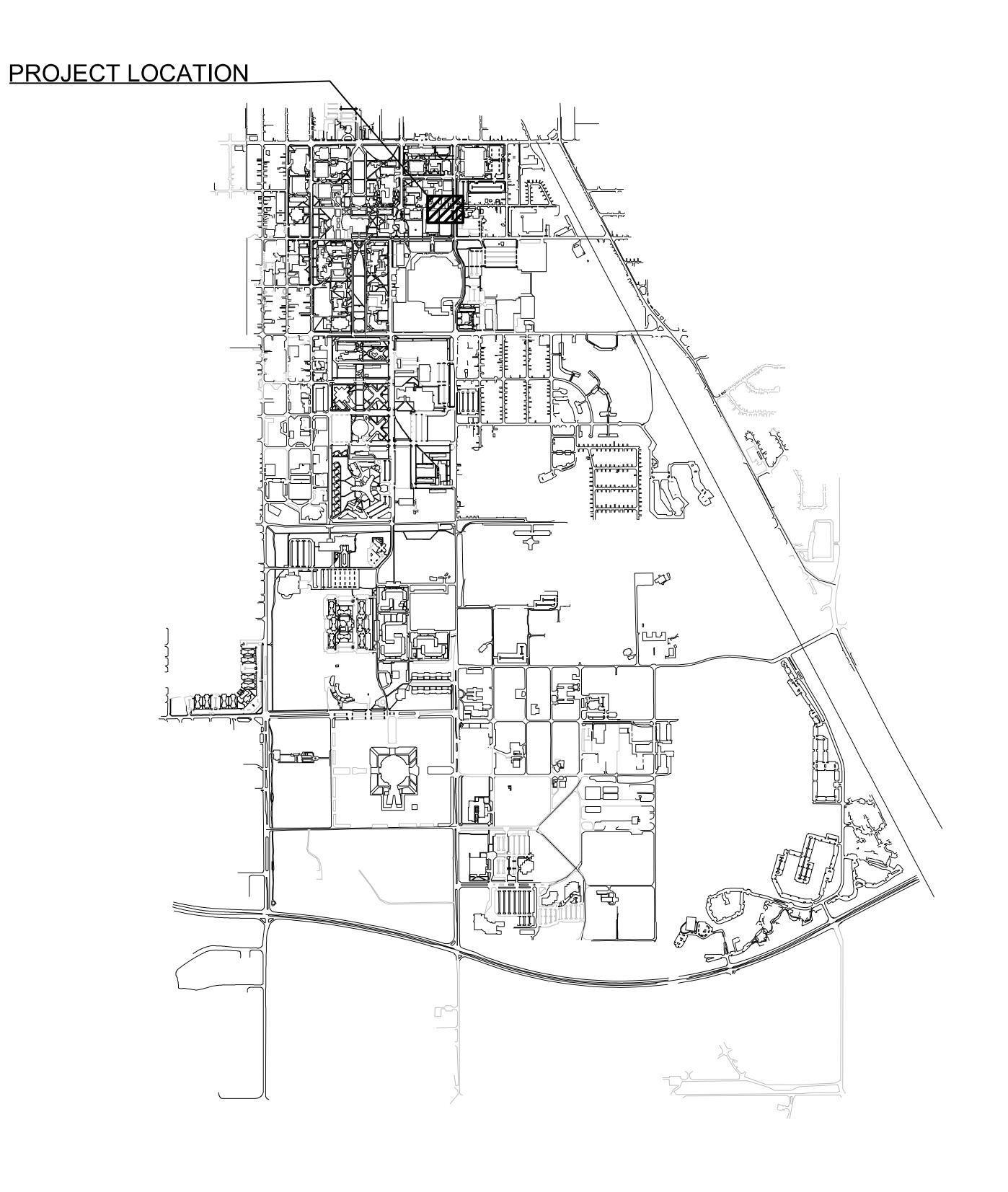
THE UNIVERSITY OF OKLAHOMA PARKING LOT LIGHTING TRANSFORMER 2400V- 12.5KV PRIMARY ELECTRICAL DISTRIBUTION SYSTEM CONVERSION





SHEET INDEX

G001 TITLE SHEET

=201 SITE PLAN

E601 PED SINGLE LINE DIAGRAMS

E701 ELECTRICAL SPECIFICATIONS

CONSTRUCTION DRAWINGS 10/24/2022



OKLAHOMA ONE CALL SYSTEM UTILITY LOCATION NUMBER-

CALL 811

, , ,

(800) 522-6543

PRIOR TO ANY EXCAVATION.



