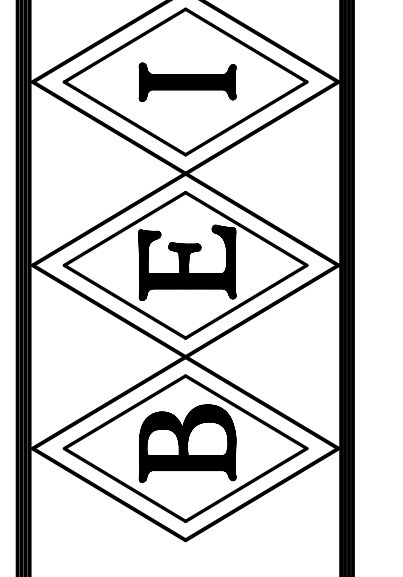


BRITTAIN ENGINEERING, INC.
CONSULTING MECHANICAL AND ELECTRICAL ENGINEERS
PO BOX 939
HICKORY, NC 28603
(828) 328-1813



**NORTH CAMPUS SITE LIGHTING FOR
CLEVELAND COMMUNITY COLLEGE**
831 NORTH POST ROAD, SHELBY, NC 28152

JOB NO. 218400
DWN BY: DGR

DATE: 10/24/25
SCALE: AS SHOWN

SHEET

C-1

2018 APPENDIX B
BUILDING CODE SUMMARY
FOR ALL COMMERCIAL PROJECTS
(Except 1 & 2-Family Dwellings and Townhouses)

PROJECT NAME: NORTH CAMPUS SITE LIGHTING FOR CLEVELAND COMMUNITY COLLEGE
PROJECT ADDRESS: 831 NORTH POST ROAD, SHELBY, NORTH CAROLINA ZIP CODE: 28152
PROPOSED USE: BUSINESS
OWNER/AUTHORIZED AGENT: JEFF LEDFORD PHONE # (704) 669-4268
OWNED BY: CITY/COUNTY PRIVATE STATE
CODE ENFORCEMENT JURISDICTION: CITY COUNTY STATE
LEAD DESIGN PROFESSIONAL: DONALD R. BRITTAIN, P.E.
DESIGNER: FIRM: _____ NAME: _____ LICENSE # _____ TELEPHONE # _____
ARCHITECTURAL: _____
CIVIL: _____
ELECTRICAL: BRITTAIN ENGINEERING, INC. DONALD R. BRITTAIN 7883 (828) 328-1813
FIRE ALARM: _____
PLUMBING: _____
MECHANICAL: _____
SPRINKLER-STANDPIPE: N/A N/A N/A N/A
STRUCTURAL: _____
RETAINING WALLS <5': N/A N/A N/A N/A
OTHER: N/A N/A N/A N/A
 2018 EDITION OF NC CODE FOR: NEW CONSTRUCTION ADDITION UPFIT
EXISTING: RECONSTRUCTION ALTERATION REPAIR
CONSTRUCTED ORIGINAL USE RENOVATED CURRENT USE

2018 N.C. REHAB CODE Information: Work area must be delineated on the submitted plans.
Check all that apply: REPAIR RENOVATION ALTERATION RECONSTRUCTION CHANGE OF USE ADDITION
Describe scope of work based on code sections of the rehab code
 Last known legal Occupancy History Property: YES NO
ORIGINAL BUILDING CONSTRUCTION DATE: _____
Consideration for review under the Rehab Code based on code section as follows:
Reviewers Notes for Field Inspector: _____

BUILDING DATA:
CONSTRUCTION TYPE: I-A II-A III-A IV V-A
 I-B II-B III-B V-B
MIXED CONSTRUCTION: YES NO TYPE: N/A
SPRINKLERS: NO PARTIAL YES CLASS NFPA13R NFPA13D
STANDPIPES: NO YES CLASS III WET DRY
FIRE DISTRICT: NO YES FLOOR: N/A AREA: _____
BUILDING HEIGHT: FEET: 20 NUMBER OF STORIES: 1
MEZZANINE: NO YES
GROSS BUILDING AREA:
FLOOR: EXISTING (SQ FT) NEW (SQ FT) SUB-TOTAL
6TH FLOOR: N/A N/A N/A
5TH FLOOR: N/A N/A N/A
4TH FLOOR: N/A N/A N/A
3RD FLOOR: N/A N/A N/A
2ND FLOOR: N/A N/A N/A
MEZZANINE: N/A N/A N/A
UPPER FLOOR: N/A N/A N/A
LOWER FLOOR: N/A N/A N/A
TOTAL: N/A N/A N/A

ALLOWABLE AREA
PRIMARY OCCUPANCY: ASSEMBLY A1 A2 A3 A4
BUSINESS EDUCATIONAL FACTORY F1 MODERATE F2 LOW
HAZARDOUS H1 DETONATE H2 DEFLAGRATE H3 CORROSIVE H4 HEALTH H5 HPM
INSTITUTIONAL I-1 I-2 I-3 I-4
MERCANTILE RESIDENTIAL R1 R2 R3 R4
STORAGE S1 MODERATE S2 LOW HIGH-PILED
 UTILITY & MISCELLANEOUS GARAGE OPEN ENCLOSED REPAIR GARAGE
SECONDARY OCCUPANCY: S-1 (STORAGE)
SPECIAL USES: 402 403 404 405 406 407 408 409 410
 411 412 413 415 416 417 418 419 420 421
SPECIAL PROVISIONS: 506.3 508.4 508.5 508.6 508.7 508.8
MIXED OCCUPANCY: YES SEPARATION: N/A EXCEPTION: _____
 INCIDENTAL USE SEPARATION:
THIS USE IS NOT EXEMPT AS A NON-SEPARATED USE (SEE EXCEPTIONS)
 NON-SEPARATED USE (302.3.1)
THE REQUIRED TYPE OF CONSTRUCTION FOR THE BUILDING SHALL BE DETERMINED BY APPLYING THE HEIGHT AND AREA LIMITATIONS FOR EACH OF THE APPLICABLE OCCUPANCIES TO THE ENTIRE BUILDING. THE MOST RESTRICTIVE TYPE OF CONSTRUCTION, SO DETERMINED, SHALL APPLY TO THE ENTIRE BUILDING.
 SEPARATED USE (302.3.2) - SEE BELOW FOR AREA CALCULATIONS

FOR EACH STORY, THE AREA OF THE OCCUPANCY SHALL BE THAT THE SUM OF THE RATIOS OF THE ACTUAL FLOOR AREA OF EACH USE DIVIDED BY THE ALLOWABLE FLOOR AREA FOR EACH USE SHALL NOT EXCEED 1.
ACTUAL AREA OF OCCUPANCY "A" + ACTUAL AREA OF OCCUPANCY "B" / ALLOWABLE AREA OF OCCUPANCY "A" + ALLOWABLE AREA OF OCCUPANCY "B" ≤ 1.00

STORY NO.	DESCRIPTION AND USE	BLDG AREA PER STORY (ACTUAL)	TABLE 503.5 ¹ AREA	AREA FOR TAG SPRINKLER INCREASE ²	ALLOWABLE AREA OR UNLIMITED ³	MAXIMUM AREA OR UNLIMITED ⁴
ONE (1)	BUSINESS	10,700	9,000	N/A	18,000	27,000
TWO (2)	BUSINESS	10,700	9,000	N/A	18,000	27,000

¹FRONTAGE AREA INCREASES FROM SECTION 506.2 (COMBINED) THIS:
a. PERIMETER WHICH FRONTS A PUBLIC WAY OR OPEN SPACE HAVING 20 FEET MINIMUM WIDTH = _____ (F)
b. TOTAL BUILDING PERIMETER = _____ (P)
c. RATIO (F/P) = _____ (R)
d. W = MINIMUM WIDTH OF PUBLIC WAY = _____ (W)
e. PERCENT OF FRONTAGE INCREASE = (R - 0.25) x W/30 = _____ (%)
²THE SPRINKLER INCREASE PER SECTION 508.4 IS AS FOLLOWS:
a. MULTI-STORY BUILDING I_s = 2 PERCENT
b. SINGLE STORY BUILDING I_s = 1 PERCENT
³UNLIMITED AREA APPLIES TO BUILDINGS OF SECTIONS GROUP B.F.M.S.A.4 (507.7); GROUP A MOTION PICTURE THEATERS (507.9); WALLS (402.6); AND H2 AIRCRAFT PAINT HANGARS (507.7).
⁴MAXIMUM BUILDING AREA = TOTAL NUMBER OF STORIES IN THE BUILDING x E (506.4).
⁵THE MAXIMUM AREA OF ROOFS MUST COMPLY WITH 406.3.5. THE MAXIMUM AREA OF AIR TRAFFIC CONTROL TOWERS MUST COMPLY WITH 412.1.2.

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ALLOWABLE HEIGHT

ALLOWABLE (TABLE 503)	INCREASE FOR SPRINKLER PROTECTION	SHOWN ON PLANS	CODE REFERENCE
TYPE OF CONSTRUCTION	TYPE VB	TYPE VB	503
BUILDING HEIGHT (FEET)	FEET = H+20	FEET 35	503
BUILDING HEIGHT (STORIES)	STORIES 2	STORIES 3	503

FIRE PROTECTION REQUIREMENTS

LIFE SAFETY PLAN #, IF PROVIDED	FIRE SEPARATION DISTANCE (FEET)	RATING	DETAIL AND SHEET #	DESIGN # FOR RATED ASSEMBLY	DESIGN # FOR RATED PENETRATION	DESIGN # FOR RATED JOINTS
STRUCTURAL FRAME, INCLUDING COLUMNS, GIRDERS, TRUSSES	N/A	N/A	N/A	N/A	N/A	N/A
BEARING WALLS						
EXTERIOR	N/A	N/A	N/A	N/A	N/A	N/A
NORTH	N/A	N/A	N/A	N/A	N/A	N/A
EAST	N/A	N/A	N/A	N/A	N/A	N/A
WEST	N/A	N/A	N/A	N/A	N/A	N/A
SOUTH	N/A	N/A	N/A	N/A	N/A	N/A
INTERIOR	N/A	N/A	N/A	N/A	N/A	N/A
NONBEARING WALLS AND PARTITIONS						
EXTERIOR						
NORTH	<5	1 HR	1 HR	U419	N/A	N/A
EAST	>5	N/A	N/A	N/A	N/A	N/A
WEST	>5	N/A	N/A	N/A	N/A	N/A
SOUTH	N/A	N/A	N/A	N/A	N/A	N/A
INTERIOR WALLS & PARTITIONS	N/A	N/A	N/A	N/A	N/A	N/A
FLOOR CONSTRUCTION INCLUDING SUPPORTING BEAMS AND JOISTS	N/A	N/A	N/A	N/A	N/A	N/A
ROOF CONSTRUCTION INCLUDING SUPPORTING BEAMS AND JOISTS	N/A	N/A	N/A	N/A	N/A	N/A
SHAFT ENCLOSURES - ELEVATORS	N/A	N/A	N/A	N/A	N/A	N/A
SHAFT ENCLOSURES - ESCALATORS	N/A	N/A	N/A	N/A	N/A	N/A
CORRIDOR SEPARATION	N/A	N/A	N/A	N/A	N/A	N/A
OCCUPANCY SEPARATION	N/A	N/A	N/A	N/A	N/A	N/A
PARTY/FIRE WALL SEPARATION	N/A	N/A	N/A	N/A	N/A	N/A
SMOKE BARRIER SEPARATION	N/A	N/A	N/A	N/A	N/A	N/A
TENANT SEPARATION	N/A	N/A	N/A	N/A	N/A	N/A
INCIDENTAL USE SEPARATION	N/A	N/A	N/A	N/A	N/A	N/A

LIFE SAFETY REQUIREMENTS

EMERGENCY LIGHTING:	NO	YES
EXIT SIGNS:	<input type="checkbox"/> NO	<input type="checkbox"/> YES
FIRE ALARM:	<input type="checkbox"/> NO	<input type="checkbox"/> YES
SMOKE DETECTION SYSTEMS:	<input type="checkbox"/> NO	<input type="checkbox"/> YES
PANIC HARDWARE:	<input type="checkbox"/> NO	<input type="checkbox"/> YES

EXIT REQUIREMENTS
NUMBER AND ARRANGEMENT OF EXITS

FLOOR, ROOM OR SPACE DESIGNATION	MINIMUM ¹ NUMBER OF EXITS	TRAVEL DISTANCE	ARRANGEMENT MEANS OF EGRESS ² (SECTION 1014.2)
	REQUIRED SHOWN ON PLANS	ALLOWABLE (TABLE 1015.1)	ACTUAL TRAVEL DISTANCE SHOWN ON PLANS
LOWER FLOOR PLAN	2	300	58 100'
UPPER FLOOR PLAN	2	300	58 100'

¹CORRIDOR DEAD ENDS (SECTION 1016.3)
²SINGLE EXITS (TABLE 1018.2)
³COMMON PATH OF TRAVEL (SECTION 1013.3)

EXITS

USE GROUP OR SPACE DESIGNATION	(A) AREA ¹ SQ. FT.	(B) AREA PER OCCUPANT ² PERmitted	(C) UNLIMITED EGRESS WIDTH PER OCCUPANT (TABLE 1005.1)	EXIT WIDTH (e) ³ 2x4.5x	REQUIRED WIDTH (SECTION 1005.1)	ACTUAL WIDTH SHOWN ON PLANS
LOWER FLOOR PLAN	10,700	100	107	N/A	.15	16.1
UPPER FLOOR PLAN	10,700	100	107	.2	.15	21.4

¹SEE TABLE 1004.1.2 TO DETERMINE WHETHER NET OR GROSS AREA IS APPLICABLE.
²SEE DEFINITION "AREA, GROSS" AND "AREA, NET" (SECTION 1002).
³MIN. STAIRWAY WIDTH (SECTION 1005.1); MIN. CORRIDOR WIDTH (SECTION 1016.2); MIN. DOOR WIDTH (SECTION 1018.1).
⁴MIN. WIDTH OF EXIT PASSAGEWAY (SECTION 1020.2)
⁵SEE SECTION 1004.5 FOR CONVEYING EXITS.
⁶THE LOSS OF ONE MEANS OF EGRESS SHALL NOT REDUCE THE AVAILABLE CAPACITY TO LESS THAN 50% OF THE TOTAL REQUIRED (SECTION 1005.1).
⁷ASSEMBLY OCCUPANCIES (SECTION 1024).

