitability for use as engineered fill, and to develop moisture-density relationships in accordance with the recommendations provided herein. Samples should be provided to the geotechnical engineer at least 5 days prior to their use to allow for the appropriate laboratory testing to be performed.

The maximum loose lift thickness depends upon the type of compaction equipment use. The table below provides maximum loose lifts that may be placed based on compaction equipment utilized.

LIFT THICKNESS RECOMMENDATIONS

Equipment	Maximum Loose Lift Thickness, in.
Large, Self-Propelled Equipment (CAT 815, CAT CS56, etc.)	8
Small, Self-Propelled or Remote Controlled (Rammax, etc.)	8
Hand Operated (Plate Tamps, Jumping Jacks, Wacker- Packers)	6

ECS recommends that fill operations be observed and tested by an engineering technician to document that compaction requirements are being met. The testing agency should perform a sufficient number of tests to document that compaction is being achieved. For mass grading operations we recommend a minimum of one density test per 2,500 square feet per lift of fill placed or per 1 foot of fill thickness, whichever results in more tests. When dry, the majority of the site soil should provide adequate subgrade support for fill placement and construction operations. When wet, the soil may degrade quickly with disturbance from construction traffic. Good site drainage should be maintained during earthwork operations to prevent ponding water on exposed subgrades.

We recommend at least one test per 1 foot thickness of fill for every 100 linear feet of utility trench backfill. Where fill will be placed on existing slopes, we recommend that benches be cut in the existing slope to accept the new fill. Fill slopes should be overbuilt and then cut back to expose compacted material on the slope face.

The building areas should be well defined during fill placement by maintaining grade controls. Filling operations should be observed on a full-time basis by ECS to document that the recommended degree of compaction is achieved. The elevation and location of the in-place density tests should be accurately identified at the time of fill placement. Areas which fail to achieve the required degree of compaction should be re-compacted and re-tested until the recommended compaction is achieved. Failing test areas may require moisture adjustments or other suitable remedial activities in order to achieve the required compaction.

Fill materials should not be placed on frozen, frost-heaved or wet soils. Such materials should be removed prior to fill placement. Borrow fill materials should not contain wet or frozen materials at the time of placement. Wet or frost-heaved soils should also be removed prior to placement of granular sub-base materials, foundation or slab concrete, and asphalt pavement materials.

If difficulties are encountered during the site grading operations, or if the actual site conditions differ from those encountered during our subsurface exploration, the geotechnical engineer should be notified immediately.

5.3 Foundation Design

Provided the foundation subgrades are prepared in strict accordance with the **Site and Subgrade Preparation** and **Engineered Fill** sections of this report, the proposed restroom pavilion/picnic structure and waterfront plaza overlook can be supported on conventional shallow foundations bearing in approved existing fill or new engineered fill. Isolated column and continuous wall footings can be proportioned for a maximum net allowable soil bearing pressure of 2,000 pounds per square foot (psf). The net allowable soil bearing pressure refers to that pressure which may be transmitted to the foundation bearing soils in excess of the final minimum surrounding overburden pressure.

Footings should bear at a depth to provide adequate frost cover protection and develop the recommended soil bearing pressure. We recommend foundations bear at a minimum depth of 12 inches below the adjacent ground surface. To reduce the possibility of foundation bearing failure and excessive settlement due to local shear or "punching" failures, we recommend that continuous footings have a minimum width of 18 inches and isolated column footings have a minimum lateral dimension of 30 inches.

The final footing subgrades should be evaluated by ECS personnel to document that the bearing soils are capable of supporting the recommended net allowable bearing pressure and suitable for foundation construction. These evaluations should include visual observations, hand rod probing, and dynamic cone penetrometer (ASTM STP 399) testing, or other methods deemed appropriate by the geotechnical engineer at the time of construction.

Exposure to the environment may weaken the soils at the foundation bearing elevation if the foundation excavations remain exposed during periods of inclement weather. Therefore, foundation concrete should be placed the same day the foundations are excavated. If the bearing soils are softened by water or exposure to the environment, the softened soils must be removed from the foundation excavation bottoms prior to placement of concrete. If the excavation must remain open overnight, or if inclement weather is imminent while the bearing soils are exposed, we recommend that a 2 to 3-inch thick "mud-mat" of "lean" concrete be placed over the exposed bearing soils before the placement of reinforcing steel.

5.4 Floor Slab Design

Provided the slab subgrades are prepared in strict accordance with the **Site and Subgrade Preparation** and **Engineered Fill** sections of this report, a modulus of subgrade reaction value of 125 pci is appropriate for slab-on-grade design. We recommend slabs-on-grade are underlain by a minimum of 4 inches of granular material having a maximum aggregate size of 1½ inches and no more than 5 percent fines to help protect the subgrade soils. Prior to placing the granular material, the slab subgrade soil should be properly compacted, proofrolled, and free of standing water, mud and frozen soil.