Gwin Engineering Consultants, LLC

242592 E 880 Road, Chandler, OK 74834

Phone: (405) 850-0205

Email: ogwin@gwin-engineering.com

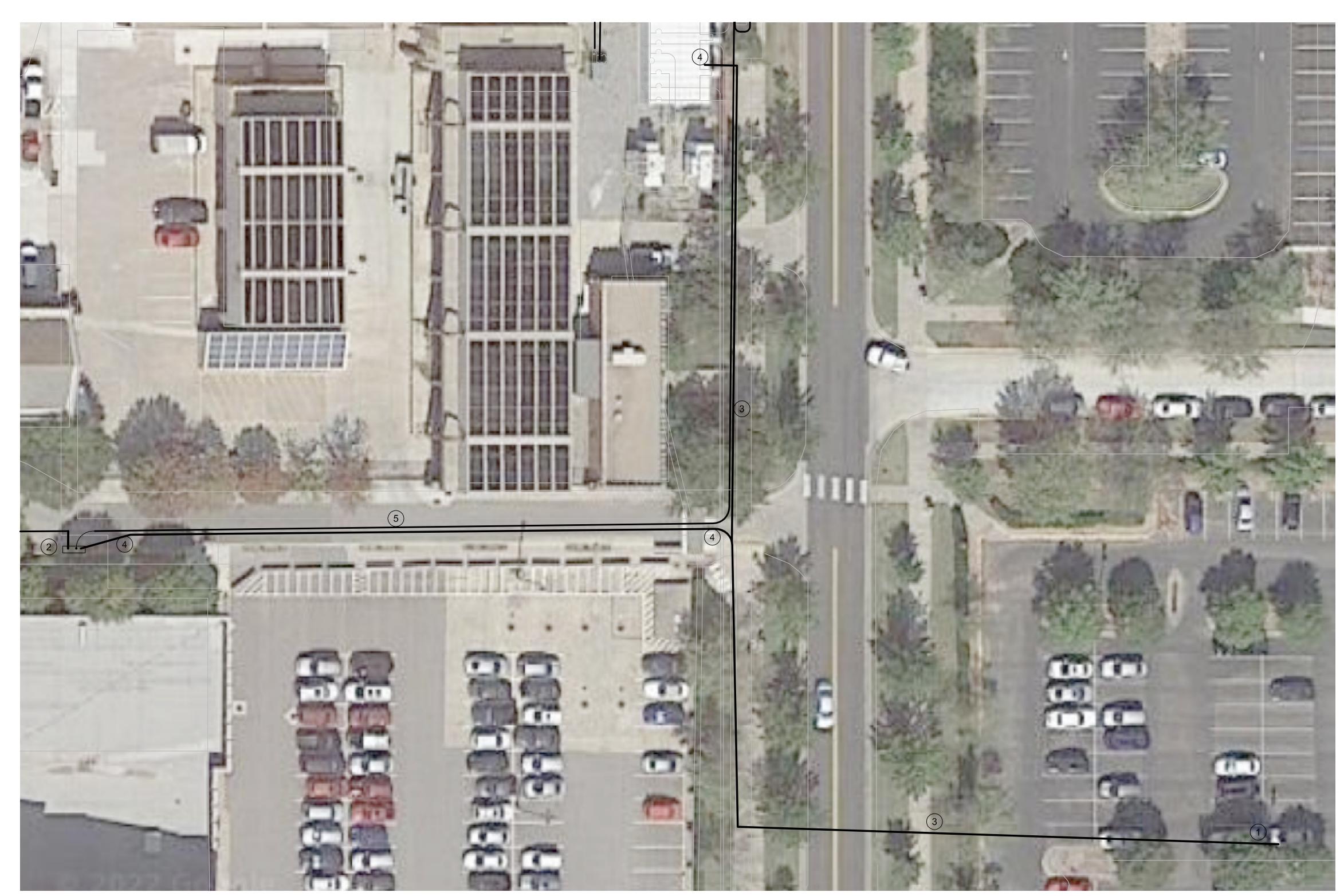
Oklahoma CA # 7649; Expires 6/30/2024

TITLE SHEET

09/20/2022
PROJECT NUMBER
222803

G001

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DRAWING GENERAL NOTES

- A. ALL MV CABLE AND TRANSFORMERS WILL BE SUPPLIED BY OUFM UTILITIES. CONTRACTOR WILL INSTALL MV CABLES AND TRANSFORMER, AND WILL SUPPLY AND INSTALL ALL OTHER MATERIALS.
- B. UNLESS NOTED OTHERWISE, RETURN ANY SALVAGED EQUIPMENT TO OUFM UTILITIES.
- C. THE DESCRIPTION OF THE WORK TO BE PERFORMED MAY NOT BE IN THE OPTIMUM ORDER TO MINIMIZE ANY BUILDING OUTAGES. ADJUST THE SEQUENCE OF ACTIVITIES TO ACHIEVE THIS BASED ON FOUND CONDITIONS.
- D. THE CONTRACTOR SHALL MAKE GOOD ANY LANDSCAPE, SIDEWALK, SOLID SLAB SOD ON ALL DISTURBED AREAS, ETC. DISTURBED DURING THE WORK.
- E. ANY EARTH DISTURBED AROUND EXISTING EQUIPMENT PADS MUST BE RECOMPACTED TO 90 %THEORETICAL MAXIMUM DENSITY.
- F. ALL WORK PERFORMED AND MATERIALS SUPPLIED SHALL CONFORM TO THE PLANS AND/OR PROJECT SPECIFICATIONS.
- G. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING ALL UTILITY COMPANIES AND GOVERNMENTAL AGENCIES WHO MIGHT HAVE UTILITY LINES ON OR ABOUT THE PREMISES, OR WHO MIGHT BE AFFECTED BY THE CONSTRUCTION. THE CONTRACTOR SHALL ALSO COORDINATE THEIR ACTIVITIES WITH THE UTILITY COMPANIES TO ENSURE COMPLIANCE WITH THE PROJECT SCHEDULE. THE CONTRACTOR SHALL MAKE EVERY EFFORT TO PROTECT EXISTING UTILITY LINES, AND SHALL REPAIR ANY DAMAGES AT THEIR OWN EXPENSE.
- I. MEDIUM VOLTAGE TERMINATIONS AND SPLICES ARE TO BE "ELASTOMOLD" BRAND.
- J. CONNECT ALL CONCENTRIC NEUTRALS TO EACH OTHER AND GROUND/GROUNDING LUG OR BAR AT EACH TRANSFORMER AND SECTOR CAN.