PERCENTAGE OF OPENINGS (TABLE 704.8)

NORTH ELEVATION	TOTAL BUILDING ELEVATION AREA = 3,317 SQ. FT.	TOTAL SQUARE FOOTAGE OF OPENINGS = 368 SQ. FT.	TOTAL = 368/3,317 = 11% < 15%
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STRUCTURAL DESIGN
(SEE STRUCTURAL DRAWINGS FOR BUILDING SUMMARY)

PLUMBING FIXTURE REQUIREMENTS

USE ASSEMBLY	WATERCLOSETS		URINALS		LAVATORIES		DRINKING FOUNTAINS	
	MALE	FEMALE	MALE	FEMALE	REGULAR	ACCESSIBLE	REGULAR	ACCESSIBLE
EXISTING	3	6	1	4	2	2	2	2
NEW	2	2	N/A	2	N/A	2	2	2
REQUIRED	4	4		3	N/A	N/A	N/A	2

ACCESSIBLE PARKING

LOT OR PARKING AREA	TOTAL # OF SPACES	REQUIRED # OF SPACES	# OF ACCESSIBLE SPACES PROVIDED		TOTAL # OF ACCESSIBLE PROVIDED
			REGULAR w/ 5' ACCESS AISLE	VAN SPACES w/ 8' ACCESS AISLE	
TOTAL:					

SPECIAL APPROVALS
SPECIAL APPROVAL: (LOCAL JURISDICTION, DEPARTMENT OF INSURANCE, OSC, DPL, DFS, ICC, etc., DESCRIBE BELOW)

ENERGY SUMMARY
ENERGY REQUIREMENTS:
The following data shall be considered minimum and any special attribute required to meet the energy code shall also be provided. Each Designer shall furnish the required portions of the project information for the plan data sheet. If energy cost budget method, state the annual energy cost budget versus allowable annual energy cost budget.

THERMAL ENVELOPE

Method of Compliance: Prescriptive Performance Energy Cost Budget

ROOF/CEILING ASSEMBLY (each assembly)

Exterior Air Film	.34
Single Ply Membrane	.34
Rigid Insulation	.20
Air Space	.34
Suspended Ceiling	.68
Interior Air Film	.68
U-Value of total assembly	1/22.38 = 0.04488
R-Value of insulation	20
U-Value of assembly	N/A
Skylights in each assembly	N/A
U-Value of skylight	N/A
total sq ft of skylights in each assembly	

EXTERIOR WALLS (4" brick and metal studs)

Exterior Air Film	.34
Face Brick	.7
2" Air Space	.45
1/2" exterior sheathing	.54
6" batt insulation	19
5/8" Fire Code Gypsum Board	.68
Interior Air Film	.68
U-Value of total assembly	1/22.39 = 0.74
R-Value of insulation	19
Openings (window or doors glazing)	
U-Value of assembly	.57
Shading coefficient	.70
Projection factor	.70
Law E (if required)	N/A
Door R-Value	2.0

WALLS ADJACENT TO UNCONDITIONED SPACE (each assembly)

Openings (windows or doors glazing)	
U-Value of assembly	.49
Law E required (if applicable)	N/A
Door R-Value	2.0

WALLS BELOW GRADE (each assembly) (Vertical N/A)

FLOORS OVER UNCONDITIONED SPACE (each assembly) (Vertical N/A)

FLOORS SLAB ON GRADE (Horizontal N/A)

Interior Air Film	.68
Concrete block	.24
Vapor Barrier	.34
Rigid Perimeter (2"x24")	NONE
U-Value of total assembly	1/1.26 = 0.793
R-Value of insulation	N/A
Horizontal-Vertical requirement	N/A
Slab heated	N/A

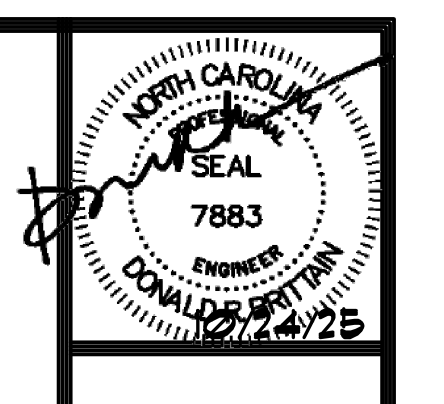
ELECTRICAL SUMMARY
(SEE ELECTRICAL DRAWINGS FOR BUILDING SUMMARY)

MECHANICAL SUMMARY
N/A

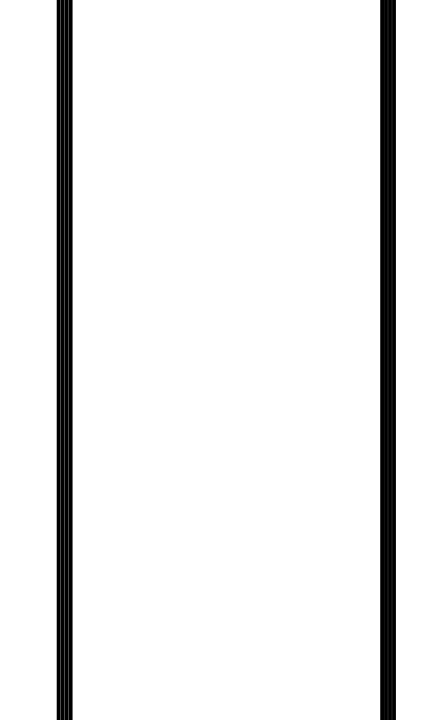
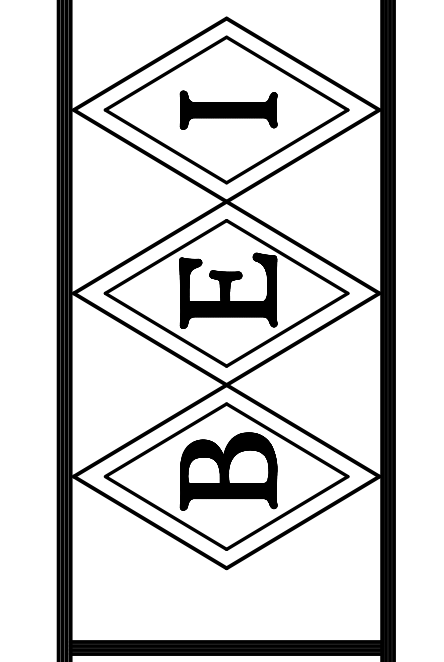
SCHEDULE OF SPECIAL INSPECTION SERVICES
 No Special Inspection Required for this Project Special Inspections Needed
The following sheets comprise the required schedule of special inspections for this project. The construction divisions which require special inspections for this project are as follows.

<input type="checkbox"/> IT-1 Verification of Soils	<input type="checkbox"/> IT-10 Inspection of Structural Steel Fabricators
<input type="checkbox"/> IT-2 Excavation and Fill	<input type="checkbox"/> IT-11 Structural Masonry
<input type="checkbox"/> IT-3 Piling and Drilling Piers	<input type="checkbox"/> IT-12 Welding
<input type="checkbox"/> IT-4 Modular Retaining Walls	<input type="checkbox"/> IT-13 High Strength Bolts & Steel Framing Inspection
<input type="checkbox"/> IT-5 Reinforced Concrete	<input type="checkbox"/> IT-14 Sprayed Fire-Resistance Materials
<input type="checkbox"/> IT-6 Post Tension Slab	<input type="checkbox"/> IT-15 Exterior Insulation and Finish System
<input type="checkbox"/> IT-7 Pre-cast Concrete Erection	<input type="checkbox"/> IT-16 Seismic Resistance
<input type="checkbox"/> IT-8 Pre-stressed Concrete	<input type="checkbox"/> IT-17 Smoke Control
<input type="checkbox"/> IT-9 Inspection of Pre-Cast Fabrication	<input type="checkbox"/> IT-18 Detention Basin
	<input type="checkbox"/> IT-19 Special Cases

Check the above boxes for the special inspection required for this project and list below specific special inspections required under Chapter 17.



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DETAILED ELECTRICAL SPECIFICATIONS

SCOPE: FURNISH ALL MATERIALS, LABOR, TOOLS, EQUIPMENT AND SUPERVISION NECESSARY TO INSTALL COMPLETE ELECTRICAL POWER AND LIGHTING SYSTEM IN THE BUILDING AS FURTHER DESCRIBED ON THE ELECTRICAL CONTRACT DRAWINGS.
SUPPLY: ALL MATERIALS, FITTINGS AND HARDWARE NECESSARY FOR COMPLETE OPERATING SYSTEMS WITHIN THE OBVIOUS INTENT OF THE DRAWINGS. NO ATTEMPT HAS BEEN MADE TO DETAIL OR LIST ALL MATERIALS.
THE ELECTRICAL CONTRACTOR IS CAUTIONED TO READ THE ENTIRE PROJECT DRAWINGS AND SPECIFICATIONS TO ASSURE HIMSELF OF A THOROUGH KNOWLEDGE OF BUILDING CONSTRUCTION, STRUCTURAL RESTRICTIONS TO ELECTRICAL CONTRACT WORK AND TO ASSURE THAT NO REFERENCES ANYWHERE IN THE PROJECT DRAWINGS AND SPECIFICATIONS TO WORK BY THE ELECTRICAL CONTRACTOR IS OVERLOOKED.

CODES, PERMITS AND INSPECTIONS: THE LATEST EDITION OF THE STATE OF NORTH CAROLINA BUILDING CODE WHICH INCLUDES THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE IS HEREBY MADE A PART OF THIS SPECIFICATION. CODES REQUIRE OVER THESE SPECIFICATIONS WHERE THE SPECIFICATIONS EXCEED THAT OF THE SPECIFICATIONS. HOWEVER, THE SPECIFICATIONS SHALL BE FOLLOWED WHERE THEY EXCEED CODE REQUIREMENTS. THE ELECTRICAL CONTRACTOR SHALL, AT NO ADDITIONAL COST TO THE OWNER, OBTAIN THE SERVICES OF A LOCAL ELECTRICAL INSPECTOR TO MAKE ALL REQUIRED DURING CONSTRUCTION AND COMPLETED ELECTRICAL SYSTEM INSPECTIONS.

MATERIALS AND WORKMANSHIP: ALL MATERIAL BUILT INTO THIS PROJECT SHALL BE NEW OF EQUIVALENT OR BETTER QUALITY THAN THAT SPECIFIED. SPECIFIC MAKE AND CATALOG NUMBERS USED HEREIN ARE TO ESTABLISH THE ITEM FUNCTION, ARRANGEMENT AND QUALITY REQUIRED AND IS IN NO WAY TO RESTRICT COMPETITION. ALL MATERIALS SHALL BE UL APPROVED/LABELED AND/OR BE APPROVED BY A THIRD PARTY TESTING AGENCY IN THE STATE OF NORTH CAROLINA FOR THE PARTICULAR APPLICATION AS USED ON THIS PROJECT.

