

STATE OF HAWAII
DEPARTMENT OF DEFENSE
ENGINEERING OFFICE
3949 DIAMOND HEAD ROAD
HONOLULU, HAWAII 96816-4495

APRIL 12, 2024

ADDENDUM NO. 3

TO CONSTRUCT

**BIRKHIMER EMERGENCY OPERATIONS CENTER (EOC)
UPGRADES AND IMPROVEMENTS
PROJECT NO.: CA-202313-C
TAX MAP KEY: 3-1-042:006
Honolulu, Oahu, HAWAII**

FOR THE

**DEPARTMENT OF DEFENSE
ENGINEERING OFFICE
STATE OF HAWAII**

ISSUED BY

**STATE OF HAWAII DEPARTMENT OF DEFENSE
3949 DIAMOND HEAD ROAD, HONOLULU HAWAII
96816-4495
TELEPHONE: 808-369-3567**

The items in this Addendum shall govern the work, taking precedence over previously issued specifications and drawings governing the items mentioned. Acknowledge receipt of this Addendum in the space provided on the Solicitation, Offer and Contract Form.

A. CHANGES TO SPECIFICATIONS

- 1. Revised Text:
 - a. Section 15400 replaced in its entirety:
 - i. Paragraph 2.10.A.1 UNDERGROUND POTABLE WATER TANK SYSTEM: Revised section to include FRP as approved equal material for the underground water tank.
 - ii. Paragraph 2.10.B.2 UNDERGROUND POTABLE WATER TANK SYSTEM: Revised section to include UV light.

B. CHANGES TO PLANS: The following items are revised:

- 1. The following previously issued drawings dated March 21, 2024, are revised and reissued. These drawings (listed below and attached) supersede the previously issued drawings.

Sheet Group	Sheet No.	Sheet Name, Description
STRUCTURAL	S-501	STRUCTURAL NOTES AND REPAIR DETAILS – Added technical details for concrete.
STRUCTURAL	S-502	STRUCTURAL DETAILS Added retaining wall and light pole foundation details.
PLUMBING	PB401	WATER STORAGE SYSTEM SCHEMATIC Revised WFS-1 recirculation sequence.
PLUMBING	PB601	PLUMBING SCHEDULES Revised WFS-1 schedule to include UV light.

SECTION 15400 - PLUMBING, GENERAL PURPOSE

PART 1 - GENERAL

1.01 SUMMARY

- A. This section includes the following for plumbing:
 - 1. Plumbing, piping, fittings, and accessories.
 - 2. Plumbing specialties.
 - 3. Pipe supports, anchors, and seals.
 - 4. Testing, adjusting, and balancing.
 - 5. Manufacturer's literature, shop drawings, and record drawings.
- B. Related Work Described Elsewhere:
 - 1. DIVISION 16 - ELECTRICAL.

1.02 DEFINITIONS

- A. AABC: Associated Air Balance Council
- B. AMCA: Air Movement and Control Association
- C. ASHRAE: American Society of Heating, Refrigerating, and Air-Conditioning Engineers
- D. ASME: American Society of Mechanical Engineers
- E. ASTM: American Society for Testing and Materials
- F. AWWA: American Water Works Association
- G. CISPI: Cast Iron Soil Pipe Institute
- H. MSS: Manufacturers Standardization Society
- I. NEBB: National Environmental Balancing Bureau

1.03 GENERAL REQUIREMENTS

- A. It is the intent of the plans and specifications to provide a complete installation. Should there be omissions or discrepancies in the plans and specifications, the Contractor shall call the attention of the Contracting Officer to such omissions and discrepancies in advance of the date of bid opening so that the necessary corrections can be made. Otherwise, the Contractor shall furnish and install the omissions or discrepancies as if the same were specified and provided for.

- B. Standards:
1. All work shall be done in accordance with the latest edition of the Uniform Plumbing Code and applicable ordinances of the City and County of Honolulu.
 2. All plumbing fixtures shall comply with the Board of Water Supply requirement for water conservation.
 3. Work shall comply with applicable regulations of the State of Hawaii Health Department.
 4. All plumbing fixtures and installation shall comply with the Americans with Disabilities Act Accessibility Guidelines.
 5. Contractor shall obtain all permits, licenses, and certificates and pay for all fees.

1.04 SUBMITTALS

- A. Submit in accordance with SECTION 01300 - SUBMITTALS.
- B. Shop Drawings and Diagrams: The Contractor shall submit 8 copies of shop drawings and brochures or catalog cuts of equipment for review and reply prior to start of work. Drawings shall show complete dimensioned installation, including all piping in building, equipment installation, elevation, invert, supports and foundations. The Contractor shall show the entire work with inverts, sleeves, and dimensions. Contractor shall check project drawings to avoid interferences with structural features and with work of other trades. No plumbing or piping work shall commence until plans have been reviewed by the Contracting Officer. Any deviations from the shop drawings shall require prior approval by the Contracting Officer.
- C. Product Data:
1. Approval of Materials, Fixtures and Equipment: As soon as practicable and within 30 days after award of contract and before commencement of installation of any materials and equipment, a complete schedule of the materials and equipment proposed for installation shall be submitted for the approval of the Contracting Officer. The schedule shall include catalogs, cuts, diagrams; drawings and such other descriptive data as may be required by the Contracting Officer. No consideration will be given to partial lists submitted from time to time. Any scheduled materials, fixtures and equipment not conforming to the specifications may be rejected.
- D. Operations and Maintenance Manual: Submit operations and maintenance data indicating the operation and maintenance of each system, subsystem, and piece of equipment not part of a system. Include operation and maintenance data required as follows:
1. Operation Data:
 - a. Emergency instructions and procedures.

- b. System, subsystem, and equipment descriptions, including operating standards.
 - c. Operating procedures, including startup, shutdown, seasonal, and weekend operations.
 - d. Description of controls and sequence of operations.
 - e. Piping diagrams.
2. Maintenance Data:
- a. Manufacturer's information.
 - b. Name, address, and telephone number of installer or supplier.
 - c. Maintenance procedures.
 - d. Maintenance record forms.
 - e. Copies of maintenance service agreements.
- E. Maintenance and Service Schedules: Provide maintenance and service schedule for preventative and routine maintenance. Provide report indicating the maintenance performed on all new equipment installed as a part of this project.
- F. Material Safety Data Sheets: Provide properties of each material; the physical, health, and environmental health hazards; protective measures; and safety precautions for handling, storing, and transporting the material.
- G. Equipment or Fixture Listing: The materials and equipment or fixture schedule shall include catalogs, cuts, diagrams; drawings and such other descriptive data as may be required by the Contracting Officer. No consideration will be given to partial lists submitted from time to time. Any scheduled materials, fixtures and equipment not conforming to the specifications may be rejected.
- H. Field Posted As-Built Drawings: The Contractor shall keep at the job site a complete, neat, and accurate record of all approved deviations from the contract drawings, shop drawings and specifications, indicating the work as actually installed. These changes shall be recorded on prints of the drawings affected and the shop drawings. Record drawings and reproducible as-builts shall be submitted to the Contracting Officer after final acceptance.
- I. Warranty: Submit warranty as noted under item entitled "WARRANTY" hereinbelow.

1.05 WARRANTY

- A. Manufacturer's Warranty: Submit all manufacturer's certified full standard product warranty terms and conditions applicable to all specified equipment assemblies and parts for the Contracting Officer's approval prior to equipment delivery and commencement of equipment on-site installation. Warranty shall cover all costs

for parts, labor, associated travel, and expenses from the project acceptance date. The above warranty shall not be interpreted as voiding, limiting, or reducing any equipment Manufacturer's Warranty permitted by law.

- B. Contractor's Warranty: The Contractor shall certify in writing the following items:
1. All equipment, accessories and material furnished for a period of 2 years from the project acceptance date against all defects in material and workmanship. The warranty period shall commence from the project acceptance date. If any equipment, piping, or material fails, does not operate satisfactorily, or shows undue wear, the Contractor will be notified, and shall be required to correct the defect and damage to other work caused by such defect immediately and at no additional cost to the State.
 2. All equipment and materials to provide the results specified or shown.
 3. All piping to be drip free and properly installed to be free of vibration, pounding or objectionable noise.
- C. The State shall have the right to require a written certificate, dated and signed by a responsible employee of this Contractor, evidencing the performance of any portion of the work, or any testing, as a condition precedent to the acceptance of any work or the result of any test. Whenever a regulatory agency performs inspections or tests of any portion of the work, a certificate shall be furnished by the Contractor that the inspection or test was satisfactorily passed.

PART 2 - PRODUCTS

2.01 GENERAL

- A. All materials shall be new and of the best quality available in their respective kinds, free from all defects and shall be of the make and types specified or accepted equivalent.

2.02 FIXTURES

- A. Water Closet (WC): Top spud flushometer bowl.
1. White vitreous china, floor-mounted, floor outlet, 1-1/2 inch top spud, 2-1/8 inch fully glazed trapway, 12 inch rough-in, elongated bowl.
 2. Exposed Manual Water Closet Flushometer: Low consumption, 1.28 gpf, adjustable tailpiece, vandal-resistant stop cap, nickel-silver or polished chrome finish.
 3. Manufacturers: Kohler Co., American Standard, Sloan, or accepted equivalent.

2.03 SANITARY SEWER AND VENT PIPING

- A. Cast iron service weight hub and spigot pipe and fittings, ASTM A74, with ASTM C564 rubber compression fittings or caulked and leaded joints (above and below ground).

- B. Cast iron service weight hubless pipe and fittings, CISPI 301, with CISPI 310 coupling joints (above ground only).
- C. Cast iron service weight hubless pipe and fittings, CISPI 301, with cast iron couplings with neoprene gasket and stainless-steel nuts and bolts, MG Coupling Co or accepted equivalent (above and below ground). Nuts and bolts installed underground shall be field coated with a bituminous coating, 4 mils minimum thickness.

2.04 WATER PIPING

- A. Copper Tubing: ASTM B88, hard drawn. Type L above grade, Type K with Polyethylene jacket below grade.
 - 1. Fittings: ASME B16.18, cast bronze, or ASME B16.22, wrought copper and bronze.
 - 2. Joints: ASTM B32, solder, Grade 95TA or brazed.
- B. Insulation (Hot Water and Exposed Outdoor Cold Water) Pre-molded fiberglass pipe insulation, one inch thick, with all-service jacket, Owens-Corning 25 ASJ/SSL or accepted equivalent. Provide nested insulation segments on fittings, valves, and flanges. Seal ends with vapor barrier mastic. Provide 0.016 inch thick aluminum jacket on piping exposed to the weather.

2.05 PIPE HANGERS AND SUPPORTS

- A. Conform to MSS SP69.
- B. Hangers for Pipe Sizes 1/2 to 1-1/2 Inches: Malleable iron, adjustable swivel, split ring.
- C. Hangers for Cold Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.
- D. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
- E. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.
- F. Vertical Support: Steel riser clamp.
- G. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
- H. Hanger Rods: Mild steel threaded both ends, threaded one end, or continuous threaded, cadmium plated or galvanized.
- I. Inserts: Malleable iron case of galvanized steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to suit threaded hanger rods.

2.06 FLANGES, UNIONS, AND COUPLINGS

- A. Pipe Size 2 Inches and Under:
 - 1. Ferrous Pipe: 150 psig malleable iron threaded unions.
 - 2. Copper Tube and Pipe: 150 psig bronze unions with soldered joints.
- B. Pipe Size Over 2 Inches:
 - 1. Ferrous Pipe: 150 psig forged steel slip-on flanges; 1/16 inch thick preformed neoprene gaskets.
 - 2. Copper Tube and Pipe: 150 psig slip-on bronze flanges; 1/16 inch thick preformed neoprene gaskets.
- C. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.

2.07 BALL VALVES

- A. Up to and Including 3 Inches:
 - 1. Manufacturers: NIBCO or accepted equivalent.
 - 2. Bronze 2-piece body, stainless steel ball, full port for 2 inches and less, conventional port above, Teflon seats and stuffing box ring, lever handle solder ends, extended neck for insulation.

2.08 CHECK VALVES

- A. Up to and Including 2 Inches:
 - 1. Manufacturers: NIBCO or accepted equivalent.
 - 2. Bronze swing disk, screwed or solder ends, class 125.

2.09 PLUMBING SPECIALTIES

- A. Manufacturers: J.R. Smith, Josam, Zurn, or accepted equivalent.
- B. Floor Sink: See drawings.
- C. Cleanouts: See drawings.
- D. Water Hammer Arrestors and Shock Suppressors: PDI WH-201, normal air charge 50 psig, maximum operating temperature 225 degrees Fahrenheit and 100 psi. Polypropylene liner, butyl diaphragm, steel shell. Amtrol "Diatrol" shock suppressor or accepted equivalent.
- E. Balancing Valves:
 - 1. Manufacturers: Armstrong CB, Bell & Gossett or accepted equivalent.
 - 2. Construction: Brass or bronze body with union on inlet or outlet, with memory stop. For flow measuring, flow balancing, positive shut-off and drain connection.
 - 3. Provide at hot water return line.

- F. Thermostatic Mixing Valve:
 - 1. High low thermostatic water mixing valve with 1 GPM minimum flow capacity. 3/4" inlet and outlet sweat connections. Integral combination checkstops with wall support. 125 PSI maximum operating pressure. Copper encapsulated thermostatic assembly with stainless steel shuttle. Temperature adjustment range 90-140 degree F.

2.10 UNDERGROUND POTABLE WATER TANK SYSTEM

- A. Underground Water Tank: Factory-welded and coated carbon steel water tank, pressure tested for tightness to ensure quality and dependability of water supply. Interior liner shall comply with NSF/ANSI 61 Drinking Water System Components – Health Effects for the safe storage of potable water. Exterior corrosion protection system for underground water tank shall comply with UL-1746. Underground water tank shall be provided with a factory hydrotest report.
 - 1. Materials: Carbon steel in accordance with ASME VIII or approved equal Fiberglass Reinforced Plastic meeting ANSI/AWWA D120 and NSF/ANSI Standard 61.
- B. Water Filtration Skid: 304 Stainless Steel Cartridge construction. Max pleated filter rating of 10 µm. (2) filtration units in parallel operation.
 - 1. Control Panel: Panel interface shall include features to includes monitoring of the underground water tank's water level.
 - 2. UV Light: Provide with UV light on water recirculation line.
- C. Duplex Booster Pump: Variable speed control, speeds up and slows down based on demand of system, maintaining constant pressure. Lead-lag pump control to alternate pump starts, allowing equal run times on all pumps for longer life cycles.
 - 1. Control Panel: The control panel shall be UL508A listed for industrial control panels and of the same manufacturer of the pump system. All programming shall be written and supported by the pump system manufacturer. The panel enclosure shall be powder coated steel, UL Type 4, and carry a NEMA 1 rating as an assembly. Single point of power connection and integral disconnect. The panel interface shall include features to include monitoring for pump suction pressure, system pressure, PID speed, estimated flow, pump status, pump alarm.
 - 2. Variable Speed Drive: The drives shall be a microprocessor controlled PWM output drive for variable torque duty and supplies for the maximum full load amps produced by the motor. The drive shall be in a NEMA 1 self-contained enclosure.
- D. Level Control: Radar sensor type with continuous level measurement of liquids. Double Chamber stainless steel housing.
- E. Control Valve: 2-way solenoid type control valve designed to provide open/close control of fluids in response to electrical signal. Control valve shall be able to be

activated by level control sensor for filling the storage tank. Heavy-duty, nylon-reinforced diaphragm. Soft seat seal with drip tight Class VI enclosure. Control valve shall be easily maintained without removal from the water line.

2.12 ELECTRIC WATER HEATER

- A. Copper upper heating element and stainless steel lower heating element. Automatic temperature control. 21 GPH recovery at a 90 degree F rise. Enhanced-flow brass drain valve. Temperature and pressure relief valve.

2.13 HOT WATER RETURN PUMP

- A. Suction manifold and discharge manifold made of 316 stainless steel. Base frame made of 304 steel. Check valve and two isolating valves required. Pressure gauges on suction and discharge manifolds. Pressure transducer on discharge manifold.

2.14 EXPANSION TANKS

- A. Steel construction, pre-charge with heavy duty butyl bladder, 150 PSI working pressure, all wetted components shall be of approved materials, designed for potable water application. Tank shall have NPT system connections, charging valve and drain connections.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Ream pipe and tube ends. Remove burrs.
- B. Remove scale and dirt, on inside and outside, before assembly.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
- C. Route piping in orderly manner and maintain gradient.
- D. Install piping to conserve building space and not interfere with use of space.
- E. Group piping whenever practical at common elevations.
- F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- G. Provide clearance for installation of insulation and access to valves and fittings.
- H. Provide access where valves and fittings are not exposed. Coordinate size and location of access doors. Install valves with stems upright or horizontal, not inverted.

3.03 APPLICATION

- A. Install unions downstream of valves and at equipment or apparatus connections.
- B. Install brass male adapters each side of valves in copper piped system. Sweat solder adapters to pipe.
- C. Install gate or ball valves for shut-off and to isolate equipment, part of systems, or vertical risers.
- D. Install ball valves for throttling, bypass, or manual flow control services.

3.04 INSTRUMENTS

- A. Instruments used in testing mechanical systems and equipment shall be as recommended by the AABC, NEBB, AMCA, or ASHRAE. Test instruments used shall be initially and periodically checked thereafter to verify their calibration accuracy as described in AABC or NEBB procedures. Provide calibration verification of each test instrument with each test report.
- B. Test equipment shall be furnished by the Contractor and shall remain his property.

3.05 TEST AND BALANCE

- A. Systems and equipment as listed in the Specifications shall be tested and balanced in accordance with qualified procedures from the AABC or NEBB Standards.
- B. Procedures for each system test and equipment test shall be maintained on file by the Contractor and shall be readily available to the Contracting Officer if requested.
- C. Procedures used in tests shall be included in the submitted report.
- D. Piping: Remove from systems, during testing, equipment which would be damaged by test pressure. Replace removed equipment after testing. Systems may be tested in sections as work progresses. However, any previously tested portion shall become part of any later test of composite system. Correct leaks by remaking joints with new material; makeshift remedies will not be permitted. Test time will be accrued only while full test pressure is on system. Do testing before backfilling or concealing.
- E. Test systems per following schedule. If not scheduled, minimum test pressures are 150 percent of indicated system working or static pressure. Unless indicated otherwise, "Tolerance" shall be no pressure drop, except that due to a temperature change, in a 24-hour period.

3.06 GENERAL TESTING PROCEDURES

- A. Valves:
 - 1. General Service Valves: Test bonnets for tightness. Test-operate from closed-to-open-to-closed position while under test pressure.

2. Automatic Valves: Test solenoid valves, water-regulating valves, and pressure-reducing valves for proper operation at settings indicated.
3. Water Safety Valves: Test relief valves, safety relief valves, safety valves, and temperature and pressure-relief valves 3 times.

3.07 WATER SYSTEM PROCEDURE

- A. Adjust water systems to provide required or design quantities.
- B. Use calibrated fittings and pressure gages to determine flow rates for system balance. Where flow metering devices are not installed, base flow balance on temperature difference across various heat transfer elements in system.
- C. Adjust systems to provide specified pressure drops and flows through heat transfer elements prior to thermal testing. Perform balancing by measurement of temperature differential in conjunction with air balancing.
- D. Effect system balance with automatic control valves fully open to heat transfer elements.
- E. Effect adjustment of water distribution systems by means of balancing cocks, valves, and fittings. Do not use service or shut-off valves for balancing unless indexed for balance point.
- F. Where available pump capacity is less than total flow requirements or individual system parts, full flow in one part may be simulated by temporary restriction of flow to other parts.
- G. Submit written verification that items listed above have been completed.