A granular capillary break layer can often eliminate the need for a moisture/vapor retarder and can assist in more uniform curing of concrete. If a moisture/vapor retarder is used, special attention should be given to the surface curing of the slabs to minimize uneven drying of the slabs and associated cracking and/or slab curling. The use of a blotter or cushion layer above the vapor retarder can also be considered for project specific reasons. Please refer to ACI 302.1R96 Guide for Concrete Floor and Slab Construction and ASTM E 1643 "Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs" for additional guidance on this issue.

Unless monolithic foundation slabs are used, we recommend that the floor slab be isolated from the foundation footings so settlement of the foundations will not induce shear stresses in the floor slab. Also, in order to reduce the crack width of shrinkage cracks that may develop near the surface of the slab, we recommend mesh reinforcement be placed in the floor slab. The Wire Reinforcement Institute recommends the mesh reinforcement be placed 2 inches below the slab surface or upper one-third of slab thickness, whichever is closer to the surface. Adequate construction joints, contraction joints and isolation joints should also be provided in the slab to reduce the impacts of cracking and shrinkage. Please refer to ACI 302.1R96 Guide for Concrete Floor and Slab Construction for additional information regarding concrete slab joint design.

5.5 <u>Seismic Site Class Determination and Liquefaction Potential</u>

A quantitative liquefaction analysis is beyond the scope of this study. However, a qualitative assessment of liquefaction based on the 2015 International Building Code (IBC) design earthquake indicates that the clayey soils (i.e. SC and CL) encountered below the ground water table have a low potential to liquefy during the design seismic event.

South Carolina has adopted the International Building Code (IBC 2015), and the IBC 2015 requires that a seismic Site Class be assigned for new structures in South Carolina. Based on the soil test boring data and our knowledge of the geology of the region, a seismic Site Class of "D" is recommended for this site. The spectral response accelerations and site coefficients for the site are given below.

IBC	Site Class	S₅	S ₁	Fa	Fv	S _{DS}	S _{D1}
2015	D	1.002g	0.338g	1.099	1.724	0.734g	0.388g

Seismic Design	Parameters
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5.6 <u>Site Drainage</u>

Positive drainage should be provided around the perimeter of the structures to minimize the potential for moisture infiltration into the foundation and slab subgrade soils. We recommend that landscaped areas adjacent to structures be sloped away from the construction and maintain a fall of at least 6 inches for the first 10 feet outward from the structure.

The proper diversion of surface water during site grading and construction will help reduce the potential for delays associated with periods of inclement weather. Please note that the need for construction dewatering should be determined at the time of construction. If grading operations are performed during the wet seasons (i.e. fall and winter) the use of gravity flow ditches may be necessary to divert precipitation and surface water away from the construction areas. The proper diversion of surface water is especially critical since portions of the site soils are expected to be moisture sensitive. Based upon our past experience, the use of "crowning" large areas of exposed soils should be useful to help divert surface water from the prepared subgrades.

5.7 <u>Construction Considerations</u>

It is imperative to maintain good site drainage during earthwork operations to help maintain the integrity of the surface soils. The surface of the site should be kept properly graded to enhance drainage of surface water away from the proposed construction areas during the earthwork phase of this project. We recommend that surface drainage be diverted away from the proposed building and pavements areas without significantly interrupting its flow. Other practices would involve sealing the exposed soils with a smooth-drum roller at the end of the day's work to reduce the potential for infiltration of surface water into the exposed soils.

The key to minimizing disturbance problems with the soils is to have proper control of the earthwork operations. Specifically, it should be the earthwork contractor's responsibility to maintain the site soils within a workable moisture content range to obtain the required in-place density and maintain a stable subgrade. Scarifying and drying operations should be included in the contractor's price and not be considered an extra to the contract. In addition, construction equipment should not be permitted to randomly run across the site, especially once the desired

final grades have been established. Construction equipment should be limited to designated lanes and areas, especially during wet periods to minimize disturbance of the site subgrades.

6.0 CLOSING

This report has been prepared in accordance with generally accepted geotechnical engineering practice. No other warranty is expressed or implied. Our evaluation of foundation support conditions is based on our understanding of the site and project information, and the data obtained in our exploration. The general subsurface conditions used in our foundation evaluation are based on interpolation of subsurface data between the borings. In evaluating the boring data, we have reviewed previous correlations between penetration resistance values and foundation bearing pressures observed in soil conditions similar to those at your site. Once the final project design criteria are established, please contact us so that our recommendations during construction which deviate from the data outlined in this exploration should be reported to us for our evaluation. *Furthermore, ECS should be provided a copy of the final plans and specifications in advance of construction to verify that our recommendations have been correctly interpreted.* The assessment of site environmental conditions for the presence of pollutants in the soil, rock, and groundwater of the site was beyond the scope of this exploration.