CONDUCTORS: ALL CONDUCTORS SHALL BE COPPER (#10 AWG AND SMALLER SHALL BE SOLID, AND #8 AWG AND LARGER STRANDED) WITH THHN/THWN INSULATION, INSTALLED IN CONDUIT. CONDUCTORS SHALL BE #12 AWG MINIMUM EXCEPT WITHIN LIGHT FIXTURES, LOW VOLTAGE CONTROLS OR COMMUNICATION/FIRE ALARM EQUIPMENT. CONDUCTOR COLOR CODE SHALL CONFORM TO THE NEC. CONDUCTORS SHALL BE CONTINUOUS FROM TERMINAL TO TERMINAL OR PULL BOX TO PULL BOX. JOINTS SHALL BE MADE IN PULL BOXES. TERMINATIONS FOR ALL ELECTRICAL EQUIPMENT SHALL BE TESTED AND APPROVED FOR USE WITH 75°C RATED CONDUCTORS.

RACEWAYS: RACEWAYS SHALL BE UL APPROVED RIGID GALVANIZED STEEL WITH THREADED JOINTS OR METALLIC TUBING (EMT) WITH THREADED STEEL HEXAGONAL COMPRESSION FITTINGS - NEITHER INDENTOR TYPE OR DIE METAL DRIVING WILL BE ACCEPTED. FLOOR SLAB AND UNDER GROUND OUTSIDE THE BUILDING HOLES MAY BE PVC. FITTINGS IN EMT SHALL BE WEATHER TIGHT (THOMAS AND BETTS SERIES #5123 WITH NYLON INSULATED THROATS). BENDS SHALL BE FACTORY FABRICATED OR MADE "COLD" WITH BENDING TOOL, FREE OF KINKS OR RESTRICTIONS. NO SINGLE BEND SHALL BE IN EXCESS OF 90 DEGREES. THERE SHALL BE NO MORE THAN THE EQUIVALENT OF THREE (3) 90 DEGREE BENDS FROM PULL BOX TO PULL BOX. ALL RACEWAYS SHALL BE IDENTIFIED. THREADS SHALL BE CUT STRAIGHT AND TRUE - PIPE ENDS SHALL BE REAMED AND SMOOTHED INSIDE AND OUT. SUPPORT 1-1/2 INCH AND LARGER CONDUIT 10 FEET O/C OR LESS, AND 1 INCH AND SMALLER 6 FEET O/C. RACEWAYS SHALL BE SUPPORTED DIRECTLY FROM BUILDING STRUCTURE WITH BOLTS, SCREWS, STRAPS, HANGER RODS AND BRACKETS. ALL METALLIC HARDWARE SHALL BE GALVANIZED OR CADMIUM PLATED. NAILS, WIRE AND/OR PERFORATED STRAPS WILL NOT BE ACCEPTED. USE THREADED LOCKNUTS OUTSIDE AND THREADED LOCKNUT AND BUSHING INSIDE ALL RACEWAY CONNECTIONS TO BOXES, DEVICES, PANELS AND GUTTERS. USE NON-METALLIC BUSHINGS ON ALL 1-1/4 INCH AND LARGER CONDUIT. EXPOSED CONDUIT SHALL BE RUN STRAIGHT AND TRUE, PARALLEL AND PERPENDICULAR TO PRIMARY BUILDING LINES.

BOXES AND DEVICES: ALL BOXES, PANELS AND EQUIPMENT SHALL BE SUPPORTED DIRECTLY FROM THE BUILDING STRUCTURE AND SHALL NOT DEPEND ON THE FEEDER RACEWAYS FOR SUPPORT. ALL ITEMS SHALL BE CAREFULLY ALIGNED SO THAT COVERS WILL FINISH FLUSH AND STRAIGHT. ALL UNUSED KNOCKOUTS SHALL BE CLOSED WITH BLANKING DEVICES. BOXES IN CONCRETE OR MASONRY SHALL BE 3-1/2 INCH DEEP (MINIMUM) SQUARE 16 GAUGE GALVANIZED STEEL - STEEL CITY SERIES GW. BOXES INSTALLED IN WOOD PARTITIONS SHALL BE STEEL CITY 3-1/2 INCH DEEP GANGABLE SQUARE CORNER TYPE. SURFACE MOUNTED BOXES SHALL BE STEEL CITY #52151 AND/OR #52171 OR EQUAL. RECEPTABLES SHALL BE PASS & SEYMOUR #322 SERIES OR EQUAL. SWITCHES SHALL BE PASS & SEYMOUR CBS20AC SERIES OR EQUAL. COVER PLATES SHALL BE STAINLESS STEEL (COORDINATE W/ OWNER). PULL BOXES SHALL BE 14 GAUGE GALVANIZED STEEL WITH BLANK COVER SIZED AS REQUIRED BY NATIONAL ELECTRICAL CODE. LOCATE DEVICES AND EQUIPMENT ABOVE FLOOR UNLESS OTHERWISE SPECIFIED. OTHERWISE SPECIFICALLY NOTED ON PLANS: WALL SWITCHES - 4'-0" OR TO NEAREST MASONRY COURSE JOINT. RECEPTABLES - 1'-6" OR TO NEAREST MASONRY COURSE JOINT. LIGHT FIXTURES - AS NOTED ON FIXTURE SCHEDULE.

GROUNDING: THE ELECTRICAL SYSTEM AND ALL ELECTRICAL EQUIPMENT SHALL BE GROUNDED IN ACCORDANCE WITH ARTICLE 250 OF THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE. GREEN EQUIPMENT GROUND WIRE SHALL BE INSTALLED WITH ALL FEEDERS AND BRANCH CIRCUITS AND IT SHALL BE SIZED PER NEC 250.122, WHERE ONLY ONE GROUND ROD IS DRIVEN AS ALLOWED BY THE EXCEPTION IN NEC ARTICLE 250.53(A)(2), THE CONTRACTOR SHALL SUBMIT A TESTING REPORT SHOWING A RESISTANCE OF 25 OHMS OR LESS TO THE ENGINEER.
LIGHTING FIXTURES: LIGHTING FIXTURES AND LAMPS SHALL BE PROVIDED AND INSTALLED AS PER SCHEDULE. CATALOG NUMBERS GIVEN IN THE FIXTURE SCHEDULE INDICATE THE MINIMUM QUALITY AND PERFORMANCE REQUIRED. EQUAL FIXTURES WILL BE ALLOWED ONLY UPON APPROVAL BY ENGINEER. EQUAL FIXTURES SHALL MEET THE MINIMUM QUALITY AND PERFORMANCE OF THE SPECIFIED FIXTURES BY HUBBELL, COOPER, PHILIPS OR ACUITY SHALL BE ALLOWED. ALL FIXTURES SHALL BE CLEANED ON COMPLETION OF INSTALLATION. BALLASTS AND/OR THE FIXTURE UNIT IN WHICH THEY ARE INSTALLED SHALL HAVE UL APPROVAL FOR DIRECT CONTACT MOUNTING TO COMBUSTIBLE CEILING MATERIAL. ALL FIXTURES SHALL BE SUPPLIED WITH ELECTRONIC BALLASTS AND LED FIXTURES SHALL BE SUPPLIED WITH DIMMABLE LED DRIVERS. THE FIXTURES SHALL BE COMPLETE IN ALL RESPECTS INCLUDING PLASTER RINGS WHERE REQUIRED, END PLATES AND OTHER APPURTENANCES NECESSARY FOR THE COMPLETE INSTALLATION. ALL LIGHTING FIXTURES SHALL BE SECURED TO THE CEILING STRUCTURE PER THE NEC. ADDITIONAL SUPPORT WIRES (TIE WIRES) SHALL BE INSTALLED AT EACH END OF THE FIXTURE. THERE SHALL BE TWO TIE WIRES OF THE SAME TYPE AS USED TO SUPPORT THE LAY-IN CEILING TRACK. ONE WIRE AT EACH OPPOSITE CORNER OF THE FIXTURE. THE WIRES SHALL BE FASTENED TO THE BUILDING STRUCTURE. FOR FIRE RATED CEILING, FIXTURE SHALL BE SUPPORTED ON ALL FOUR CORNERS PER THE CEILING DESIGN CRITERIA TO THE BUILDING STRUCTURE.

TESTING: CABLE INSULATION TESTING: THE CONTRACTOR SHALL MEGGER ALL BUSWAYS, CABLES AND CONTROL CONNECTIONS TO PROVE INSULATION RESISTANCE IS OF ACCEPTABLE VALUE.
EMERGENCY LIGHT TESTING: CONTRACTOR SHALL PERFORM A TEST ON EACH UNIT AFTER IT IS PERMANENTLY INSTALLED AND CHARGED FOR A MINIMUM OF 24 HOURS. BATTERY SHALL BE TESTED FOR 90 MINUTES AND IT SHALL MEET THE REQUIREMENTS OF NEC 700.12 (A). ANY UNIT WHICH FAILS THE TEST MUST BE REPAIRED OR REPLACED, AND TESTED AGAIN. A COPY OF THE TEST REPORT SHALL BE PRESENTED TO THE ENGINEER PRIOR TO FINAL INSPECTION.
TESTING DOCUMENTATION: ALL TESTS SHALL BE COMPLETELY DOCUMENTED AND TURNED OVER TO THE ENGINEER WHERE REQUIRED IN THESE SPECIFICATIONS. THE TEST CERTIFICATIONS SHALL IDENTIFY THE TEST VALUES, EQUIPMENT TESTED, TIME OF DAY AND DATE OF TESTING, TEMPERATURE AT TIME OF TESTING, THE NAME OF THE ELECTRICIAN THAT CONDUCTED THE TEST, AND SIGNATURE OF PERSON RESPONSIBLE FOR THE TEST.

PANELBOARDS: PROVIDE PANELBOARDS RATED AND SIZED AS INDICATED IN THE SCHEDULE AND SHOWN ON THE PLANS EQUAL TO SQUARE D COMPANY MODEL NO FOR SERVICES UP TO 240 VOLTS; MODEL NF FOR SERVICES UP TO 480 VOLTS; AND "I-LINE" FOR POWER DISTRIBUTION PANELS. ALL PANELBOARDS SHALL BE SUPPLIED WITH A COPPER EQUIPMENT GROUNDING BUS. CONSTRUCTION FEATURES SHALL INCLUDE MINIMUM 5" WIDE GUTTERS, DEAD FRONT CONSTRUCTION, ELECTROPLATED COPPER CURRENT CARRYING PARTS; UL LISTED TERMINALS SUITABLE FOR CONDUCTORS SPECIFIED. FLUSH FRONT HINGED "DOOR IN DOOR" WITH CYLINDER TUMBLER TYPE LOCKS (ALL KEYS ALIKE); CIRCUIT DIRECTORY AND FRAME, CODE GAUGE STEEL, GALVANIZED AND BAKED ENAMEL FINISHED. CIRCUIT BREAKERS SHALL BE BOLT-ON TYPE QOB (NO PANELBOARDS), TYPE EDB (NO PANELBOARDS), AND TYPE FA AND FH (I-LINE PANELBOARDS). BREAKERS SHALL BE TOGGLE ACTION WITH QUICK-MAKE, QUICK-BREAK MECHANISM. TRIP INDICATOR SHALL BE TAKEN FROM THE SAME POSITION BETWEEN ON AND OFF. ALL MULTI-POLE BREAKERS SHALL BE COMMON TRIP WITH A SINGLE HANDLE. ACCEPTABLE MANUFACTURERS: SQUARE D, GENERAL ELECTRIC, SIEMENS, CUTLER-HAMMER.
SAFETY SWITCHES: SWITCHES SHALL BE EQUAL TO SQUARE D TYPE HD WITH RATINGS AND FUSING PROVISIONS AS INDICATED.

IDENTIFICATION AND NAMEPLATES: PROVIDE ENGRAVED, LAMINATED BAKELITE (WHITE LETTERS ON BLACK SURFACE) NAMEPLATES SCREWED TO EACH PIECE OF ELECTRICAL DISTRIBUTION EQUIPMENT AS FOLLOWS:
A. PANELBOARDS, SWITCHBOARDS - DESIGNATION L1, P1, ETC., VOLTAGE, PHASE NUMBER OF WIRES, ETC.; WORDING EXAMPLE: PANEL L1-208V 3P 4-WIRE.
B. MOTOR STARTERS, DISCONNECT SWITCHES - UNLESS MOUNTED DIRECTLY ON OR ADJACENT TO IDENTIFY EQUIPMENT: WORDING EXAMPLE: EXHAUST FAN 1, MAKE-UP AIR UNIT.
PROVIDE TYPED DIRECTORIES FOR PANELBOARD BRANCH CIRCUIT IDENTIFICATION. IDENTIFY EACH CIRCUIT BREAKER AS TO THE EXACT ROOM NUMBERS OR AREA SERVED AND THE TYPE OF CIRCUIT, I.E. "ROOMS 101-104 LIGHTS" OR "CAFETERIA EXHAUST FAN". PROVIDE ALL ADDITIONAL LABELING AS REQUIRED BY NEC ARTICLES 110.16 (ARC FLASH HAZARD) & 110.24 (AVAILABLE FAULT CURRENT).
EQUIPMENT CONNECTIONS: THIS CONTRACTOR SHALL BRING ALL REQUIRED ELECTRICAL SERVICE TO ALL EQUIPMENT ITEMS FURNISHED UNDER OTHER SECTIONS OF THESE SPECIFICATIONS OR BY THE OWNER, MAKE FINAL CONNECTIONS, AND LEAVE EQUIPMENT READY FOR OPERATION. THIS CONTRACTOR SHALL COORDINATE WITH ANY AFFECTED TRADE TO ASSURE CORRECT OPERATION OF THE EQUIPMENT ITEM.