3.08 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

- A. Prior to starting work, verify system is complete, flushed, and clean.
- B. Inject disinfectant, free chlorine in liquid, powder, table, or gas form, throughout system to obtain 50 to 80 mg/L residual.
- C. Bleed water from outlets to ensure distribution and test for disinfectant residual at minimum 15 percent of outlets.
- D. Maintain disinfectant in system for 24 hours.
- E. If final disinfectant residual tests less than 25 mg/L, repeat treatment.
- F. Flush disinfectant from system until residual equal to that of incoming water or 1 mg/L.
- G. No sooner than 24 hours after flushing, take samples from 10 percent of outlets and from water entry and analyze in accordance with AWWA C651.

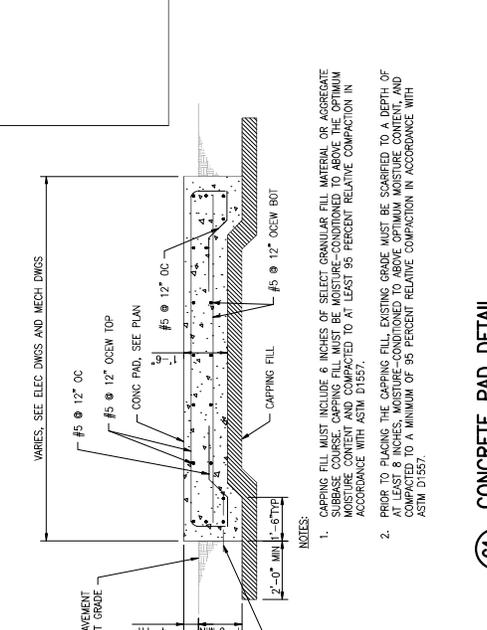
3.09 TESTING AND INSPECTION

- A. Contractor shall furnish all equipment for tests and any required retests and pay for all cost of repairing any damage resulting from such tests. Contractor shall adjust systems until they are approved. Tests shall be performed in the presence of, and to the satisfaction of the State and inspector of the official agency involved.

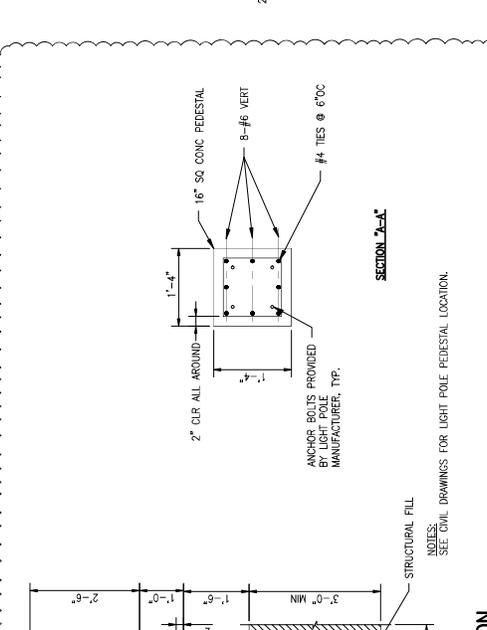
3.10 CLEAN UP

- A. Debris shall not be allowed as a result of this work. Upon completion of this work, remove all debris and excess materials, tools, etc., resulting from this work from the job site and leave the location of this work broom-cleaned in an acceptable manner as approved by the State. All work including plumbing fixtures, traps and mechanical equipment shall be thoroughly cleaned and ready for use.

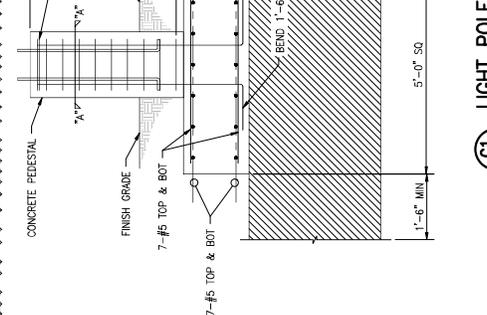
END OF SECTION



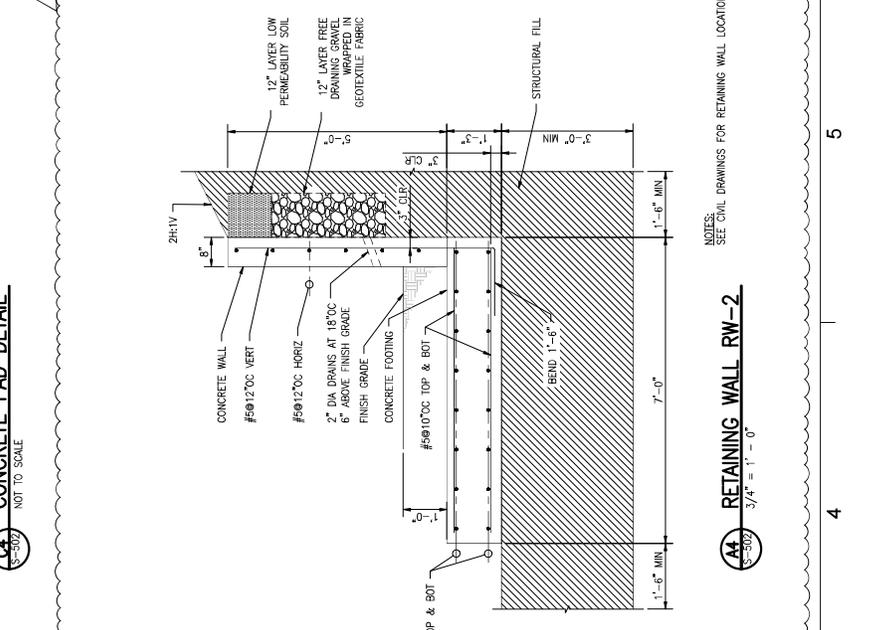
SECTION 2-A
 CONCRETE PEDESTAL
 NOTES:
 SEE CIVIL DRAWINGS FOR LIGHT POLE PEDESTAL LOCATION.



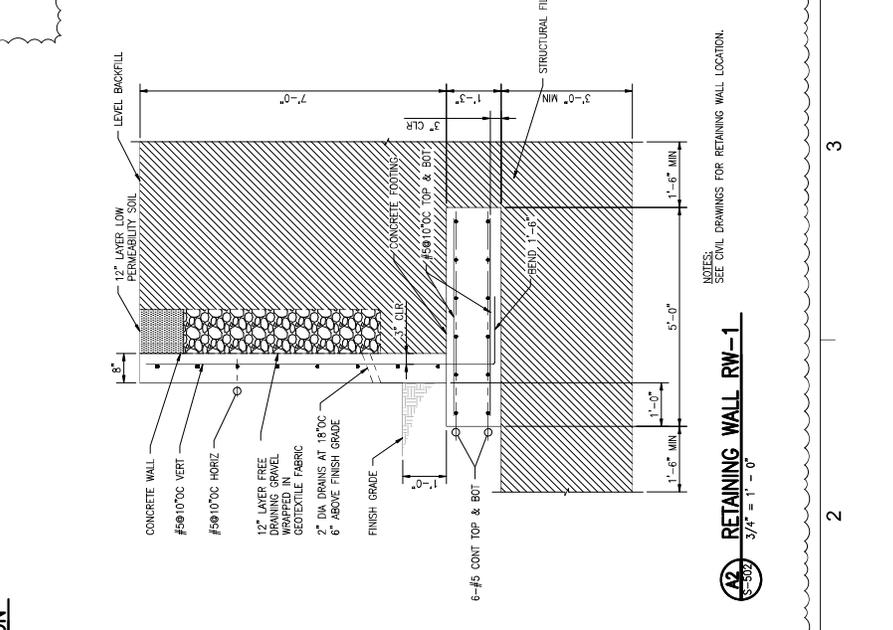
SECTION 2-B
 CONCRETE PAD DETAIL
 NOTES:
 SEE CIVIL DRAWINGS FOR RETAINING WALL LOCATION.



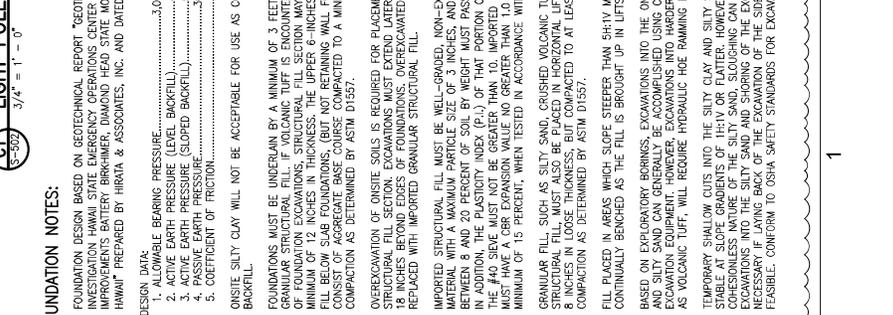
SECTION 2-C
 LIGHT POLE FOUNDATION
 NOTES:
 SEE CIVIL DRAWINGS FOR RETAINING WALL LOCATION.



SECTION 2-D
 RETAINING WALL RW-1
 NOTES:
 SEE CIVIL DRAWINGS FOR RETAINING WALL LOCATION.



SECTION 2-E
 RETAINING WALL RW-2
 NOTES:
 SEE CIVIL DRAWINGS FOR RETAINING WALL LOCATION.



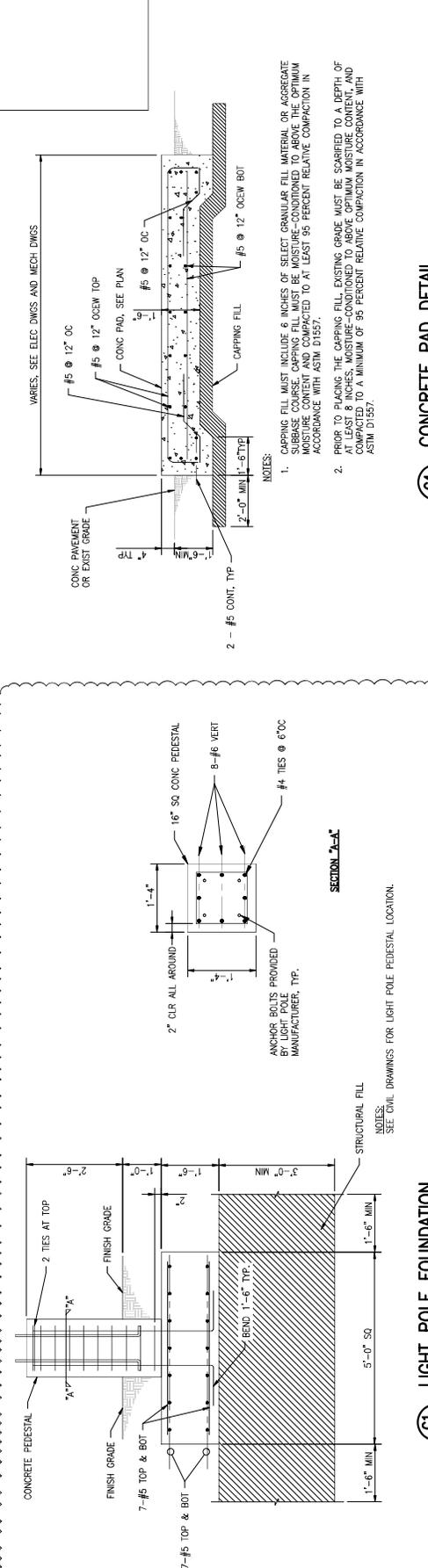
SECTION 2-F
 RETAINING WALL RW-3
 NOTES:
 SEE CIVIL DRAWINGS FOR RETAINING WALL LOCATION.

FOUNDATION NOTES:

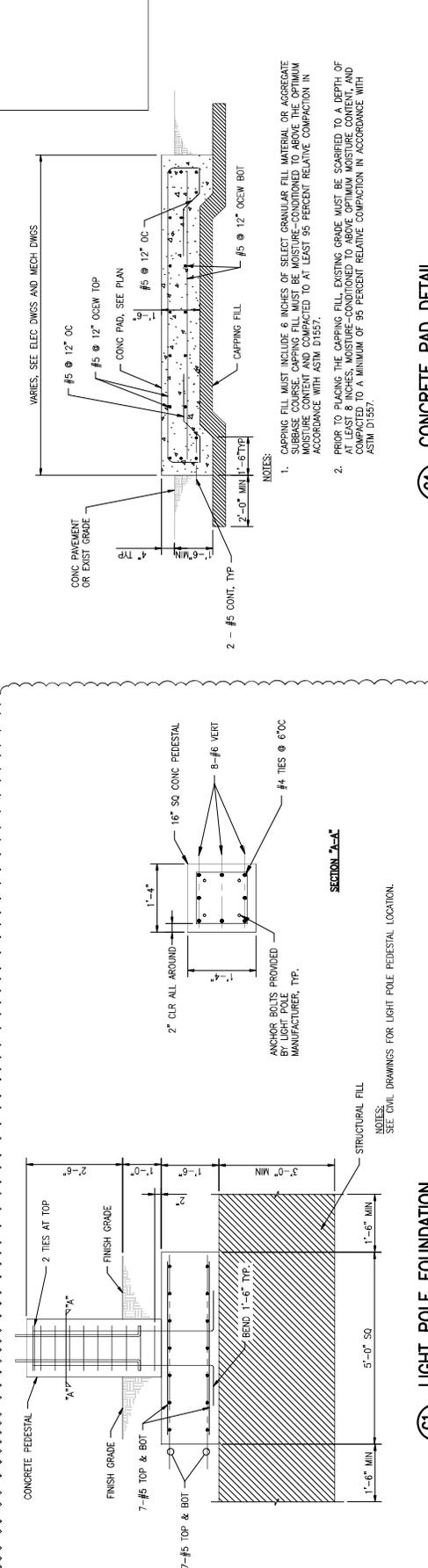
- FOUNDATION DESIGN BASED ON GEOTECHNICAL REPORT "GEOTECHNICAL INVESTIGATION HAWAII STATE EMERGENCY OPERATIONS CENTER (SEOC) IMPROVEMENTS BATTERY BIRKHMIR, DIAMOND HEAD STATE MONUMENT, HONOLULU, HAWAII" PREPARED BY HIRATA & ASSOCIATES, INC. AND DATED MARCH 21, 2024.
- DESIGN DATA:
 - 1. ALLOWABLE BEARING PRESSURE.....3,000 PSF
 - 2. ACTIVE EARTH PRESSURE (LEVEL BACKFILL).....45 PCF
 - 3. ACTIVE EARTH PRESSURE (SLOPED BACKFILL).....55 PCF
 - 4. PASSIVE EARTH PRESSURE.....360 PCF
 - 5. COEFFICIENT OF FRICTION.....0.40
- ON-SITE SILTY CLAY WILL NOT BE ACCEPTABLE FOR USE AS COMPACTED FILL OR BACKFILL.
- FOUNDATIONS MUST BE UNDERMIN BY A MINIMUM OF 3 FEET OF IMPORTED GRANULAR STRUCTURAL FILL. IF VOLCANIC TUFF IS ENCOUNTERED AT THE BOTTOM OF FOUNDATION EXCAVATIONS, STRUCTURAL FILL SECTION MAY BE REDUCED TO A MINIMUM OF 12 INCHES IN THICKNESS. THE UPPER 6-INCHES OF STRUCTURAL FILL BELOW SLAB FOUNDATIONS, (BUT NOT RETAINING WALL FOOTINGS) MUST BE COMPACTED TO A MINIMUM OF 95 PERCENT RELATIVE COMPACTION AS DETERMINED BY ASTM D1557.
- OVEREXCAVATION OF ON-SITE SOILS IS REQUIRED FOR PLACEMENT OF THE FOUNDATIONS. EXCAVATIONS DEEPER THAN 18 INCHES MUST BE UNDERMINED BY A MINIMUM OF 18 INCHES. FOUNDATIONS OF FOUNDATIONS OVEREXCAVATED SOIL MUST BE REPLACED WITH IMPORTED GRANULAR STRUCTURAL FILL.
- IMPORTED STRUCTURAL FILL MUST BE WELL-GRADED, NON-EXPANSIVE, GRANULAR MATERIAL WITH MAXIMUM PARTICLE SIZE OF 3/8 INCHES AND STATE STANDARD BETWEEN #10 AND #20 PERCENT FINES. THE MAXIMUM HEIGHT OF SOIL PASSING THE #40 SIEVE MUST NOT BE GREATER THAN 10. IMPORTED STRUCTURAL FILL MUST HAVE A CR EXPANSION VALUE NO GREATER THAN 1.0 PERCENT AND A MINIMUM OF 15 PERCENT, WHEN TESTED IN ACCORDANCE WITH ASTM D1883.
- GRANULAR FILL, SUCH AS SILTY SAND, CRUSHED VOLCANIC TUFF, AND IMPORTED STRUCTURAL FILL, MUST ALSO BE PLACED IN HORIZONTAL LIFTS RESTRICTED TO 8 INCHES IN THICKNESS, BUT COMPACTED TO AT LEAST 95 PERCENT COMPACTION AS DETERMINED BY ASTM D1557.
- FILL PLACED IN AREAS WHICH SLOPE STEEPER THAN 5H:1V MUST BE CONTINUALLY BENCH AS THE FILL IS BROUGHT UP IN LIFTS.
- BASED ON EXPLORATORY BORINGS, EXCAVATIONS INTO THE ON-SITE SILTY CLAY MUST BE LIMITED TO 18 INCHES. EXCAVATIONS INTO HARDER MATERIALS, SUCH AS VOLCANIC TUFF, WILL REQUIRE HYDRAULIC HOE RAMMING EQUIPMENT.
- TEMPORARY SLOTTED CURTS INTO THE SILTY CLAY AND SILTY SAND MUST BE INSTALLED TO PREVENT COLLAPSE OF EXCAVATIONS. SLOTTED CURTS MUST BE CONSTRUCTION NATURE OF THE SILTY SAND, SLOUGHING CAN BE EXPECTED FOR EXCAVATIONS INTO THE SILTY SAND AND SHORING OF THE EXCAVATION MAY BE NECESSARY IF LAYING BACK OF THE EXCAVATION OF THE SIDEWALLS IS NOT FEASIBLE. CONFORM TO OSHA SAFETY STANDARDS FOR EXCAVATIONS.