KEYED NOTES

- 1. EXISTING PARKING LOT TRANSFORMER, 2400V-120/240V. REPLACE WITH 7200V-120/240V UNIT, CONNECTING TO ONLY ONE PHASE OF THE EXISTING PRIMARY FEEDER AND RECONNECTING THE EXISTING SECONDARY AND GROUNDING WIRING.
- 2. NEW 4 POINT SECTOR CAN OVER TUNNEL EXTENSION, INSTALLED UNDER TELECOM PROJECT.
- 3. EXISTING PRIMARY FEEDER TO TRANSFORMER, 2400V (TWO PHASES USED) BUT CONSISTING OF THREE, 1/0 AWG 15KV CONCENTRIC NEUTRAL CABLES FROM BREAKER F1 IN POWER DISTRIBUTION CENTER (PDC). FEEDER IS DIRECT BURIED FROM TRANSFORMER TO JENKINS AVE TUNNEL, THEN SUSPENDED IN TUNNEL TO PDC. HI-POT WIRES TO ENSURE THEY ARE SUITABLE FOR REPURPOSING ON THE HIGHER VOLTAGE SYSTEM.
- 4. DISCONNECT EXISTING TRANSFORMER FEEDER AT F1 AND IF POSSIBLE PULL CABLE BACK TO JUNCTION OF KUHLMAN COURT TUNNEL AND RE-ROUTE ONE PHASE, EXTENDING