CONTROL AND INTERLOCK WIRING: EXCEPT AS OTHERWISE INDICATED ON THE DRAWINGS, ALL CONTROL AND INTERLOCK WIRING SHALL BE PERFORMED BY THE RESPECTIVE CONTRACTOR WHOSE ELECTRICAL SUBCONTRACTOR SHALL INSTALL ALL STARTERS, PILOT SWITCHES, CONTROL DEVICES AND MISCELLANEOUS ITEMS OF ELECTRICAL EQUIPMENT FURNISHED UNDER OTHER SECTIONS OF THESE SPECIFICATIONS THAT ARE NOT INTEGRALLY MOUNTED WITH THEIR ASSOCIATED EQUIPMENT.
DRY TYPE DISTRIBUTION TRANSFORMERS: TRANSFORMERS TO BE DRY-TYPE WITH NATURAL DRAFT VENTILATION. UNITS TO BE RATED FOR 480 VOLTS, 3 PHASE, 3 WIRE PRIMARY, AND 120/208 VOLTS, 3 PHASE, 4 WIRE SECONDARY, UNLESS OTHERWISE INDICATED. UNITS TO BE DESIGNED FOR 60 HERTZ OPERATION, WITH KVA CAPACITIES AS SHOWN ON DRAWINGS. TRANSFORMERS TO CONFORM WITH APPLICABLE NEMA AND ANSI STANDARDS, INCLUDING NEMA TP-1 ENERGY EFFICIENT STANDARDS AND BE UL LISTED. TRANSFORMERS TO HAVE CLASS H INSULATION, HIGH GRADE SILICONE STEEL CORES, AND BE RATED FOR A MAXIMUM TEMPERATURE RISE OF 115 DEGREES C. UNITS RATED 30 KVA AND LARGER TO HAVE FOUR 2 1/2% TAPS BELOW NORMAL AND TWO 2 1/2% TAPS ABOVE NORMAL. UNITS RATED LESS THAN 30 KVA TO HAVE TWO 5% TAPS BELOW NORMAL. SOUND LEVELS GENERATED BY TRANSFORMERS ARE NOT TO EXCEED THE FOLLOWING VALUES: 9 KVA AND LESS -40 DB, 10 TO 45 KVA -42 DB, 50 TO 150 KVA -45 DB.
SERVICE: THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING SERVICE WITH THE UTILITY COMPANY. ALL CHARGES ASSOCIATED WITH SERVICE SHALL BE PAID BY THE E.C. PROVIDE UTILITY REQUIRED METERING PROVISIONS, PROVIDE CT CAN OR CONCRETE PAD FOR TRANSFORMER AS REQUIRED. PROVIDE CONDUIT FOR UTILITY PRIMARY IF REQUIRED. EC SHALL WORK DIRECTLY WITH THE UTILITY AND SHALL COMPLETE AND SUBMIT ALL LOAD DATA SHEETS REQUIRED FOR SERVICE APPLICATION, WHERE A NEW SERVICE IS NOT REQUIRED, BUT LOADS ARE ADDED TO AN EXISTING SERVICE, E.C. SHALL NOTIFY UTILITY OF ADDITIONAL LOADS. E.C. SHALL PROVIDE THIS INFORMATION AT BEGINNING OF PROJECT TO ALLOW TIME FOR A TRANSFORMER CHANGE OUT IF NECESSARY.

VIBRATION ISOLATION AND SEISMIC RESTRAINT: ALL EQUIPMENT AND CONDUIT FURNISHED AND INSTALLED UNDER THIS CONTRACT SHALL BE SEISMICALLY RESTRAINED BY CHAPTER 16 OF THE INTERNATIONAL BUILDING CODE, VOL. 1 - GENERAL CONSTRUCTION.

SUBMITTALS: SHOP DRAWING SUBMITTALS WILL BE REQUIRED FOR THIS PROJECT. SUBMIT ELECTRONIC COPIES OF ALL LIGHT FIXTURES AND MAJOR SPECIFIED EQUIPMENT TO THE ENGINEER FOR APPROVAL. THE ELECTRICAL CONTRACTOR SHALL REVIEW ALL SUBMITTALS AND MAKE CORRECTIONS AS REQUIRED PRIOR TO SUBMITTING TO ENGINEER FOR APPROVAL. THE CONTRACTOR SHALL ALSO AFFIX HIS STAMP TO THE SUBMITTALS INDICATING THAT HIS REVIEW HAS BEEN COMPLETED. IT IS UNDERSTOOD THAT PROOF OF EQUALITY IS THE RESPONSIBILITY OF THE CONTRACTOR AND/OR SUPPLIER AND THAT IT IS NOT THE RESPONSIBILITY OF THE ENGINEER TO PROVE THE INEQUALITY OF THE PROPOSED SUBSTITUTIONS. FURTHERMORE, THE DECISION OF THE ENGINEER IS FINAL. SHOULD ANY SUBSTITUTE ITEMS BE SUBMITTED AND DISAPPROVED, THEN THOSE ITEMS MUST BE FURNISHED EXACTLY AS DESCRIBED HEREIN. THE ENGINEER'S REVIEW OF SHOP DRAWINGS AND/OR SUBMITTALS DATA SHALL NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR DEVIATIONS FROM THE CONTRACT DRAWINGS OR SPECIFICATIONS.
PROJECT CLOSE-OUT: DEMONSTRATION OF COMPLETE ELECTRICAL SYSTEMS: AFTER INSTALLATION HAS BEEN COMPLETED, EQUIPMENT HAS BEEN TESTED, SYSTEMS PLACED IN PERMANENT OPERATION, AND ALL ADJUSTMENTS MADE, THIS CONTRACTOR SHALL DEMONSTRATE THE PROPER OPERATION AND MAINTENANCE OF ALL EQUIPMENT HE HAS INSTALLED TO THE OWNER'S REPRESENTATIVE.
OPERATING AND MAINTENANCE MANUALS: THIS CONTRACTOR SHALL PROVIDE THE OWNER WITH A SET OF OPERATION AND MAINTENANCE MANUALS FOR THE EQUIPMENT HE HAS PROVIDED AND INSTALLED ON THE PROJECT. THE FIRST PAGE OF THE MANUALS SHALL IDENTIFY THE MAKE AND MODEL ADDRESS AND PHONE NUMBER OF ARCHITECT, ENGINEER, MECHANICAL AND ELECTRICAL SUB-CONTRACTORS AND ANY SERVICE COMPANIES INVOLVED AND NIGHT PHONE NUMBERS OF EACH PARTY REPRESENTING THE ELECTRICAL CONTRACTOR RESPONSIBLE FOR SERVICE DURING WARRANTY PERIOD.
WARRANTIES / GUARANTEE: THIS CONTRACTOR SHALL DELIVER TO THE OWNER ALL WARRANTIES FOR EQUIPMENT HE HAS PURCHASED AND INSTALLED. THIS CONTRACTOR SHALL ALSO GUARANTEE THAT ALL WORK PERFORMED AND/OR MATERIALS INSTALLED UNDER HIS CONTRACT IS OF THE QUALITY THAT COMPLES WITH ALL SPECIFIC REQUIREMENTS OF THE PROJECT DOCUMENTS AND INSURES THE OWNER AGAINST ALL DEFECTS OF MATERIAL AND WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF FINAL ACCEPTANCE.
FINAL CLEAN UP: DURING CONSTRUCTION THIS CONTRACTOR SHALL KEEP THE SITE CLEAR OF DEBRIS AND UPON COMPLETION OF CONSTRUCTION HE SHALL CLEAN UP THE PREMISES AND REMOVE ALL EVIDENCE OF HIS WORK.
RECORD DRAWINGS: AT THE END OF THE PROJECT, THE CONTRACTOR SHALL SUBMIT ONE SET OF THE ELECTRICAL DRAWINGS, UPDATED TO REFLECT CHANGES THAT HAVE TAKEN PLACE DURING THE CONSTRUCTION PERIOD, TO THE OWNER FOR THEIR USE. THE CORRECTED PLANS SHALL INDICATE ALL CHANGES AND DEVIATIONS FROM THE ORIGINAL CONTRACT DOCUMENTS.

ELECTRICAL SYSTEM AND EQUIPMENT

METHOD OF COMPLIANCE:
Energy Code: Prescriptive Performance
ASHRAE 90.1: Prescriptive Performance

Lighting schedule
lamp type required in fixture See Fixture Schedule
number of lamps in fixture See Fixture Schedule
ballast type used in the fixture See Fixture Schedule
number of ballasts in fixture See Fixture Schedule
total wattage per fixture See Fixture Schedule
total interior wattage specified vs allowed 12,700/16,400
total exterior wattage specified vs allowed N/A

Additional Prescriptive Compliance
C406.2 More Efficient Mechanical Equipment N/A
C406.3 Reduced Lighting Power Density N/A
C406.4 Enhanced Lighting Controls N/A
C406.5 On-Site Supply of Renewable Energy N/A
C406.6 Dedicated Outdoor Air System N/A
C406.7 High-Efficiency Service Water Heating N/A

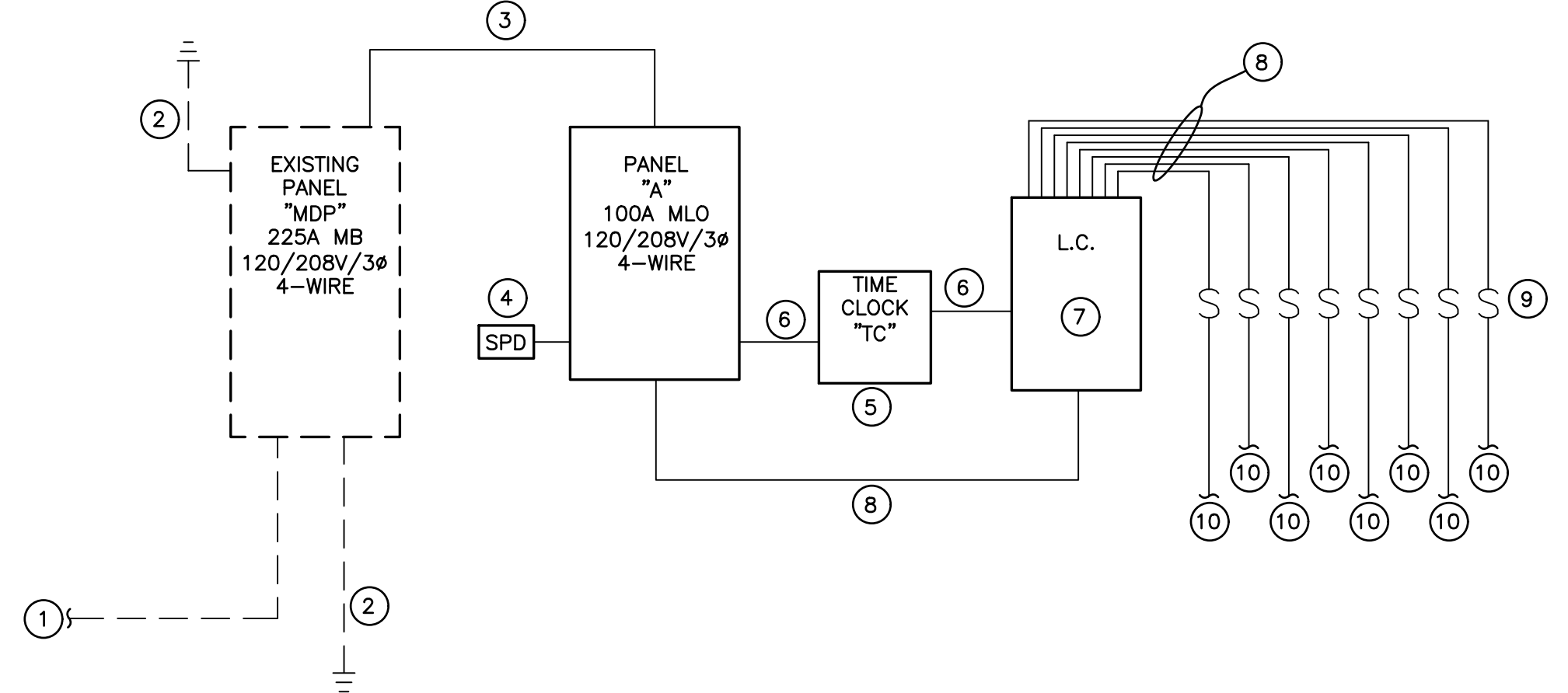
ELECTRICAL LEGEND	
SYMBOL	DESCRIPTION
---	CONDUIT
----	CONDUIT UNDERFLOOR OR UNDERGROUND
→	ARROW INDICATES HOMERUN, TICKMARKS: NEUTRAL, PHASE, GND.
■	POWER PANEL
Ⓧ	JUNCTION BOX
Ⓧ	DISCONNECT SWITCH; FUSED; NONFUSED
FPN	FUSE PER NAMEPLATE
S _m	MOTOR TOGGLE SWITCH
Ⓜ	MOTOR
Ⓧ	EXISTING OR BY OTHERS
Ⓧ	LIGHT FIXTURE
S ₁ , S ₂ , S ₄	SINGLE POLE SWITCH, 3 WAY, 4 WAY
S _p , S _d	PILOT LIGHT, DIMMER
AFF	ABOVE FINISHED FLOOR
Ⓧ	DUPLEX RECEPT, ABOVE COUNTER
Ⓧ	WEATHERPROOF, GROUND FAULT, USB
Ⓧ	QUAD-PLEX RECEPTACLE

