# TOWN OF CLARENCE VETERANS MEMORIAL at 10405 MAIN STREET, (T)CLARENCE, ERIE COUNTY, NY

### SITEWORK BID PACKAGE: MARCH 4, 2020

### DRAWING LIST

#### **SITEWORK:**

C101: SITE LAYOUT AND LANDSCAPE PLAN

C102: SITE GRADING, DRAINAGE & UTILITIES PLAN

C103: SITEWORK DETAILS

C104: MONUMENT AND FOUNTAIN FOUNDATIONS

C105: GENERAL NOTES & TYPICAL DETAILS — FOUNDATIONS

E1: ELECTRICAL SCHEDULES
E2: ELECTRICAL DETAILS

E3: ELECTRICAL SITEWORK PLAN
E4: ELECTRICAL SPECIFICATIONS

WATER FEATURE SYSTEM::

PUMP/FILTER SYSTEM LAYOUT AND SPECIFICATIONS (TO FOLLOW)

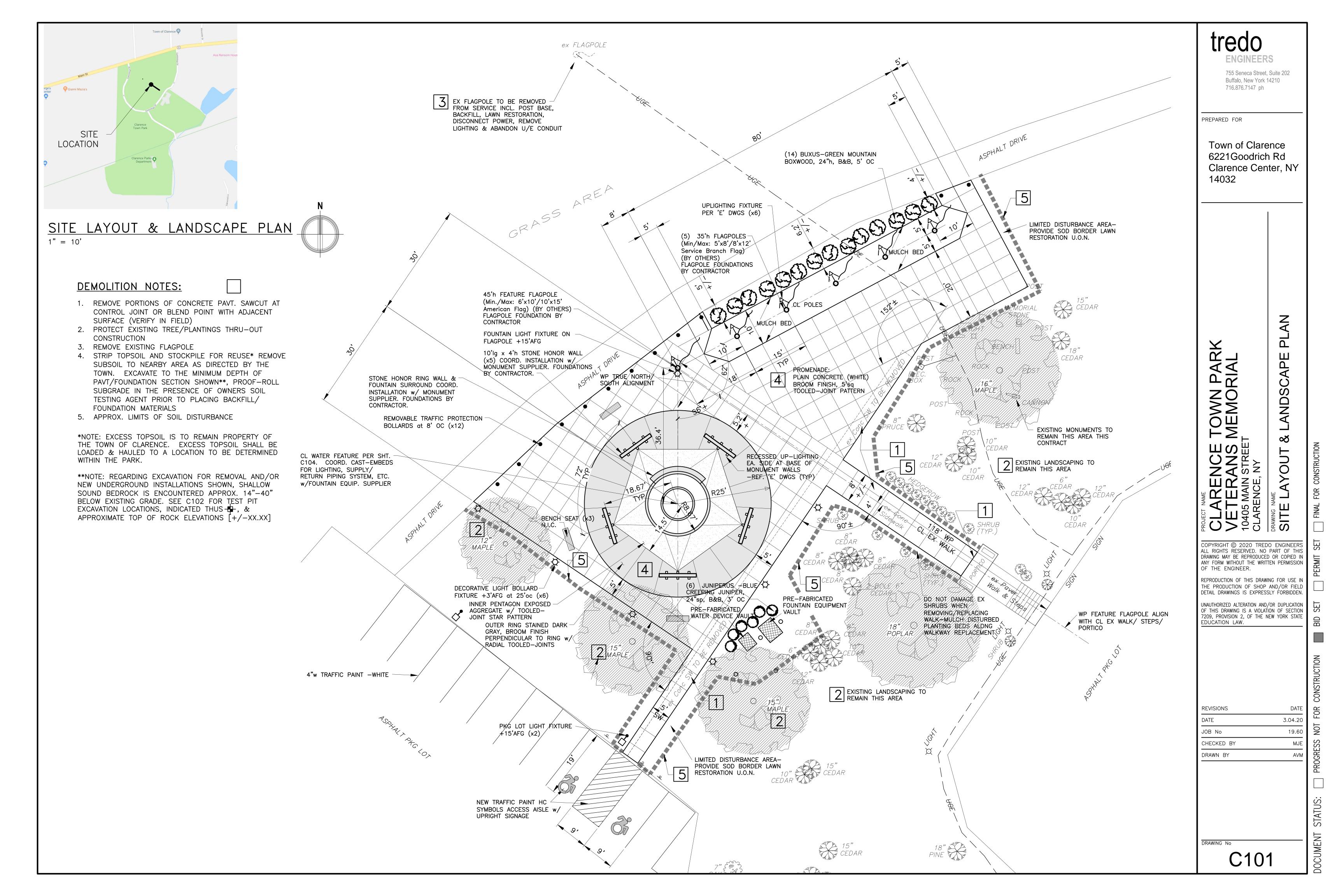


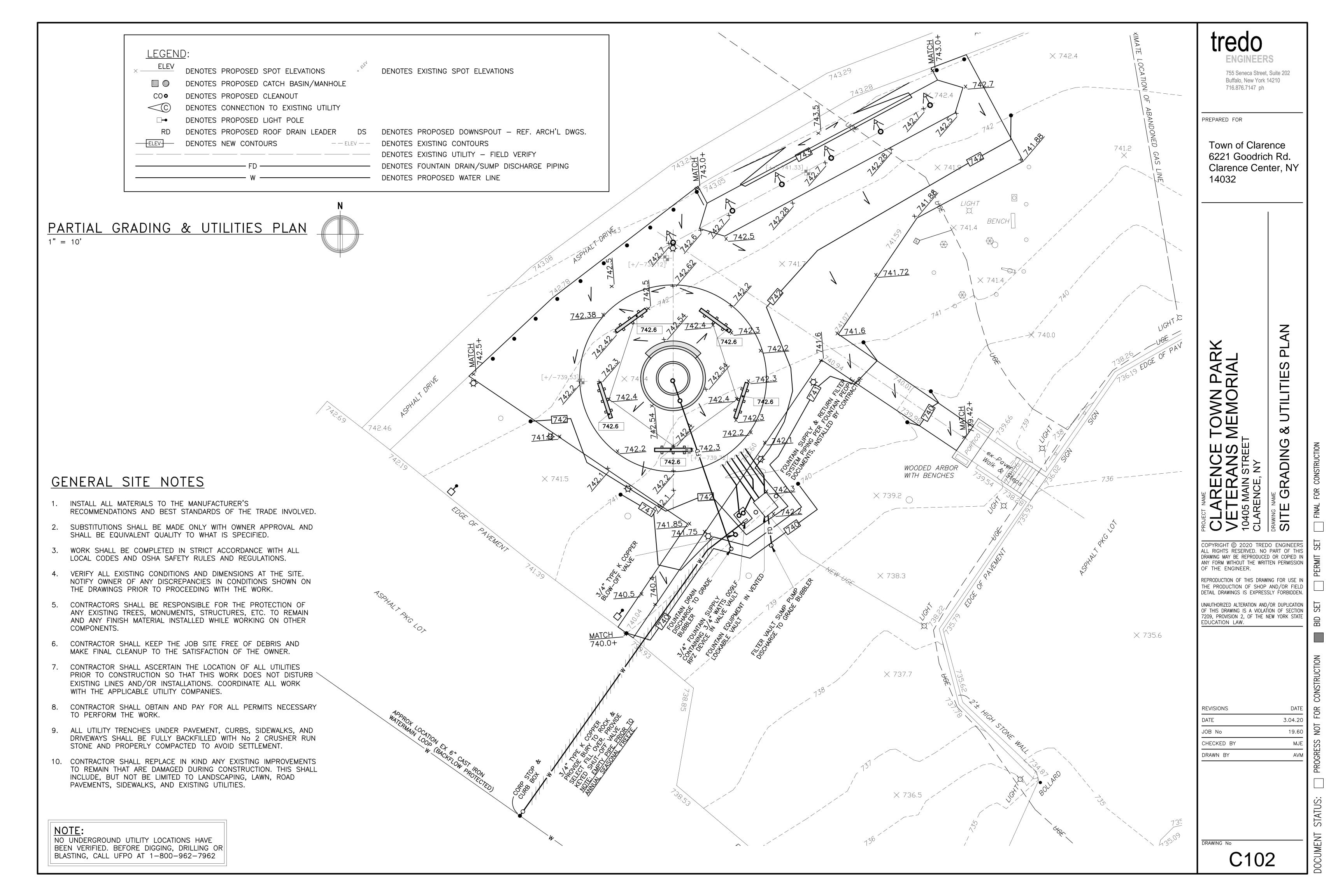
CLIENT:
TOWN OF CLARENCE
6221 GOODRICH RD
CLARENCE CENTER, NY
TEL.: 716-741-8952

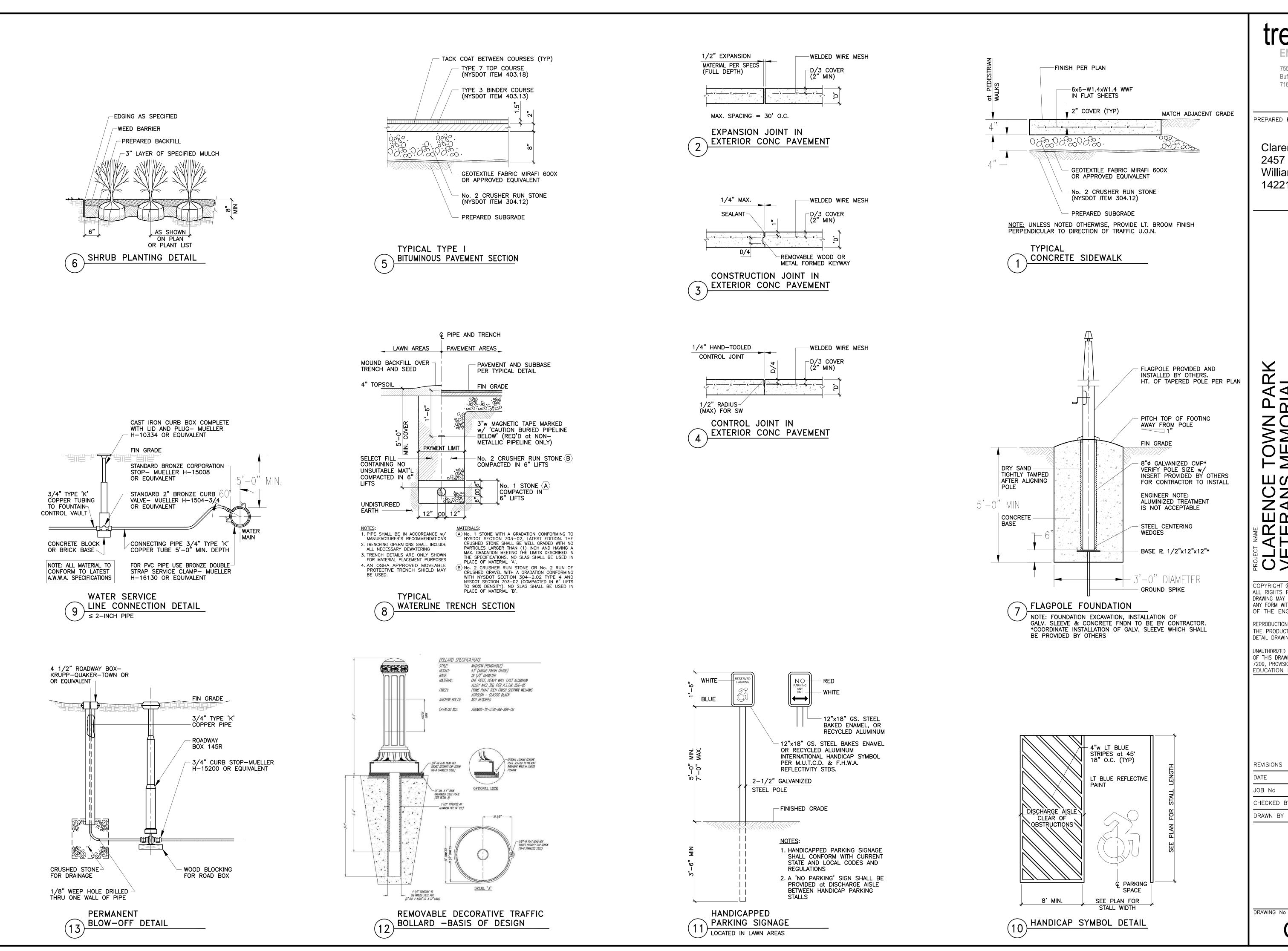
CIVIL ENGINEER:
TREDO ENGINEERS
755 SENECA STREET, SUITE 202
BUFFALO, NY 14210
TEL.: 716-876-7147