APPENDIX

Site Location Diagram Boring Location Plan Reference Notes for Boring Logs Boring Logs (B-1 through B-3)







REFERENCE NOTES FOR BORING LOGS

MATERIAL	,2		DRILLING SAMPLING SYMBOLS & ABBREVIATIONS										
	ASPH	ALT	SS	Split Spoor	n Sampler	r P	М	Pressu	remeter T	est			
13 N 1 1 1 1 1 1			ST	Shelby Tul	be Sample	er R	D	Rock B	it Drilling				
	CONC	RETE	WS	Wash Sam	ple	R	С	Rock Core, NX, BX, AX					
D0			BS	Bulk Samp	le of Cutti	ings RI	EC	Control Recovery %					
00002	GRAV	EL	PA	Power Aug	er (no sai	mple) R0	Rock Quality Designation %						
ŴŴ			HSA	Hon Hollow Stelli Augel									
	TOPS	JIL			F	PARTICLE SIZE	E IDE						
	VOID		DESIGNA	TION	PARTI	CLE SIZES							
<u>. </u>			Boulders 12 inches (300 mm) or larger										
	BRICK		Cobbles		3 inches to 12 inches (75 mm to 300 mm)								
80 00	ACCP	EGATE BASE COURSE	Gravel:	Coarse	3/4 inch to 3 inches (19 mm to 75 mm)								
°0 00 ~ 5	AGON			Fine	4.75 mm to 19 mm (No. 4 sieve to ¾ inch)								
	FILL ³	MAN-PLACED SOILS	Sand:	Coarse	2.00 r	nm to 4.75 mm	(No.	10 to N	lo. 4 sieve	e)			
×	GW	WELL-GRADED GRAVEL		Medium	0.425	mm to 2.00 mn	ח (No	o. 40 to	No. 10 sie	eve)			
	011	gravel-sand mixtures, little or no fines		Fine	0.074	mm to 0.425 m	m (N bon	10. 200 o No. 20	to No. 40	sieve)			
	GP	POORLY-GRADED GRAVEL gravel-sand mixtures, little or no fines		ay (Filles)	<0.07			a 110. 2	JU Sleve)	-			
	GM	SILTY GRAVEL		COHESIVE	SILTS &	CLAYS				COARSE	FINE		
		gravel-sand-silt mixtures	Unco	NFINED	a== ⁵		7			GRAINED	GRAINE		
	GC	CLAYEY GRAVEL	Сомр		SPT [°]	CONSISTENCY	-	,		(//)	(70)		
/_/_/ Z	sw	WELL-GRADED SAND	STREN	GTH, Q _P	(BPF)	Very Soft		Trac	е	<5	<5		
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••••		gravelly sand, little or no fines	1.00	- <2.00	9 - 15	Stiff		Adie	ctive	25 - <50	30 - <5		
	SM	SILTY SAND	2.00 ·	- <4.00	16 - 30	Very Stiff		(ex: '	Silty")	20 000	00 40		
	80		4.00	- 8.00	31 - 50	Hard		<u> </u>					
/////	30	sand-clay mixtures	8<	3.00	>50	Very Hard			W	ATER LEVELS	5 ⁶		
ПППП	ML	SILT						$\overline{\Delta}$	WL	Water Level ((WS)(WD)		
		non-plastic to medium plasticity	GRAVE	LS, SANDS	& NON-C	OHESIVE SILT	s	÷		(WS) While	e Sampling		
	MH		ę	SPT⁵		DENSITY				(WD) While	e Drilling		
	~			<5		Very Loose		$\underline{\Psi}$	SHW	Seasonal Hig	gh WT		
	CL	low to medium plasticity	5	5 - 10		Loose		Ŧ	ACR	After Casing	Removal		
	СН	FAT CLAY	1	1 - 30	Μ	edium Dense		Ā	SWT	Stabilized Wa	ater Table		
		high plasticity	3	1 - 50		Dense			DCI	Dry Cave-In			
ברב	OL	ORGANIC SILT or CLAY non-plastic to low plasticity		>50	,	Very Dense			WCI	Wet Cave-In			
	ОН	ORGANIC SILT or CLAY high plasticity											
	РТ	PEAT											

¹Classifications and symbols per ASTM D 2488-09 (Visual-Manual Procedure) unless noted otherwise.

²To be consistent with general practice, "POORLY GRADED" has been removed from GP, GP-GM, GP-GC, SP, SP-SM, SP-SC soil types on the boring logs.

³Non-ASTM designations are included in soil descriptions and symbols along with ASTM symbol [Ex: (SM-FILL)].

⁴Typically estimated via pocket penetrometer or Torvane shear test and expressed in tons per square foot (tsf).

⁵Standard Penetration Test (SPT) refers to the number of hammer blows (blow count) of a 140 lb. hammer falling 30 inches on a 2 inch OD split spoon sampler required to drive the sampler 12 inches (ASTM D 1586). "N-value" is another term for "blow count" and is expressed in blows per foot (bpf).

⁶The water levels are those levels actually measured in the borehole at the times indicated by the symbol. The measurements are relatively reliable when augering, without adding fluids, in granular soils. In clay and cohesive silts, the determination of water levels may require several days for the water level to stabilize. In such cases, additional methods of measurement are generally employed.

⁷Minor deviation from ASTM D 2488-09.

Reference Notes for Boring Logs (FINAL 08-23-2016).doc

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