AS REQUIRED TO SECTOR CAN. IF THE FEEDER CAN NOT BE PULLED BACK INTACT, CUT AT THE TUNNEL JUNCTION (REMOVE AND DISPOSE OF CABLE TO NORTH) AND SPLICE IN A NEW CABLE TO ONE PHASE AND EXTEND IT TO THE SECTOR CAN. TERMINATE AND CONNECT TO ONE PHASE AT THE CAN.
- 5. EXISTING FEEDER IN TUNNEL TO WAGNER HALL VIA SECTOR CAN.

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> 342592 E Phone: (Email: og





9-20-22 PRELIMINARY FOR REVIEW
10-24-22 FOR CONSTRUCTION

SIGNED BY FR

DRAWN BY

CHECKED BY FR

PARKING LOT LIGHTING
TRANSFORMER 2400V12.5KV PED CONVERSION
UNIVERSITY OF OKLAHOMA

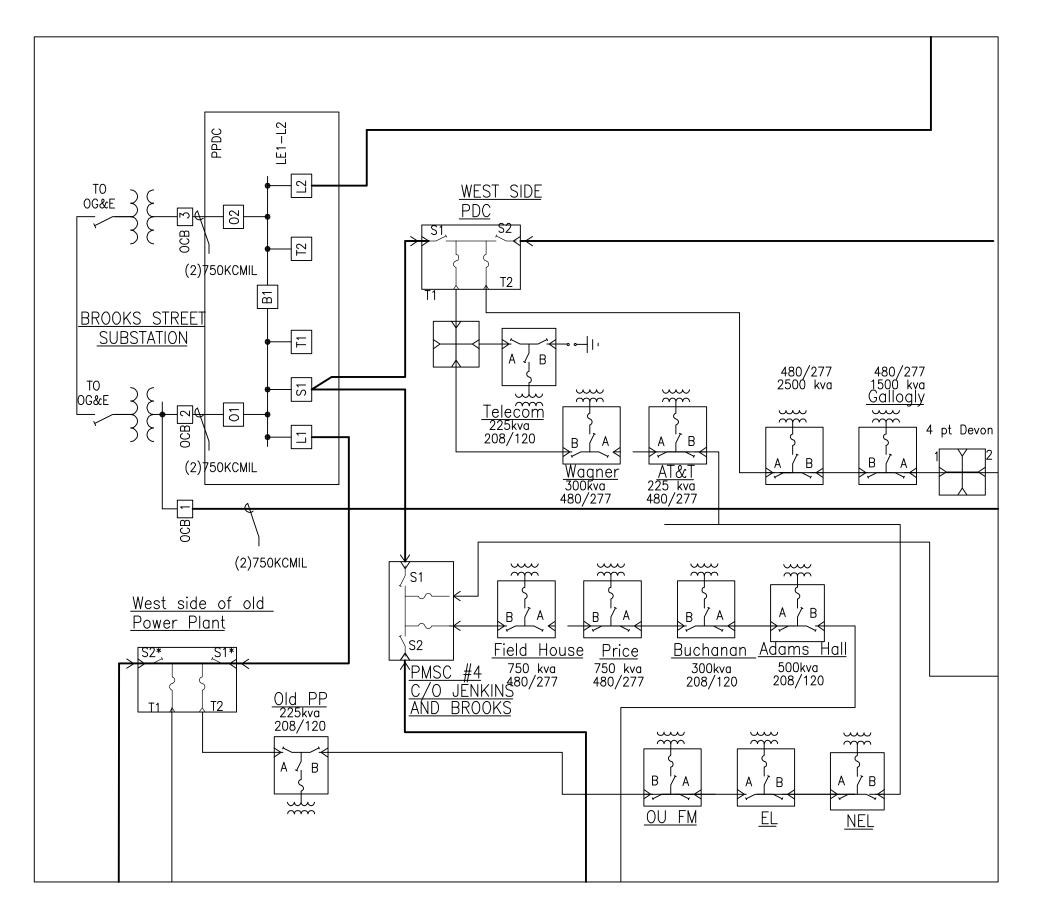
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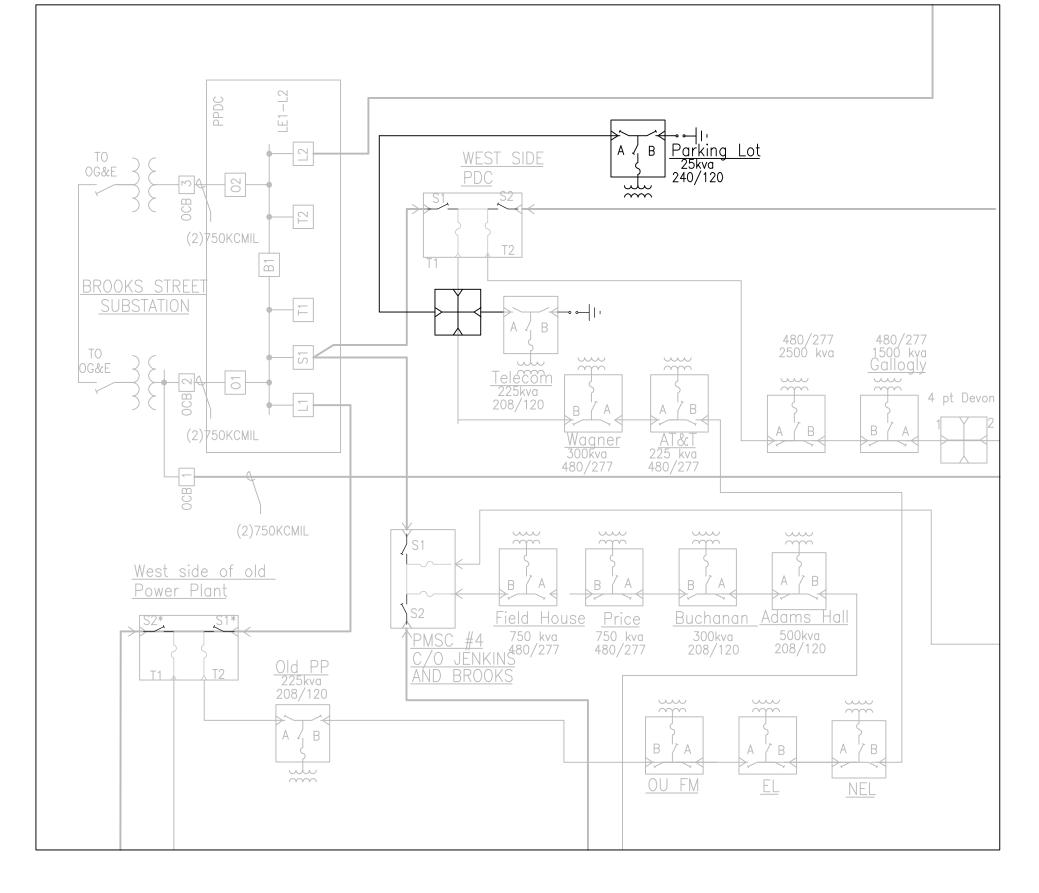
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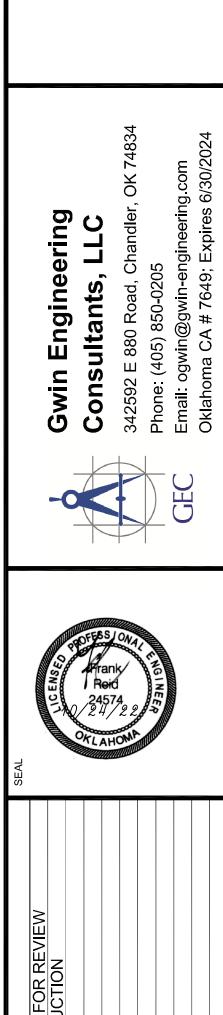