ELECTRICAL ENGINEER:
EBS ENGINEERING, PC
2568 WALDEN AVENUE, SUITE 107
CHEEKTOWAGA, NY 14225
TEL.: 716-836-9600

FOUNTAIN DESIGNER: FOUNTAIN PEOPLE 4600 HWY 123 SAN MARCOS, TX 78666 TEL.: 512-392-1155

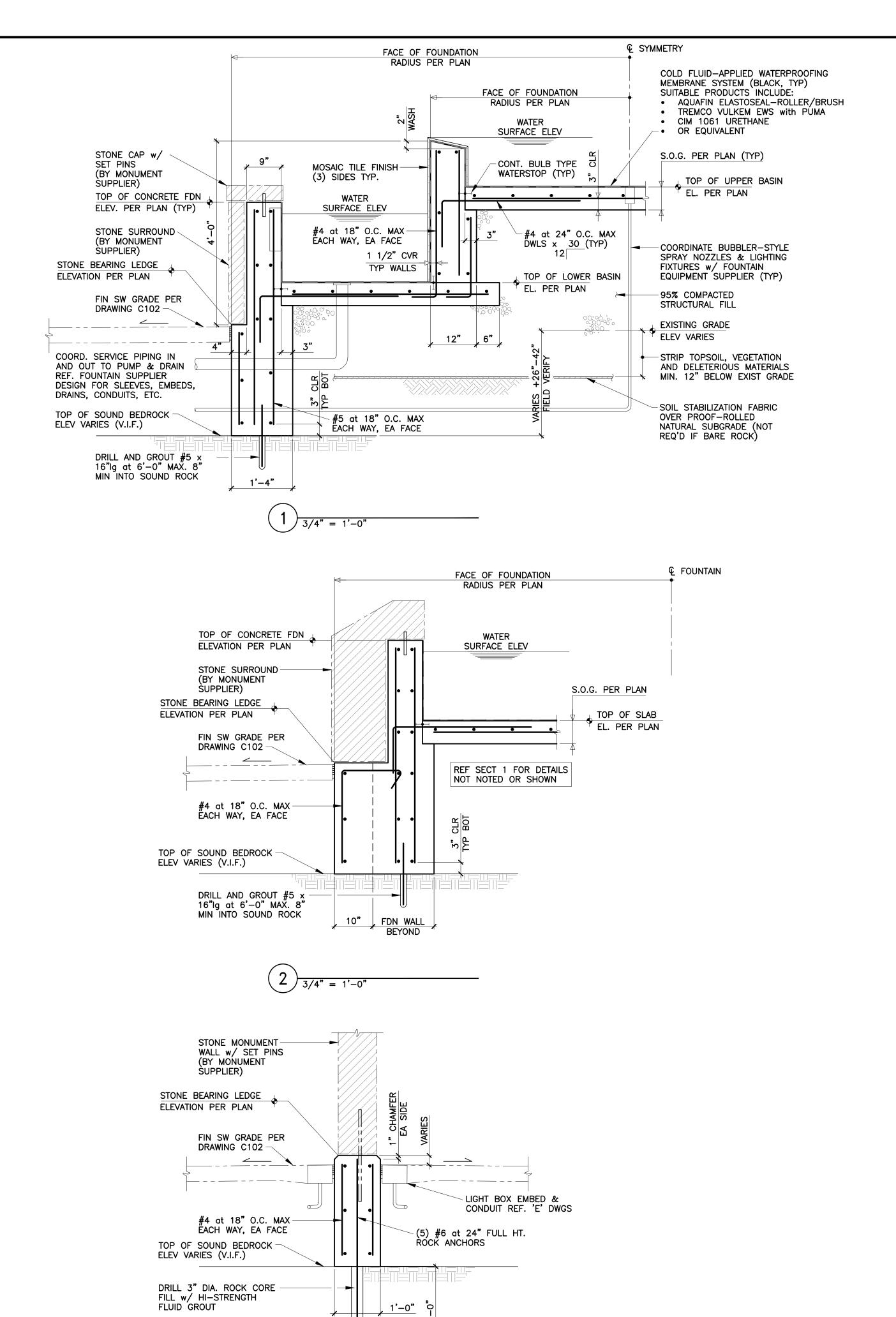


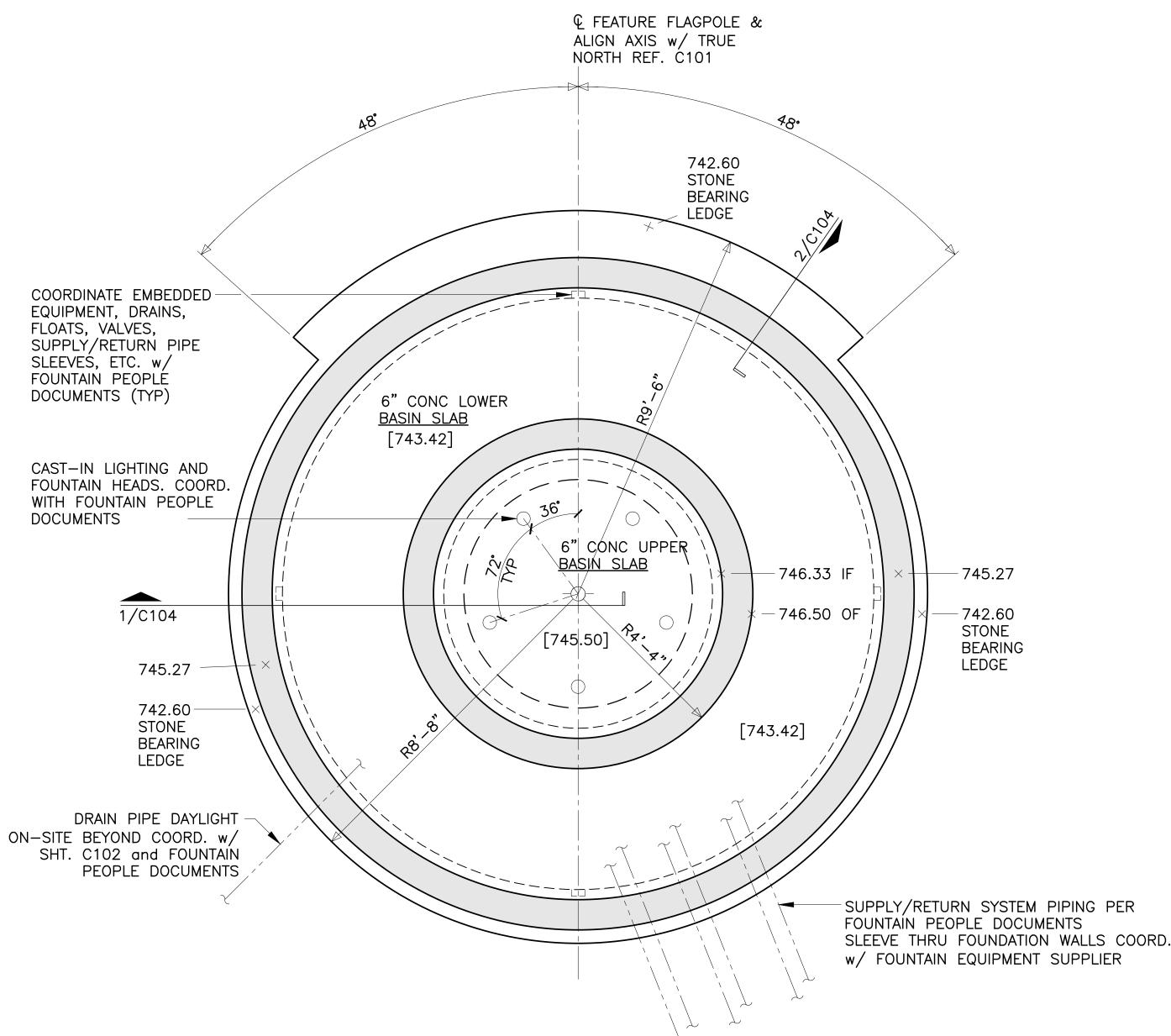


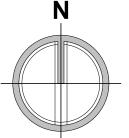


tredo **ENGINEERS** 755 Seneca Street, Suite 202 Buffalo, New York 14210 716.876.7147 ph PREPARED FOR Clarence Rotary 2457 Wehrle Drive Williamsville, NY 14221 PA RIA TOWN COPYRIGHT © 2020 TREDO ENGINEERS ALL RIGHTS RESERVED. NO PART OF THIS DRAWING MAY BE REPRODUCED OR COPIED I ANY FORM WITHOUT THE WRITTEN PERMISSION OF THE ENGINEER. REPRODUCTION OF THIS DRAWING FOR USE I THE PRODUCTION OF SHOP AND/OR FIELD DETAIL DRAWINGS IS EXPRESSLY FORBIDDEN UNAUTHORIZED ALTERATION AND/OR DUPLICATION OF THIS DRAWING IS A VIOLATION OF SECTION 7209, PROVISION 2, OF THE NEW YORK STATE EDUCATION LAW. DATE REVISIONS 3.04.20 JOB No 19.60 CHECKED BY MJE DRAWN BY AVM

C103

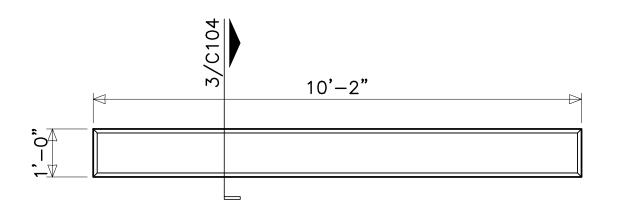






### FOUNTAIN FOUNDATION PLAN 1/2" = 1'-0"

- 1. TOP OF FOUNDATIONS VARY, NOTED THUS: imes
- 2. TOP OF BASIN SLAB EL. VARIES, NOTED THUS: [ ]
- 3. BASIN SLAB ON GRADE TO BE 6"thk REINFORCED WITH #4 at 12" O.C. MAX EACH WAY. HAND—TROWEL FINISH
- 4. ALL REINFORCING SHOWN (WALLS AND SLABS) SHALL BE TIED (BONDED) TO COMPLY WITH CURRENT NEC REQUIREMENTS
- 5. COORDINATE AND EMBED ALL EQUIPMENT, PIPING, AND ELECTRICAL ROUGH—INS WITH FOUNTAIN DESIGN DOCUMENTS PRIOR TO PREPARATION OF SHOP DWGS AND CASTING OF CONCRETE



### $\frac{\text{MONUMENT WALL FNDN PLAN }(x5)}{1/2" = 1'-0"}$

- 1. BOTTOM OF WALL BEARING ON SOUND BEDROCK EL. VARIES
- 2. TOP OF CONC WALL/MONUMENT BEARING EL. PER SITE PLAN C102 NOTED THUS: \_\_\_\_\_\_
- 3. EXPOSED TOP AND SIDES OF WALL FOUNDATIONS SHALL BE STAINED AT THE SAME TIME THAT THE SURROUNDING PAVEMENTS ARE STAINED TO PROVIDE CONSISTENT COLORIZATION

### tredo

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PREPARED FOR

Town of Clarence 6221 Goodrich Road Clarence Center, NY 14032

arence Center, NY 032 \_\_\_\_\_\_

ENCE TOWN PARK
RANS MEMORIAL
IN STREET
SE, NY

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DRAWING No

C104

#### **GENERAL NOTES**

#### **FOUNDATIONS**

- F1 ALL FOUNDATIONS SHALL BEAR ON EXISTING BEDROCK.
- F2 NO FOUNDATIONS OR SLABS SHALL BE PLACED IN WATER OR ON FROZEN GROUND.
- F3 ALL EXCAVATIONS ARE TO BE FINISHED BY HAND. PLACE FOOTING CONCRETE SAME DAY OF EXCAVATION OR PROTECT SUBGRADE BY IMMEDIATELY PLACING A 3-INCH LEAN CONCRETE MUD MAT.
- F4 ALL FINISHED EXCAVATIONS AND BEARING GRADES SHALL BE INSPECTED AND APPROVED BY THE OWNER'S SOIL TESTING AGENCY BEFORE ANY CONCRETE IS PLACED.
- F5 ALL STRUCTURAL FILL UNDER ANY PORTION OF THE STRUCTURE SHALL BE COMPACTED IN 8-INCH LIFTS. SEE SPECIFICATIONS FOR THE ACCEPTABLE GRADATIONS AND COMPACTION REQUIREMENTS.
- F6 THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THE VALIDITY OF THE SUBSURFACE CONDITIONS DESCRIBED ON THE DRAWINGS. THESE DATA REPRESENT CONDITIONS ONLY AT THESE SPECIFIC LOCATIONS AT THE PARTICULAR TIME THEY WERE MADE.
- F7 BACKFILL AGAINST FOUNDATION WALLS BELOW GRADE SO THAT THE DIFFERENCE IN FILL LEVEL ON OPPOSITE SIDES DOES NOT EXCEED 1'\_0" AT ANY TIME.
- F8 ALL FOUNDATION WALLS SHALL BE BRACED DURING THE OPERATION OF BACKFILLING AND COMPACTION. BRACING SHALL BE LEFT IN POSITION UNTIL PERMANENT RESTRAINTS ARE EFFECTIVE. BACKFILL NO FOUNDATION WALLS UNTIL PERMANENT LATERAL STRUCTURAL SUPPORT SYSTEM IS IN PLACE AND OF ADEQUATE STRENGTH TO WITHSTAND THE APPLIED LATERAL PRESSURES.
- F10 LOCATE ALL EXISTING BELOW GRADE UTILITIES. PROVIDE UTILITIES WITH POSITIVE PROTECTION AGAINST DAMAGE DUE TO SETTLEMENT AND CONSTRUCTION OPERATIONS.
- F11 USE SIDE FORMS FOR ALL WALLS.
- F12 THE EXPOSED SUBGRADE SOILS MAY BE SENSITIVE TO DISTURBANCE AND STRENGTH DEGRADATION WHEN HIGH MOISTURE CONTENTS ARE PRESENT. MINIMIZE CONSTRUCTION TRAFFIC OVER EXPOSED SUBGRADES AND DO NOT ALLOW WATER TO POND ON THESE SUBGRADES. CONTROL SURFACE AND GROUND WATER BY PROPER SITE GRADING, SURFACE DRAINAGE CHANNELS, PERIMETER CUTOFF TRENCHES AND SUMP PUMP METHODS UNTIL GROUND FLOOR SLABS, PERIMETER WALLS AND WATERPROOFING ARE INSTALLED AND THE PERMANENT BUILDING DRAINAGE SYSTEM IS FULLY OPERATIONAL.
- F13 RETAIN THE PERIMETER OF THE GENERAL EXCAVATION WHERE NECESSARY AND AS RECOMMENDED BY THE OWNER'S SOILS TESTING AGENCY. THE DESIGN, INSTALLATION, MAINTENANCE AND REMOVAL ARE THE COMPLETE AND SOLE RESPONSIBILITY OF THE CONTRACTOR. PROVIDE ALL MEASURES AND PRECAUTIONS NECESSARY TO PREVENT AND MINIMIZE SETTLEMENT OF EXISTING OR NEW CONSTRUCTION INSIDE OR OUTSIDE THE PROJECT LIMITS.
- F14 SEE SPECIFICATION SECTION 312000 -EARTHMOVING FOR ADDITIONAL REQUIREMENTS.