FOUNDATION NOTES:

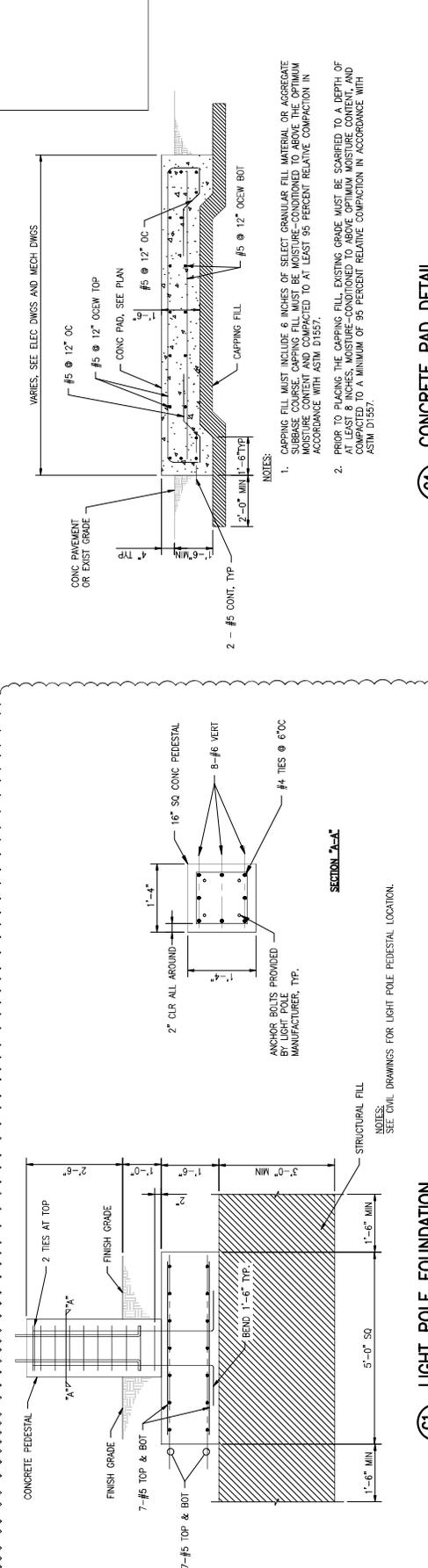
- CAPPING FILL MUST INCLUDE 6 INCHES OF SELECT GRANULAR FILL MATERIAL OR AGGREGATE SUBBASE COURSE. CAPPING FILL MUST BE MOISTURE-CONDITIONED TO ADEQUATELY ABOVE THE OPTIMUM MOISTURE CONTENT AND COMPACTED TO AT LEAST 95 PERCENT RELATIVE COMPACTION IN ACCORDANCE WITH ASTM D1557.
- PRIOR TO PLACING THE CAPPING FILL, EXISTING GRADE MUST BE SURFACED TO A DEPTH OF 6 INCHES BELOW THE FINISH GRADE. THE SURFACE MUST BE MOISTURE-CONDITIONED AND COMPACTED TO A MINIMUM OF 95 PERCENT RELATIVE COMPACTION IN ACCORDANCE WITH ASTM D1557.



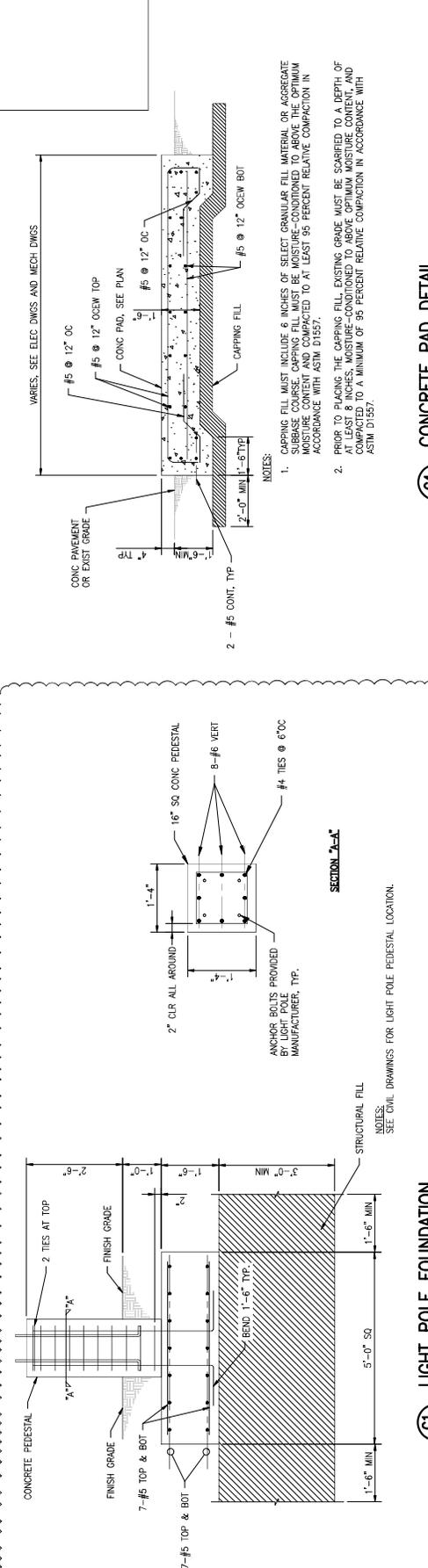
SECTION 2-G
 RETAINING WALL RW-4
 NOTES:
 SEE CIVIL DRAWINGS FOR RETAINING WALL LOCATION.