1 EXISTING PARTIAL SINGLE LINE DIAGRAM
SCALE: NTS

2 NEW PARTIAL SINGLE LINE DIAGRAM SCALE: NTS

<u>ELECTRICAL LEGEND</u>

SYMBOL	DESCRIPTION		3 POINT SECONALIZE TERMINAL
	15KV, 750KCMIL, 600 A NOMINAL		
	15KV, 1/0 AWG, 200 A NOMINAL	>>	4 POINT SECONALIZE TERMINAL
→>	15KV, 600A, NON LOAD BREAK CONNECTOR		
→	15KV, 200A, LOAD BREAKER ELBOW		TYPE 9, 15KV, FUSED SWITCHING CUBICLE RTE R-VAC (2-600A SWITCH AND 2-200A FUSE WITH DC SURGE ARRESTER FOR EACH SOURCE AND TAP SIDE BUSHING TERMINATION)
ı 	9KV M.O.V. LIGHTNING ARRESTOR		,
→>	15KV PROTECTIVE CAP		TYPE 11, 15KV, FUSED SWITCHING CUBICLE RTE R-VAC (3-600A SWITCH AND 1-200A SWITCH WITH DC SURGE ARRESTER FOR EACH SOURCE AND TAP SIDE BUSHING TERMINATION)
(LE17-18)	SECONALIZING DEVICE		15/0/ 74 TRANSCORMER INTERNAL FUSE LIWAY SWITCH
LE17	SWITCH OR 30 GROUP OF ELBOW	}	15KV, 3Ø, TRANSFORMER, INTERNAL FUSE, HWAY SWITCH
	LOADBREAK GROUP OPERATED SWITCH		TYPE 10, 15KV, SWITCHING CUBICLE RTE R-VAC
/	NON LOADBREAK SWITCH		(4-600A SWITCH WITH DC SURGE ARRESTER FOR EACH SOURCE AND TAP SIDE BUSHING TERMINATION)
	FUSE		
	FAULT INDICATORS		
~~~~	TRANSFORMERS		



FR

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FR

PARKING LOT LIGHTING
TRANSFORMER 2400V12.5KV PED CONVERSION
UNIVERSITY OF OKLAHOMA

PED SINGLE LINE DIAGRAMS

09/20/2022

E601

OF

PROJECT NUMBER 222803

DRAWING NUMBER

DRAWN BY

CHECKED BY

#### A. <u>INTENT</u>

The intent of this section is to cover Basic Electrical Requirements specifically applicable to Electrical Work

#### B. GENERAL REQUIREMENTS

immediately and in writing.

Visit the building site prior to bidding, examine all existing conditions, and verify all dimensions. No extras will be awarded after the contract is signed if conflicts or obstructions between new work and existing construction are not reported.

Work installed by this Contractor which interferes with or affects the existing structures shall be changed as directed and all costs incident to such changes shall be paid by this Contractor.

Any existing condition uncovered during the construction process which, by generally accepted construction practices, should be remedied, should be brought to the attention of the architect

Specific locations, mounting heights and overall dimensions of devices and fixtures are to be obtained from the architectural details when available and from site data.

All work of this contract shall be done neatly and proficiently and only by workers skilled in their particular craft.

Except where modified by specific notation to the contrary, it shall be understood that the indication and/or description of any item in the drawings, specifications, or both carries with it the instruction to furnish and install the item, regardless of whether or not this instruction is explicitly stated as part of the indication or description.

#### All work shall be done during normal working hours.

#### C. SCOPE OF WORK

Provide all materials, labor, equipment and services necessary for the installation of all systems as indicated on the drawings.

#### D. CONTRACT DRAWINGS

The contract drawings for the work are diagrammatic, intended to convey the scope of work and indicate the general arrangement and approximate location of equipment and wiring, the Contractor shall be responsible for checking and verifying all conditions and dimensions. Do not scale drawings.

Drawing Definitions: Where the term "provide" is used, this shall mean furnish and install, complete and ready for the intended use. "Furnish" means supply and deliver to the Project site, ready for unloading, unpacking, assembly, and installation. "Install" describes the operations at the Project site including the actual assembly, erection, anchoring, and all similar

Provide any fittings, etc., necessary for the complete installation of all work of this contract. Provide any accessories required for the complete installation and operation of all systems.

Include all costs to make any alterations and offsets of conduits, etc., and of equipment as necessary to avoid installation conflicts with existing work.

The drawings and specifications are complementary and any work and material required by the drawings and not mentioned in the specifications or vice versa, shall be executed as if same were both specified and shown.

Any questions or conflict between drawings and specifications, shall be referred to the

The Engineer reserves the right to require any and or all Contractors to make minor changes in arrangements at no additional cost to the Owner.

## E. CODES, STANDARDS AND TESTS

The 2017 edition of the National Electric Code shall be the minimum requirement for all work. All electrical materials used in this work and all workmanship and tests performed therein, unless specifically stated otherwise, shall conform to the latest rules, regulations and specifications for the Nation Board of Fire Underwriters, local and state codes, authorities having jurisdiction and local utility company. Examine the drawings and specifications for compliance with prevailing codes, regulations and ordinances and base bid and work accordingly. Any minor discrepancy between these drawings / specifications and codes, laws, ordinances, rules and regulations shall be corrected by the Contractor as required. Major discrepancies shall immediately be brought to the attention of the architect, prior to installation.

All tests shall be performed in accordance with state, county, local, Owner's and engineer's requirements.

## F. PERMITS

The Contractor is responsible for applying for all required permits and paying for all permits, inspection, licensing, and service fees to Authorities having jurisdiction over the work. The Contractor is responsible for arranging for all inspection visits.

## G. COORDINATION

Perform work under this contract in close harmony with other contractors so completed work shall present a neat and workmanlike installation. The electrical Contractor shall consult the plans of all other trades in all instances before installing his work so that their installations will not interfere with other disciplines. In the event of a conflict, the Contractor shall report to the Owner's representative at once and do no further work until a satisfactory arrangement is decided upon. Any work done, or equipment placed in position by the Contractor, creating a conflict in violation hereof, shall be readjusted to the satisfaction of the Owner's representative at the expense of the Contractor. The decision of the Owner's representative shall be final in regard to changes due to conflicting conditions.

## H. SUBMITTALS

Submit to engineer/architect copies of certified shop Drawings, paper or electrionic, descriptive data, diagrams and specifications on all Specified materials and equipment for review in ample time before manufacturers are authorized to make shipment. The information submitted shall be prepared and arranged in a format which will permit easy identification and comparison by the engineer / architect of specified equipment. It shall be the responsibility of the Contractor to furnish any additional copies (showing architect / engineer stamp and comments) as necessary for suppliers and/or building officials.

The make, type and finish of all materials, equipment and apparatus shall be approved by the engineer/ architect in writing before the Contractor installs it. Any substitution for any specified Equipment or material shall first be approved by the engineer / architect in writing.

Items to be submitted include the following:

Panelboards and Circuit Breakers

Disconnect Switches Wiring Devices