#### CONCRETE

- C1 ALL CONCRETE SHALL BE CONTROLLED CONCRETE.
- C2 A QUALITY CONTROL PROGRAM OF FIELD TESTING AND INSPECTION SHALL BE PERFORMED ON ALL STRUCTURAL CONCRETE WORK IN ACCORDANCE WITH THE SPECIFICATIONS.
- C3 CONCRETE SHALL HAVE THE FOLLOWING MINIMUM COMPRESSIVE STRENGTH AT 28-DAYS:

A.	FOUNDATION WALLS	4000 PSI
В.	SLABS ON GRADE	3500 PSI
C.	ALL OTHER CONCRETE	3000 PSI

- C4 ALL CONCRETE SHALL BE NORMAL WEIGHT CONCRETE WITH A NOMINAL AIR DRY DENSITY OF 145 PCF.
- C5 FOR AIR ENTRAINMENT AND OTHER CONCRETE CHARACTERISTICS SEE SPECIFICATIONS.
- C6 PROVIDE CONSTRUCTION JOINTS WHERE SHOWN. OMIT NONE AND ADD NONE WITHOUT WRITTEN APPROVAL FROM THE ARCHITECT/ENGINEER. SUBMIT DRAWINGS SHOWING ALL PROPOSED CONSTRUCTION JOINT LOCATIONS FOR APPROVAL PRIOR TO PREPARATION OF AFFECTED REINFORCEMENT SHOP DRAWINGS.
- C7 SIZES OF CONCRETE PLACEMENTS SHALL NOT EXCEED THE FOLLOWING:
- A. WALLS SECTION 60-FEET MAXIMUM LENGTH.

B. SLABS ON GRADE - PLACE IN ACCORDANCE WITH JOINT PATTERNS INDICATED ON PLAN. PLACE IN LINEAR STRIPS NOT TO EXCEED 30 FT. PLACEMENTS AREA SHALL NOT EXCEED "FORMED JOINTS" AS INDICATED ON PLAN WITHOUT PRIOR ACCEPTANCE BY THE ARCHITECT/ENGINEER. BEGIN SAWCUTTING OF THE SLAB AS SOON AS THE SAW DOES NOT CAUSE THE SURFACE TO BE TORN OR DAMAGED, BUT IN NO CASE MORE THAN 12 HOURS AFTER SLAB FINISHING OPERATIONS.

FOR BID/SCHEDULING PURPOSES. IT IS ASSUMED THAT. FOLLOWING COMPLETION OF THE FOUNDATIONS AND FOUNTAIN EQUIPMENT ROUGH-IN. THE EXPOSED AGGREGATE PENTAGON AND THE STAINED OUTER RING WILL BE CAST AND FINISHED SEPERATELY. THE BALANCE OF THE PLAZA PAVEMENTS SHALL BE COMPLETED AFTER THE STONE MONUMENTS ARE INSTALLED.

- C8 MINIMUM ELAPSED TIME BETWEEN ADJACENT CONCRETE PLACEMENTS SHALL BE 48 HOURS.
- C9 CONCRETE SLABS SHALL BE CAST SO THAT THE SLAB THICKNESS IS AT NO POINT LESS THAN THAT INDICATED ON THE DRAWINGS.
- C10 CONCRETE MIX DESIGN FOR EACH TYPE AND STRENGTH OF CONCRETE SPECIFIED SHALL BE SUBMITTED FOR ARCHITECT/ENGINEER REVIEW 30-DAYS PRIOR TO PLACEMENT OF CONCRETE.
- C11 WIRE BRUSH CLEAN AND MOISTEN ALL CONSTRUCTION JOINTS IMMEDIATELY PRIOR TO PLACING NEW CONCRETE.
- C12 NO CALCIUM CHLORIDE SHALL BE USED IN ANY CONCRETE.
- C13 REFER TO ACI 305 FOR HOT WEATHER CONCRETE REQUIREMENTS AND ACI 306 FOR COLD WEATHER CONCRETE REQUIREMENTS.
- C14 SEE SPECIFICATION <u>SECTION 033000 CAST IN PLACE CONCRETE</u> FOR CONCRETE MIX CRITERIA AND ADDITIONAL REQUIREMENTS.

#### **REINFORCING**

- R1 ALL BAR REINFORCEMENT SHALL CONFORM TO ASTM 615, GRADE 60.
- R2 WELDED WIRE FABRIC REINFORCEMENT SHALL CONFORM TO ASTM A185.
- R3 CLEARANCE OF MAIN REINFORCEMENT FROM ADJACENT SURFACES SHALL CONFORM TO THE FOLLOWING (UNLESS OTHERWISE SHOWN IN DETAIL):
- 3 INCHES UNFORMED SURFACES IN CONTACT WITH GROUND (WALL BOTTOM) SLABS ON GRADE **2 1/2 INCHES** FORMED SURFACES IN CONTACT WITH 2 INCHES **GROUND OR EXPOSED TO WEATHER (WALLS)**
- D. IN ALL CASES, CLEARANCE NOT LESS THAN DIAMETER OF BARS.

NOTE: MAXIMUM DEVIATION FROM THESE REQUIREMENTS SHALL BE +1/4" FOR SECTIONS TEN (10) INCHES OR LESS AND +1/2" FOR SECTIONS OVER TEN (10) INCHES THICK.

- R4 REINFORCEMENT SHALL BE CONTINUOUS THROUGH ALL CONSTRUCTION JOINTS UNLESS OTHERWISE INDICATED ON DRAWINGS.
- R5 WHERE REINFORCING IS NOT SHOWN ON THE DRAWINGS, PROVIDE REINFORCEMENT IN ACCORDANCE WITH APPLICABLE TYPICAL DETAILS OR SIMILAR TO THAT SHOWN FOR MOST NEARLY SIMILAR SITUATIONS, AS DETERMINED BY THE ARCHITECT/ENGINEER. IN NO CASE SHALL REINFORCEMENT BE LESS THAN MINIMUM PERMITTED BY THE APPLICABLE CODES.
- R6 ALL WORKMANSHIP AND MATERIAL SHALL CONFORM TO THE "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES" (ACI-315), AND BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI-318).
- R7 ALL REINFORCING SHALL BE INSPECTED AND APPROVED BY THE ARCHITECT/ENGINEER OR OWNER'S TESTING AGENCY BEFORE CONCRETE IS PLACED.
- R8 WHERE CONTINUOUS BARS ARE CALLED FOR, THEY SHALL BE RUN CONTINUOUSLY AROUND CORNERS, LAPPED AT NECESSARY SPLICES AND HOOKED AT DISCONTINUOUS ENDS.
- R9 WELDED WIRE FABRIC SHALL BE LAPPED ONE FULL MESH PANEL OR 6" MINIMUM.
- R10 ALL REINFORCING SPLICES SHALL CONFORM TO THE TABLE(S) PROVIDED IN THE GENERAL NOTES FOR EACH STRENGTH OF CONCRETE BUT IN NO CASE LESS THAN THE REQUIREMENTS OF THE LATEST EDITION OF ACI-318.
- R11 SLABS AND WALLS SHALL NOT BE SLEEVED OR BOXED OUT OR HAVE THEIR REINFORCING INTERRUPTED EXCEPT AS SPECIFICALLY NOTED ON THE DRAWINGS. PROVIDE ADDITIONAL REINFORCEMENT AROUND OPENINGS AS SHOWN IN THE DETAILS.
- R12 SUBMIT CHECKED SHOP DRAWINGS TO THE ENGINEER FOR REVIEW PRIOR TO FABRICATION OF REINFORCING. DRAWINGS SHALL SHOW REINFORCING DETAILS, INCLUDING SIZE AND SPACING OF BARS AND SUPPORT DETAILS. SHOP DRAWINGS SHALL INDICATE CONSTRUCTION JOINTS, CURBS, DEPRESSIONS, SLEEVES, AND OPENINGS, ETC... WITH ALL ADDITIONAL REINFORCING REQUIRED.
- R13 BAR SUPPORTS SHALL BE GALVANIZED OR STAINLESS STEEL. IN ADDITION, BAR SUPPORTS IN CONTACT WITH **EXPOSED SURFACES SHALL BE PLASTIC TIPPED.**

#### **MISCELLANEOUS**

REQUIREMENTS.

- M1 CONTRACTOR SHALL VERIFY ALL DIMENSIONS ON THE JOB. VERIFICATION OF EXISTING DIMENSIONS AND CONDITIONS SHALL BE DONE PRIOR TO PREPARATION OF SHOP DRAWINGS.
- M2 ALL OPENINGS THROUGH SLABS AND WALLS ARE NOT SHOWN. PROVIDE UNIT PRICES FOR ADDITIONAL FRAMING AND REINFORCING.
- M3 CONSULT THE ARCHITECTURAL, MECHANICAL AND ELECTRICAL DRAWINGS FOR LOCATIONS AND DIMENSIONS OF CHASES, INSERTS, OPENINGS, SLEEVES, WASHES, DRIPS, REVEALS, DEPRESSIONS AND OTHER PROJECT
- M4 ALL WORK SHALL CONFORM TO THE LATEST EDITIONS OF THE BUILDING CODE OF NEW YORK STATE, THE AISC CODE, THE ACI BUILDING CODE (ACI 318, ACI 530), THE AMERICAN WELDING SOCIETY CODE AND ALL OTHER APPLICABLE ASTM STANDARDS. IN CASES OF CONFLICT, THE MOST STRINGENT SHALL GOVERN.
- M5 TYPICAL DETAILS APPLY TO ALL DRAWINGS AND SHALL BE USED EXCEPT WHERE OTHERWISE SHOWN OR NOTED.

#### **DESIGN LOADS**

WIND LOAD - SOLID SIGN	
ULTIMATE DESIGN WIND SPEED	105 MPH
RISK CATEGORY	1
WIND EXPOSURE	В
GUST FACTOR	0.85
NET FORCE COEFFICIENT	1.4

#### BEAM, SLAB AND WALL REINFORCING LAP SPLICE LENGTHS

LAP SPLICE LENGTHS FOR REINFORCING IN 4000 PSI CONCRETE ARE AS FOLLOWS:

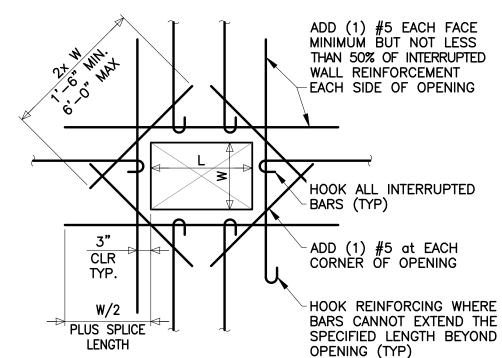
	TENSIO	N SPLICE	
BAR SIZE	TOP	OTHER	DEVELOPMENT LENGTH
3	21	15	13
4	29	20	17
5	36	26	21
6	43	31	25
7	54	39	32
8	71	51	42
9	90	65	53
10	115	82	68
11	163	101	83

#### LAP SPLICE LENGTHS FOR REINFORCING IN 3000 PSI CONCRETE ARE AS FOLLOWS:

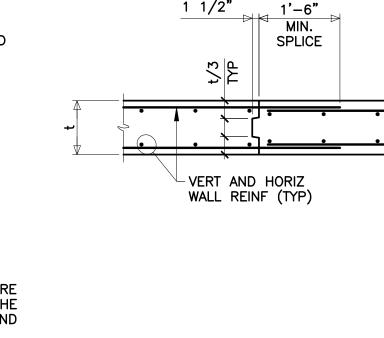
	TENSIO	N SPLICE	
BAR SIZE	TOP	OTHER	<b>DEVELOPMENT LENGTH</b>
3	21	15	13
4	29	20	17
5	36	26	21
6	46	33	27
7	63	45	37
8	82	59	49
9	104	75	61
10	132	95	78
11	163	116	96

#### NOTES:

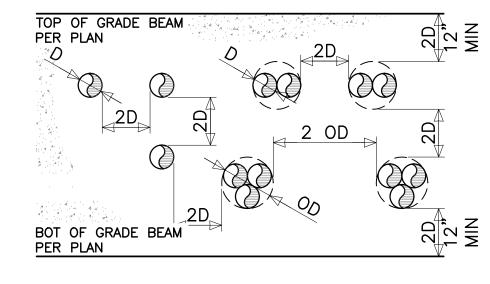
- 1. LAPPED SPLICE LENGTHS BASED ON ASTM A-615, GRADE 60, REBAR.
- 2. REINFORCING BARS ARE CLASSED AS TOP BARS WHEN MORE THAN 12" OF CONCRETE IS CAST BENEATH RESPECTIVE REINFORCING BAR.
- COMPRESSION SPLICES PERMISSIBLE ONLY WHERE SPECIFICALLY NOTED ON THE DRAWINGS, DETAILS OR SCHEDULES.
- TENSION SPLICES SHALL BE USED IN ALL BEAMS, SLABS AND WALLS UNLESS OTHERWISE NOTED. WHEN LAPPING LARGER BAR WITH SMALLER BAR, LAP LENGTH FOR SMALLER BAR SHALL GOVERN RESPECTIVE SPLICE.
- SPLICE CONTINUOUS TOP REINFORCING BARS AT CENTER OF CLEAR SPAN WITH COMPRESSION SPLICES.
- SPLICE CONTINUOUS BOTTOM REINFORCING BARS AT CENTER OF SUPPORTING ELEMENT WITH COMPRESSION SPLICES.
- 8. ALL SPLICE LENGTHS NOTED IN INCHES.