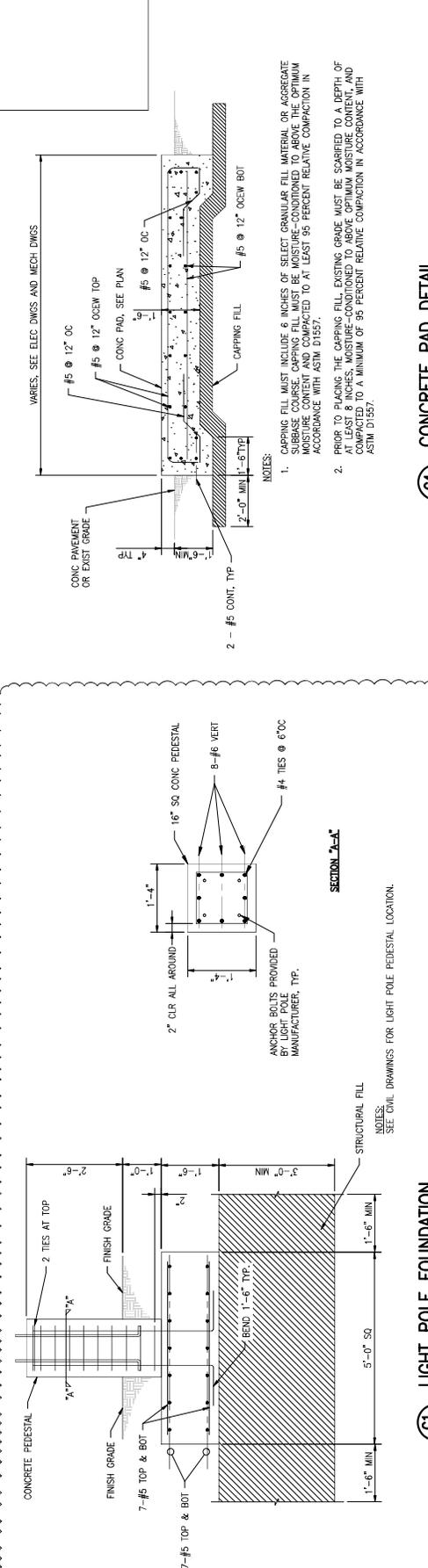
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 NOTES:
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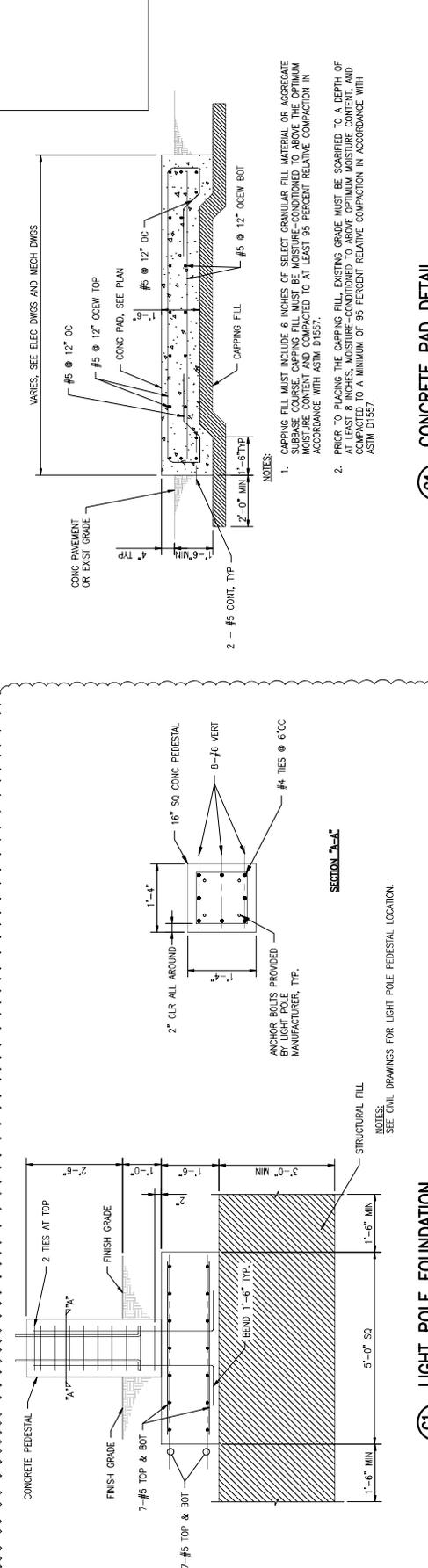
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 NOTES:
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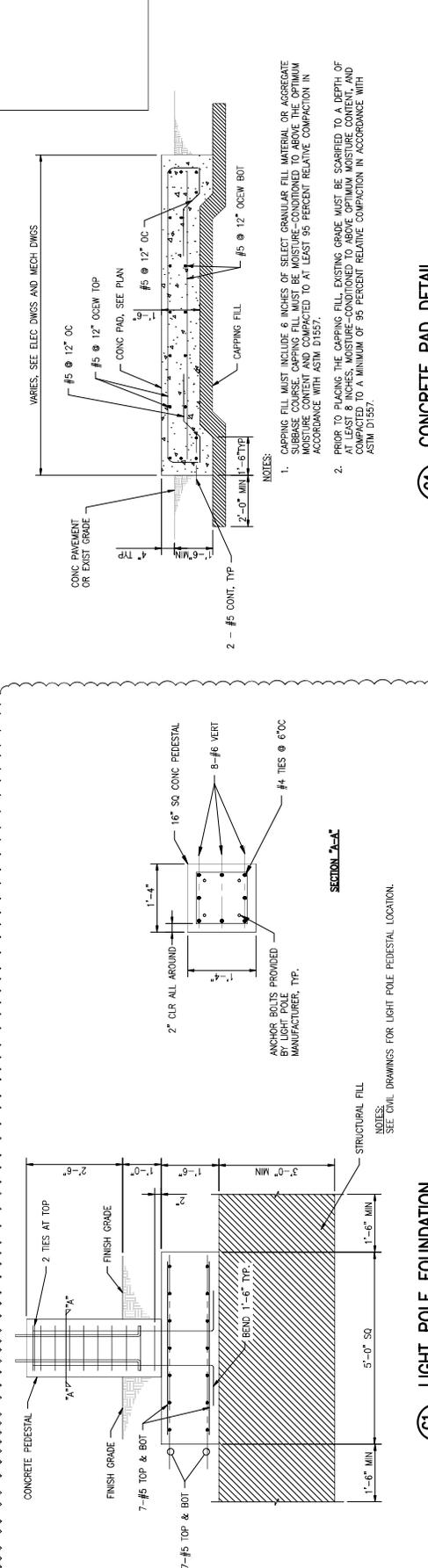
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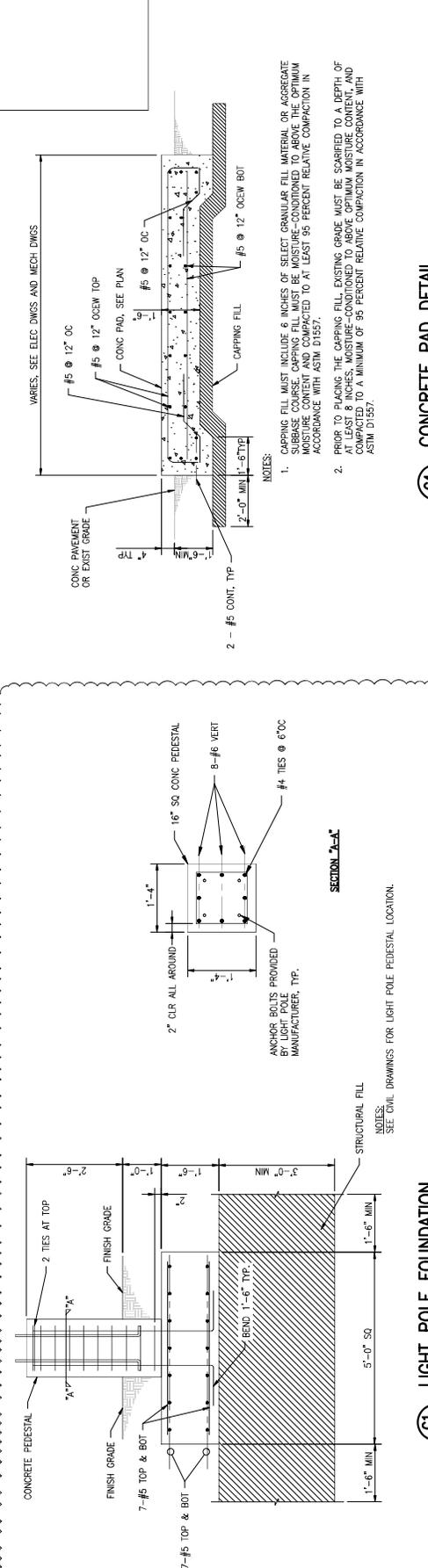
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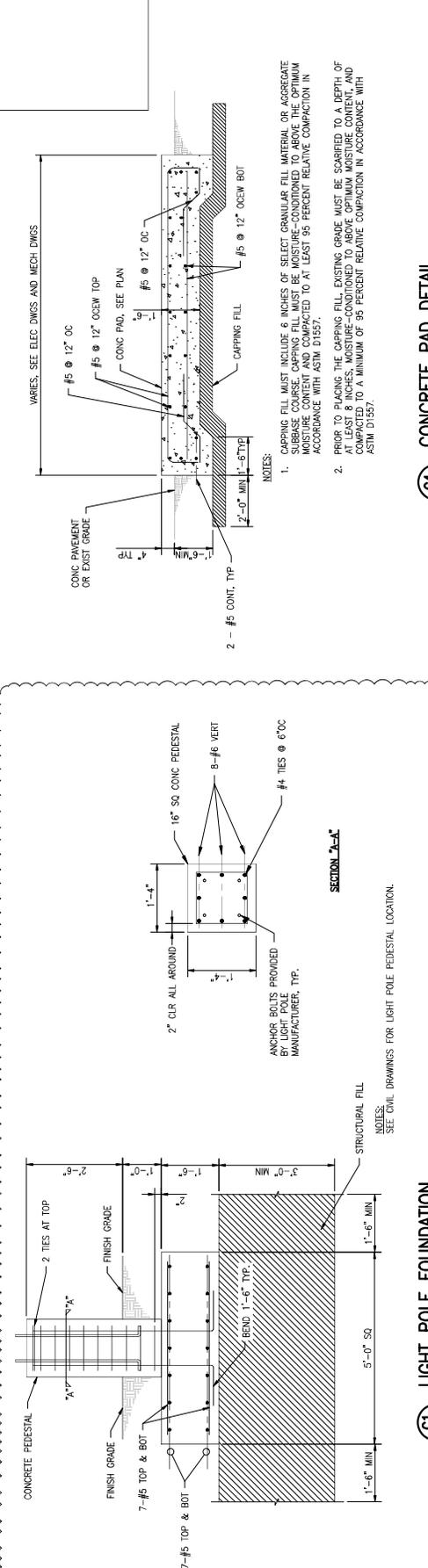
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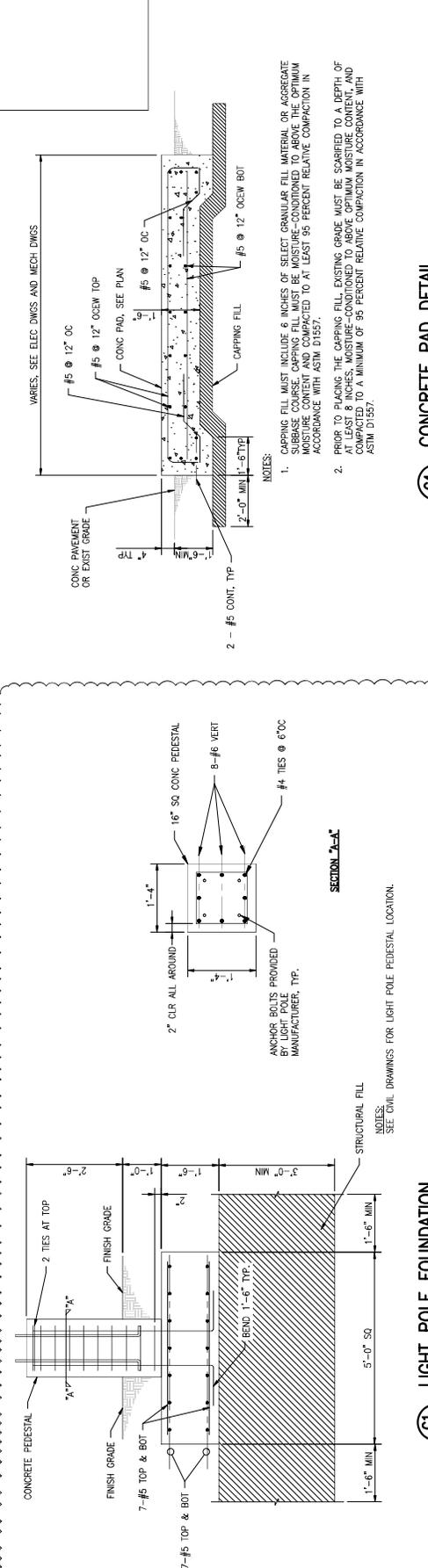
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 NOTES:
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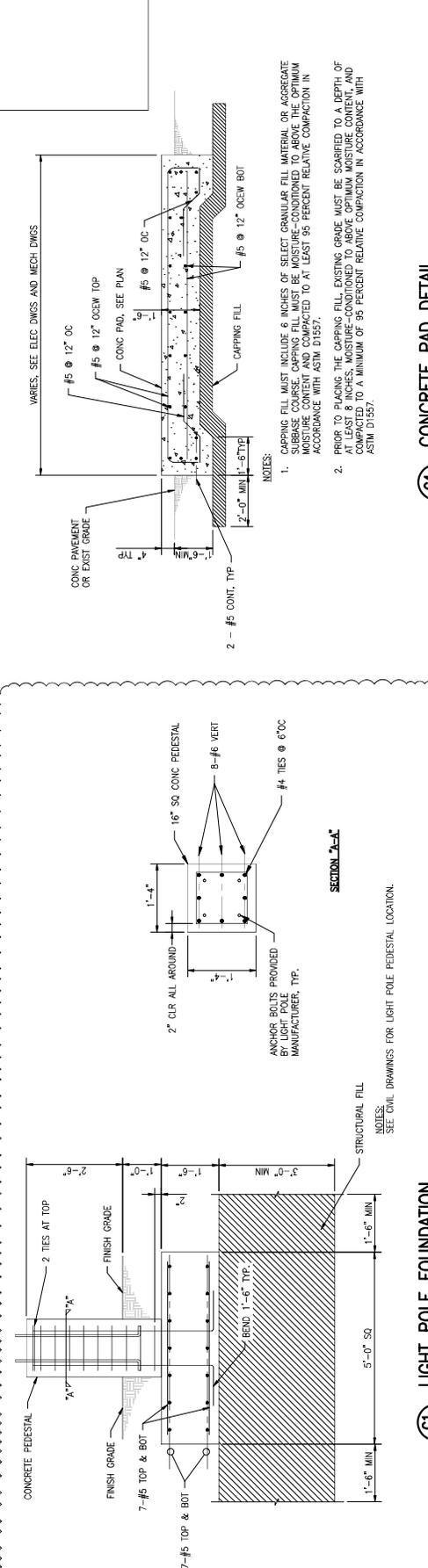
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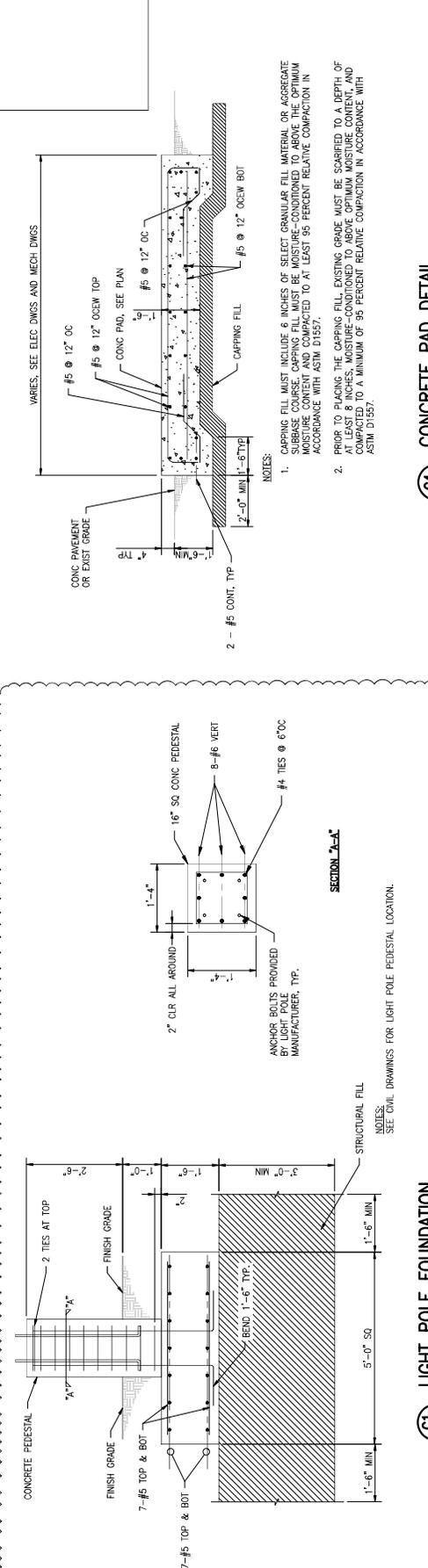
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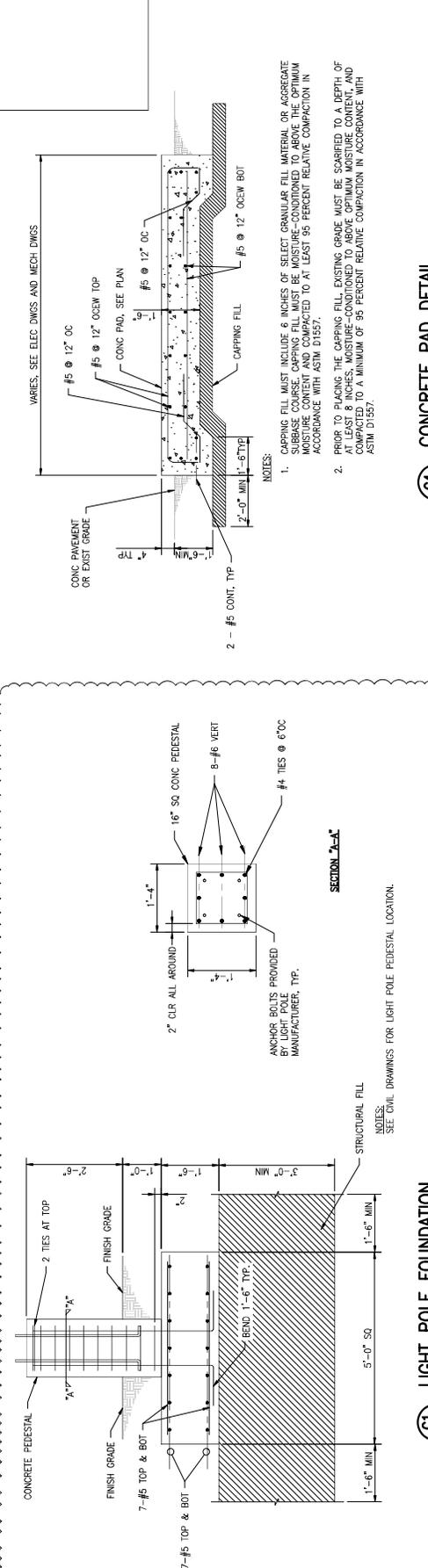
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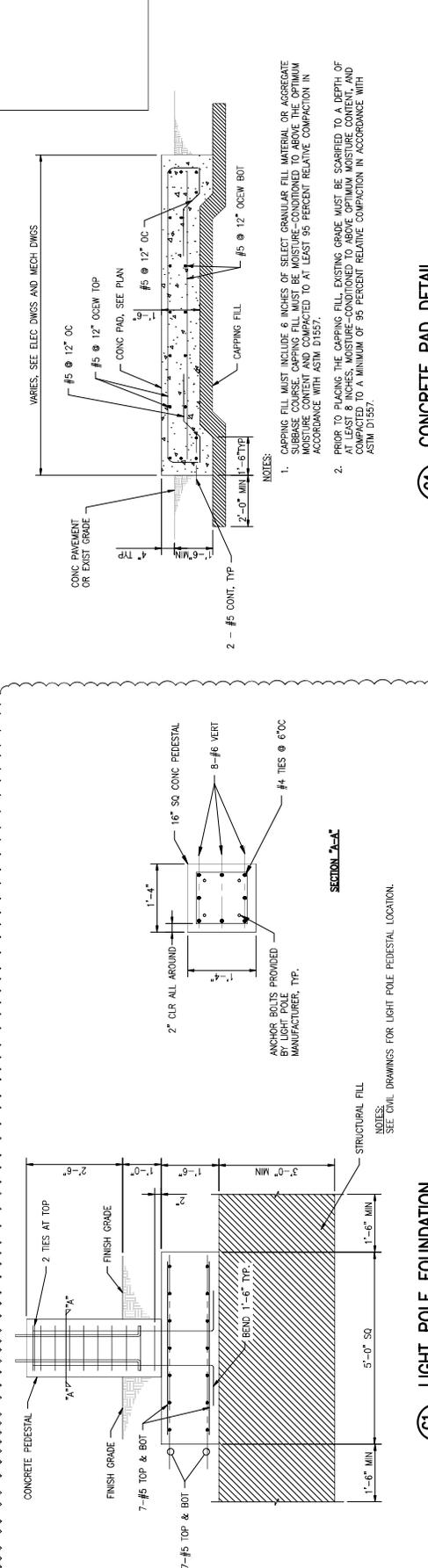
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 NOTES:
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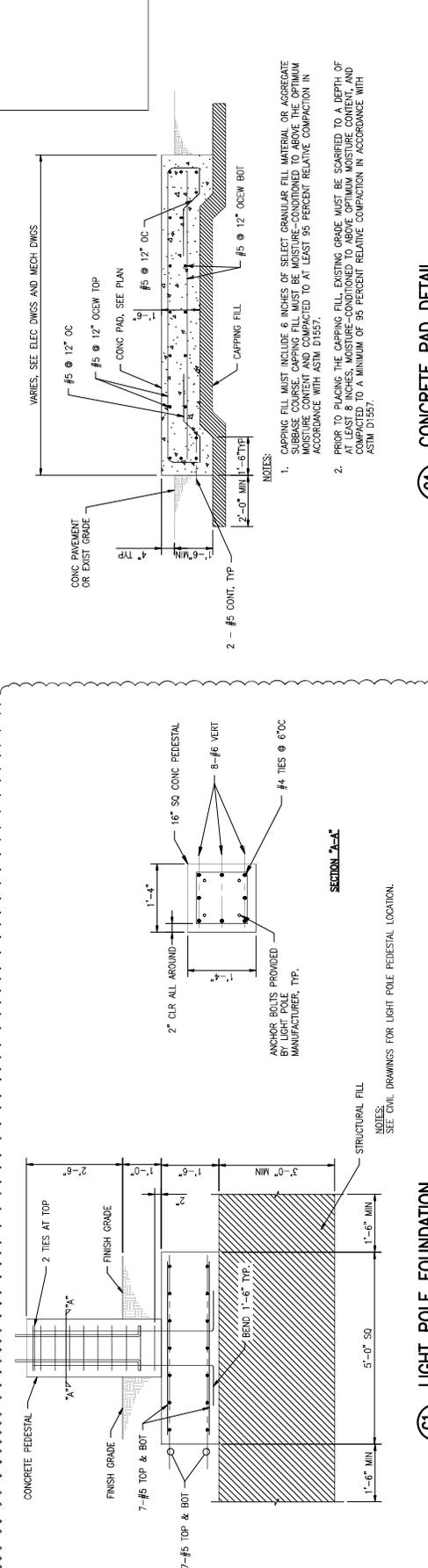
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 NOTES:
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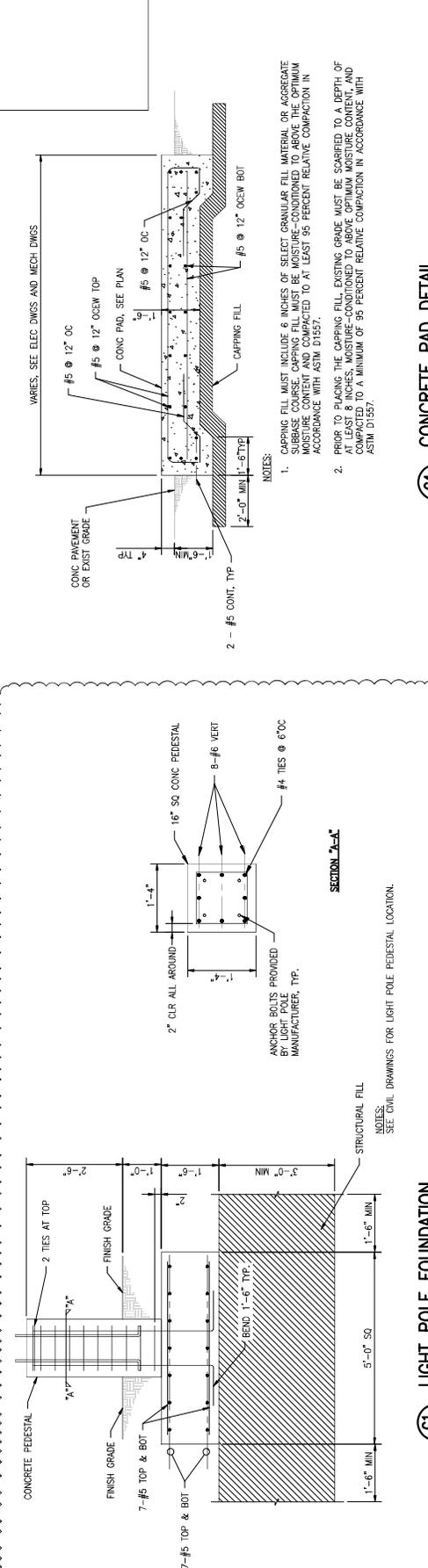
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 NOTES:
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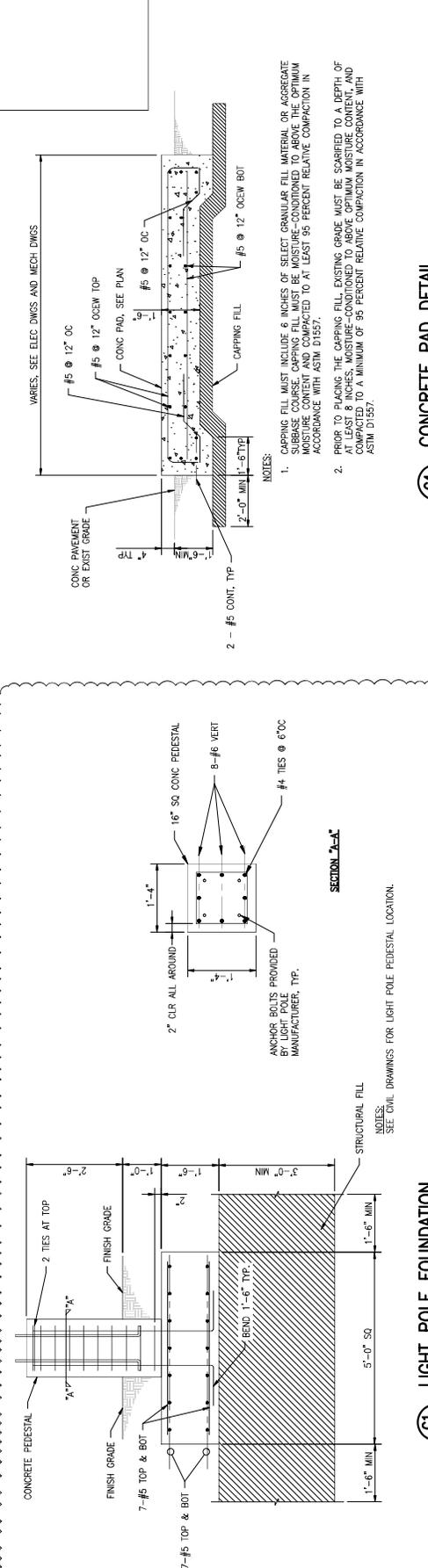
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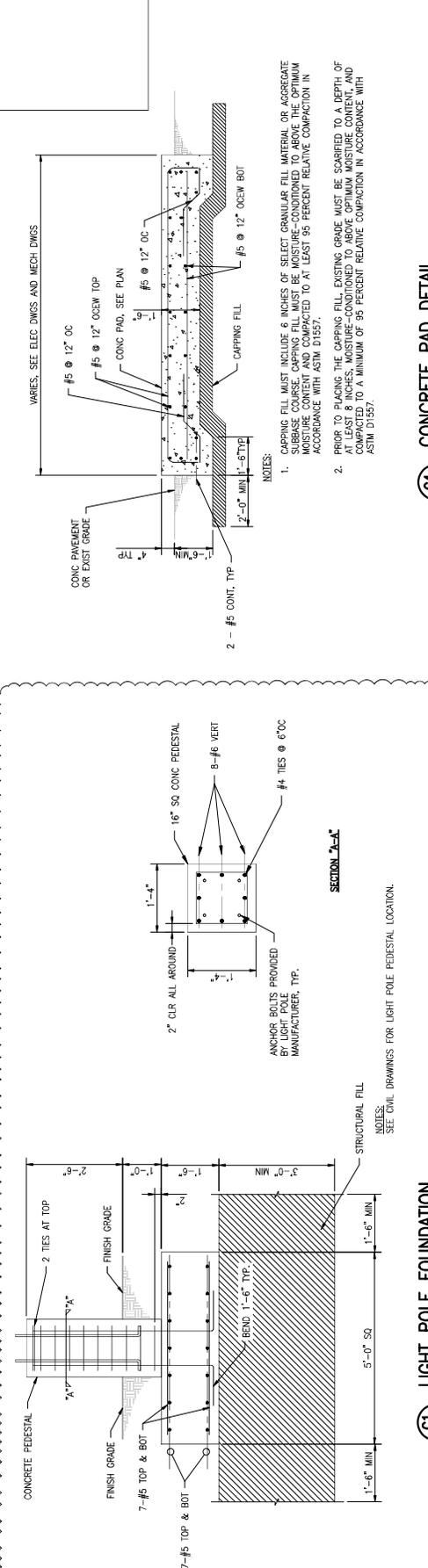
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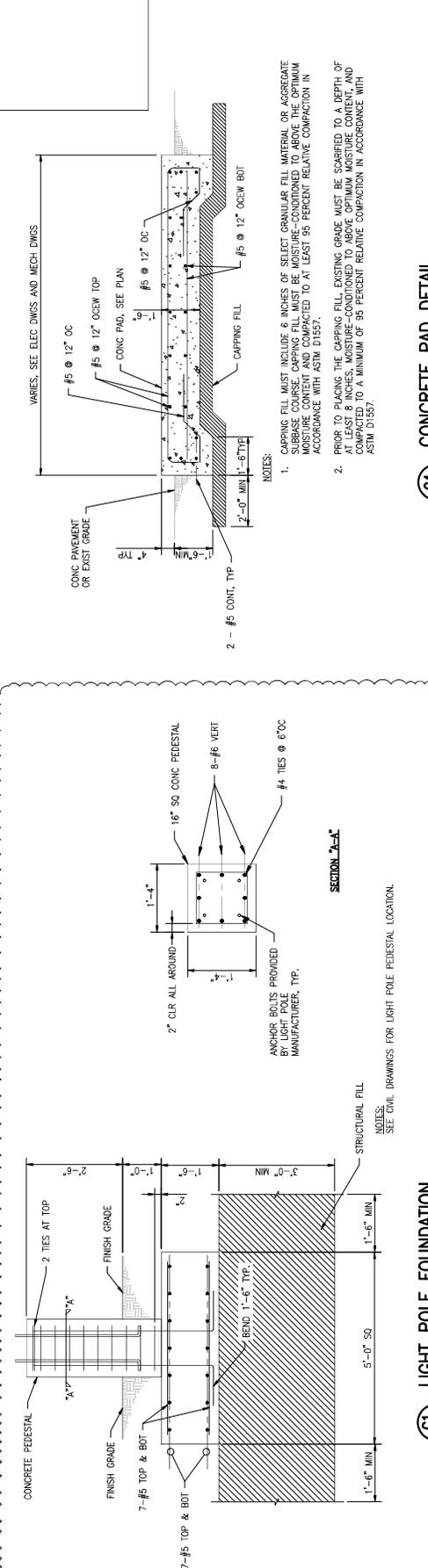
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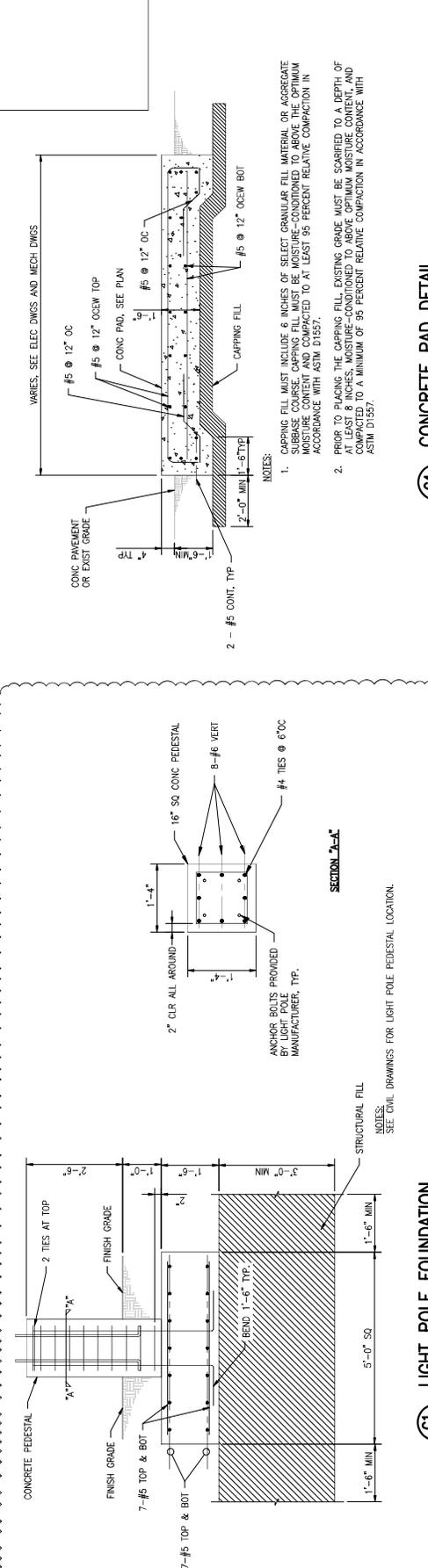
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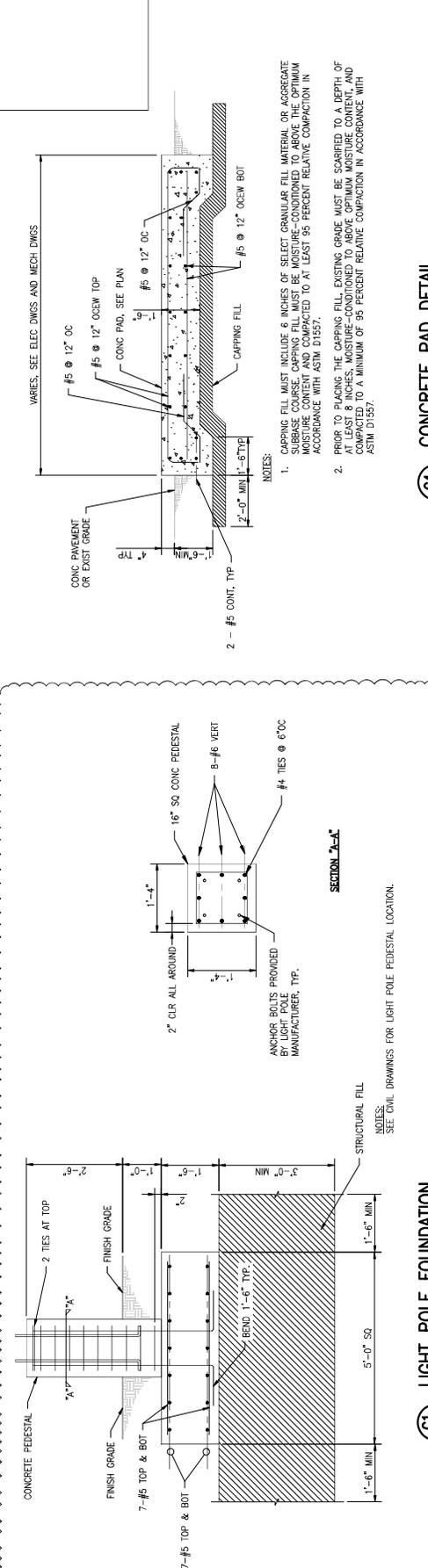
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 NOTES:
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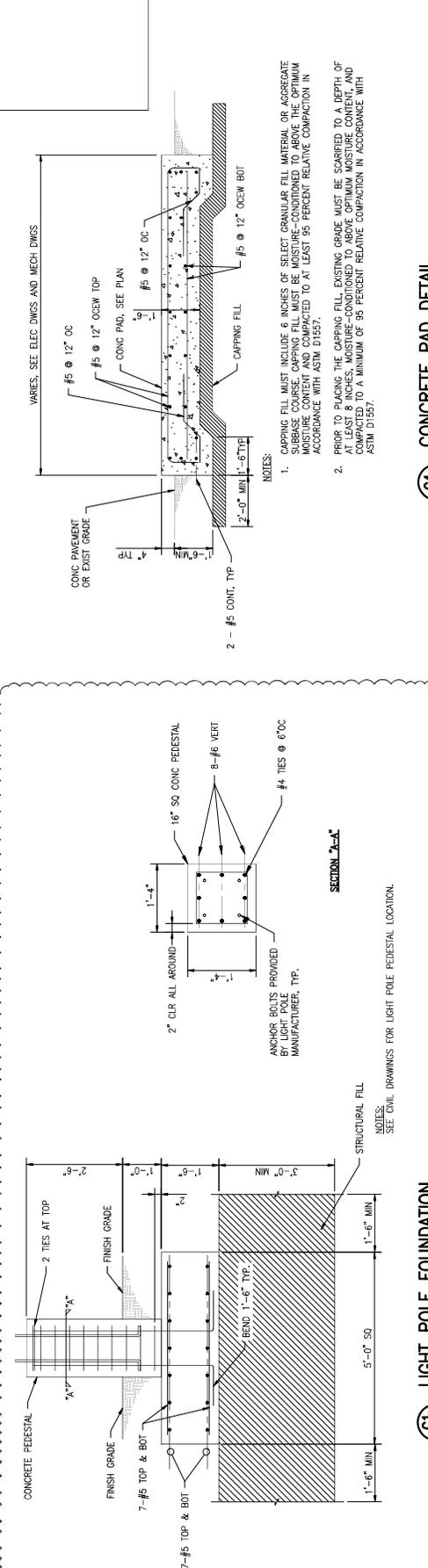
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 RETAINING WALL RW-22
 NOTES:
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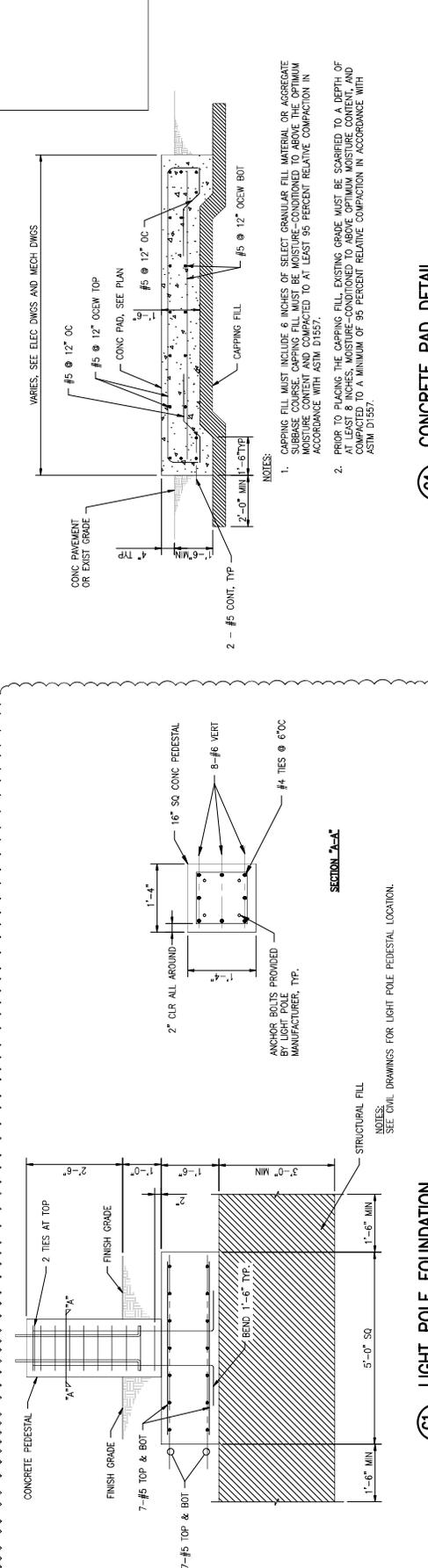