LIGHTING FIXTURE SCHEDULE

MARK	TYPE	MOUNTING	MANUFACTURER ** CATALOG NO.	LAMPS QTY/TYPE	TOTAL WATTS	VOLTAGE	REMARKS
A1	LED AREA LIGHT	POLE & CROSS ARM	LIGHT: GIGA TERA LIGHTING MAH500-X507G1 (2 HEADS) MOUNTING BRACKET/ARM AS REQUIRED BY EQUIPMENT MANUFACTURE. POLE: 50' EMBEDDED POLE AS REQUIRED BY EQUIPMENT MANUFACTURE. REFER TO DETAILS ON FOLLOWING DRAWING SHEETS.	LED 75,000 LUMEN PER HEAD 5000K, 70CRI	1,000W	208V	REFER TO EQUIPMENT MANUFACTURES AMING INFORMATION AND ADJUST AS REQUIRED. ALL EQUIPMENT TO BE WET LOCATION LISTED. POLE TO BE UL LISTED. 2 HEADS AT THIS LOCATION. FIXTURE, CROSS ARM AND POLE TO BE FROM SINGLE SOURCE.
A2	LED AREA LIGHT	POLE & CROSS ARM	LIGHT: GIGA TERA LIGHTING MAH500-X507G1 (2 HEADS) MOUNTING BRACKET/ARM AS REQUIRED BY EQUIPMENT MANUFACTURE. POLE: 50' EMBEDDED POLE AS REQUIRED BY EQUIPMENT MANUFACTURE. REFER TO DETAILS ON FOLLOWING DRAWING SHEETS.	LED 75,000 LUMEN PER HEAD 5000K, 70CRI	1,000W	208V	REFER TO EQUIPMENT MANUFACTURES AMING INFORMATION AND ADJUST AS REQUIRED. ALL EQUIPMENT TO BE WET LOCATION LISTED. POLE TO BE UL LISTED. 2 HEADS AT THIS LOCATION. FIXTURE, CROSS ARM AND POLE TO BE FROM SINGLE SOURCE.
A3	LED AREA LIGHT	POLE & CROSS ARM	LIGHT: GIGA TERA LIGHTING MAH500-X507G1 (2 HEADS) MOUNTING BRACKET/ARM AS REQUIRED BY EQUIPMENT MANUFACTURE. POLE: 50' EMBEDDED POLE AS REQUIRED BY EQUIPMENT MANUFACTURE. REFER TO DETAILS ON FOLLOWING DRAWING SHEETS.	LED 75,000 LUMEN PER HEAD 5000K, 70CRI	1,000W	208V	REFER TO EQUIPMENT MANUFACTURES AMING INFORMATION AND ADJUST AS REQUIRED. ALL EQUIPMENT TO BE WET LOCATION LISTED. POLE TO BE UL LISTED. 2 HEADS AT THIS LOCATION. FIXTURE, CROSS ARM AND POLE TO BE FROM SINGLE SOURCE.
A4	LED AREA LIGHT	POLE & CROSS ARM	LIGHT: GIGA TERA LIGHTING MAH500-X507G1 (2 HEADS) MOUNTING BRACKET/ARM AS REQUIRED BY EQUIPMENT MANUFACTURE. POLE: 50' EMBEDDED POLE AS REQUIRED BY EQUIPMENT MANUFACTURE. REFER TO DETAILS ON FOLLOWING DRAWING SHEETS.	LED 75,000 LUMEN PER HEAD 5000K, 70CRI	1,000W	208V	REFER TO EQUIPMENT MANUFACTURES AMING INFORMATION AND ADJUST AS REQUIRED. ALL EQUIPMENT TO BE WET LOCATION LISTED. POLE TO BE UL LISTED. 2 HEADS AT THIS LOCATION. FIXTURE, CROSS ARM AND POLE TO BE FROM SINGLE SOURCE.
A5	LED AREA LIGHT	POLE & CROSS ARM	LIGHT: GIGA TERA LIGHTING MAH500-X507G1 (2 HEADS) MOUNTING BRACKET/ARM AS REQUIRED BY EQUIPMENT MANUFACTURE. POLE: 50' EMBEDDED POLE AS REQUIRED BY EQUIPMENT MANUFACTURE. REFER TO DETAILS ON FOLLOWING DRAWING SHEETS.	LED 75,000 LUMEN PER HEAD 5000K, 70CRI	1,000W	208V	REFER TO EQUIPMENT MANUFACTURES AMING INFORMATION AND ADJUST AS REQUIRED. ALL EQUIPMENT TO BE WET LOCATION LISTED. POLE TO BE UL LISTED. 2 HEADS AT THIS LOCATION. FIXTURE, CROSS ARM AND POLE TO BE FROM SINGLE SOURCE.
B1	LED AREA LIGHT	POLE & CROSS ARM	LIGHT: GIGA TERA LIGHTING MAH500-X507G1 (3 HEADS) MOUNTING BRACKET/ARM AS REQUIRED BY EQUIPMENT MANUFACTURE. POLE: 50' EMBEDDED POLE AS REQUIRED BY EQUIPMENT MANUFACTURE. REFER TO DETAILS ON FOLLOWING DRAWING SHEETS.	LED 75,000 LUMEN PER HEAD 5000K, 70CRI	1,500W	208V	REFER TO EQUIPMENT MANUFACTURES AMING INFORMATION AND ADJUST AS REQUIRED. ALL EQUIPMENT TO BE WET LOCATION LISTED. POLE TO BE UL LISTED. 3 HEADS AT THIS LOCATION. FIXTURE, CROSS ARM AND POLE TO BE FROM SINGLE SOURCE.
B2	LED AREA LIGHT	POLE & CROSS ARM	LIGHT: GIGA TERA LIGHTING MAH500-X507G1 (3 HEADS) MOUNTING BRACKET/ARM AS REQUIRED BY EQUIPMENT MANUFACTURE. POLE: 50' EMBEDDED POLE AS REQUIRED BY EQUIPMENT MANUFACTURE. REFER TO DETAILS ON FOLLOWING DRAWING SHEETS.	LED 75,000 LUMEN PER HEAD 5000K, 70CRI	1,500W	208V	REFER TO EQUIPMENT MANUFACTURES AMING INFORMATION AND ADJUST AS REQUIRED. ALL EQUIPMENT TO BE WET LOCATION LISTED. POLE TO BE UL LISTED. 3 HEADS AT THIS LOCATION. FIXTURE, CROSS ARM AND POLE TO BE FROM SINGLE SOURCE.
B3	LED AREA LIGHT	POLE & CROSS ARM	LIGHT: GIGA TERA LIGHTING MAH500-X507G1 (3 HEADS) MOUNTING BRACKET/ARM AS REQUIRED BY EQUIPMENT MANUFACTURE. POLE: 50' EMBEDDED POLE AS REQUIRED BY EQUIPMENT MANUFACTURE. REFER TO DETAILS ON FOLLOWING DRAWING SHEETS.	LED 75,000 LUMEN PER HEAD 5000K, 70CRI	1,500W	208V	REFER TO EQUIPMENT MANUFACTURES AMING INFORMATION AND ADJUST AS REQUIRED. ALL EQUIPMENT TO BE WET LOCATION LISTED. POLE TO BE UL LISTED. 3 HEADS AT THIS LOCATION. FIXTURE, CROSS ARM AND POLE TO BE FROM SINGLE SOURCE.
C1	LED SITE LIGHT	POLE & CONC. BASE	LITHONIA LIGHTING RSX2 LED P6 40K R3 208 RPA HS PER7 DOBXD - DLL 127F 1.5 JU	LED 30,267 LUMEN 4000K, 80CRI	244W	208V	TYPE III WIDE DISTRIBUTION W/ HOUSE SIDE SHIELD. ROUND POLE MNT'G. UNIT MOUNTED PHOTOCELL. DARK BRONZE. 30" ROUND TAPERED STEEL POLE BY OWNER. EC SHALL DRILL POLE AS REQ'D FOR MOUNTING OF HEAD.
C2	LED SITE LIGHT	POLE & CONC. BASE	LITHONIA LIGHTING RSX2 LED P6 40K R5 208 RPA PER7 DOBXD - DLL 127F 1.5 JU	LED 31,075 LUMEN 4000K, 80CRI	244W	208V	TYPE V WIDE DISTRIBUTION. ROUND POLE MNT'G. UNIT MOUNTED PHOTOCELL. DARK BRONZE. 30" ROUND TAPERED STEEL POLE BY OWNER. EC SHALL DRILL POLE AS REQ'D FOR MOUNTING OF HEAD.
C3	LED SITE LIGHT	POLE & CONC. BASE	LITHONIA LIGHTING RSX2 LED P6 40K R3 208 RPA PER7 DOBXD - DLL 127F 1.5 JU	LED 30,267 LUMEN 4000K, 80CRI	244W	208V	TYPE III WIDE DISTRIBUTION. ROUND POLE MNT'G. UNIT MOUNTED PHOTOCELL. DARK BRONZE. 30" ROUND TAPERED STEEL POLE BY OWNER. EC SHALL DRILL POLE AS REQ'D FOR MOUNTING OF HEAD.
D1	LED FLOOD LIGHT	POLE & CONC. BASE	LITHONIA LIGHTING ES3FA ALD SWM2 UVOLT YS DDB - BS28 XXX T020 DOBXD (ROUND BULLHORN)	LED 16,000 LUMEN 4000K, 80CRI	222W	208V	LED FLOOD LIGHT. TWO (2) AT THIS LOCATION. PROVIDE STEEL ROUND BULLHORN FOR MNT'G. LIGHT/BULLHORN TO BE DARK BRONZE. UNIT MOUNTED PHOTOCELL. SWITCHABLE LUMEN OUTPUT & COLOR TEMPERATURE; SET LUMEN OUTPUT TO 16,000 LUMEN & COLOR TEMPERATURE TO 4,000K. 30" ROUND TAPERED STEEL POLE BY OWNER. OWNER TO PROVIDE CONTRACTOR WITH TOP OF POLE DAMETER FOR BULL HORN ORDERING.
F1	LED ROADWAY LIGHT	POLE & CONC. BASE	LITHONIA LIGHTING RSX2 LED P4 40K R3 208 SPA PER7 DOBXD - DLL 127F 1.5 JU - SSS QS 25 4C DM18AS DOBXD	LED 25,000 LUMEN 4000K, 80CRI	187W	208V	TYPE III WIDE DISTRIBUTION. SQUARE POLE MNT'G. UNIT MOUNTED PHOTOCELL. DARK BRONZE. 25' SQUARE STEEL DARK BRONZE POLE.

NOTES: ** BASIS OF DESIGN HAS BEEN INDICATED ABOVE. EQUAL SYSTEMS USING ASD LIGHTING ASD-SPLF7 FIXTURES OR LITHONIA LIGHTING M3 SPORTS LIGHTING FIXTURES WILL BE ACCEPTED FOR "A1" THRU "B3" FIXTURES.