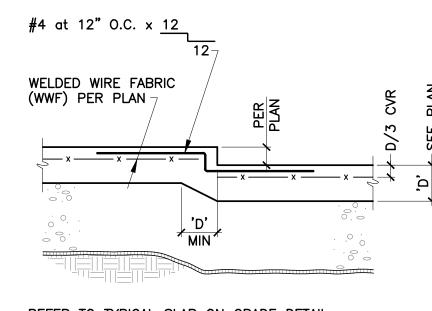






MEP SUBCONTRACTOR TO COORDINATE WITH CONTRACTOR ALL PENETRATIONS, SLEEVES, ETC. NO PENETRATIONS OR SLEEVES SHALL BE CORED OR FIELD CUT WITHOUT THE EXPRESS APPROVAL OF THE STRUCTURAL ENGINEER OF RECORD. PROVIDE ADD'L GRADE BEAM REINFORCING PER TYP. DETAIL





REFER TO TYPICAL SLAB ON GRADE DETAIL FOR ADDITIONAL INFORMATION NOT SHOWN

**DEPRESSED** SLAB ON GRADE DETAIL (DEPTH LESS THAN TOTAL SLAB THICKNESS)

755 Seneca Street Suite 202 Buffalo, New York 14210 716.876.7147 ph

PREPARED FOR

Town of Clarence 6221 Goodrich Road Clarence Center, NY

14032

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**REVISIONS** DATE DATE 3.04.20 18.60 JOB No CHECKED BY MJE MJN DRAWN BY

DRAWING No

NOT ALL SYMBOLS MAY BE REPRESENTED ON DRAW	/II
POWER SYMBOLS	
HOMERUN TO PANELBOARD 2#12, 1#12G IN 1/2"C UNLESS SHOWN OTHERWISE.	
J JUNCTION BOX (SIZE AS REQUIRED)	
~ CONDUIT/WIRE BREAK	
C CONDUIT STUB OUT	
CONDUIT STUB-DOWN	
O CONDUIT STUB-UP	
208Y/120V RECESSED OR SURFACE MOUNTED PANELBOARD	
480Y/277V RECESSED OR SURFACE MOUNTED PANELBOARD	
10 POWER TERMINAL CONNECTION TO EQUIPMENT ITEM.	
30 POWER TERMINAL CONNECTION TO EQUIPMENT ITEM.	
ELECTRIC MOTOR — PROVIDED & INSTALLED BY OTHERS, WIRED BY E.C. SEE EQUIPMENT WIRING SCHEDULE FOR ELEC. REQUIREMENTS	
← RECEPTACLE (SIMPLEX) # INDICATES CKT.	
RECEPTACLE (DUPLEX) # INDICATES CKT.	
RECEPTACLE (QUAD) # INDICATES CKT.	
RECEPTACLE (DUPLEX) — TOP HALF SHALL BE CONTROLLED BY A TOGGLE SWITCH, BOTTOM HALF SHALL BE HARDWIRED.	
RECEPTACLE (DUPLEX) W/ GROUND FAULT PROTECTION, # INDICATES CKT.	
RECEPTACLE (QUAD) W/ GROUND FAULT PROTECTION, # INDICATES CKT.	
RECEPTACLE (DUPLEX) W/ GROUND FAULT PROTECTION & A WEATHERPROOF COVER WP # INDICATES CKT.	
SPECIAL" RECEPTACLE — VERIFY NEMA TYPE AND INSTALLATION LOCATION IN FIELD.	
RECESSED FLOOR BOX — SEE "FLOOR BOX  FB SCHEDULE" FOR FURTHER INFORMATION. # INDICATES CKT.	
\$ MS MANUAL MOTOR STARTER	
MAGNETIC MOTOR STARTER	
COMBINATION MOTOR STARTER/FUSED DISCONNECT SWITCH	
NON-FUSED DISCONNECT SWITCH	

### BOILER EMERGENCY SHUTDOWN SWITCH

GENERAL NOTES TO ELECTRICAL SYMBOLS LEGEND:

FU FUSED DISCONNECT SWITCH

a. UTILIZE TYPE "MC" CABLE IN CONCEALED AREAS UNLESS NOTED OTHERWISE. EXPOSED ELECTRICAL WORK SHALL BE INSTALLED WITHIN CODE SIZED CONDUIT WITH STEEL SET SCREW FITTINGS. b. MULTIWIRE BRANCH CIRCUITS SHALL BE INSTALLED PER ALL REQUIREMENTS OF N.E.C. ARTICLE 210.4. HANDLE TIES MUST BE INSTALLED TO IDENTIFY SINGLE-POLE, MULTIWIRE BRANCH CIRCUITS

PER ALL REQUIREMENTS OF N.E.C. ARTICLE 240.15(B). c. ALL STANDARD RECEPTACLES SHALL BE INSTALLED 18" A.F.F., TO CENTER OF BOX, FLUSH TO FINISHED WALL, UNLESS OTHERWISE NOTED. d. ALL INTERIOR GFI RECEPTACLES SHALL BE INSTALLED 44" A.F.F.,

TO CENTER OF BOX/ABOVE COUNTER TOP, FLUSH TO FINISHED WALL, UNLESS OTHERWISE NOTED. COORDINATE INSTALLATION HEIGHT WITH ARCHITECTURAL MILLWORK/ELEVATION PLANS WHEN APPLICABLE. e. ALL EXTERIOR GFI RECEPTACLES SHALL BE INSTALLED

HORIZONTALLY 24" A.F.G., TO CENTER OF BOX, FLUSH TO FINISHED WALL, UNLESS OTHERWISE NOTED. PROVIDE A WEATHERPROOF COVERPLATE FOR EXTERIOR USE. f. ALL TOGGLE SWITCHES, DIMMERS, KEYED SWITCHES ETC... SHALL BE INSTALLED 48" A.F.F., TO CENTER OF BOX, FLUSH TO FINISHED WALL, UNLESS OTHERWISE NOTED.

g. ELECTRICAL DEVICES WITHIN HANDICAP ACCESSIBLE ROOMS SHALL BE INSTALLED AT HEIGHTS PER ADA REQUIREMENTS. h. COMMUNICATION DEVICES (IE: TELEPHONE, DATA, CATV) SHALL BE INSTALLED 18" A.F.F., TO CENTER OF BOX, FLUSH TO FINISHED WALL, UNLESS OTHERWISE NOTED. i. FIRE ALARM DEVICES SHALL BE INSTALLED AS NOTED IN INDIVIDUAL DESCRIPTIONS.

#### LIGHTING FIXTURE SCHEDULE

SYMBOL/ DESIGNATION	DESCRIPTION	LAMP (QTY/TYPE/ COLOR)	VOLT	VA	MOUNTING	MANUFACTURER/ MODEL #
FS	GROUND MOUNTED LED FLOODLIGHT ILLUMINATES FLAG POLES AND INSTALLED ON CONCRETE BASE. NARROW SPOT FLOOD, DARK BRONZE WITH GLARE SHIELD UNLESS OTHERWISE DIRECTED BY THE TOWN. ADJUST TO ILLUMINATE FLAGS PER TOWN REQUIREMENTS.	LED/4100°K/ 2,666 LUMENS	120V	36W	GROUND MOUNTED— TOP OF CONCRETE BASE.	HYDREL LIGHTING ; TPS1-18LED-WHT41-NS YM-GS-DDB
FP	FLAGPOLE MOUNTED LED FLOODLIGHT ILLUMINATES HONOR WALL. MEDIUM FLOOD, DARK BRONZE WITH GLARE SHIELD UNLESS OTHERWISE DIRECTED BY THE TOWN. ADJUST TO ILLUMINATE WALL PER TOWN REQUIREMENTS. PROVIDE ALL MOUNTING HARDWARE.	LED/4100°K/ 2,666 LUMENS	120V	36W	PENDANT/STEM MOUNT 15'-0" A.F.G.	HYDREL LIGHTING; TPS1-18LED-WHT41-MF YM-GS-DDB COORD. ADDITIONAL MOUNTING WITH MANUFACTURER
FH	LED FLUSH MOUNTED "IN GROUND" LED UPLIGHT WITH 30° OPTICS. TRAFFIC RATED, CLEAR ANTI—SKID TEMPERED GLASS, STAINLESS STEEL FACEPLATE AND INTEGRAL LED DRIVER.	LED/4000°K/ 771 LUMENS	120V	12.6W	FLUSH/GRADE RECCESED IN CONCRETE	BEGA LIGHTING: 77–023–R–K4
В	DECORATIVE LED BOLLARD WITH INTEGRAL DIRECT BURY STEEL BASE FOUNDATION. ALUMINUM CONSTRUCTION. BRONZE COLOR UNLESS OTHERWISE DIRECTED BY THE TOWN. PROVIDE LV TRANSFORMER AND LOCATE IN FIRST BOLLARD.	LED/4000°K	12- 24V	5.8W	GROUND MOUNTED	BEGA LIGHTING: 77–265

#### GENERAL NOTES TO LIGHTING FIXTURE SCHEDULE

CONTRACTOR TO VERIFY VOLTAGE SUPPLY TO EACH FIXTURE BEFORE ORDERING.

FURNISH ALL FIXTURES COMPLETE WITH LAMPS. ALL LIGHTING FIXTURES SHALL CONFORM, AS A MINIMUM STANDARD, TO THE APPLICABLE

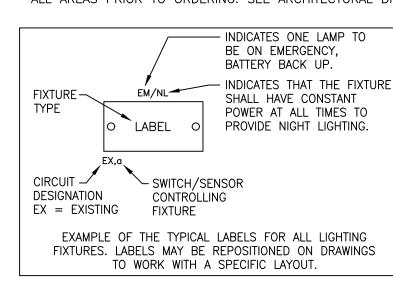
PORTIONS OF THE FEDERAL SPECIFICATIONS. 4. EACH LIGHTING FIXTURE SHALL BE SUPPORTED IN ACCORDANCE WITH ALL APPLICABLE CODE

PROVIDE "EARTHQUAKE CLIPS" ON LAY-IN (OR GRID) TROFFERS. 6. WHERE FIXTURES ARE INSTALLED ON DRYWALL CEILINGS, THEY SHALL BE SUPPORTED FROM THE CEILING FRAMING SYSTEM OR THE BUILDING STRUCTURE. SUPPORT FROM DRYWALL IS NOT

7. FIXTURES DESIGNATED "NL" SHALL BE PROVIDED WITH A CONSTANT POWER CONNECTION IN ORDER TO REMAIN ON AT ALL TIMES.

8. FIXTURES DESIGNATED "EM" SHALL HAVE BATTERY BACKUP FOR EMERGENCY LIGHTING. EMERGENCY LIGHTING BATTERY PACKS SHALL PROVIDE 1-1/2 HOURS OF RELATED LAMP

9. ELECTRICAL CONTRACTOR SHALL VERIFY THE REQUIREMENT OF FLANGE KITS FOR FIXTURES IN ALL AREAS PRIOR TO ORDERING. SEE ARCHITECTURAL DRAWINGS FOR RCP DETAILS.