Light Fixtures Motor Starters and Control Devices

MV Terminations & Splices

Shop drawings shall include, but are not limited to the following: make, model number, dimensions, electrical characteristics (rating). Shop drawings shall bear name of project and location.

Any changes to items specified must be submitted as a substitution with complete documentation of price differential and equipment details.

#### I. RECORD DRAWINGS

Contractor shall keep at least one set of colored corrected shop and design drawings at the site. Drawings shall be current, denoting approved modifications and installed departure.

All utilities which are installed below grade or concealed within walls shall be dimensionally located on the record drawings.

#### J. OWNER FURNISHED EQUIPMENT

All equipment that is furnished by the Owner is assigned to the Contractor that is designated to install the equipment as though the Contractor furnished the equipment itself. The Contractor is responsible for all aspects of the equipment including verifying the order, coordinating and accepting delivery, rigging, installation, start-up coordination, warranty repairs, collection and submittal of equipment manuals, and all other activities associated with the equipment unless specifically indicated otherwise. Refer to the pre-purchase specifications or order forms used by the Owner to select the equipment for any features included with each piece of equipment

#### K. CUTTING AND PATCHING

This Contractor is responsible for any cutting, patching, painting, supports, and roofing as required to complete work indicated on drawings. Restoration shall be handled in a manner acceptable to the engineer/architect. All floor or fire wall penetrations are to be firestopped. Use Dow Corning 3-6548 silicone RTV foam or approved equal.

Repair adjacent construction and finishes in ceilings, walls, floors or partitions that have been damaged during demolition or created during extension of work. Repair all penetrations in fire rated ceilings, walls, floors or partitions to the original fire ratings using approved fire stop

#### L. PREPARATION

Coordinate the installation of equipment with the schedules of other trades to prevent unnecessary delays in the total project.

#### M. EQUIPMENT VERIFICATION

Verify all equipment ratings, connections and locations with installing Contractor before

This Contractor shall verify that all equipment furnished will properly fit in the space provided, that it will function properly, and that all parts of equipment requiring service are readily

#### N. CLEANING / DEBRIS REMOVAL

This Contractor shall remove from the premises all accumulation of dirt, debris, waste materials and rubbish caused by his employees or work, at least once a week, except that combustible materials shall be removed daily.

Clean equipment to remove foreign objects and markings. Touch up paint as required. The Contractor is responsible for any damages caused by work of his trade.

#### O. SUBSTITUTIONS

Certain makes of materials and equipment are specified and drawings are detailed according to this material. Contractor shall base his bid on furnishing and installing the specified make and model or the "equivalent" model of another of the specified manufacturers which meets all the qualifications of the specified items.

"Equivalent" materials and equipment are those of manufacturer which meet the same standards of performance, have equal or better materials of construction, and equal or better maintenance characteristics. All equivalents must fit the space provided in the building structure. Where the use of equivalents results in changes, this Contractor shall be responsible for such changes and any costs resulting from them.

If the Contractor intends to use equipment or materials not specified, he must receive written approval from the engineer/architect prior to the award of the contract. This prior approval only permits submittal of a particular manufacturer's equipment in general. The specified item to be used must again be submitted for final review as specified under "shop drawings."

## P. <u>DEMOLITION</u>

Maintain service to other parts of the building during demolition.

## Coordinate all demolition work with the new work of all other trades.

Patch all holes in floors and ceiling resulting from the demolition which will not be used for the new work with the material to match the existing finish and fire rating.

Turn over to the Owner all removed equipment that the Owner wishes to keep. Properly dispose of all remaining equipment according to all regulatory agency requirements.

The Contractor shall disconnect and remove all existing light fixtures, receptacles, and other electrical equipment, in areas of construction unless otherwise noted on drawings. All equipment and fixtures not reused shall be disposed of by Contractor as directed by Owner or his representative

Remove all existing conduit and wire not to remain in use to the first junction box above ceiling.

Disconnect and remove all branch circuit wiring from existing circuit breakers feeding electrical devices which are removed. Maintain continuity of all existing circuits that are to remain.

All changes or code corrections that are required to existing electrical work not noted on the contract documents must be submitted to the engineer for approval, prior to commencing work.

## Q. PROTECTION OF BUILDING COMPONENTS

Provide protection from damage of any kind to the existing roof and paved surfaces during all

## R. CONTRACTOR USE OF PREMISES

Limit use of premises to allow Owner and tenant occupancy, work by others and Owner, and comfort conditions to be maintained in the occupied spaces during normal business hours.

## S. WARRANTY

This Contractor shall provide a written warranty of all work done under this contract for a period of one year from date of substantial completion. The Contractor shall, at his own expense, remedy any defects due to faulty materials and or workmanship and pay any damage to other work resulting from such defects and or the remedying thereof, which shall appear within the warranty period.

All materials shall be free of defects or errors which would result in poor application or cause defects in workmanship.

## T. PROJECT CLOSEOUT

Furnish electronic copies of installation and maintenance manuals, warranties, and other submittal data indicated for inclusion. Include wiring diagrams, parts listings, and other manufacturer's information.

Submit a certificate of final inspection and approval. Submit release of liens for all subcontractors and suppliers. Submit record drawings

Final payment will not be approved until all closeout items are received.

## PART 2 - PRODUCTS

#### A. <u>EQUIPMENT</u>

All equipment shall be as specified on the drawings and in the schedules. Provisions for substitutions are listed in Part 1.

#### B. IDENTIFICATION

All equipment shall be identified with laminated three-layer plastic engraved nameplates mechanically fastened to the equipment except contact-type permanent adhesive where screws cannot or should not penetrate substrate. Glued application is not acceptable. Identify and permanently and neatly type all circuits on panelboard directory. Hand written directories are not acceptable.

All raceways shall be identified with manufacturer's standard self-adhesive vinyl tape no less than three mils thick by two inches wide. Where applicable, install on all concealed raceways at connection to junction boxes, pull boxes, equipment and wall / floor penetrations. Unless otherwise indicated or required by governing regulations, provide orange tape with black