POWER RISER

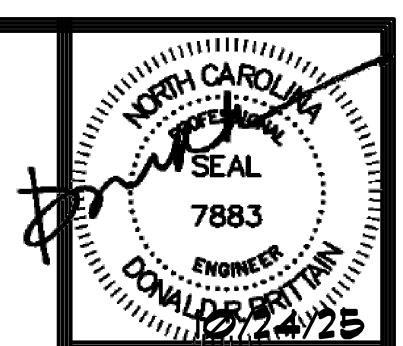


- POWER RISER NOTES:**
- EXISTING SERVICE ENTRANCE FEEDER.
 - EXISTING GROUNDING ELECTRODE CONDUCTOR.
 - 4 #3, #8 GND, 1 #2.
 - 120kVA SURGE SUPPRESSION DEVICE (SPD). UNIT SHALL BE A TYPE 2 OR 3 AND SHALL BE RATED FOR 208/120V/3P, 4-WIRE W/ GND. UNIT SHALL BE A SQUARE D CAT. #EJA21 OR EQUAL. UNIT SHALL BE MOUNTED WITHIN 12" OF PANEL & AS CLOSE TO BREAKER SERVING IT AS POSSIBLE. CONNECT W/ 4 #10, #10 GND, IN 3" PVC CONDUIT. MINIMUM WIRE LENGTH & BENDS. INDUCE A MINIMUM OF 3 TWISTS IN CONDUCTORS OVER THE ENTIRE LENGTH. SPD SHALL HAVE LED STATUS INDICATORS & SURGE COUNTER.
 - 2 CIRCUIT, 365 DAY ASTRONOMICAL TIME CLOCK, INTERMATIC CAT. #ET90215C OR EQUAL, FOR CONTROL OF LIGHTING CONTACTOR.
 - 2 #12, #12 GND, 1 #2.
 - 16 POLE, 30A, 240V RATED LIGHTING CONTACTOR W/ 120V COIL, NEMA 1 INDOOR ENCLOSURE.
 - LIGHTING CIRCUITS FOR LIGHTS/POLES A1-A5 & B1-B3.
 - 20A, 250V, 2-POLE TOGGLE SWITCH FOR MANUAL CONTROL OF LIGHTS/POLES A1-A5 & B1-B3. OWNER HAS REQUESTED MANUAL CONTROLS TO PROVIDE CAPABILITY TO TURN SOME LIGHTS OFF WHEN TIME CLOCK & LIGHTING CONTACTOR HAS THEM OWN. TYPICAL FOR 8. COORDINATE EXACT LOCATION W/ OWNER.
 - #10 CONDUCTORS & RACEWAY TO LIGHTS/POLES A1-A5 & B1-B3 AS SHOWN ON SITE PLAN.

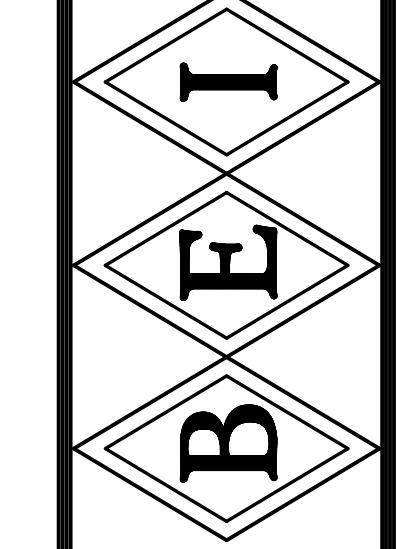
EXISTING PANEL MDP		22,000 AMPS RMS. SYM. I.C. INTEGRATED EQUIPMENT RATING		SURFACE MOUNTED	
120/208 VOLTS, 3 PHASE, 4 WIRE, 225 AMP MAIN BREAKER					
SERVES	CR LOAD CR NO.	A B C	CR NO. CR LOAD	SERVES	
RECEPTABLES	0.70 1	---	2	0.30 LIGHTS - EXTERIOR	
	1.10 3	---	4	0.30 ELC	
	0.20 5	---	6	0.90 LIGHTS	
LIGHTS	0.60 7	---	8	0.30 LIGHTS	
RECEPTABLES	0.70 9	---	10	SPARE	
GAS UNIT HEATER	0.10 11	---	12	1.00 EXHAUST FAN	
SPARE	13	---	14	SPARE	
	15	---	16		
	17	---	18		
	19	---	20		
	21	---	22		
	23	---	24	SPACE	
	25	---	26		
SPACE	27	---	28		
	29	---	30		
	31	---	32		
	33	---	34		
	35	---	36		
	37	---	38	4.23	
	39	---	40	4.23	PANEL "A"
	41	---	42	4.23	
TOTAL CONNECTED LOAD: 18.8 KVA		ALL BREAKERS ARE 1P-20A UNLESS OTHERWISE NOTED			

PANEL NOTES: (1) ADD NEW BREAKER AS REQUIRED.
*ALL LOADS & BREAKERS ARE EXISTING AND SHALL REMAIN UNLESS NOTED OTHERWISE.

PANEL A		10,000 AMPS RMS. SYM. I.C. INTEGRATED EQUIPMENT RATING		SURFACE MOUNTED	
120/208 VOLTS, 3 PHASE, 4 WIRE, 100 AMP MAIN LUG ONLY					
SERVES	CR LOAD CR NO.	A B C	CR NO. CR LOAD	SERVES	
DRIVER TRAINING AREA LIGHTS (1)	0.75 1	20	2	0.50 DRIVER TRAINING AREA LIGHTS (1)	
POLE 1	0.75 3	20	4	0.50 POLE 6	
DRIVER TRAINING AREA LIGHTS (1)	0.75 5	20	6	0.75 DRIVER TRAINING AREA LIGHTS (1)	
POLE 2	0.75 7	20	8	0.75 POLE 7	
DRIVER TRAINING AREA LIGHTS (1)	0.50 9	20	10	0.50 DRIVER TRAINING AREA LIGHTS (1)	
POLE 3	0.50 11	20	12	0.50 POLE 8	
DRIVER TRAINING AREA LIGHTS (1)	0.50 13	20	14	0.54 SITE LIGHTING	
POLE 4	0.50 15	20	16	0.54	
DRIVER TRAINING AREA LIGHTS (1)					



BRITTAIN ENGINEERING INC.
 CONSULTING MECHANICAL AND ELECTRICAL ENGINEERS
 HICKORY, NC 28603
 (828) 328-1813



**NORTH CAMPUS SITE LIGHTING FOR
 CLEVELAND COMMUNITY COLLEGE**
 831 NORTH POST ROAD, SHELBY, NC 28152

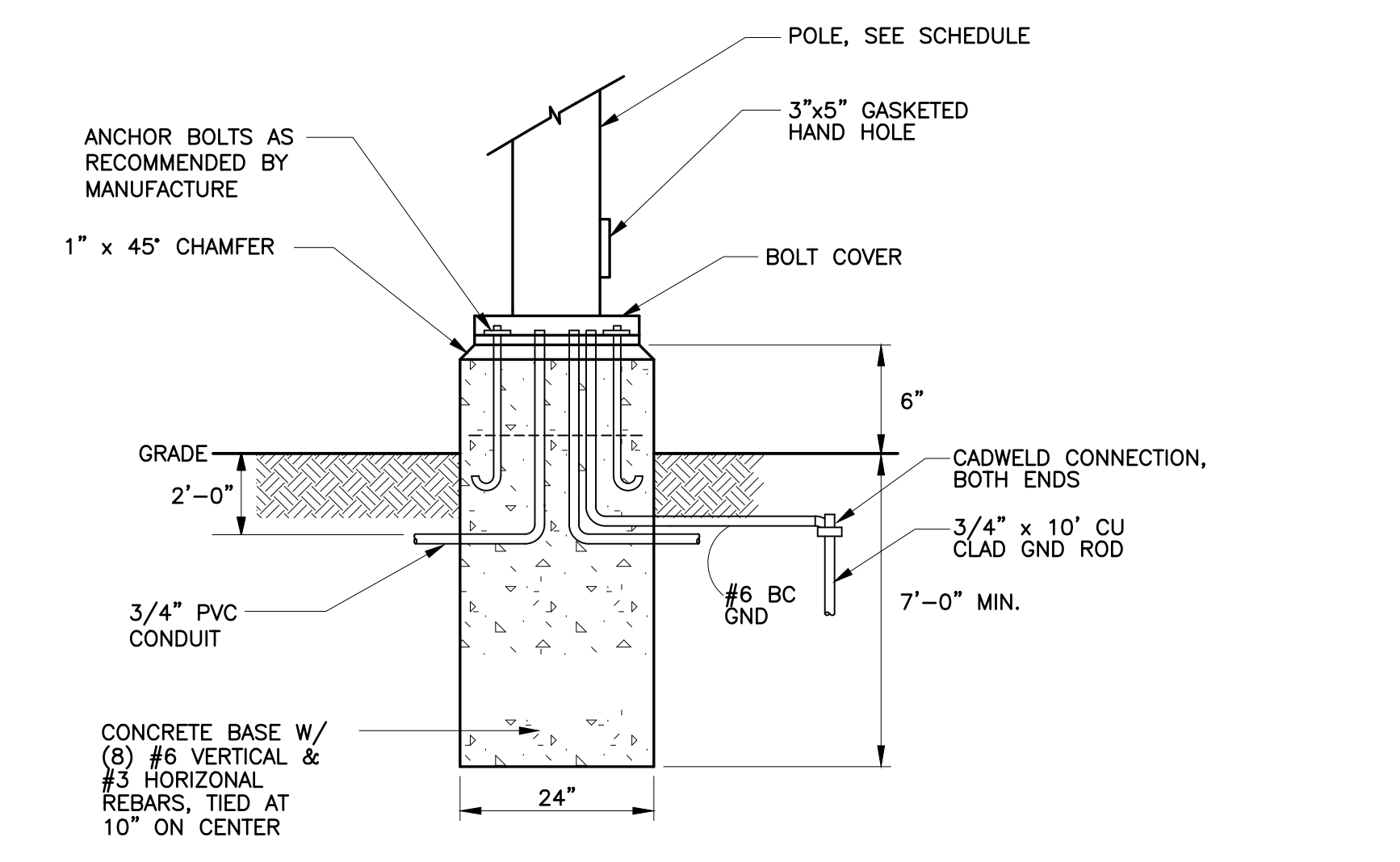
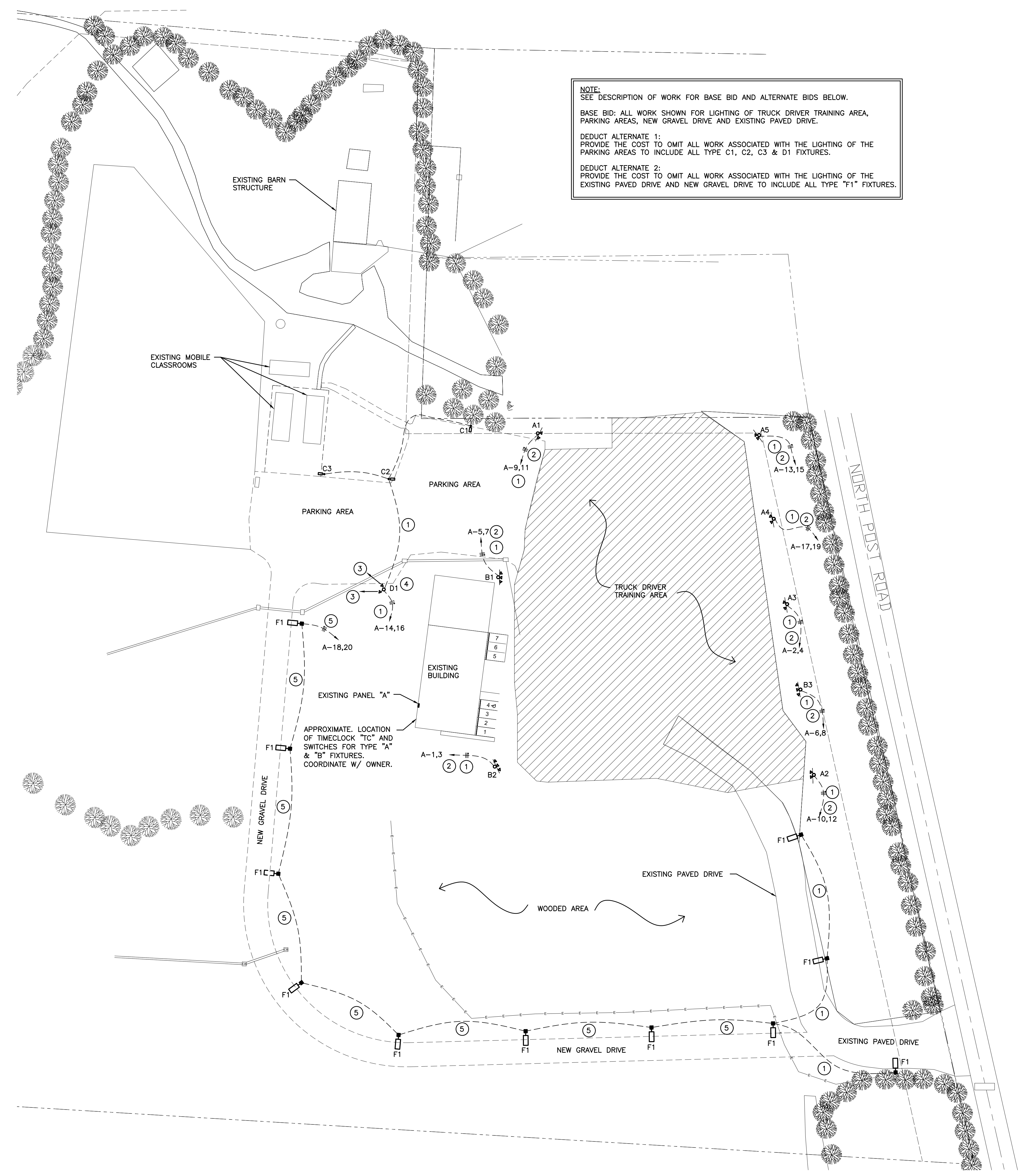
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SHEET
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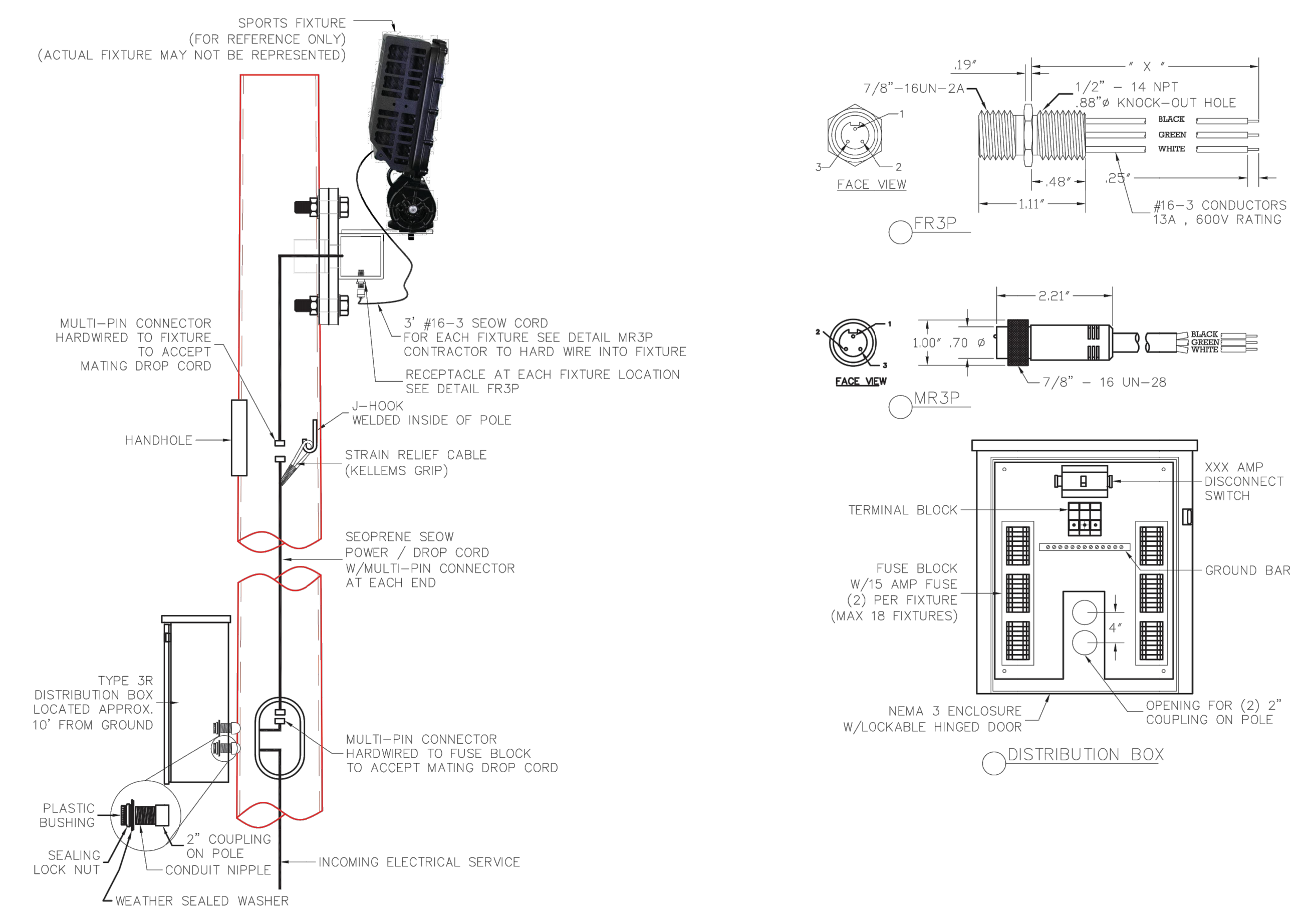
- GENERAL NOTES:**
- COORDINATE FINAL LOCATION OF ALL LIGHTING POLES IN THE FIELD WITH OWNER.
 - DO NOT MOVE ANY POLE GREATER THAN 10'-0" IN ANY DIRECTION WITHOUT APPROVAL BY ENGINEER.
 - ADJUST AIMING OF ALL FIXTURES LIGHTING THE TRUCK DRIVER TRAINING AREA AS DIRECTED BY THE LIGHTING MANUFACTURER.
 - ALL UNDERGROUND RACEWAY SHALL BE 3" MINIMUM.
 - ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR HAVING ALL PUBLIC AND PRIVATE UNDERGROUND UTILITIES LOCATED. COORDINATE W/ OWNER FOR PRIVATE UTILITIES.