CURRENT TRANSFORMER

COPPER

EF EXHAUST FAN

DIA DIAMETER

ELEV ELEVATOR

EX EXISTING

FCU FAN COIL UNIT

GROUND

F FUSE

EM EMERGENCY

DIRECT CURRENT

EC ELECTRICAL CONTRACTOR

EPO EMERGENCY POWER OFF

EWC ELECTRIC WATER COOLER

FAA FIRE ALARM ANNUNCIATOR

FMC FLEXIBLE METAL CONDUIT

ETR EXISTING TO REMAIN

FLA FULL LOAD AMPERES

GC GENERAL CONTRACTOR

EMT ELECTRICAL METALLIC TUBING

#### GENERAL SYMBOLS & ABBREVIATION

L	NOT ALL ABBREVIATIONS M	AY BE REPRESENTED ON DRAWINGS	
	SIGNIFIES EXISTING ELECTRICAL EQUIPMENT/ DEVICES TO REMAIN  SIGNIFIES EXISTING  ELECTRICAL EQUIPMENT/ DEVICES TO BE REMOVED  KEYNOTE  REVISION TAG  PHASE A AMPERES AC ALTERNATING CURRENT A/C AIR CONDITIONING AF AMPERE FRAME AFF ABOVE FINISHED FLOOR AHU AIR HANDLING UNIT AIC AMPERE INTERRUPTING CAPACITY AL ALUMINUM AT AMPERE TRIP ATS AUTOMATIC TRANSFER SWITCH AWG AMERICAN WIRE GAUGE C CONDUIT CATV CABLE TELEVISION CB CIRCUIT BREAKER CC CIVIL CONTRACTOR CCTV CLOSED CIRCUIT TELEVISION CD CANDELA	GFI GROUND FAULT CIRCUIT INTERRUPTER GND GROUND HOA HAND-OFF-AUTOMATIC SWITCH HVAC HEATING, VENTILATION, AIR CONDITION HZ HERTZ IG ISOLATED GROUND IMC INTERMEDIATE METAL CONDUIT INT INTERLOCK KCMIL THOUSAND CIRCULAR MILS KVA KILOVOLT-AMPERES KVAR KILOVOLT-AMPERES KVAR KILOVOLT-AMPERES REACTIVE LC LIGHTING CONTACTOR LFMC LIQUID TIGHT FLEXIBLE METAL CONDUIT INT MC MECHANICAL CONTRACTOR MAU MAKE-UP AIR UNIT MC MECHANICAL CONTRACTOR MCA MINIMUM CIRCUIT AMPS MCB MAIN CIRCUIT BREAKER MCC MOTOR CONTROL CENTER MCP MOTOR CIRCUIT PROTECTION MIN MINIMUM MLO MAIN LUGS ONLY NA NOT APPLICABLE NC NORMALLY CLOSED NEC NATIONAL ELECTRICAL CODE NFPA NATIONAL FIRE PROTECTION ASSOCIA NL NIGHT LIGHT NO NORMALLY OPEN	ONINO DUIT
	CD CANDELA CKT CIRCUIT CLF CURRENT LIMITING FUSE CM CEILING MOUNT CPT CONTROL POWER TRANSFORMER	NO NORMALLY OPEN NTS NOT TO SCALE OC OVER COUNTER OHE OVER HEAD ELECTRIC PB PULL BOX	

PC PLUMBING CONTRACTOR

RGS RIGID GALVANIZED STEEL

RMC RIGID METAL CONDUIT

RTS REMOTE TEST STATION

SC SPRINKLER CONTRACTOR

UGE UNDER GROUND ELECTRIC

UNDERWRITERS LABORATORY

RTU ROOF TOP UNIT

ST SHUNT TRIP

VOLT

VA VOLT-AMPERE

WG WIRE GUARD

XFMR TRANSFORMER

WP WEATHER PROOF

WATT

W

POTENTIAL TRANSFORMER

RNC RIGID NON-METALLIC CONDUIT

PNL PANEL

PWR POWER

QTY QUANTITY

#### Electronic Timer Control - - 365-Day Astronomic Electronic Control

Electronic Timer Control - 365-Da Item ET90815CR	ay Astronomic Electronic Co
	PRODUCT DESCRIPTION
	The ET90000 Series combines power Mobile App provide real-time remote co
	FEATURES

verful and intuitive scheduling with truly maintenance-free convenience. The PC App and

control, and the USB connection and Ethernet capabilities enable in-field updates.

Automatic input voltage selection from 120 to 277 VAC, 50/60 Hz Over 2,000 events plus holiday schedules

Advanced scheduling including relative events, such as fourth Thursday of November or first week of year 30 A rated contacts

100-hour supercapacitor eliminates the need for batteries USB connection for uploading, downloading and transferring programs

Easy-to-follow on-screen menus for programming to-the-minute accuracy

Mobile app for real time status and overrides

 Non-volatile memory protects programming indefinitely Firmware can be upgraded in-field via USB or Ethernet

Internally expandable, in 4-circuit increments, up to 16-circuits for 4, 8, and 12-circuit models PC App for easy scheduling or control, either remotely or through USB flash drive

#### **APPLICATIONS**

School Districts

Banks Small Hotels

Franchises

Retail Stores Municipalities

Parking Lots Offices

TECHNICAL DATA		
General		
Model Number	ET90815CR	
Description	365-Day Astronomic Electronic Control	
UPC Code	078275124929	
Brand	Intermatic	
Country of Origin (Intermatic)	MEXICO	
Warranty	3-Year limited	
IGCC	5191	

Control Specifications		
Minimum ON/OFF Times	1 Sec	
Minimum Pulse Time	1 sec	
Maximum Pulse Time	23 hours, 59 minutes	
Maximum ON/OFF Times	365 days	
Maximum ON/OFF Operations	2000	
Setpoint Program Count	2000	
ON/OFF Operations	2000	
Operation Features	Astronomic; Holiday	

LOAD POWER HOT/LINE

Appeal griting restriction Wurtple cace may be arrect concurrency within the maximum output strings brittle circuit.

Technical specifications and other information are subject to change without notice. Images can vary from original.

Technical specifications and other information are subject to change without notice. Images can vary from original.

Electronic Timer Control - - 365-Day Astronomic Electronic Control

**DIAGRAMS** 

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NTERMATIC

Electronic Timer Control - - 365-Day Astronomic Electronic Control

Item ET90815CR

TECHNICAL DATA

Country of Origin (Intermatic)

**Control Specifications** 

Minimum ON/OFF Times

Maximum ON/OFF Times

Maximum ON/OFF Operations Setpoint Program Count

Minimum Pulse Time Maximum Pulse Time

ON/OFF Operations

Operation Features

Model Number

UPC Code

Electronic Timer Control - 365-Day Astronomic Electronic Control

PRODUCT DESCRIPTION

Over 2.000 events plus holiday schedules

Automatic input voltage selection from 120 to 277 VAC, 50/60 Hz

Easy-to-follow on-screen menus for programming to-the-minute accuracy

PC App for easy scheduling or control, either remotely or through USB flash drive

100-hour supercapacitor eliminates the need for batteries USB connection for uploading, downloading and transferring programs

Non-volatile memory protects programming indefinitely

Firmware can be upgraded in-field via USB or Ethernet

Mobile app for real time status and overrides

**FEATURES** 

30 A rated contacts

**APPLICATIONS** 

School Districts

Banks

Small Hotels

Retail Stores

Municipalities

Parking Lots

Offices

Franchises

The ET90000 Series combines powerful and intuitive scheduling with truly maintenance-free convenience. The PC App and

Mobile App provide real-time remote control, and the USB connection and Ethernet capabilities enable in-field updates.

Advanced scheduling including relative events, such as fourth Thursday of November or first week of year

Internally expandable, in 4-circuit increments, up to 16-circuits for 4, 8, and 12-circuit models

365-Day Astronomic Electronic Control

078275124929

3-Year limited

39122208

1 Sec

2000

23 hours, 59 minutes

Astronomic; Holiday

5191

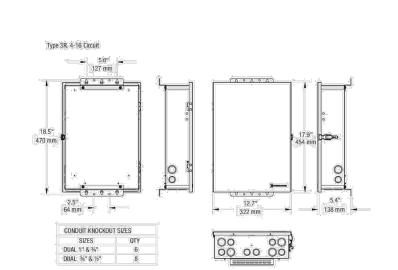
NTERMATIC Electronic Timer Control - - 365-Day Astronomic Electronic Control

NTERMATIC

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#### **DIMENSIONAL DRAWINGS**