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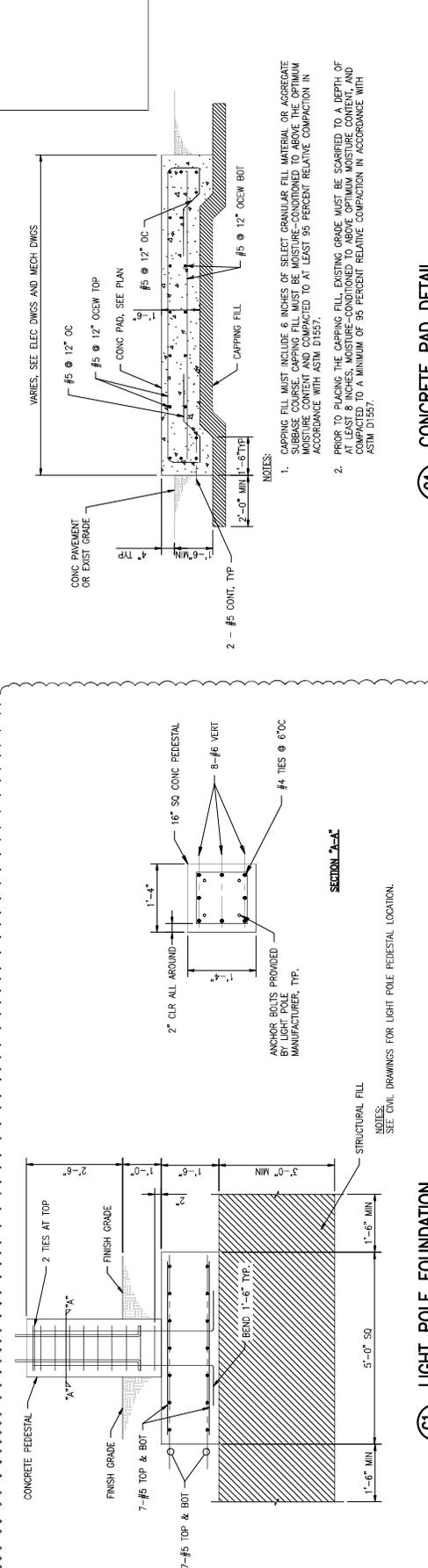
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 RETAINING WALL RW-24
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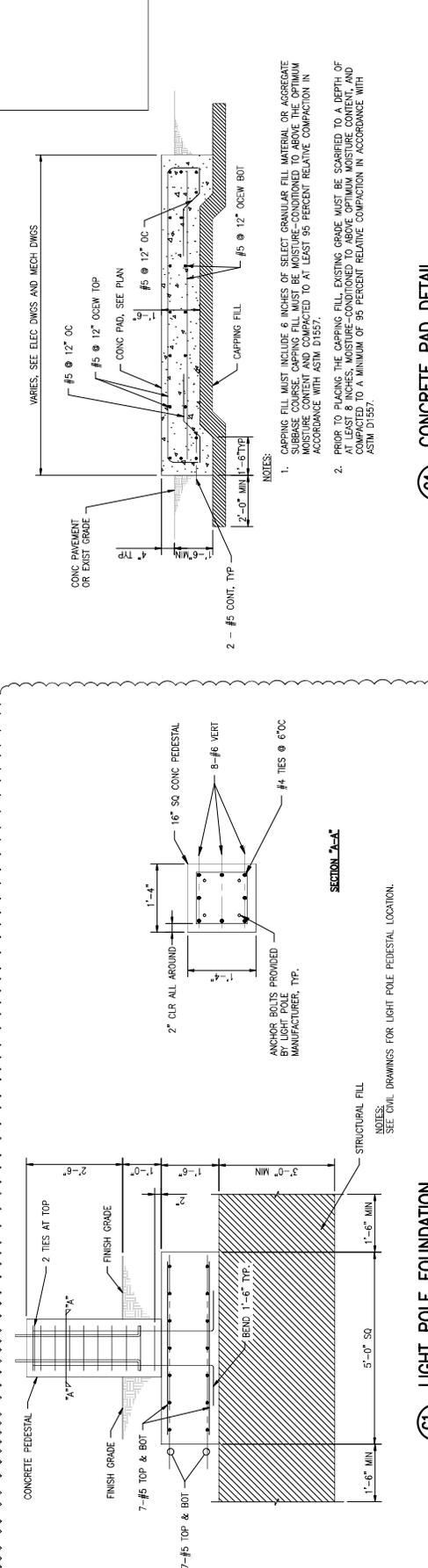
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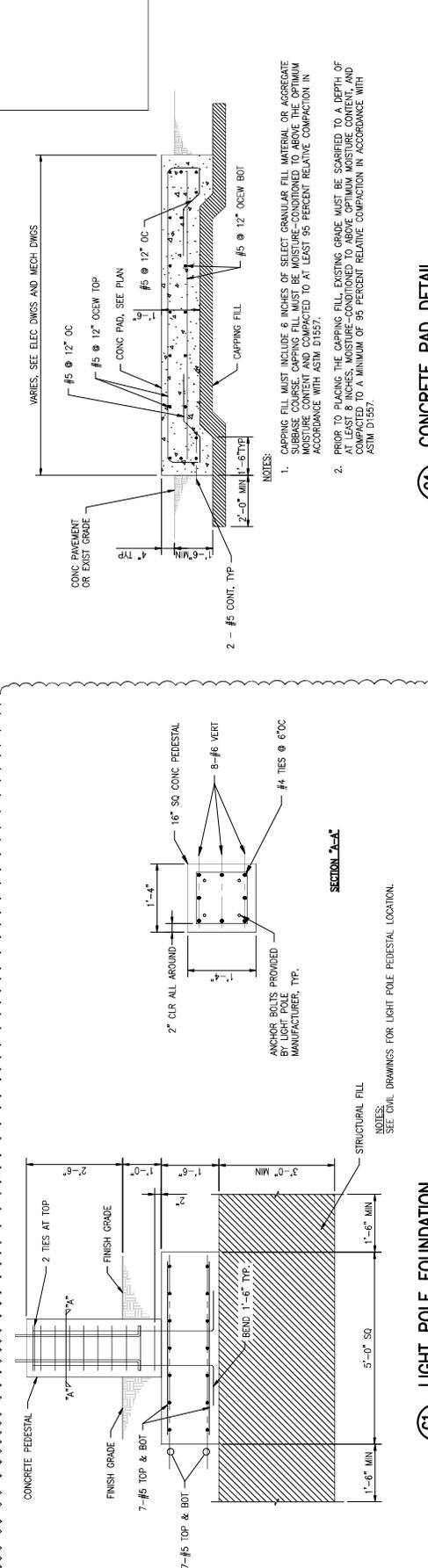
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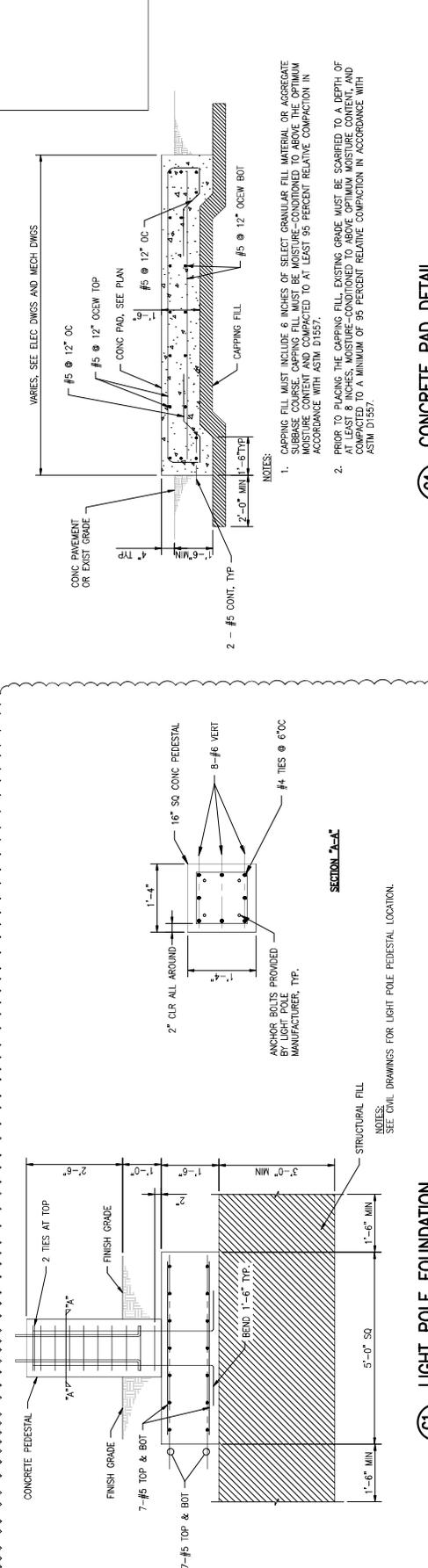
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 NOTES:
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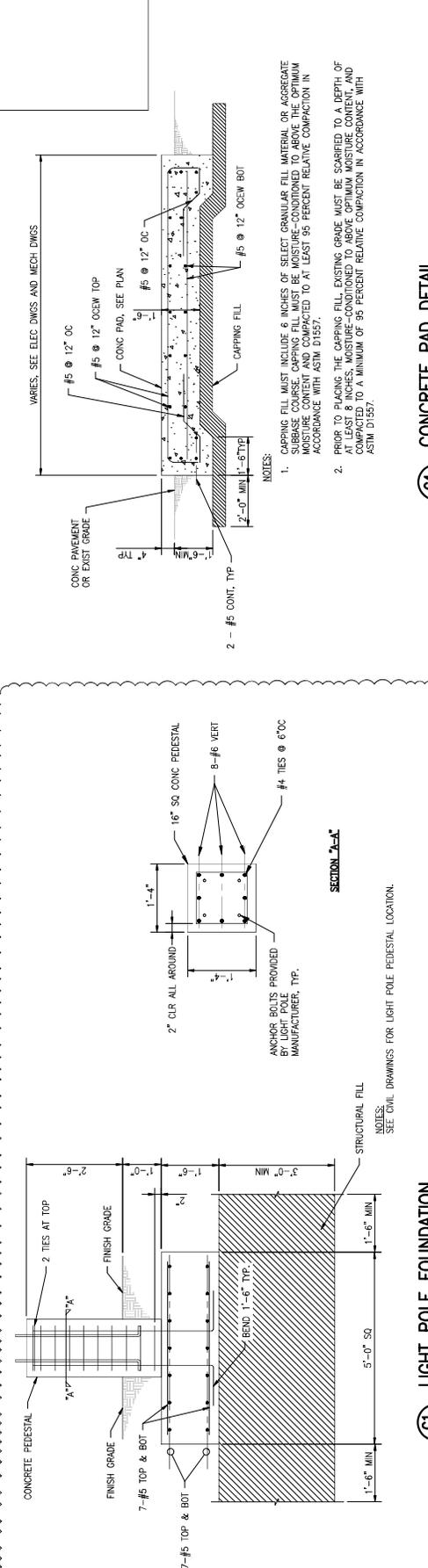
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 NOTES:
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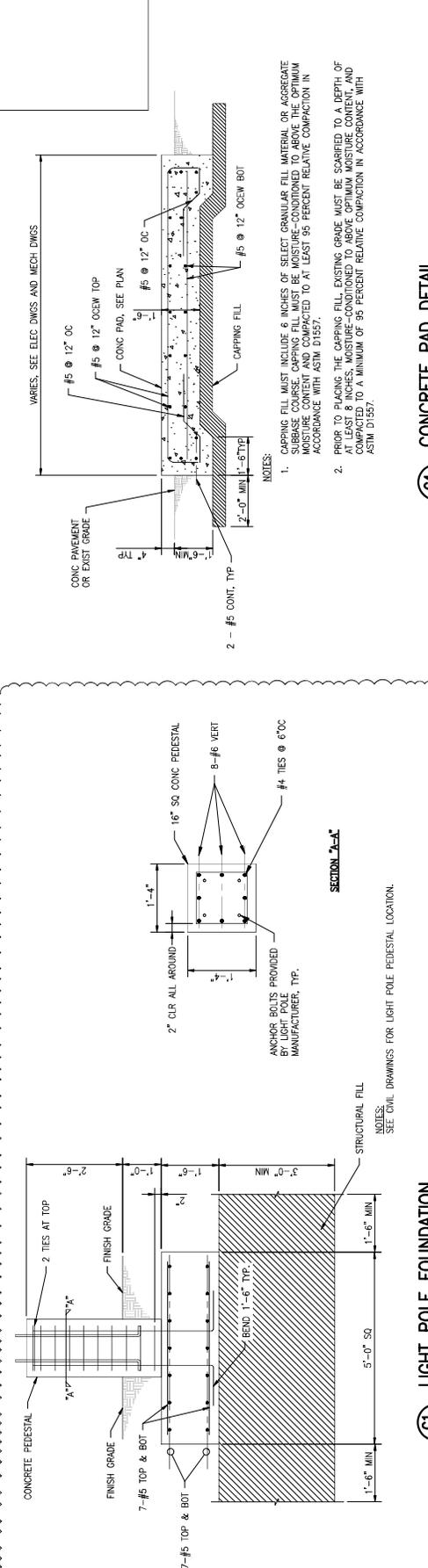
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 NOTES:
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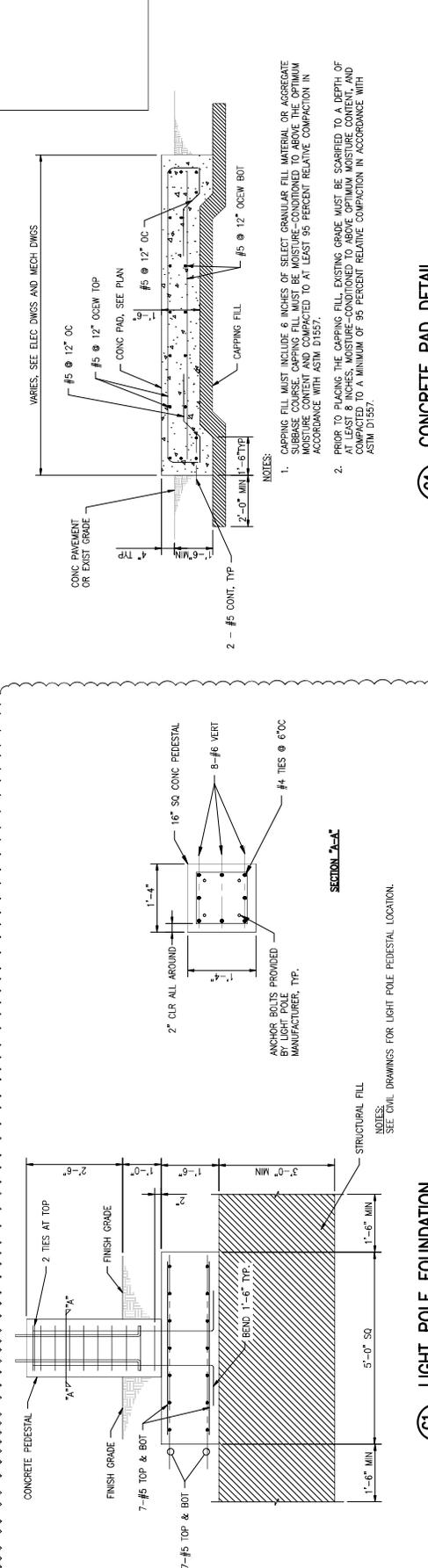
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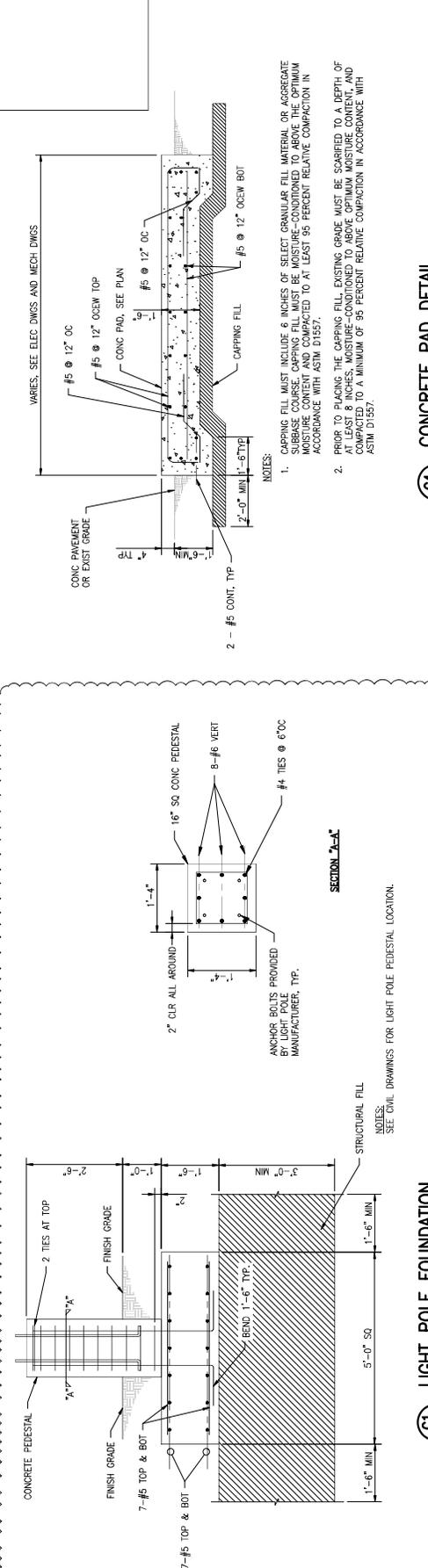
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 NOTES:
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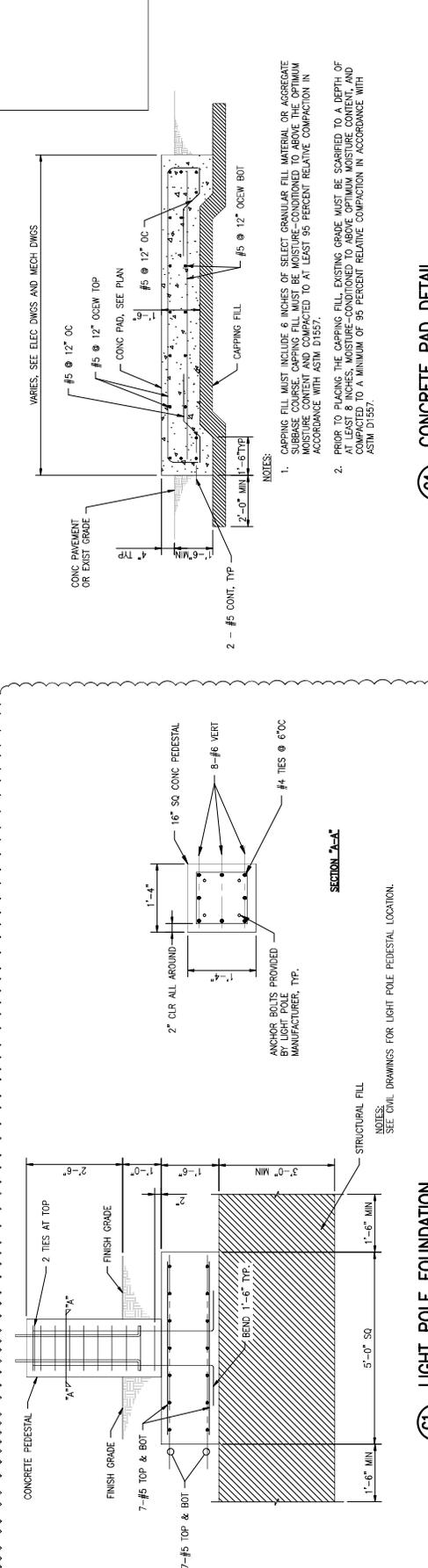
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 NOTES:
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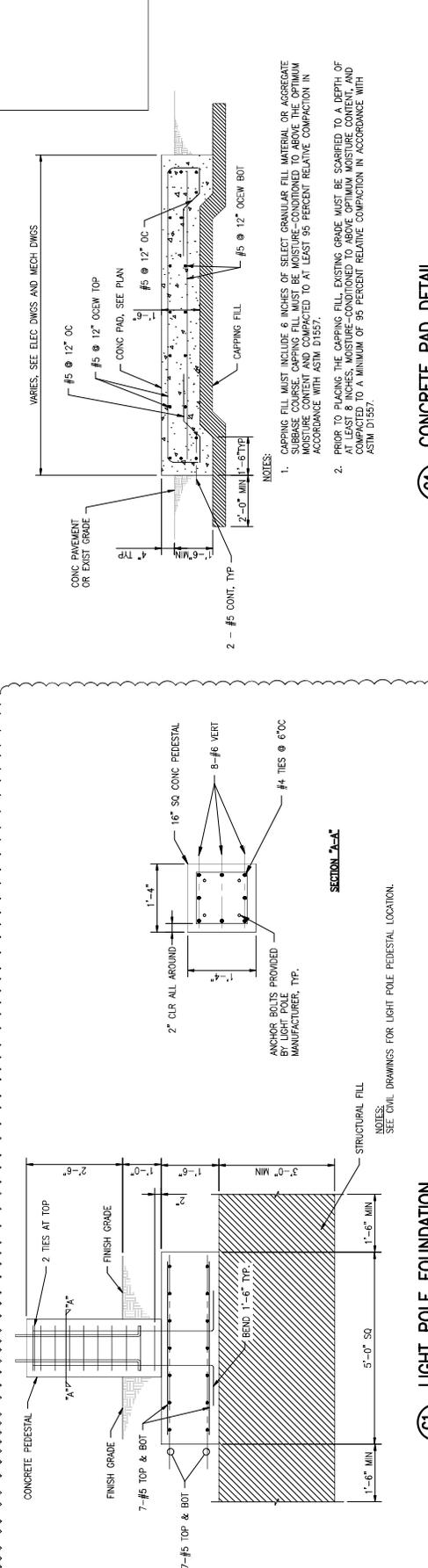
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 NOTES:
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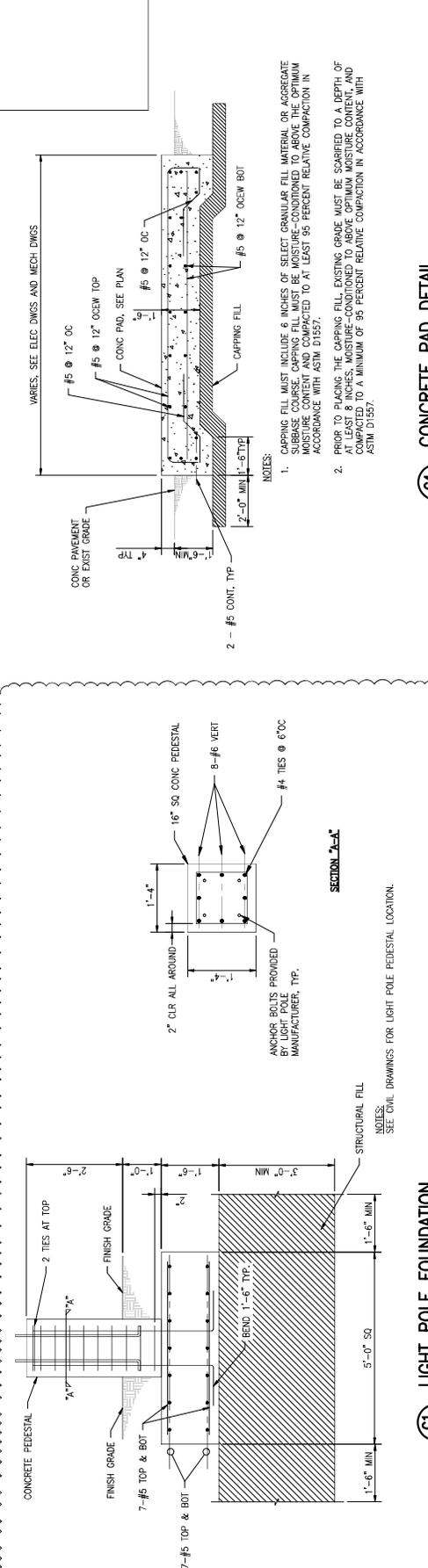
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 NOTES:
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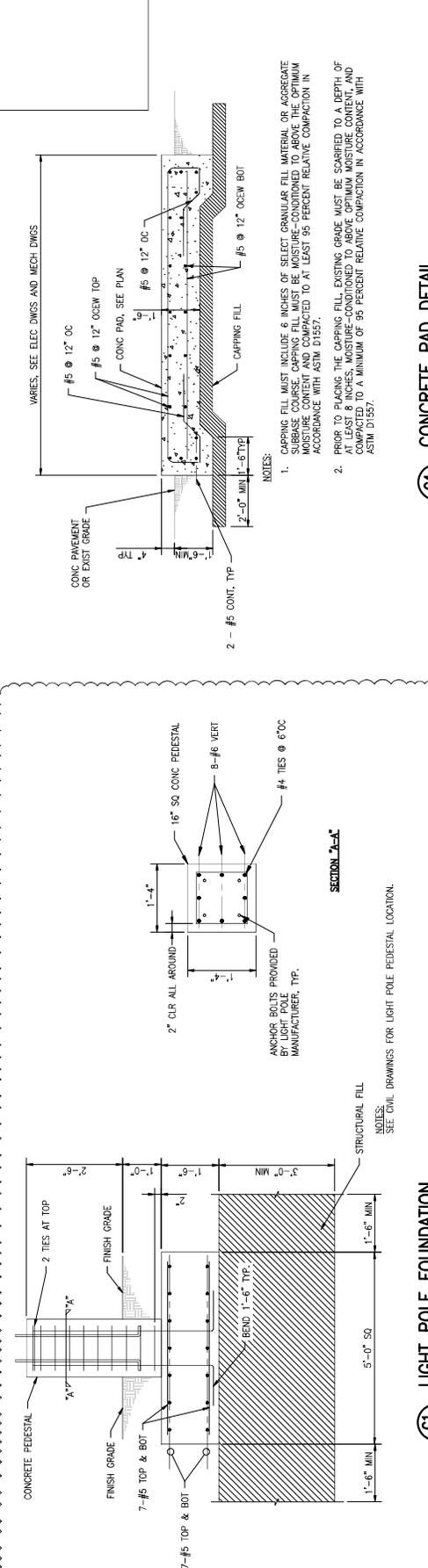
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 NOTES:
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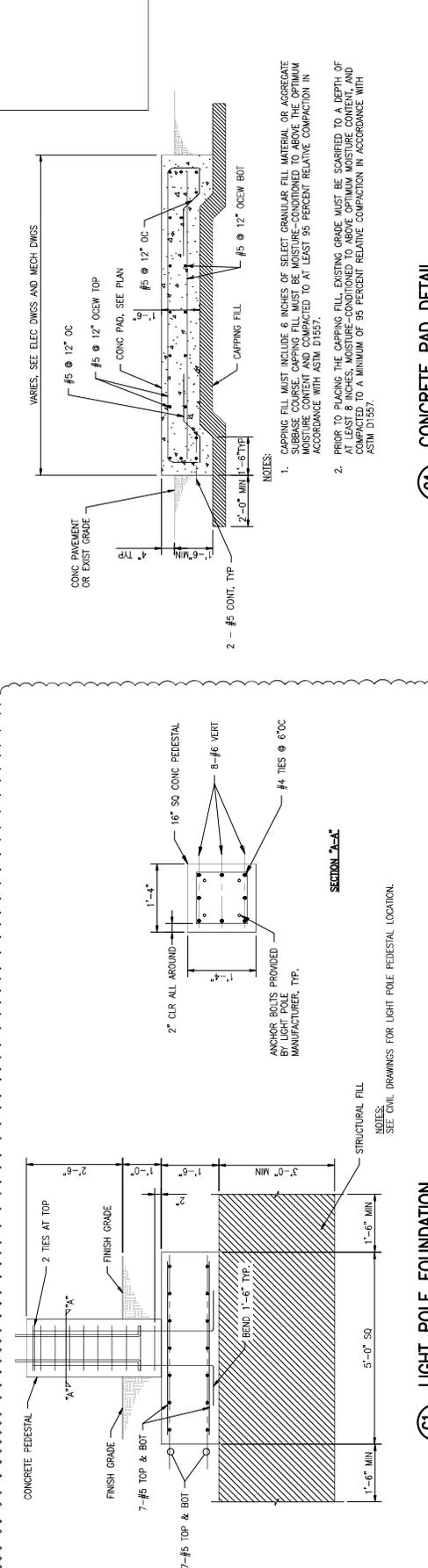
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 NOTES:
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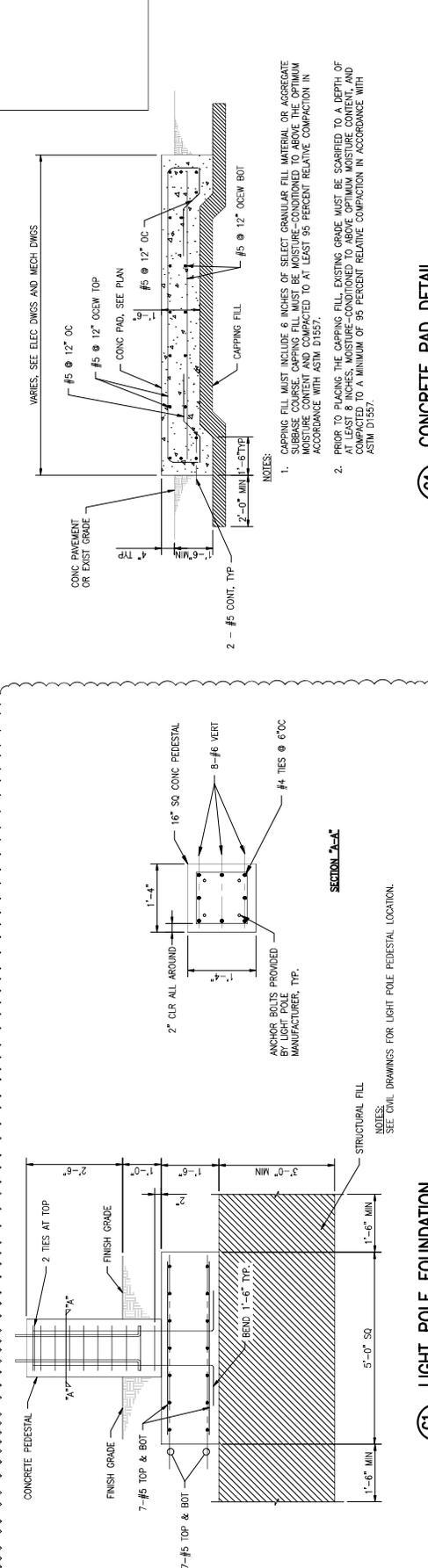
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 NOTES:
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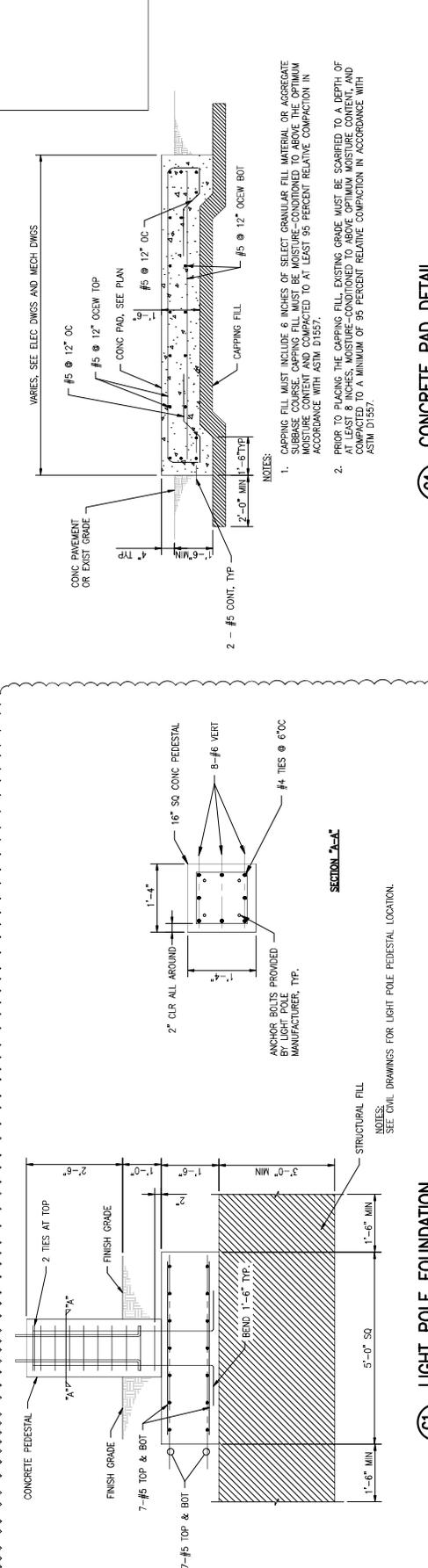
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 NOTES:
 SEE CIVIL DRAWINGS FOR RETAINING WALL LOCATION.