All current carrying conductors smaller than #10 AWG and grounded conductors smaller than #6 AWG shall be identified with colored insulation. For larger sizes, provide field-applied conductor color, self-adhesive colored vinyl tape, three mils thick by one inch wide. Heat-shrink markers shall be white polyolefin sleeves, text applied with compatible printer, or marker tapes shall be vinyl or vinyl-cloth, self-adhesive wrap-around type, with preprinted letters and numbers. For existing systems, match existing color codes. If existing color codes are not apparent, or unmarked, use the following color codes:

## 480/277V System - Brown (Phase A), Orange (Phase B), Yellow (Phase C)

208/120V System - Black (Phase A), Red (Phase B), Blue (Phase C) 240/120V System - Black (Line 1), Red (Line 2)

Neutral Conductor - White

Ground Conductor - Green Control Conductor, 120V - Red

Control Conductor, Neutral - White Control Conductor, 24V - Blue

## Control Conductor, External Source - Yellow

#### C. GROUNDING

Properly ground all motors, transformers, equipment, conduits, switchgear, etc. in compliance with the latest edition of the NEC, article 250 and as indicated on drawings.

All wiring for grounding purpose shall be copper as required for type and sizes indicated on drawings and shall be stranded conductors.

Building electrode ground rods shall be 10 feet long x 3/4 inch diameter (minimum dimensions). Ground rods shall be copper clad steel. Maximum resistance for the electrode system is 25 ohms. All ground rods shall be tested with proper test equipment for rod to earth resistance before connecting ground wire

Equipment grounding conductor: provide separate, insulated conductor within each feeder and branch circuit raceway. Terminate each end on suitable lug, bus, or bushing.

### Metal raceways may not be used for equipment grounding.

Provide exothermic type weld connections at all connections to building steel and buried ground rods. All gas lines and water pipes shall be grounded. Ground rods in test wells shall have bronze mechanical (bolted) connections to the grounding grid.

Ground all light fixtures by installing a separated green wire in any flexible conduit between outlet box and fixture.

## D. ELECTRICAL RACEWAYS

Interior conduit shall conform to National Electric Code (NEC.) And be of sufficient size and installed so that the required number of conductors can be inserted or removed without injury to, or excessive strain upon, the insulation. The minimum conduit size shall be 3/4 Inch unless

Rigid steel conduit shall be used for all conduit runs installed in concrete slabs, in all poured concrete construction and all applications inside building requiring 2 inches or larger in size. Conduit shall be supported at intervals not-to-exceed 7 feet for 3/4 inch conduit, 8 feet intervals for conduit 1 inch to and including 2 inches, and 10 feet for conduits 2-1/2 inches or larger.

Electrical metallic tubing (thin wall) may be used for switch legs (except in poured concrete walls) and branch circuits in partitions, above ceilings, and where conduit run is exposed. Conduit shall be supported at intervals not-to-exceed 7 feet for 3/4 inch conduit, 8 feet intervals for conduit 1 inch to and including 1-1/2 inch. EMT larger than 1-1/2 inch will not be permitted.

Flexible metallic conduit shall be used between outlet boxes in hung or furred ceilings and recessed lighting fixtures. Flexible conduit shall not exceed 6 feet in length, except for recessed incandescent fixtures, length shall be 12 feet.

Liquid tight flexible metallic conduit shall be used for final connections to all motors, transformers and equipment subject to vibration.

Provide conduit expansion fittings where conduit crosses a building expansion joint and in all straight conduit runs 200 feet or longer.

Provide conduit sealing fitting on conduit runs passing through the building exterior walls or roof. Conduit seal shall be installed on the warm side of penetration within six inches of conduit passage or as close to passage point as conditions will allow

## E. CONDUCTORS, WIRE AND CONNECTORS

All conductors shall be new, NEC grade copper and free from defects. building wires shall be type THHN or THWN for dry locations and type THHW or THWN for wet or dry location (90 degrees C. Dry) (75 degrees C. Wet) except as otherwise noted on the drawings.

Fixture wire conforming to NEC requirements shall be used in all lighting fixtures and from lighting fixture to first junction or outlet box.

In general, conductors smaller than #12 AWG will be permitted only for communication, signal, or control circuits. Wire #10 AWG and smaller shall be solid or stranded conductors. Wire #8 AWG and larger shall be stranded. stranded conductors smaller than #8 AWG may be used only if "Sta-kon" or equal compression lugs are used for all terminations.

Color coding is required for all service, feeder, branch, control, and signaling circuit conductors. Insulation color for neutrals shall be white for 120 volt circuits. Equipment grounding conductors shall be green.

Use no wire smaller than #12 AWG, rated at 600 volts, for power and lighting circuits and no smaller than #14 AWG for control wiring.

## F. OUTLET BOXES AND FITTINGS

Outlet boxes shall be NEC gauge steel, galvanized, of ample size to accommodate wire, switches, receptacles, or other devices mounted in the box without crowding. Use gang boxes where more than one device is to be installed at the same location.

Outlet boxes for lighting fixtures shall have 3/8 inch fixture stud where required. Ceiling outlet boxes shall be 4 inches octagonal, 2-1/8 inches deep for furred plaster and exposed work and 3 inches deep for concrete work. All boxes for concrete work shall be of type especially designed for installation in concrete.

Outlet boxes for switches, receptacles, telephone, or other devices recessed in walls shall be 4 inch square boxes with extension rings and plaster covers where required to bring box flush with wall. Use of cover plate as tension of rigidity device will not be permitted.

Provide outlet box accessories as required for each installation, including mounting brackets, wallboard hangers, extension rings, fixture studs, cable clamps, and metal straps for supporting outlet boxes, compatible with outlet boxes being used and meeting requirements of individual wiring situations. Junction and pull boxes shall be of NEC gauge steel, galvanized, and of sufficient size to accommodate the conductors served without crowding. Boxes shall be equipped with screwed or hinged covers as conditions warrant. Pull boxes located in floors shall be flush with finished floor, and of cast wrought iron, aluminum, or bronze with gasketed. waterproof cover. Conduit entrances shall be threaded.

Provide corrosion resistant cast metal weatherproof outdoor wiring boxes, of the type, shape, and size required for each application, with threaded conduit ends, cast metal face plate with spring-hinge waterproof cap, suitably configured for each application, including face plate gasket and corrosion proof fasteners.

#### G. WIRING DEVICES

Duplex receptacles shall be Heavy Duty Specification Grade 20 amp, 125 volt, 3 wire grounding type. Provide smooth ivory thermoplastic cover plate and matching screws. Approved manufacturers: Hubbell, Arrow-Hart, Bryant, Leviton, or Slater equal; with Hubbell p8 or equal cover plate.