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NTERMATIC

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PREPARED FOR

Town of Clarence 6221 Goodrich Road Clarence Center, NY 14032



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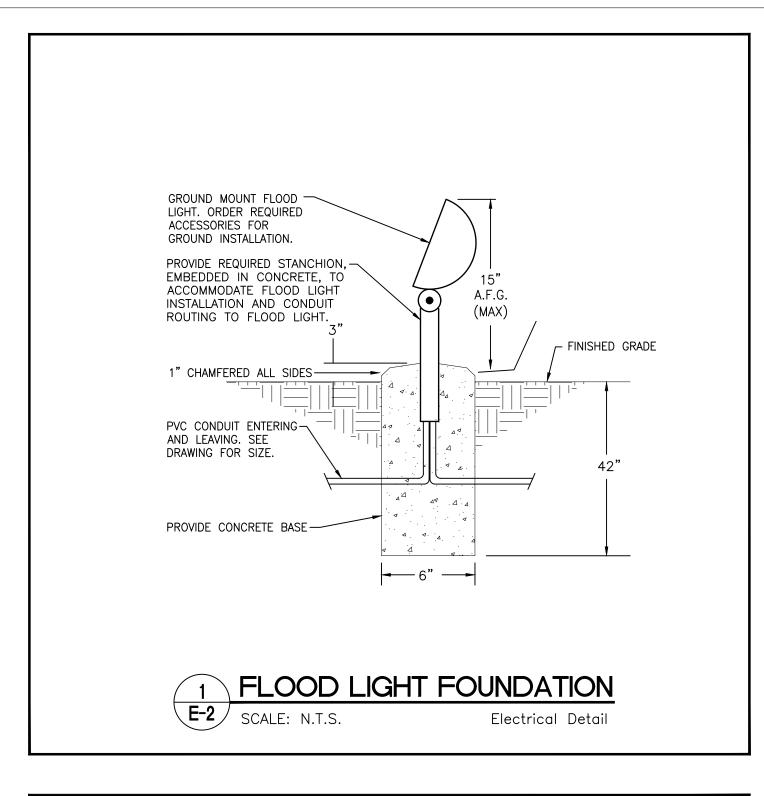
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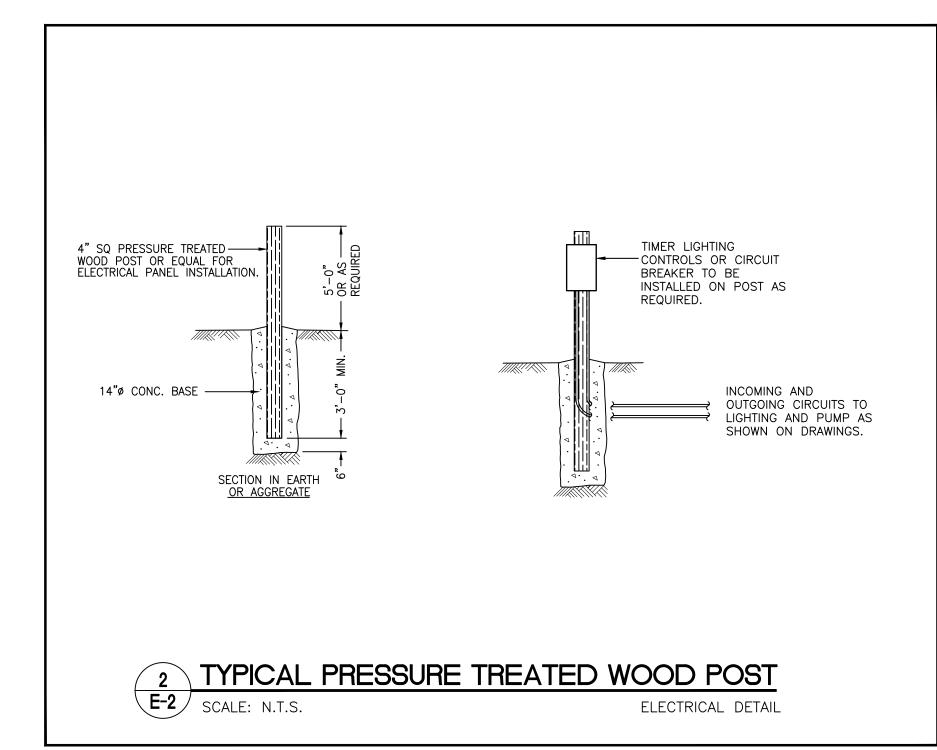
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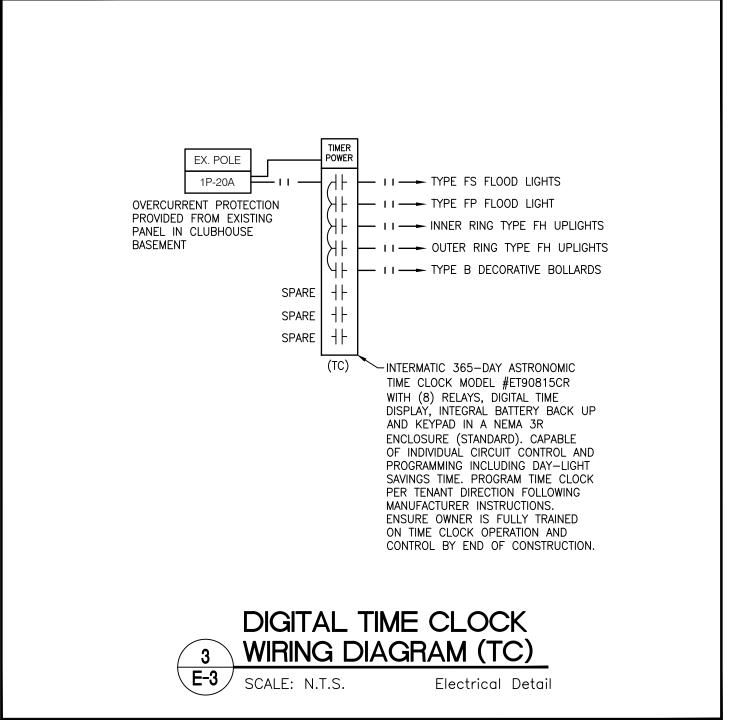
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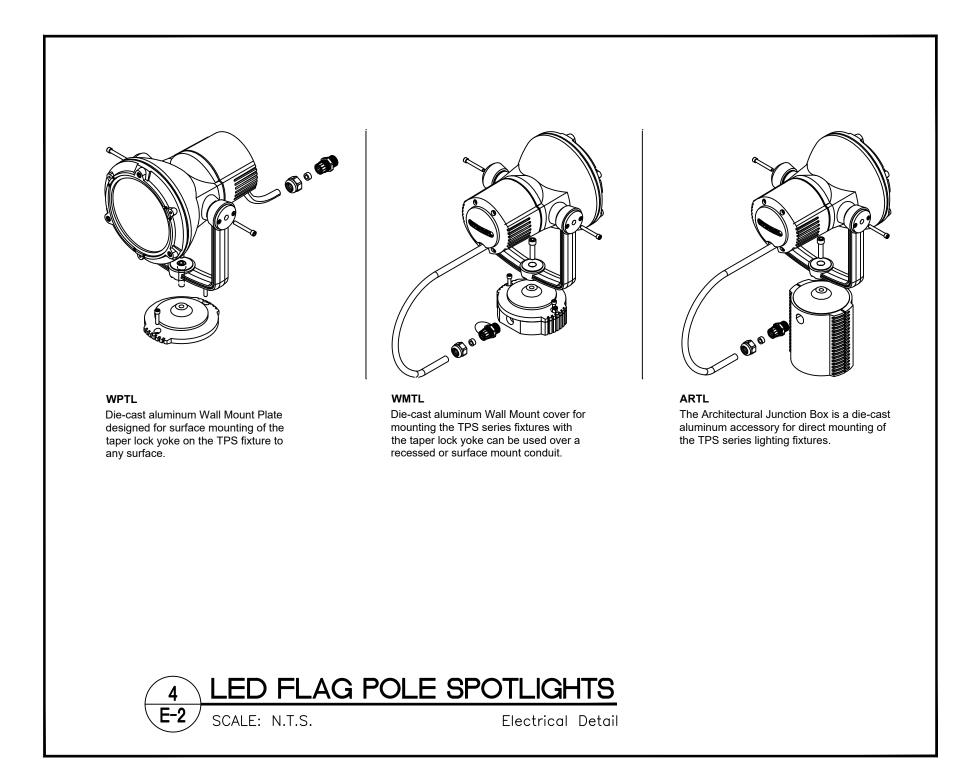
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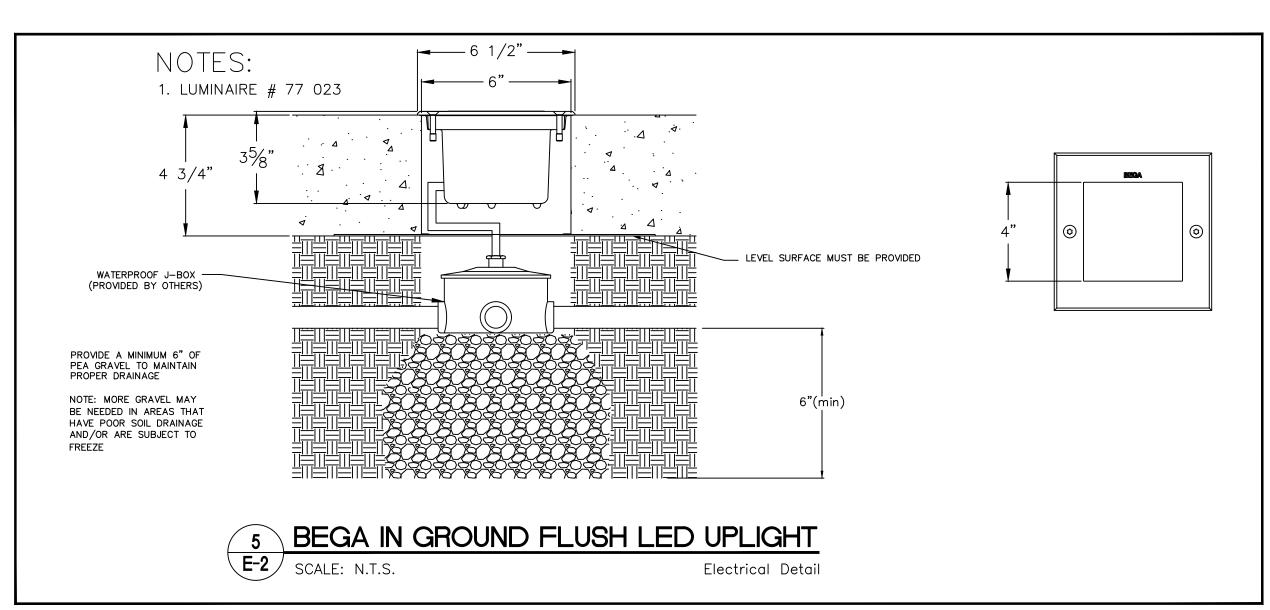
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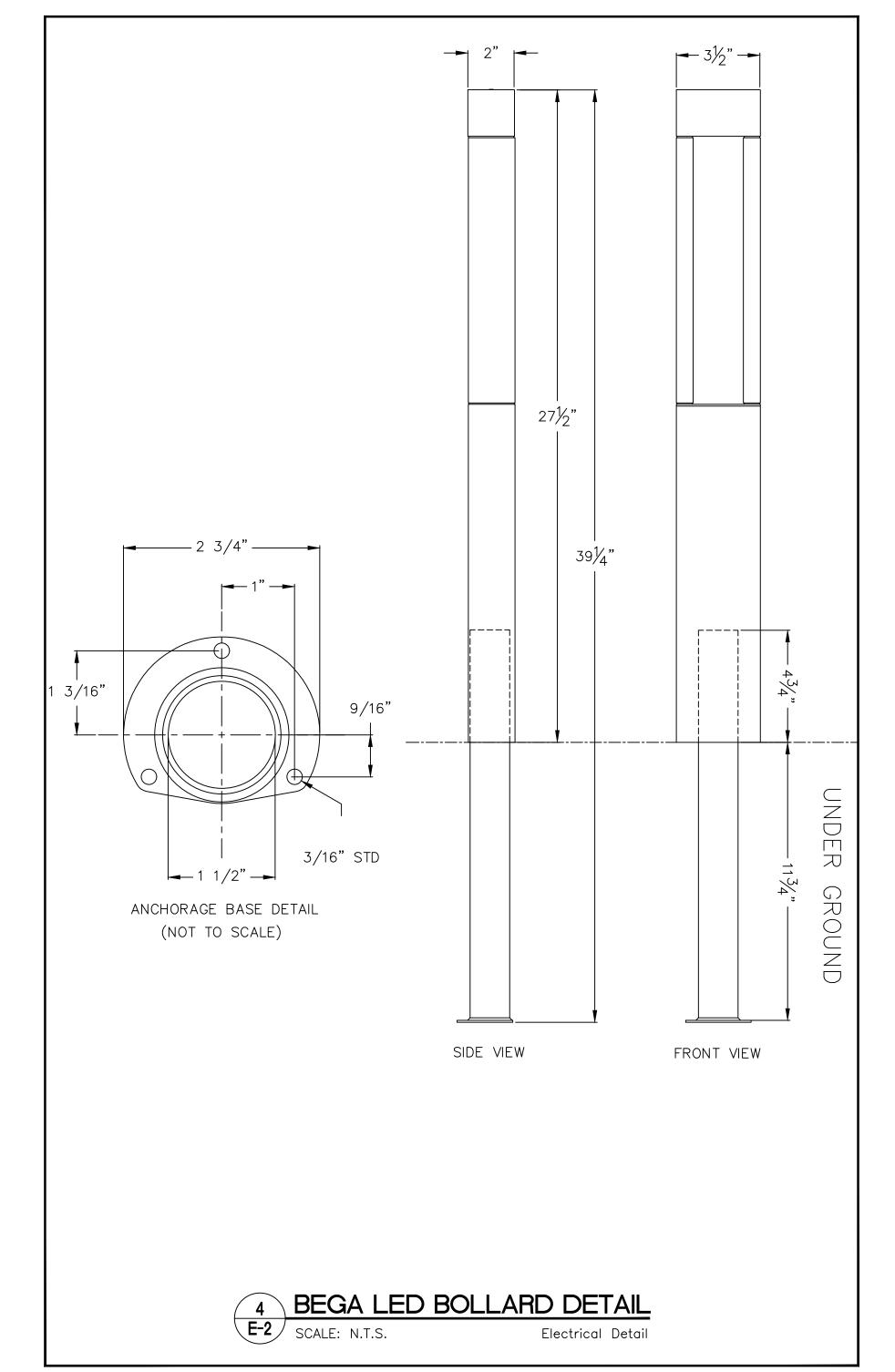












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PREPARED FOR

Town of Clarence 6221 Goodrich Road Clarence Center, NY 14032



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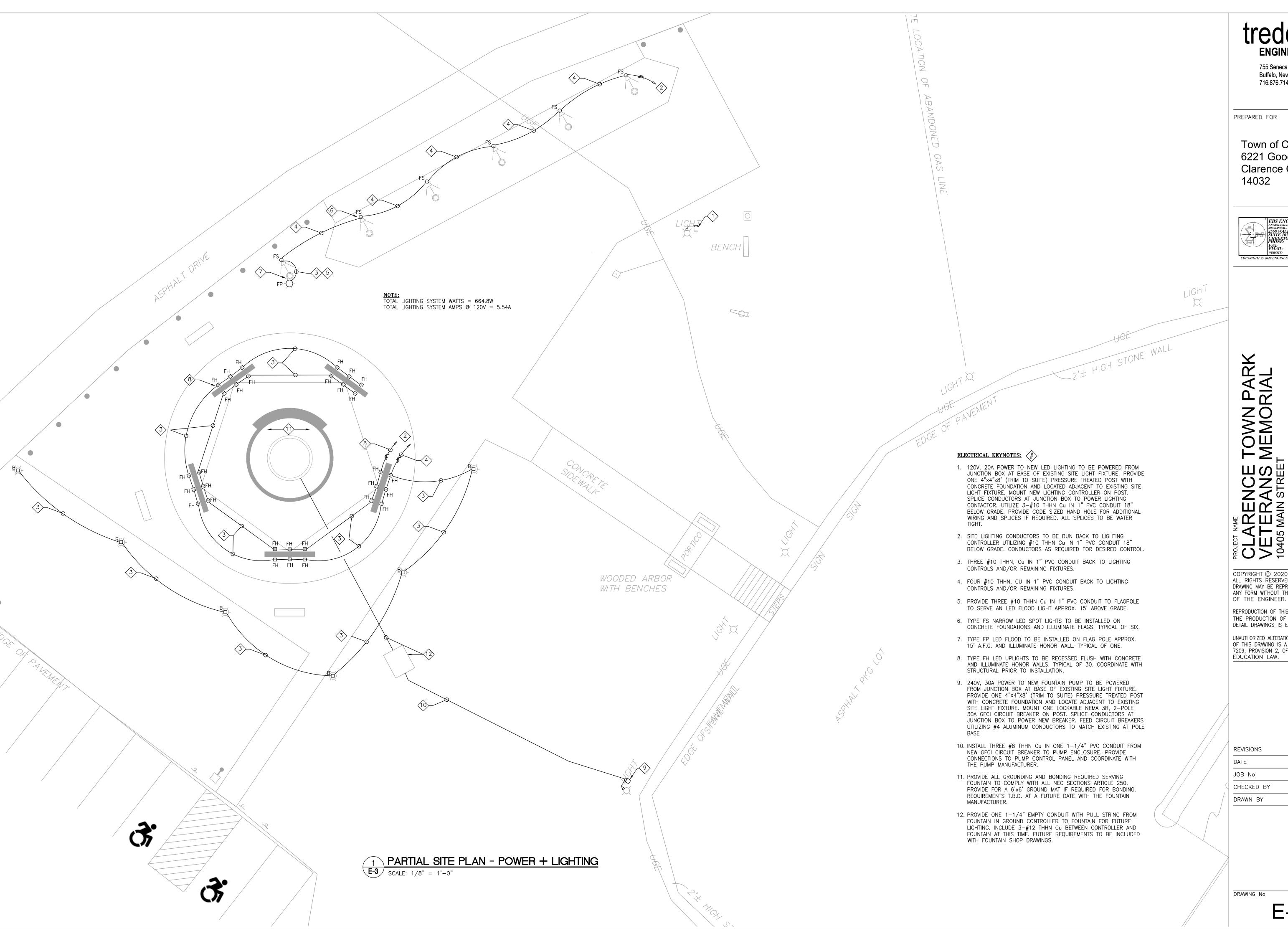
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WORK SITE

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UP TO THE BID SUBMITTAL DATE BECOME A BINDING PART OF THE CONTRACT, ALONG WITH THESE SPECIFICATIONS AS THOUGH THEY WERE ONE, AND ANYTHING IMPLIED BY THE SPECIFICATIONS SHALL BE INTERPRETED AS ALSO IMPLIED BY THE DRAWINGS AND VICE VERSA. PROVIDE NECESSARY ITEMS FOR A COMPLETE INSTALLATION OF ALL ELECTRICALLY OPERATED EQUIPMENT LISTED IN THE SPECIFICATIONS OR SHOWN ON THE CONTRACT DRAWINGS. 2. THE ARCHITECTURAL, STRUCTURAL, MECHANICAL, PLUMBING AND EQUIPMENT DRAWINGS AND SPECIFICATIONS ARE

INCORPORATED INTO, AND BECOME A PART OF THIS DIVISION. THIS CONTRACTOR SHALL EXAMINE ALL SUCH DRAWINGS AND SPECIFICATIONS AND BECOME THOROUGHLY FAMILIAR WITH THE PROVISIONS CONTAINED THEREIN. THE SUBMISSION OF HIS BID SHALL INDICATE SUCH KNOWLEDGE. 3. ELECTRICAL DRAWINGS ARE DIAGRAMMATIC. THEY ARE INTENDED TO SHOW THE APPROXIMATE LOCATIONS OF EQUIPMENT AND CONDUIT. DIMENSIONS GIVEN ON THE PLANS, IN FIGURES, SHALL TAKE PRECEDENCE OVER SCALED DIMENSIONS AND SHALL BE VERIFIED IN THE FIELD. THE ELECTRICAL CONTRACTOR SHALL LAYOUT ALL EQUIPMENT ROOMS TO MAKE SURE THE EQUIPMENT, AS PURCHASED, FITS IN THE ROOM OR SPACE SHOWN.