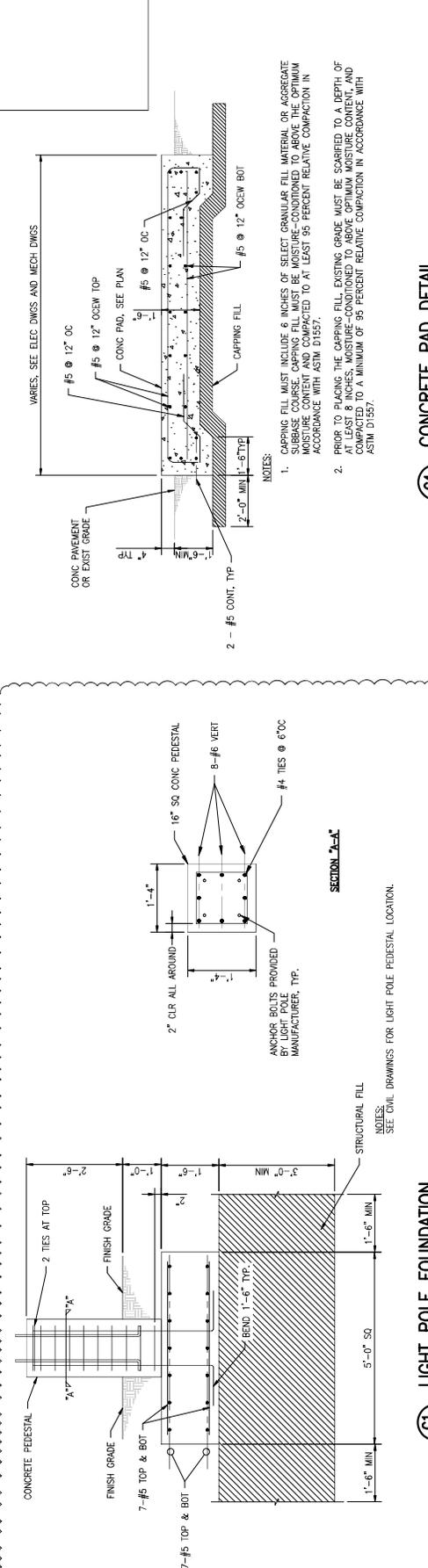
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 NOTES:
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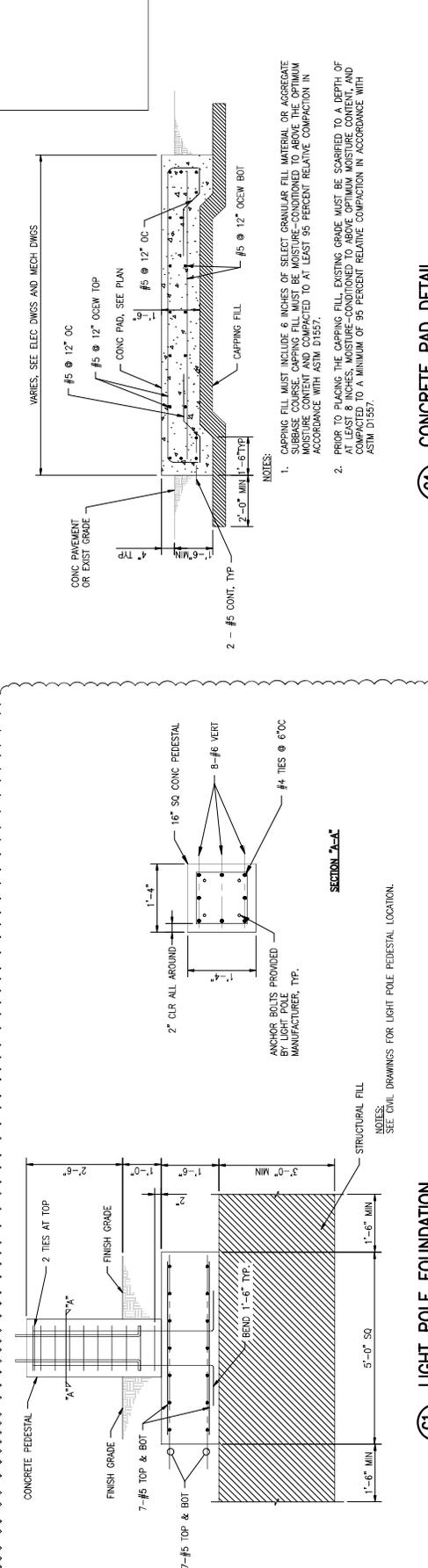
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 NOTES:
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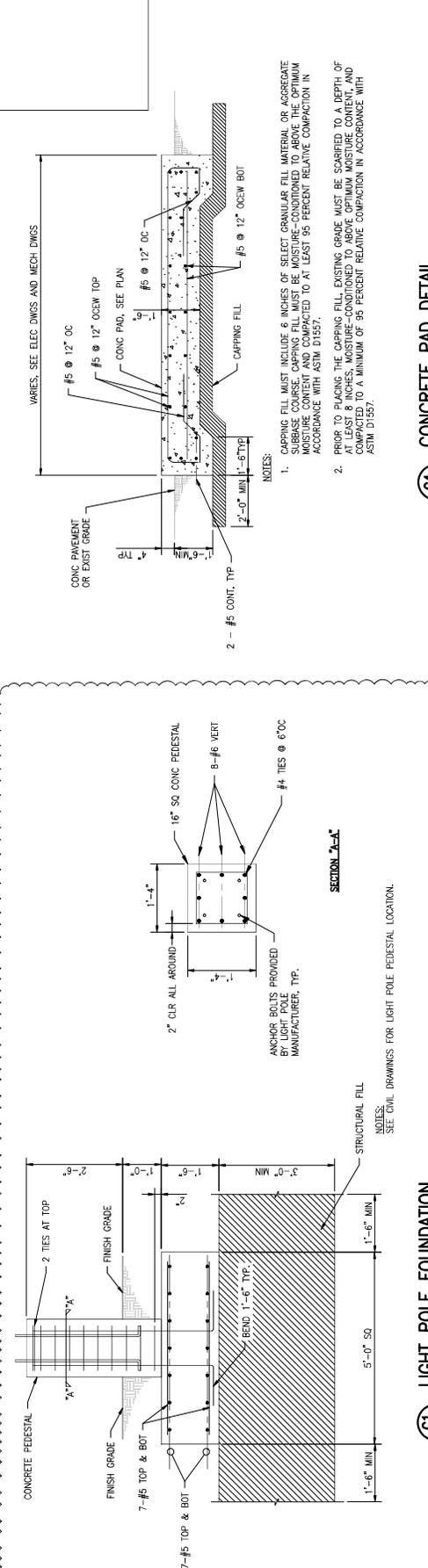
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 RETAINING WALL RW-41
 NOTES:
 SEE CIVIL DRAWINGS FOR RETAINING WALL LOCATION.