Ground fault circuit interrupter receptacles shall be duplex, 20 amp, 125 volt, 3 wire grounding type. Provide smooth ivory thermoplastic cover plate and matching screws. Approved manufacturers: Hubbell, Bryant, Leviton, or Slater equal; with Hubbell P8 or equal cover plate.

Wall switches shall be 20 amp, 120-277 volt, quiet, high capacity, toggle type. Single pole switches - approved manufacturers are Hubbell, Slater, Arrow-Hart, Bryant, Leviton. Three way switches - approved manufacturers: Hubbell , Bryant, Leviton or Slater.

Wall plates for switches, telephone outlets and other special outlets shall match the wall plates previously specified with the receptacles. All plates in each room shall match unless otherwise approved by the Owner's Representative. Approved products: Hubbell, Bryant, Leviton, or

Disconnect switches shall be heavy duty, single throw disconnect switches. Enclosure shall be NEMA 1 indoor and NEMA 3R (raintight) where they are required to be weatherproof. The ampere rating, fusible or non-fusible and voltage characteristics shall be as indicated on drawings. Square 'D', Siemens or Eaton

## H. PANELBOARDS

Furnish and install panelboards as shown on the drawings. Panelboards shall be dead front equipped with copper bus and thermal magnetic molded case circuit breakers, of frame and trip ratings as shown on the panelboard schedules. Panelboards shall be manufactured in accordance with the latest NEMA standards and shall be listed by UL and bear the UL label. All panelboards shall be of one manufacturer. Where required, panel boards shall be suitable for use as Service Entrance given compliance with NEC.

Panelboards main bus, main lugs, and/or main breaker shall be rated as noted on panelboard schedules. Current density shall be in accordance with UL requirements. Bus mounting for circuit breakers shall be bolted connections and accommodate any combination of circuit breaker units without further modifications. The complete panelboards, including main circuit breaker, bus and lugs, branch circuit breakers, and connection shall be properly designed and UL listed to withstand the effect of the available required short circuit current.

cover having metal directory frame, and flush lock all keyed alike. Finish in manufacturer's standard gray enamel. Each door shall be equipped with a latch and lock. Furnish two keys

Basis of Design: Distribution Panels - Square 'D' QMB, Branch Circuit - Square 'D' "NF" or

All panelboards shall be mounted in code gauge galvanized steel cabinets, with door in door

# "NQOD". Equals by Siemens or Eaton.

indicated on the Drawings.

I. TRANSFORMERS Provide 60 hertz, dry type, air cooled, two-winding insulated transformers with rating as

Transformers larger than 15kVA shall incorporate a UL recognized Class 220 insulation system; with a 150° C maximum coil rise and a maximum case rise. Copper windings with (2)

## Manufacturers: Square D, Eaton or Siemens

2-1/2% AN and (4) 2-1/2% BN taps.

# J. SAFETY SWITCHES / DISCONNECTS

Furnish and install safety switches and disconnects as shown on the drawings. Equipment shall be safety type, quick make, quick break, externally operated, heavy duty type. Enclosures shall be NEMA 1 or NEMA 3R as required. Sizing shall be for load unless indicated larger on the drawings.

## K. LIGHTING FIXTURES

Provide lighting fixtures of the size, type, and rating indicated on the drawings complete with, but not necessarily limited to, lamps, lampholders, reflectors, ballasts, starters, wiring, and

Furnish and install all necessary mounting hardware and supporting channel as required to support fixtures from building structure.

Furnish and install concrete pole bases as indicated on contract drawings.

# L. COMMUNICATIONS CONDUIT SYSTEM

Communication outlets shall be empty conduit with single or double gang outlets. Conduit to be stub up to 8 inches above finished ceiling and include pull string. Cover plates shall be provided by data/communications system Contractor.

# M. SUB-PARA NOT USED

Alarm horn shall be in accordance with NFPA 72 and ADA, flush type alarm horn with a sound rating of 87 dB at 10'-0", or as noted on the drawings.

Manual pull stations shall be in accordance with NFPA 72, and shall be red, double action type.

#### PART 3 - EXECUTION

#### A. SCHEDULING OF WORK

Work is to be scheduled with Owner's representative and all other trades to accommodate occupancy dates and to expedite the timely completion of the project. Any utility outages or work which interferes with use of facility must be scheduled 24 hours in advance.

Coordinate the installation with all conditions and the work of other Contractors. The Contractor shall incur all costs for relocation of equipment conflicting with existing equipment or new work by other disciplines.

Trenching, saw cutting, coring, or other structural modifications shall not be performed without notification of the Owner and careful field verification by the Contractor to insure that no adverse effect to the building's structural integrity will occur.

Ceiling mounted sprinkler, lighting, and electrical requirements take precedence over ceiling mounted mechanical requirements. See reflected ceiling plans for ceiling grid and lighting layout for coordination of final diffuser locations.

#### B. TESTING

Testing of all wiring, devices, lighting and equipment is to be conducted to ensure the electrical continuity of all connections, and to demonstrate compliance with all requirements of drawings and specifications. Clean all luminaries and relamp with new any lamps used during construction for lighting. Testing shall be witnessed by Owner's representative.

## C. INSTALLATION

Install all equipment and products in accordance with manufacturer's published instructions and recommendations.

Provide dual element, time delay RK5 fuses on all motors and disconnects as required whether indicated on drawings or not.

#### D. ELECTRICAL RACEWAYS

Conduit run exposed shall run parallel or perpendicular to walls, ceilings, or principal framing members. It is required that all conduit be installed to reflect neat, careful workmanship throughout the job. Do not install conduit which has been crushed, damaged, or deformed in any way. Install conduit in such a manner as to ensure against trouble from collection of trapped condensate, all runs of conduit shall be free of such traps wherever possible.

Conduits shall be installed a minimum of 12 inches from steam or hot water piping in parallel runs, at least 6 inches from cross runs and at least 3 inches from cold water piping. Conduits shall not be secured to other piping or other piping supports.

The full number of threads must project beyond knockout in boxes and cabinets to allow the bushing to butt up tight against the end of the conduit. All conduit hangers and supports shall be rigidly fastened to the building structure. No conduit

### shall be supported from ductwork, piping, or ceiling grid systems. Provide fire seals wherever conduit penetrates fire walls or rated floor slabs.

## E. CONDUCTORS, WIRE AND CONNECTORS

Conductors shall be continuous from outlet to outlet, no splices shall be permitted except at outlets. All electrical connections shall be made in accordance with NEC.

## **END OF SECTION**

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LES AND REVISIONS

9-20-22 | PRELIMINARY FO

10-24-22 FOR CONSTRUCT FR

**DRAWN BY** 

CHECKED BY

ELECTRICAL

09/20/2022

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F LIGHTING IER 2400V-ONVERSION PARKING TRANSFC 12.5KV PEI

DRAWING TITLE SPECIFICATIONS

PROJECT NUMBER 222802

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