- NOTES:**
- 2 #10, #10 GND, 3" C.
 - VIA TIME CLOCK, LIGHTING CONTACTOR & SWITCHES LOCATED IN EXISTING BUILDING. REFER ALSO TO POWER RISER.
 - GENERAL AIMING DIRECTION. ADJUST AS REQUIRED BY OWNER.
 - COORDINATE EXACT PLACEMENT OF POLE & FIXTURE W/ EXISTING TREE.
 - 2 #8, #10 GND, 3" C.

NOTE:
 SEE DESCRIPTION OF WORK FOR BASE BID AND ALTERNATE BIDS BELOW.
 BASE BID: ALL WORK SHOWN FOR LIGHTING OF TRUCK DRIVER TRAINING AREA, PARKING AREAS, NEW GRAVEL DRIVE AND EXISTING PAVED DRIVE.
 DEDUCT ALTERNATE 1:
 PROVIDE THE COST TO OMIT ALL WORK ASSOCIATED WITH THE LIGHTING OF THE PARKING AREAS TO INCLUDE ALL TYPE C1, C2, C3 & D1 FIXTURES.
 DEDUCT ALTERNATE 2:
 PROVIDE THE COST TO OMIT ALL WORK ASSOCIATED WITH THE LIGHTING OF THE EXISTING PAVED DRIVE AND NEW GRAVEL DRIVE TO INCLUDE ALL TYPE "F1" FIXTURES.



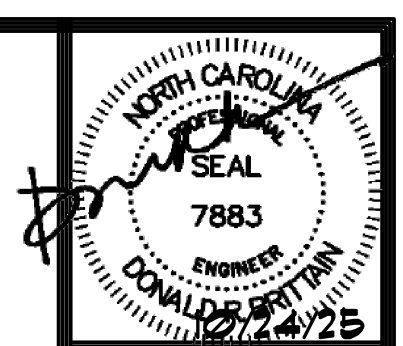
"TYPE "C", "D" & "F" POLE BASE DETAIL
 NTS



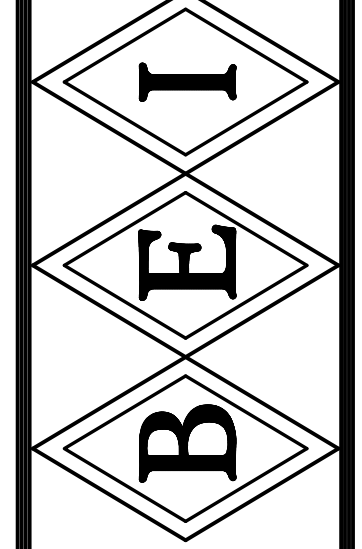
- GENERAL NOTES:**
- DETAILS ABOVE ARE TYPICAL FROM THE BASIS OF DESIGN MANUFACTURER.
 - ALL COMPONENTS FOR THE AREA LIGHTING (LIGHTS, MOUNTING BRACKETS, POLES, PANELS, CABLE ASSEMBLIES, CONNECTORS, ETC) SHALL BE PROVIDED FOR A COMPLETE INSTALLATION.
 - ALL PROFESSIONAL ENGINEERING SEALS AS REQUIRED FOR THE INSTALLATION OF THE SYSTEM, TO INCLUDE POLE AND POLE BASE, SHALL BE PROVIDED BY THE MANUFACTURER AND/OR HIS REPRESENTATIVE.

TYPICAL TYPE "A" & "B" LED AREA LIGHTING DETAILS
 NTS

SITE PLAN - LIGHTING
 SCALE: 1" = 50'-0"



BRITTAIN ENGINEERING INC.
 CONSULTING MECHANICAL AND ELECTRICAL ENGINEERS
 HICKORY, NC 28603
 (828) 328-1813



**NORTH CAMPUS SITE LIGHTING FOR
 CLEVELAND COMMUNITY COLLEGE**
 831 NORTH POST ROAD, SHELBY, NC 28152

JOB NO. 218400
 DWN BY: DGR
 DATE: 10/24/25
 SCALE: AS SHOWN

SHEET
E-3

SPECIFICATIONS - LED AREA LIGHT POLE SHAFT AND BASE

POLE SHAFT
 EACH POLE SHAFT SHALL BE MADE FROM A SINGLE PLY STEEL SHEET. THIS STEEL SHEET SHALL FORMED INTO A TUBULAR SHAPE WITH ONE OR MORE LONGITUDINAL WELDS; NO CIRCUMFERENTIALLY WELDED SPLICES ARE PERMITTED. THIS TUBULAR SHAPE SHALL HAVE A CROSS-SECTION, WHICH IS EITHER MULTI-SIDED OR ROUND. MULTI-SIDED CROSS-SECTIONS SHALL NOT UTILIZE A BEND RADIUS OF LESS THAN 2" AND SHALL NOT HAVE A CROSS-SECTION WITH LESS THAN 12 SIDES. THE MATERIAL USED FOR THE POLE SECTIONS SHALL MEET THE REQUIREMENTS OF ASTM A572 OR ASTM A595 GRADE-A.

POLES, WHICH EXCEED 50 FEET IN LENGTH, SHALL BE DESIGNED AS TWO-PIECE POLE ASSEMBLIES. THE TWO-PIECE ASSEMBLIES SHALL BE JOINED TOGETHER BY TELESOPING THE UPPER "FEMALE" SECTION OVER THE LOWER "MALE" SECTION BY A MINIMUM LAP DISTANCE OF 1.5 TIMES THE FEMALE INSIDE DIAMETER. THE LONGITUDINALLY WELDED SEAM ON THE FEMALE SECTION SHALL BE WELDED BOTH INSIDE AND OUT TO INSURE 100% WELD PENETRATION AT THE TELESOPED AREA. POLE ASSEMBLIES, WHICH EXCEED 50 FEET IN HEIGHT, SHALL ALSO BE DESIGNED WITH AN INTERNAL CABLE GUIDE AND STRAIN RELIEF MECHANISM, WHICH SHALL BE ATTACHED AT THE MID-HEIGHT OF THE POLE ASSEMBLY. THIS CABLE GUIDE ASSEMBLY SHALL CONSISTS OF AN OFFSET BAR, STEEL PIPE SLEEVE WITH INTERNAL PVC SHEATHING TO REDUCE WEAR, AND HAND HOLE OPPOSITE THE OFFSET BAR FOR ACCESS.