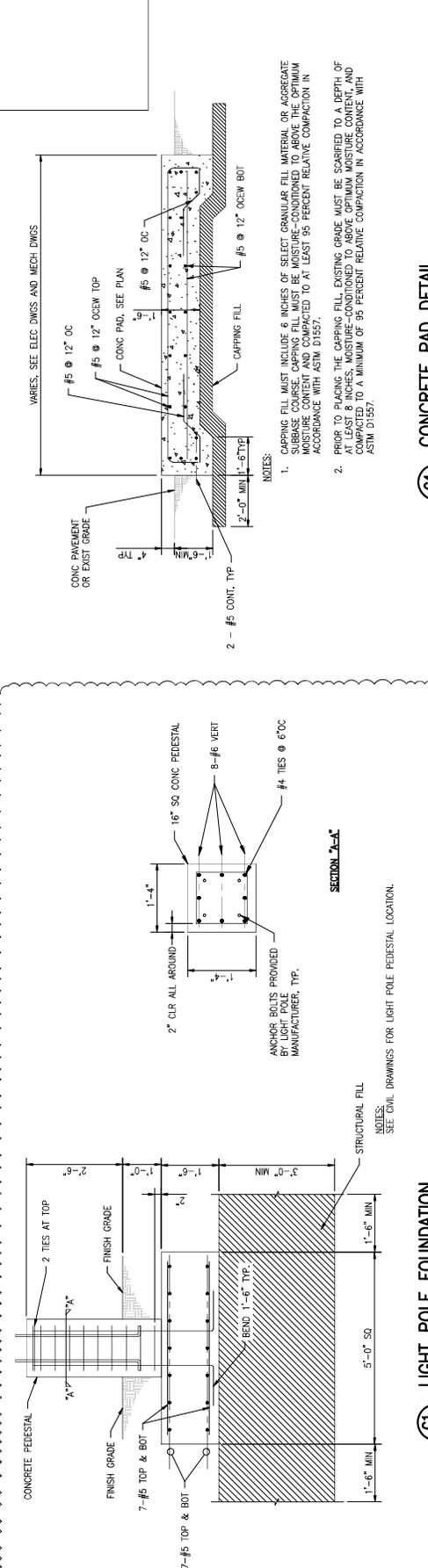
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 NOTES:
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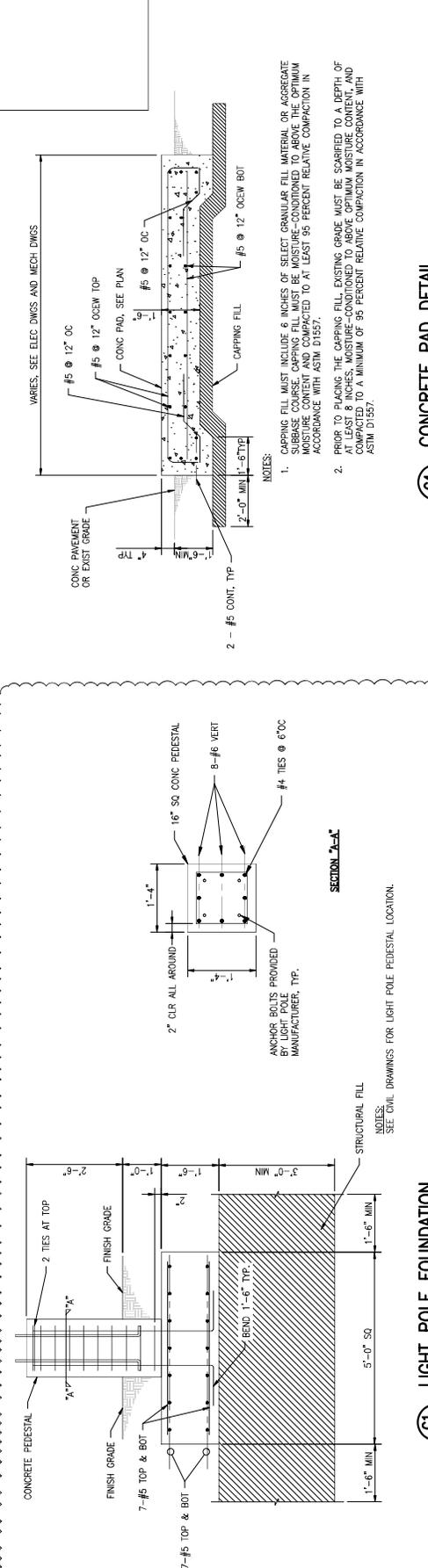
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 NOTES:
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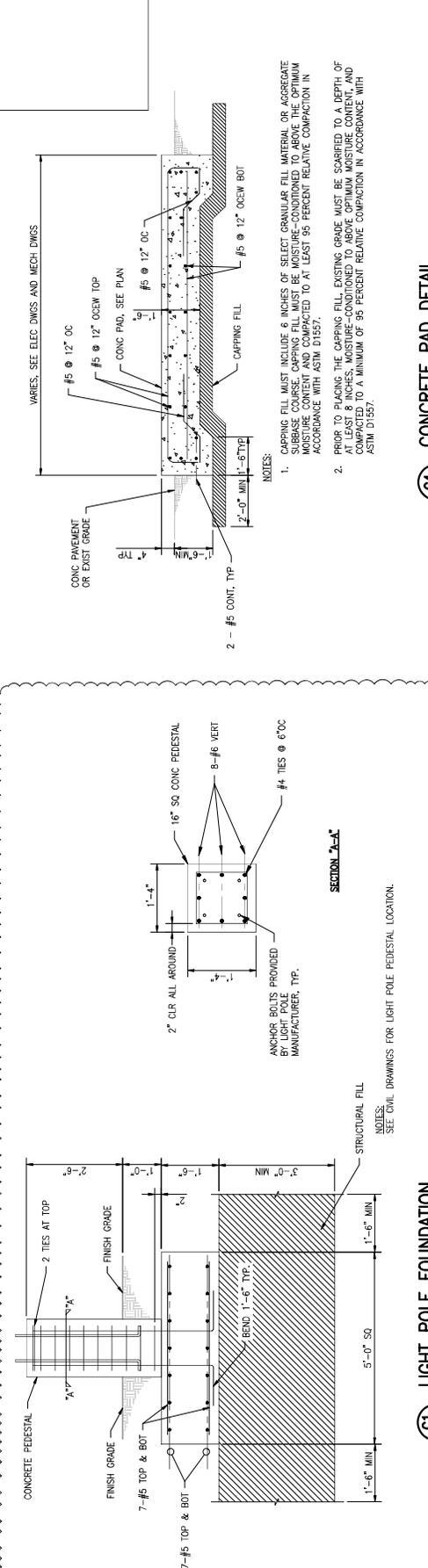
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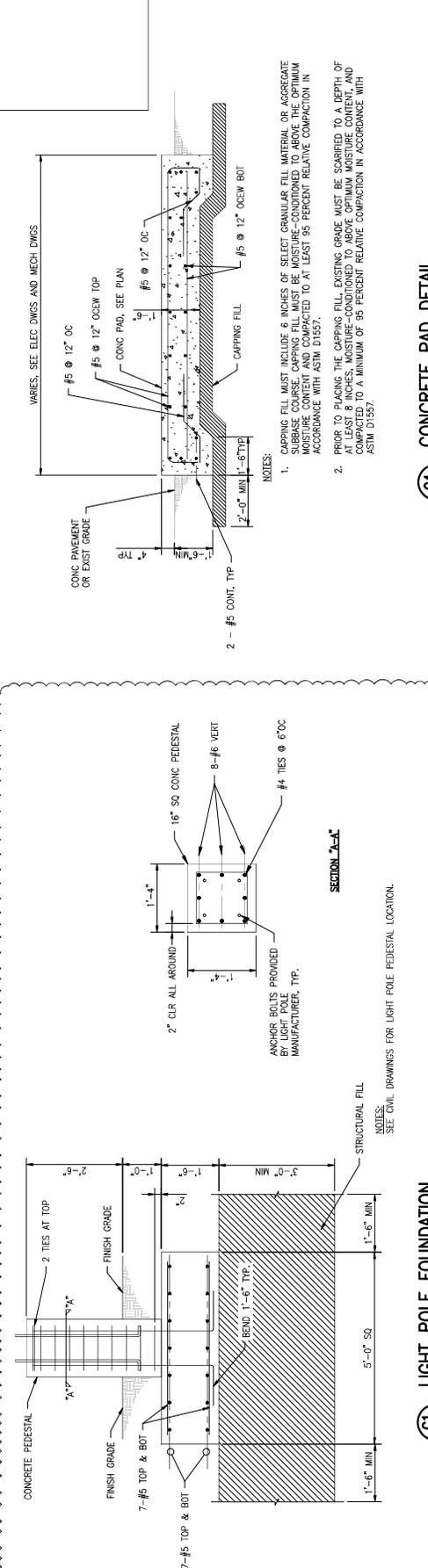
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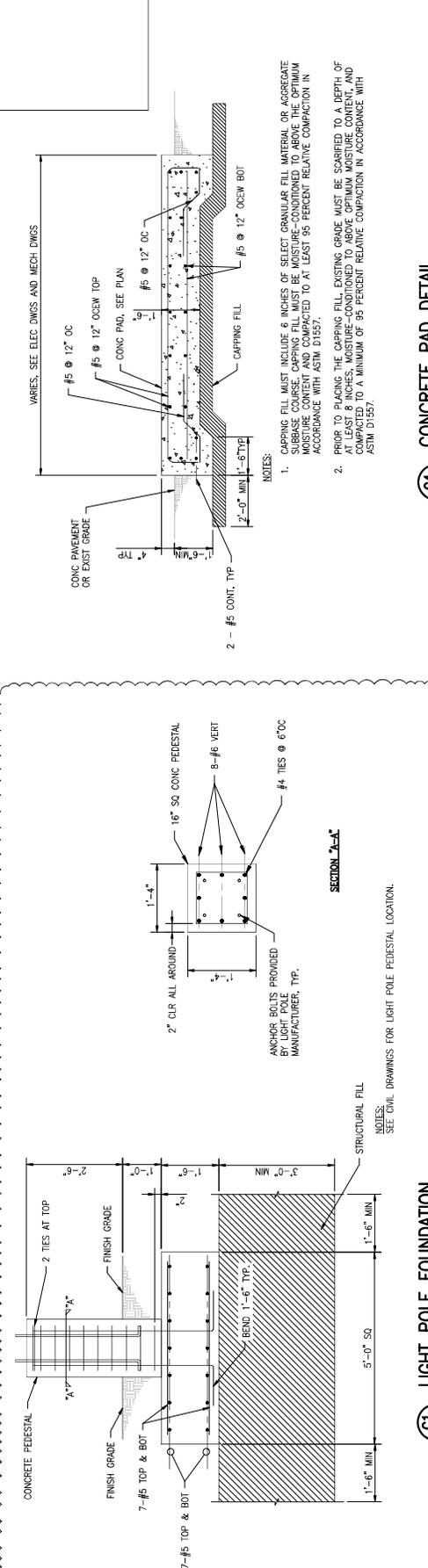
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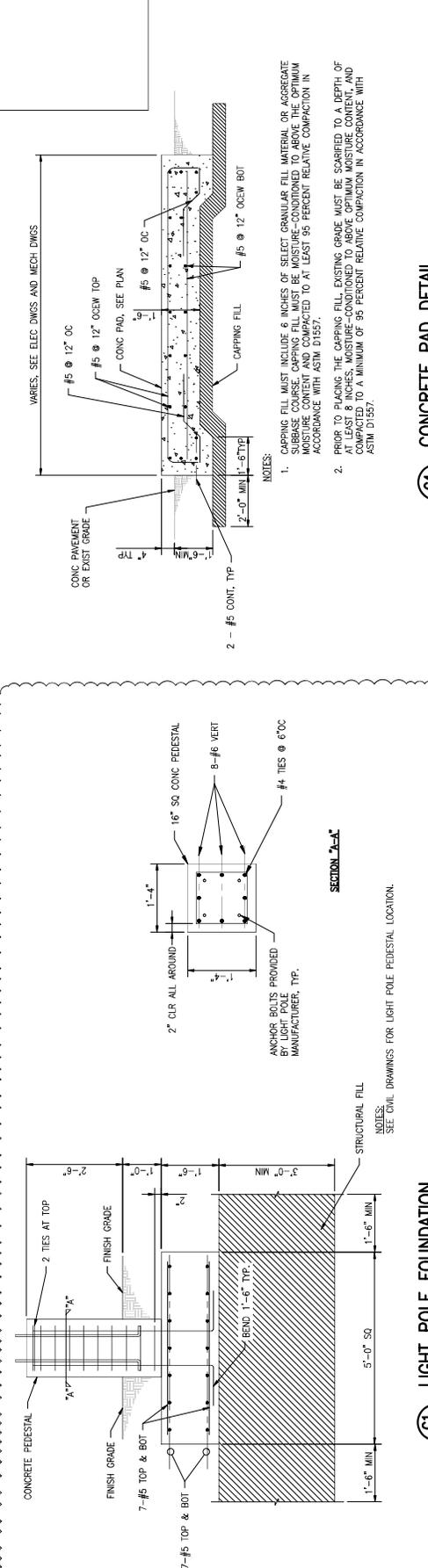
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 NOTES:
 SEE CIVIL DRAWINGS FOR RETAINING WALL LOCATION.