FIFLD CONDITIONS 4. UNTIL THE TIME OF INSTALLATION. THE ARCHITECT RESERVES THE RIGHT TO MAKE MINOR CHANGES IN THE LOCATION OF CONDUIT AND EQUIPMENT WITHOUT ADDITIONAL COST TO THE CONTRACT.

5. THE ELECTRICAL DRAWINGS AND SPECIFICATIONS ARE INTENDED TO SUPPLEMENT EACH OTHER. MATERIAL AND LABOR NECESSARY TO THE PROJECT SHALL BE FURNISHED AND INSTALLED EVEN THOUGH NOT SPECIFICALLY MENTIONED IN BOTH. LABOR AND/OR MATERIALS NEITHER SHOWN NOR SPECIFIED, BUT OBVIOUSLY NECESSARY FOR THE COMPLETION AND PROPER FUNCTIONING OF THE SYSTEM, SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR AT NO ADDITIONAL COST.

EXACT LOCATION OF ALL EQUIPMENT SHALL BE VERIFIED IN THE FIELD AND ROUTING OF CONDUITS SHALL SUIT

6. ARRANGE ALL EQUIPMENT SUBSTANTIALLY AS SHOWN ON THE DRAWINGS. MAKE DEVIATIONS ONLY WHERE NECESSARY TO AVOID INTERFERENCE. CHECK ALL EQUIPMENT SIZES AGAINST AVAILABLE SPACE PRIOR TO SHIPMENT TO AVOID INTERFERENCE. 7. EXAMINE THE WORK OF OTHER TRADES INSOFAR AS THEIR WORK COMES IN CONTACT WITH OR IS COVERED BY

THIS WORK. IN NO CASE ATTACH TO, OR FINISH AGAINST ANY DEFECTIVE WORK OR INSTALL WORK IN A MANNER WHICH WILL PREVENT PROPER INSTALLATION OF THE WORK OF OTHER TRADES. 8. ELECTRICAL CONTRACTOR SHALL VERIFY WITH OTHER TRADES ALL ELECTRICAL CHARACTERISTICS OF EQUIPMENT REQUIRING ELECTRICAL CONNECTIONS. CONTRACTOR SHALL VERIFY VOLTAGE, PHASE AND HORSEPOWER AND SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO START OF WORK. ELECTRICAL CONTRACTOR SHALL PROVIDE DISCONNECTING MEANS AND OVERLOAD PROTECTION FOR ALL EQUIPMENT, UNLESS FURNISHED INTEGRAL

9. IT IS THE INTENT OF THESE DRAWINGS THAT THIS BE A COMPLETE ELECTRICAL JOB. ANY ERRORS OR OMISSIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO BIDDING THE JOB.

VISIT TO THE SITE:

1. THIS CONTRACTOR SHALL VISIT THE SITE OF THE WORK AND FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING HIS WORK. THE SUBMISSION OF HIS PROPOSAL SHALL INDICATE SUCH KNOWLEDGE. NO ADDITIONAL PAYMENT SHALL BE MADE ON CLAIMS THAT ARISE FROM A LACK OF KNOWLEDGE OF THE EXISTING CONDITIONS.

CODE AND PERMITS: . INSTALLATION SHALL BE IN FULL ACCORDANCE WITH ALL CODES, RULES AND REGULATIONS OF MUNICIPAL, CITY, COUNTY, STATE AND PUBLIC UTILITIES AND ALL OTHER AUTHORITIES HAVING JURISDICTION OVER THE PREMISES. 2. COMPLY WITH ANY SPECIFICATION REQUIREMENTS THAT ARE IN EXCESS BUT NOT IN CONFLICT WITH CODE REQUIREMENTS. 3. THE CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS. PLAN REVIEWS AND CERTIFICATES OF INSPECTION

IN CONNECTION WITH HIS WORK, REQUIRED BY THE FOREGOING AUTHORITIES. BEFORE FINAL PAYMENT OF THE CONTRACT IS ALLOWED. ALL CERTIFICATES SHALL BE DELIVERED TO THE ARCHITECT IN DUPLICATE. 4. ELECTRICAL MATERIAL AND EQUIPMENT SHALL BE LISTED TO A NATIONALLY RECOGNIZED TESTING LABORATORY, SUCH AS UL, CSA, ETL OR APPROVED EQUIVALENT.

1. ALL ELECTRICAL INSPECTIONS SHALL BE BY A 3RD PARTY AGENCY APPROVED BY THE LOCAL TOWN.

RECORD DRAWINGS:

1. SUBMIT TO THE ARCHITECT ONE SET OF REPRODUCIBLE ELECTRICAL DRAWINGS SHOWING THE RECORD

STANDARDS AND SUBSTITUTIONS:

1. WHEREVER THE WORDS "APPROVED BY", "APPROVED EQUAL", "AS DIRECTED" OR SIMILAR PHRASES ARE USED IN THE FOLLOWING SPECIFICATIONS, THEY SHALL BE UNDERSTOOD TO REFER TO THE OWNER AS THE APPROVING AGENCY. THE NAME OR MAKE OF ANY EQUIPMENT OR MATERIALS NAMED IN THIS SPECIFICATION (WHETHER OR NOT THE WORDS "OR APPROVED EQUAL" ARE USED) SHALL BE KNOWN AS THE "STANDARD". 2. THESE SPECIFICATIONS ESTABLISH QUALITY STANDARD OF MATERIALS AND EQUIPMENT TO BE PROVIDED. SPECIFIC ITEMS ARE IDENTIFIED BY MANUFACTURER, TRADE NAME OR CATALOG DESIGNATION. THIS CONTRACTOR SHALL SUBMIT HIS BASE BID PRICE BASED UPON STANDARD SPECIFIED EQUIPMENT DESCRIBED HEREIN AND AS DETAILED ON DRAWINGS AND ASSOCIATED CONTRACT DOCUMENTS. THESE SPECIFICATIONS ARE NOT TO BE CONSIDERED PROPRIETARY. THE CONTRACTOR MAY SUBMIT INFORMATION ON MATERIALS AND MANUFACTURERS (OTHER THAN THOSE LISTED) FOR REVIEW BY THE ARCHITECT AND ENGINEER NO LATER THAN TEN (10) DAYS BEFORE BIDS ARE SUBMITTED. IN ADDITION, SAMPLES OF PROPOSED EQUIPMENT MAY BE REQUIRED TO BE SUBMITTED TO THE ENGINEER FOR REVIEW NO LATER THAN TEN (10) DAYS BEFORE BIDS ARE SUBMITTED. MANUFACTURERS OF PRODUCTS ACCEPTED BY THE ARCHITECT AND ENGINEER WILL BE LISTED IN AN ADDENDUM TO THE SPECIFICATIONS AS AN ACCEPTABLE SUBSTITUTION EQUIPMENT ACCEPTED AS DETAILED BELOW AND SHALL BE SHOWN AS A SEPARATE ADD OR DEDUCT PRICE TO BE FACTORED INTO THE BASE BID PRICE BY THE ARCHITECT AND OWNER IF ACCEPTED.

3. SHOULD THE CONTRACTOR PROPOSE TO FURNISH MATERIALS AND EQUIPMENT OTHER THAN THOSE SPECIFIED OR APPROVED BY ADDENDUM, SUBMIT A WRITTEN REQUEST FOR SUBSTITUTIONS TO THE ARCHITECT AT THE BID OPENING. THE REQUEST SHALL BE AN ALTERNATE TO THE ORIGINAL BID; BE ACCOMPANIED WITH COMPLETE DESCRIPTIVE (MANUFACTURER, BRAND NAME, CATALOG NUMBER, ETC.) AND TECHNICAL DATA FOR ALL ITEMS. FAILURE BY THIS CONTRACTOR TO SUBMIT THE REQUISITE DOCUMENTATION DETAILED ABOVE SHALL BE UNDERSTOOD BY THE ARCHITECT AND ENGINEER TO INDICATE THAT SUBSTITUTE EQUIPMENT WILL NOT BE PRESENTED BY THE CONTRACTOR FOR CONSIDERATION. SUCH SUBSTITUTIONS WILL NOT BE CONSIDERED AFTER THE BID OPENING DATE AND DELAY OF PROJECT WILL NOT BE PERMITTED FOR FURTHER INSPECTION AND EVALUATION AFTER THIS DATE.

4. WHERE SUCH SUBSTITUTIONS ALTER THE DESIGN OR SPACE REQUIREMENTS INDICATED ON THE DRAWINGS, INCLUDE ALL ITEMS OF COST FOR THE REVISED DESIGN AND CONSTRUCTION INCLUDING COST OF ALL ALLIED

5. ACCEPTANCE OR REJECTION OF THE PROPOSED SUBSTITUTIONS SHALL BE SUBJECT TO APPROVAL OF THE ARCHITECT AND ENGINEER. IF REQUESTED, THE CONTRACTOR SHALL SUBMIT (AT HIS COST) INSPECTION SAMPLES OF BOTH THE SPECIFIED AND PROPOSED SUBSTITUTE ITEMS. 6. IN ALL CASES WHERE SUBSTITUTIONS ARE PERMITTED, THE CONTRACTOR SHALL BEAR ANY EXTRA COST OF EVALUATING THE QUALITY OF THE MATERIAL AND EQUIPMENT TO BE PROVIDED, INCLUDING ALL ARCH/ENGINEER FEES ASSOCIATED WITH CHANGE.

G. <u>TESTING AND PLACING IN SER</u>VICE:

1. ANY MATERIAL OR EQUIPMENT FAILING A TEST SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S

2. TESTS SHALL INCLUDE THE FOLLOWING: a. MEASURE THE LOAD ON EACH PHASE OF THE MAIN SERVICE AND EACH PHASE OF EVERY FEEDER UNDER FULL LOAD CONDITIONS b. MEASURE THE NO-LOAD AND FULL-LOAD VOLTAGES (PHASE TO PHASE, PHASE TO NEUTRAL AND PHASE TO

GROUND FOR EACH PHASE OF EACH SERVICE, OF EACH SEPARATELY DERIVED SYSTEM, AND AT EACH PANELBOARD OR TRANSFORMER). c. MEASURE THE GROUND RESISTANCE OF THE MAIN SERVICE GROUNDING ELECTRODE AND THE GROUND

RESISTANCE OF EACH SEPARATELY DERIVED SYSTEM'S GROUNDING ELECTRODE. d. MAKE INSULATION RESISTANCE TESTS ON ALL DRY TYPE TRANSFORMERS AND MOTORS.

INTERFERENCES:

1. BEFORE THE INSTALLATION OF ANY ITEM BEGINS, THE ELECTRICAL CONTRACTOR SHALL CAREFULLY ASCERTAIN

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OF ANY OF THE OTHER CONTRACTORS AS SOON AS THEY ARE DISCOVERED. THE ARCHITECT AND / OR ENGINEER SHALL DETERMINE WHICH EQUIPMENT WILL BE RELOCATED, REGARDLESS OF WHICH WAS INSTALLED FIRST. THEIR DECISION WILL BE FINAL.

**QUALITY ASSURANCE:** . ALL PRODUCTS SHALL BE NEW AND OF THE TYPE AND QUALITY SPECIFIED. WHERE MATERIALS, EQUIPMENT, APPARATUS OR OTHER PRODUCTS ARE SPECIFIED BY MANUFACTURER, BRAND NAME, TYPE OF CATALOG NUMBER, SUCH DESIGNATION SHALL ESTABLISH THE STANDARDS OF THE DESIRED QUALITY AND STYLE. IT IS THE INTENT OF THESE SPECIFICATIONS TO ESTABLISH A STANDARD OF QUALITY OF MATERIALS AND EQUIPMENT INSTALLED.

BASIC ELECTRICAL MATERIALS AND METHODS

1. GENERAL: FURNISH AND MOUNT ON EACH PANELBOARD, SWITCHBOARD (INCLUDING BRANCH SWITCHES), LARGE JUNCTION BOX, SAFETY SWITCH, STARTER, REMOTE CONTROL, PUSH BUTTON STATION, AND ALL SIMILAR CONTROLS, A NAMEPLATE DESCRIPTIVE OF THE EQUIPMENT OR EQUIPMENT CONTROLLED. 2. PROVIDE BLACK AND WHITE NAMEPLATES CONSTRUCTED FROM LAMINATED PHENOLIC WITH A WHITE CENTER CORE. LETTERS SHALL BE ENGRAVED IN THE PHENOLIC TO FORM WHITE LETTERS 3/8" HIGH. FASTEN THE NAMEPLATES WITH SCREWS AND AN ADHESIVE TYPE FASTENER.

THIS CONTRACTOR SHALL FURNISH AND INSTALL ALL ANGLE IRON, CHANNEL IRON, RODS, SUPPORTS, HANGERS, CONCRETE OR PLYWOOD REQUIRED TO INSTALL, MOUNT AND SUPPORT ANY ELECTRICAL EQUIPMENT OR DEVICE CALLED FOR ON THE PLANS. 2. SUPPORTING MATERIAL SHALL BE COMPLETE WITH HANGERS, CONNECTORS, BOLTS, CLAMPS AND NECESSARY

ACCESSORIES TO MAKE A COMPLETE INSTALLATION. SUPPORTING MATERIAL SHALL BE GALVANIZED, PAINTED OR OTHERWISE SUITABLY FINISHED. PRODUCTS BY BRINKLEY, STEEL CITY OR RACO WILL BE ACCEPTABLE. 3. ALL SURFACE-MOUNTED EQUIPMENT ON BLOCK WALLS SHALL BE MOUNTED ON 3/4" PAINTED PLYWOOD BACKBOARD. ALL FLOOR-MOUNTED EQUIPMENT SHALL BE INSTALLED ON A 4" HIGH CONCRETE HOUSEKEEPING

1. THE ELECTRICAL WORK FOR CONSTRUCTION PROPOSED SHALL CONFORM TO ALL FEDERAL (OSHA), STATE, ALL SPECIFIC SAFETY REQUIREMENTS AND THE REQUIREMENTS OF THE CURRENT EDITION OF THE NEC. 2. CHECK THE HVAC AND PLUMBING SPECIFICATIONS FOR ELECTRICAL REQUIREMENTS AND INCLUDE THE SAME IN THE CONTRACT COST.