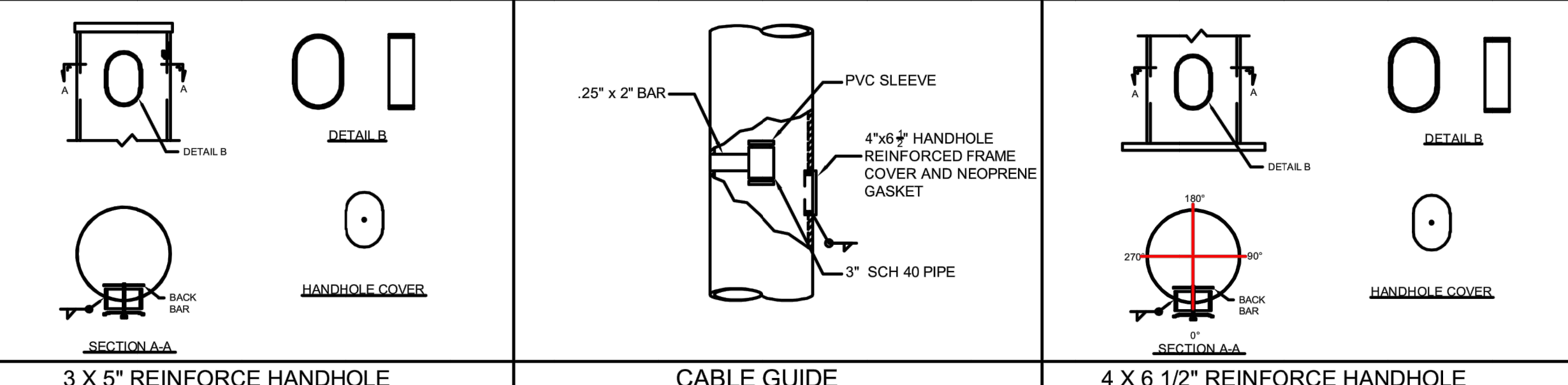
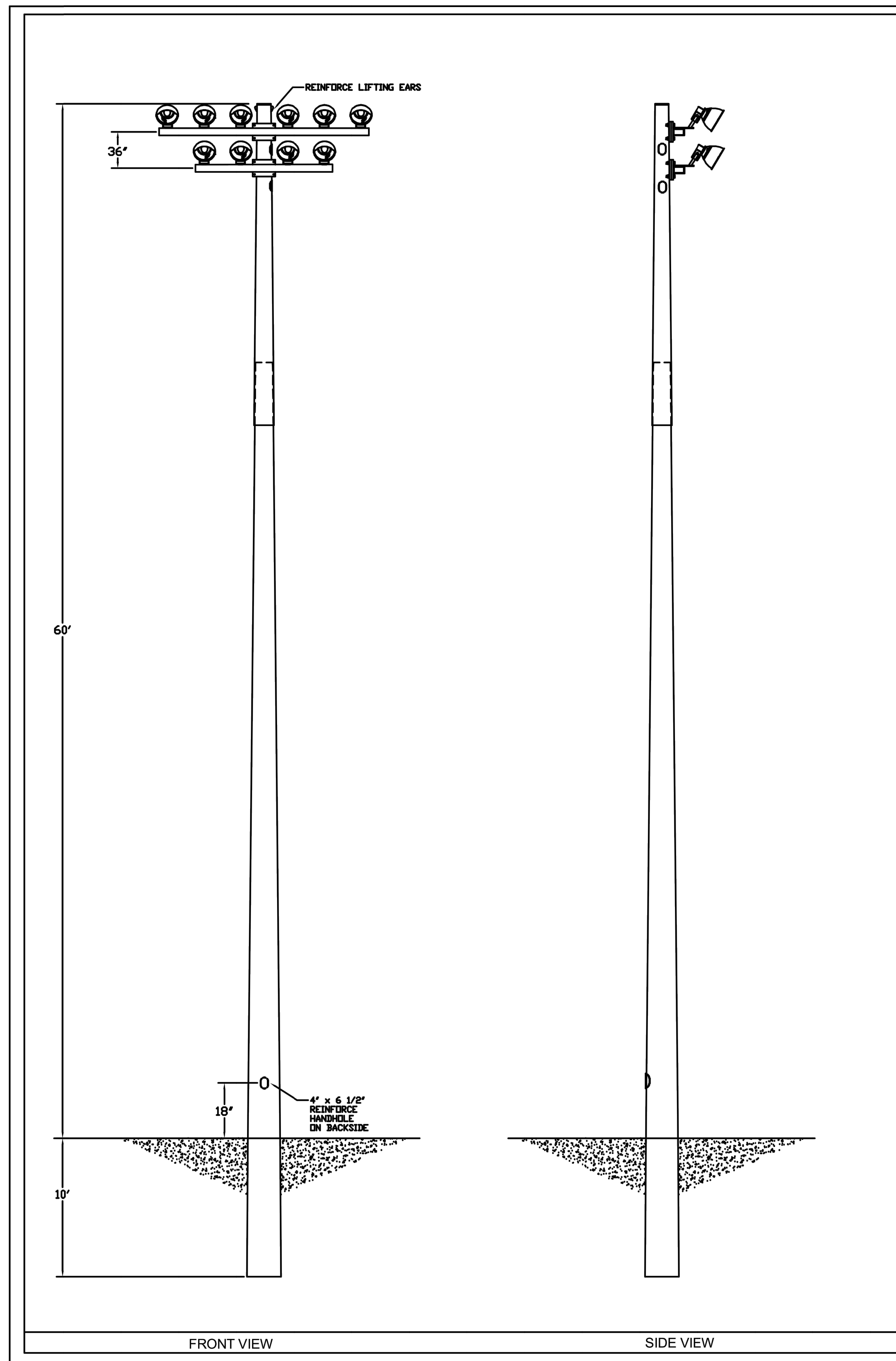
EMBEDDED POLES (EMBEDDED POLES SHALL BE USED FOR THIS PROJECT)
 EMBEDDED POLES SHALL BE SET DIRECTLY INTO THE GROUND WITH AN EMBEDMENT DISTANCE WHICH IS EQUAL TO 10% OF THE FREE POLE HEIGHT PLUS 2 FEET. THE EMBEDDED POLE SHALL NOT UTILIZE A STUB BASE OR BASE PLATE AS AN ANCHORING MEANS BUT SHALL REST UPON A BEARING PLATE WHICH SHALL BE INTEGRALLY WELDED TO THE BOTTOM OF THE POLE SHAFT. THE EMBEDDED PORTION OF THE POLE PLUS 6" SHALL BE ADDITIONALLY PROTECTED WITH A MASTIC COATING DESCRIBED HEREFTER UNDER "PROTECTIVE COATINGS". TWO 3' X 5' HAND HOLES SHALL BE LOCATED 24 INCHES BELOW GRADE AND ORIENTED AT 180 DEGREES APART TO PROVIDE FOR WIRE ACCESS.

STUB BASE
 THE STUB BASE CONSISTS OF A STEEL PIPE WITH AN INTEGRALLY WELDED FLANGE PLATE, WHICH CONFORMS TO THE REQUIREMENTS AND DIMENSIONS OF THE AFOREMENTIONED BASE PLATE. THE FLANGE PLATE IS MECHANICALLY FASTENED TO THE BASE PLATE WITH HARDWARE, WHICH MEETS THE REQUIREMENTS OF ASTM A325. THE BOLTS SHALL INCLUDE TWO FLAT WASHERS AND ONE HEAVY HEX NUT. ALL BOLT HOLES SHALL BE CIRCUMFERENTIALLY SLOTTED TO ALLOW FOR ± 2.5 DEGREES ROTATION FOR FIELD ADJUSTMENT. THE STEEL PIPE USED FOR THE STUB BASE SHALL EITHER MEET OR EXCEED THE REQUIREMENTS OF ASTM A53 GRADE B. THE STUB BASE SHALL HAVE A PAIR OF WIRE ENTRANCES AT 180 DEGREES APART LOCATED 24 INCHES BELOW GRADE, DEPENDENT UPON LOCAL ELECTRICAL CODES.

HAND HOLES
 ALL HAND HOLES SHALL BE PERIPHERALLY REINFORCED WITH FLAT BAR WHICH IS INTEGRALLY WELDED TO THE POLE SHAFT. EACH POLE SHALL HAVE A 4' X 6 1/2" REINFORCED HAND HOLE LOCATED 18" FROM THE BASE OF THE POLE OR FOR EMBEDDED POLES, 18" ABOVE FINISHED GRADE. COVER PLATES SHALL BE INCLUDED WITH ALL HAND HOLES AND SHALL BE ATTACHED TO THE POLE WITH A BACK-BAR AND SCREW. ALL POLES SHALL BE PROVIDED WITH A TAPPED BAR FOR A GROUND LUG OPPOSITE THE HAND HOLE.

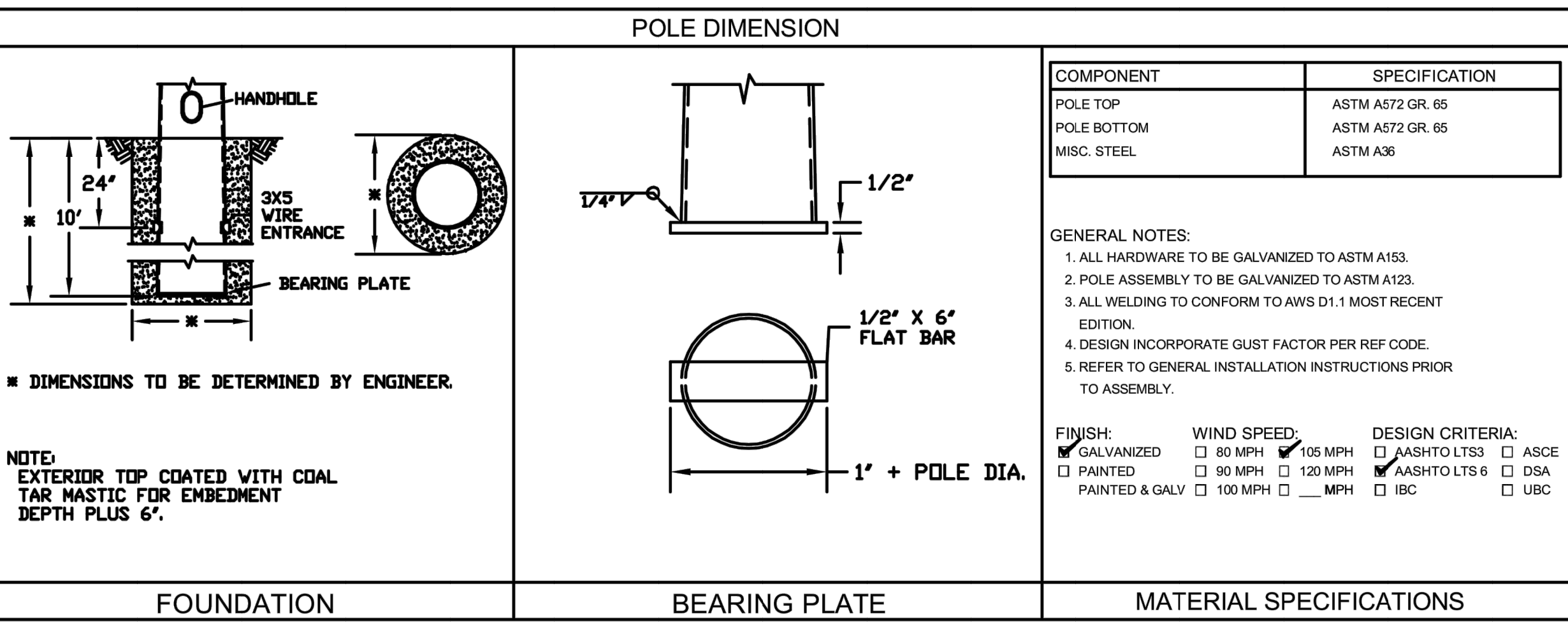
PROTECTIVE COATINGS
 ALL POLE SHAFT AND STUB BASE SECTIONS SHALL BE GALVANIZED IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM A123. EACH SHAFT ASSEMBLY SHALL BE COMPLETELY COATED BOTH INSIDE AND OUT WITH A SINGLE DIP. DOUBLE DIPPING WILL NOT BE PERMITTED IN COMPLIANCE WITH USGA (UNITED STATES GALVANIZING ASSOCIATION) RECOMMENDED PRACTICES. EMBEDDED PORTIONS OF ALL POLE SHAFTS AND STUB BASES SHALL BE ADDITIONALLY PROTECTED WITH MASTIC COATING WHICH MEETS THE PERFORMANCE REQUIREMENTS OF TT-V-51F VARNISH: ASPHALT.

WELDING
 ALL WELDING SHALL BE PERFORMED BY AWS (AMERICAN WELDING SOCIETY) CERTIFIED WELDERS AND ALL WELDS SHALL COMPLY WITH THE MOST RECENT EDITION OF THE AW STRUCTURAL WELDING CODE.



SECTION A-A	SECTION B-B	SECTION C-C
3 X 5" REINFORCE HANDHOLE	CABLE GUIDE	4 X 6 1/2" REINFORCE HANDHOLE

	BASE OD (in)	TOP OD (in)	WALL THC	LENGTH (ft)	WEIGHT (lbs)
TOP	8.25	5.57	.188	19.10	268
BOTTOM	15	7.58	.188	53	1230



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TYPICAL TYPE "A" & "B" LED AREA LIGHTING POLE DETAILS

NTS