SECTION 2-AH
 RETAINING WALL RW-48
 NOTES:
 SEE CIVIL DRAWINGS FOR RETAINING WALL LOCATION.



SECTION 2-AI
 RETAINING WALL RW-49
 NOTES:
 SEE CIVIL DRAWINGS FOR RETAINING WALL LOCATION.



SECTION 2-AJ

ELECTRIC WATER HEATER SCHEDULE

MARK	LOCATION	AREA SERVED	RECOVERY RATE	TANK STORAGE (GAL)	E-POWER (Y/N)	INPUT (KW)	VOLTS	PH	HZ	MAXIMUM DIAMETER (IN)	QT	REMARKS
EWH-1	WATER HEATER CLOSET	KITCHEN, MEN'S AND WOMEN'S RESTROOMS	21GPH @ 90F RISE	50	NO	4.5	240	1	60	20.25	1	PROVIDE DRAIN PAN WITH DRAINPIPE ROUTED TO NEAREST FLOOR DRAIN

HOT WATER RECIRCULATION PUMP SCHEDULE

MARK	LOCATION	SERVED	FLOW RATE (GPM)	HEAD (FT)	E-POWER (Y/N)	ELECTRICAL			REMARKS			
						V	PH	HZ				
HWRP-1	MEN'S AND WOMEN'S RESTROOM AND KITCHEN	EWH-1	1.25	2.3	NO	115	1	60	25	0.22	1	PROVIDE WITH AQUASTAT AND TIMER.

WATER HEATER EXPANSION TANK SCHEDULE

UNIT	LOCATION	SYSTEM SERVE	TANK VOLUME (GAL)	ACCEPTANCE VOLUME (GAL)	MAX WORKING PRESSURE (PSI)	DIAMETER (IN)	HEIGHT (IN)	OPER. WEIGHT (IN)	NOTES
ET-1	WATER HEATER CLOSET	DOMESTIC HOT WATER SYSTEM	4.5	2.5	100	11	15.5	10	IN-LINE TANK

THERMOSTATIC MIXING VALVE SCHEDULE

UNIT	BUILDING	LOCATION	MAX OPERATING PRESSURE (PSI)	MAX OUTLET TEMP (°F)	HOT WATER INLET TEMP (°F)	OUTLET SEPOINT SIZE (IN)	REMARKS
TMV	BIRKHMIR	WATER HEATER CLOSET	125	140	140	3/4", 1"	PROVIDE WITH (2) BOLT ON COFFERDAM; 84"L x 48"W AND 48" DIA.

UNDERGROUND WATER STORAGE TANK SCHEDULE

UNIT	SYSTEM SERVE	TANK VOLUME (GAL)	DIAMETER	LENGTH	MAX OPERATING PRESSURE (PSI)	REMARKS
UWST-1	DOMESTIC WATER SYSTEM	15,000	10'-0"	30'-10"	60	PROVIDE WITH (2) BOLT ON COFFERDAM; 84"L x 48"W AND 48" DIA.

DOMESTIC WATER BOOSTER PUMP SCHEDULE

MARK	LOCATION	AREA SERVED	TYPE	FLOW (GPM)	HEAD (FT)	# OF PUMPS	V	PH	HZ	FLA (PER PUMP)	FILA (PANEL)	MCA (PANEL)	REMARKS
DWP-1	ROOM 10 - PUMP ROOM	BUILDING DOMESTIC WATER	VERTICAL MULTISTAGE CENTRIFUGAL	68	112	2	208	3	60	3	23.2	25.9	DUPLEX PUMP SET WITH VFD

ABOVEGROUND FUEL STORAGE TANK SCHEDULE

UNIT	SYSTEM SERVE	FUEL TYPE	TANK VOLUME (GAL)	LENGTH	WIDTH	HEIGHT	OPER. WEIGHT (LBS)
AST-2	GENERATOR FUEL	ABOVEGROUND, HORIZONTAL	6,000	17'-7"	8'-0"	8'-9"	101,600

CONTROL VALVE SCHEDULE

VALVE NO.	EQUIPMENT	MAX FLOW (GPM)	MAX PRESSURE (FT HEAD)	PIPE SIZE (IN)	VALVE TYPE	VALVE SIZE (IN)	VALVE Cv	AT FULL FLOW	CONFIG.	ACTION	NORMAL POSITION	E-POWER (Y/N)	ELECTRICAL V/PH/HZ
CV-1	UWST-1	140	9.8	2-1/2"	GLOBE	2-1/2"	68	2-WAY	SOLENOID	CLOSE	YES	120/1/60	
CV-2	WFS-1	100	4.8	2"	GLOBE	2"	47	2-WAY	SOLENOID	CLOSE	YES	120/1/60	

FUEL MONITORING SYSTEM SCHEDULE

UNIT	SYSTEM SERVE	FUEL TYPE	DESCRIPTION	E-POWER (Y/N)	V	P	HZ	AMPS
FMS-2	MFP-2, AST-2	DIESEL	PROVIDE WITH CONNECTIONS FOR FUEL PIPING, CABLE TO MONITORING CABLE, FUEL TANK LEVEL MONITORING CABLE.	YES	120	1	60	10

WATER FILTRATION SKID SCHEDULE

UNIT	SYSTEM SERVE	FLOW (GPM)	DESCRIPTION	E-POWER (Y/N)	V	P	HZ
WFS-1	DOMESTIC WATER UWST-1	68	FILTRATION UNITS IN PARALLEL OPERATION. PROVIDE WITH DOMESTIC WATER SYSTEM CONTROL PANEL ON THE SKID FOR MONITORING OF UWST-1. PROVIDE WITH UV LIGHT ON RECIRCULATION LINE FOR DISINFECTION.	YES	120	1	60

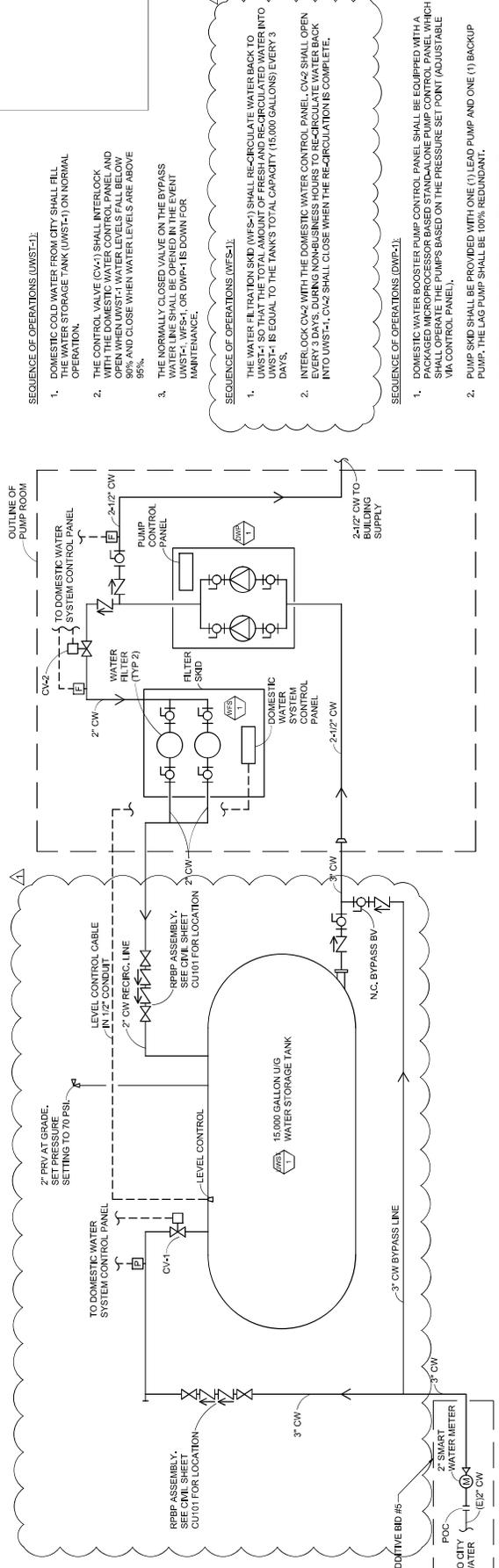
PLUMBING FIXTURE SCHEDULE

FIXTURE	SYMBOL	QUANTITY	WASTE	VENT	COLD WATER	HOT WATER	ELECTRICAL POWER	REMARKS
WATER CLOSET	WC	7	4"	2"	1"	---	---	WHITE LOW FLOW TYPE (1.28 GAL/FLUSH), FLOOR MOUNTED FLOOR OUTLET, SIPHON JET, MANUAL FLUSH VALVE, TOP INLET SPUD, ELONGATED BOWL.

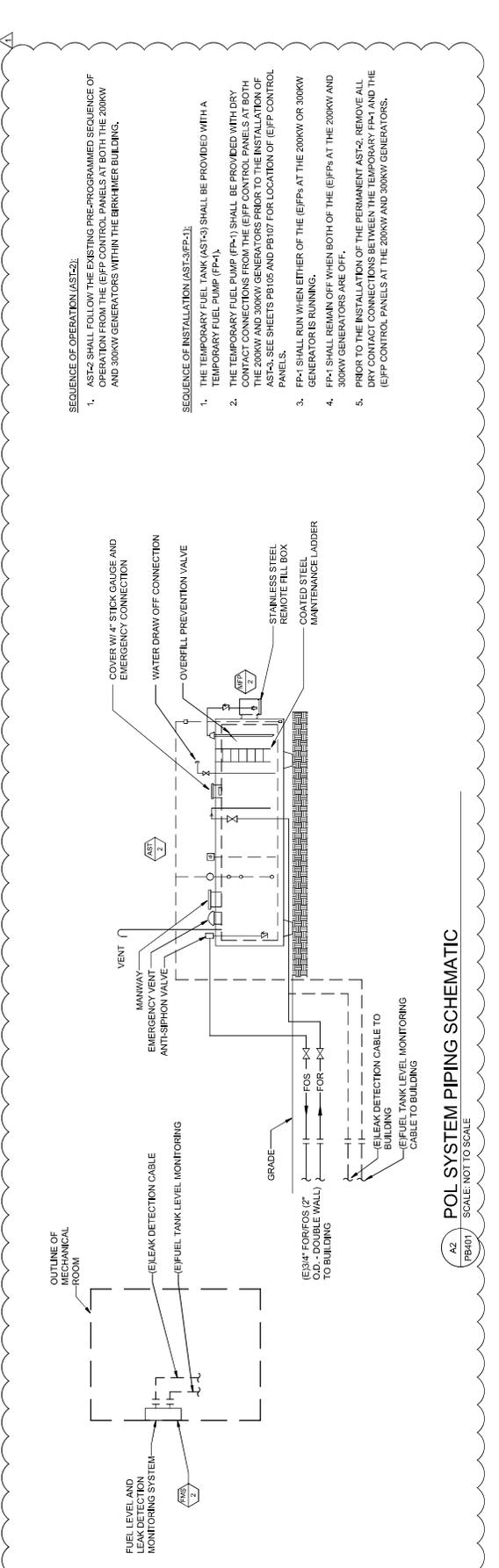
MANUAL FUEL PORT SCHEDULE

UNIT	SYSTEM SERVE	FUEL TYPE	DESCRIPTION	E-POWER (Y/N)	V	P	HZ	AMPS
MFP-2	AST-2	DIESEL	MANUAL FILL SYSTEM FOR ABOVEGROUND STORAGE TANK WITH EXTERIOR CONNECTION FOR FUEL TRUCK. PROVIDE WITH TANK LEVEL MONITOR AND INTERNAL OVERFLOW ALARM. CONTROLS IN NEMA 4X ENCLOSURE.	YES	120	1	60	10

STATE OF HAWAII
 DEPARTMENT OF PERMITS
 PLUMBING SCHEDULES
 BIRKHMIR EMERGENCY OPERATIONS CENTER (EOC)
 UPGRADES AND IMPROVEMENTS
 4204 DIAMOND HEAD RD HONOLULU, HI 96816
 TMK: 3-1-042-006
 SHEET: 01 OF 02
 PB601



DOMESTIC WATER STORAGE SYSTEM SCHEMATIC
SCALE: NOT TO SCALE



POL SYSTEM PIPING SCHEMATIC
SCALE: NOT TO SCALE

- SEQUENCE OF OPERATIONS (UWST-1):**
- DOMESTIC COLD WATER FROM CITY SHALL FILL THE WATER STORAGE TANK (UWST-1) ON NORMAL OPERATION.
 - THE CONTROL VALVE (CV-1) SHALL INTERLOCK WITH THE DOMESTIC WATER CONTROL PANEL AND OPEN WHEN UWST-1 WATER LEVELS FALL BELOW 90% AND CLOSE WHEN WATER LEVELS ARE ABOVE 95%.
 - THE NORMALLY CLOSED VALVE ON THE BYPASS WATER LINE SHALL BE OPENED IN THE EVENT UWST-1, WFS-1, OR DWP-1 IS DOWN FOR MAINTENANCE.
- SEQUENCE OF OPERATIONS (WFS-1):**
- THE WATER RECIRCULATION SKID (WFS-1) SHALL RECIRCULATE WATER BACK TO UWST-1 SO THAT THE TOTAL AMOUNT OF FRESH AND RECIRCULATED WATER INTO UWST-1 IS EQUAL TO THE TANK'S TOTAL CAPACITY (15,000 GALLONS) EVERY 3 DAYS.
 - INTERLOCK CV-2 WITH THE DOMESTIC WATER CONTROL PANEL. CV-2 SHALL OPEN EVERY 3 DAYS, DURING NON-BUSINESS HOURS TO RECIRCULATE WATER BACK INTO UWST-1. CV-2 SHALL CLOSE WHEN THE RECIRCULATION IS COMPLETE.
- SEQUENCE OF OPERATIONS (DWP-1):**
- DOMESTIC WATER BOOSTER PUMP CONTROL PANEL SHALL BE EQUIPPED WITH A PACKAGED MICROPROCESSOR BASED STANDBY PUMP CONTROL PANEL WHICH SHALL OPERATE THE PUMPS BASED ON THE PRESSURE SET POINT (ADJUSTABLE VIA CONTROL PANEL).
 - PUMP SKID SHALL BE PROVIDED WITH ONE (1) LEAD PUMP AND ONE (1) BACKUP PUMP. THE LAG PUMP SHALL BE 100% REDUNDANT.
 - THE LEAD AND LAG PUMP SHALL ALTERNATE EVERY DAY.
 - PRESSURE SET POINT OF 45 PSI.

- SEQUENCE OF OPERATION (AST-2):**
- AST-2 SHALL FOLLOW THE EXISTING PRE-PROGRAMMED SEQUENCE OF OPERATION FROM THE (EFPF) CONTROL PANELS AT BOTH THE 200KW AND 300KW GENERATORS WITHIN THE BIRKHAMER BUILDING.
- SEQUENCE OF INSTALLATION (AST-2/EFP-1):**
- THE TEMPORARY FUEL TANK (AST-2) SHALL BE PROVIDED WITH A TEMPORARY FUEL PUMP (FP-1).
 - THE TEMPORARY FUEL PUMP (FP-1) SHALL BE PROVIDED WITH DRY CONTACT CONNECTIONS FROM THE (EFPF) CONTROL PANELS AT BOTH THE 200KW AND 300KW GENERATORS PRIOR TO THE INSTALLATION OF AST-2. SEE SHEETS PB105 AND PB107 FOR LOCATION OF (EFPF) CONTROL PANELS.
 - FP-1 SHALL RUN WHEN EITHER OF THE (EFPF) AT THE 200KW OR 300KW GENERATOR IS RUNNING.
 - FP-1 SHALL REMAIN OFF WHEN BOTH OF THE (EFPF) AT THE 200KW AND 300KW GENERATORS ARE OFF.
 - PRIOR TO THE INSTALLATION OF THE PERMANENT AST-2, REMOVE ALL DRY CONTACT CONNECTIONS BETWEEN THE TEMPORARY FP-1 AND THE (EFPF) CONTROL PANELS AT THE 200KW AND 300KW GENERATORS.