3. EQUIPMENT CONNECTIONS, STARTERS, DISCONNECT SWITCHES, CONTROL TRANSFORMERS AND PUSHBUTTON STATIONS FOR THE EQUIPMENT FURNISHED BY THE OWNER OR UNDER A SEPARATE CONTRACT SHALL BE INSTALLED AND CONNECTED UNDER THIS DIVISION, AS INDICATED ON THE CONTRACT DRAWINGS. 4. ALL CUTTING, PATCHING, EXCAVATING, BACKFILLING AND CONCRETE WORK RELATED TO THIS CONTRACT WILL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR. THIS CONTRACTOR SHALL ASSUME THE RESPONSIBILITY OF PROVIDING THE SLEEVES, CHASES AND OPENINGS NECESSARY FOR THE ELECTRICAL INSTALLATION AND FOR THEIR REPAIR IN AN ACCEPTABLE MANNER, AS DETERMINED BY THE ARCHITECT. ALL HOLES SHALL BE CORE-DRILLED. PROVIDE FIRE STOP IN ALL OPENINGS CREATED THROUGH FIRE-RATED WALLS, FLOORS OR CEILINGS. PROVIDE WATER TIGHT SEALS FOR ALL OPENINGS CREATED THROUGH FOUNDATION WALLS OR EXTERIOR WALLS.

5. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL REQUIRED ACCESS PANELS NECESSARY FOR HIS WORK, COORDINATE WITH ARCHITECT PRIOR TO INSTALLATION.

D. MATERIALS AND WORKMANSHIE 1. ALL WORK SHALL BE INSTALLED IN A PRACTICAL AND WORKMANLIKE MANNER, BY MECHANICS SKILLED IN THE SEVERAL TRADES NECESSARY. 2. ALL MATERIALS SHALL BE NEW AND FREE FROM DEFECTS AND SHALL BE THE BEST OF THEIR SEVERAL KINDS UNLESS SPECIFIED OR INDICATED ON THE DRAWINGS TO THE CONTRARY. 3. DURING EACH PHASE AND AT THE COMPLETION OF THE CONSTRUCTION, THIS CONTRACTOR SHALL REMOVE ALL

4. ALL ELECTRICAL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OR ETL LABEL. 5. THIS CONTRACTOR SHALL GUARANTEE HIS WORKMANSHIP AND MATERIAL (LAMPS EXCEPTED) FOR A PERIOD OF ONE YEAR FROM THE DATE OF BUILDING OPENING AND LEAVE HIS WORK IN PERFECT ORDER AT THE COMPLETION. SHOULD DEFECTS DEVELOP WITHIN THE GUARANTEE PERIOD, THE CONTRACTOR SHALL, UPON NOTICE OF THE SAME, REMEDY THE DEFECTS AND HAVE ALL DAMAGES TO OTHER WORK OR FURNISHINGS

DEBRIS AND EXCESS MATERIALS CAUSED BY HIS WORK. HE SHALL LEAVE THE AREA OF OPERATION BROOM

THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIAL, STORAGE, UNPACKING AND PLACEMENT; TO INCLUDE BUT NOT BE LIMITED TO, THE FOLLOWING ITEMS:

CAUSED BY THE REPAIRS CORRECTED AT HIS EXPENSE TO THE CONDITION BEFORE SUCH DAMAGE.

a. COMPLETE SITE LIGHTING SYSTEM AS SHOWN ON DRAWINGS. b. SITE LIGHTING CONTROL TIMER, PROGRAMMING AND OWNER INSTRUCTION. c. SPLICES INTO EXISTING WIRING ON SITE.

d. EXCAVATION AND BACKFILLING AS REQUIRED FOR CONDUIT INSTALLATION. e. TESTING OF ALL BRANCH WIRING AND CONTROLS. f. WIRING AND ASSOCIATED PRODUCTS REQUIRED FOR ENERGIZING A SITE FOUNTAIN.

a. GROUNDING AND BONDING OF FOUNTAIN. h. REMAINING ELECTRICAL REQUIREMENTS FOR FOUNTAIN PACKAGE WITH FURTHER DETAIL TO BE PROVIDED IN

SHOP DRAWINGS. i. SECURE STORAGE OF MATERIALS AND REMOVAL OF DEBRIS.

THE ELECTRICAL CONTRACTOR SHALL FURNISH, INSTALL AND REMOVE AS REQUIRED ALL TEMPORARY POWER AND TEMPORARY LIGHTING IN ALL AREAS AND INDIVIDUAL ROOMS WHEN NEEDED BY THE INDIVIDUAL TRADES IN THE PERFORMANCE OF THEIR WORK. THIS CONTRACTOR SHALL PROVIDE A MINIMUM OF TWENTY (20) FOOTCANDLES OF ILLUMINATION FOR TEMPORARY LIGHTING. ANY ADDITIONAL LIGHTING REQUIRED BY INDIVIDUAL TRADES SHALL BE PROVIDED BY THE INDIVIDUAL TRADES INCLUDING POWER FOR THE LIGHTING. THE ELECTRICAL WORK FOR CONSTRUCTION PURPOSES SHALL CONFORM TO ALL FEDERAL (OSHA), STATE, SPECIFIC SAFETY REQUIREMENTS, AS WELL AS THE REQUIREMENTS OF THE NATIONAL ELECTRIC CODE AND NATIONAL ELECTRICAL SAFETY CODE. THE ELECTRICAL CONTRACTOR SHALL OBTAIN AND PAY FOR ALL REQUIRED APPLICATIONS, PERMITS AND INSPECTIONS PERTAINING TO THIS WORK. THIS COST SHALL BE INCLUDED IN THE CONTRACTOR'S PRICE. 2. NEW LIGHT FIXTURES SHALL NOT BE USED FOR TEMPORARY LIGHTING.

1. CONDUCTORS SHALL BE ANNEALED COPPER, STRANDED 98% CONDUCTIVITY, 600 V RATED FOR FEEDERS AND BRANCH CIRCUITS, TYPE THHN/THWN INSULATION, MINIMUM #12 AWG SIZE FOR BRANCH CIRCUITS. PROVIDE #10 AWG MINIMUM SIZE FOR BRANCH CIRCUIT RUNS EXCEEDING 100 FEET. ALUMINUM CONDUCTORS SHALL NOT BE USED FOR BRANCH CIRCUITS. ANACONDA, GENERAL CABLE, ROME CABLE OR ACCEPTED EQUAL

2. COLOR CODE CONDUCTORS (EXCEPT CONTROL AND INSTRUMENTATION CONDUCTORS) AS FOLLOWS: a. 240/120V 1ø SYSTEM PHASE A-BLACK; PHASE B-RED; NEUTRAL-WHITE; GROUND-GREEN b. 208/120V 3ø SYSTEM PHASE A-BLACK; PHASE B-RED; PHASE C-BLUE; NEUTRAL-WHITE; GROUND-GREEN c. 480/277V 3Ø SYSTEM PHASE A-BROWN; PHASE B-ORANGE; PHASE C-YELLOW; NEUTRAL-GREY;

GROUND-GREEN 3. #12 AND #10 CONDUCTORS SHALL HAVE CONTINUOUS INSULATION COLOR, AS LISTED ABOVE. 4. COLOR CODE CONDUCTORS LARGER THAN ABOVE, WHICH DO NOT HAVE CONTINUOUS INSULATION COLOR BY APPLICATION OF AT LEAST TWO LAPS OF COLORED TAPE ON EACH CONDUCTOR AT ALL POINTS OF ACCESS INCLUDING JUNCTION BOXES. COLOR TAPE SHALL BE THE EQUAL OF 3M PRODUCTS SCOTCH #35.

5. FLEXIBLE CORD SHALL BE HEAVY DUTY TYPE SO WITH AN EQUIPMENT GROUND CONDUCTOR IN ADDITION TO THE CURRENT CARRYING CONDUCTORS.

6. CONTROL CONDUCTORS SHALL BE #14 MINIMUM FOR NEC CLASS I AND #16 FOR NEC CLASS II. 7. CONDUCTORS #8 AWG AND LARGER SHALL BE STRANDED. 8. CONDUCTORS #10 AWG AND SMALLER SHALL BE SOLID.

9. INSTALL SEPARATE NEUTRALS FOR EACH SINGLE PHASE BRANCH CIRCUIT. 10.CONNECT #10 AND SMALLER WIRES WITH CONSTANT PRESSURE EXPANDABLE SPRING TYPE CONNECTORS, "SCOTCHLOK" BY 3M OR B-CAP BY BUCHANAN.

11.CONNECT #8 AND LARGER WIRES WITH COMPRESSION CONNECTORS OR SPLICES AS MANUFACTURED BY BURNDY OR T&B. 12.INSULATE SPLICING CONNECTORS TO AT LEAST 200% OF THE WIRE INSULATION. USE PRE-STRETCHED TUBING CONNECTOR INSULATORS, 3M PST FOR #2 AND LARGER CONDUCTORS.

13.PULL CONDUCTORS USING RECOGNIZED METHODS AND EQUIPMENT LEAVING AT LEAST 6" WIRE AT ALL JUNCTION BOXES FOR CONNECTIONS 14.CLEANOUT EACH CONDUIT SYSTEM BEFORE PULLING WIRE.

15.PULL CONDUCTORS USING RECOGNIZED METHODS AND EQUIPMENT LEAVING AT LEAST 6" WIRE AT ALL JUNCTION BOXES FOR CONNECTIONS. 16.FORM AND TIE ALL WIRING IN PANELBOARDS. 17.THERE SHALL BE NO WIRENUT JOINTS OR SPLICES MADE INSIDE SWITCHBOARDS/PANELBOARDS.

18.MAKE ALL CONNECTIONS TO DISCONNECT SWITCHES, MOTOR CONTROLLERS, MOTORS AND OTHER EQUIPMENT SHOWN ON THE PLANS. EXIT LIGHTS, FIRE ALARM AND EMERGENCY CIRCUITS SHALL BE INSTALLED IN SEPARATE CONDUIT SYSTEMS. INSTALL A MAXIMUM OF 3 SINGLE PHASE CIRCUITS IN A SINGLE RACEWAY, UNLESS OTHERWISE SPECIFICALLY CALLED FOR (SIX (6) CURRENT CARRYING CONDUCTORS MAXIMUM PLUS GROUND).

19.INSTALL MULTIWIRE BRANCH CIRCUITS PER ALL REQUIREMENTS OF N.E.C. ARTICLE 210.4. HANDLE TIES MUST BE INSTALLED TO IDENTIFY SINGLE-POLE, MULTIWIRE BRANCH CIRCUITS PER ALL REQUIREMENTS OF N.E.C. ARTICLE 240.15(B).

20.BRANCH CIRCUIT WIRE SIZES (AND CONDUITS) SHALL BE INCREASED FROM THOSE INDICATED ON THE PLANS TO PREVENT EXCESSIVE VOLTAGE DROP. BRANCH CIRCUITS SHALL BE INSTALLED WITH WIRES OF SUFFICIENT SIZE SO THAT VOLTAGE DROP BETWEEN THE PANEL AND THE LOADS DOES NOT EXCEED LIMIT OF 3%.

RACEWAYS AND BOXES

1. ALL WIRE SHALL BE RUN IN ACCORDANCE WITH CODE IN CORROSION RESISTANT, RIGID, THREADED, METAL CONDUIT A. SWITCHES: OR ELECTRICAL METALLIC TUBING (E.M.T.) UNLESS OTHERWISE SPECIFICALLY STATED HEREIN. a. CONDUIT IN EXTERIOR WALLS, BELOW FLOOR SLAB, OR UNDERGROUND SHALL BE RIGID, THREADED, GALVANIZED,

b. CARLON PVC TYPE 40 HEAVY WALL CONDUIT WITH GROUND WIRE MAY BE USED BELOW FLOOR SLAB OR UNDERGROUND IN LIEU OF RIGID, THREADED, GALVANIZED CONDUIT. PVC SCHEDULE 40 CONDUIT SHALL NOT BE RUN IN OR ABOVE FLOOR SLAB. PVC CONDUIT SHALL TERMINATE BELOW FLOOR SLAB WITH RIGID, THREADED METAL CONDUIT ADAPTER. CONDUIT ABOVE SLAB SHALL BE METAL.

c. CONDUIT RUN EXPOSED TO THE WEATHER SHALL BE HEAVY WALL, METAL THREADED TYPE.

2. CONDUIT SIZE SHALL BE 1/2" MINIMUM.

3. CONDUIT SHALL BE SECURELY FASTENED IN PLACE. 4. ALL CONDUIT SHALL BE CONCEALED IN WALLS, FLOOR AND CEILINGS WHEREVER POSSIBLE. EXPOSED CONDUIT IN

FINISHED AREAS WILL NOT BE PERMITTED. EXPOSED CONDUIT WILL BE PERMITTED IN UNFINISHED AREAS WITH THE SPECIFIC APPROVAL OF THE ARCHITECT. 5. USE FLEXIBLE CONDUIT FOR THE CONNECTION TO RECESSED OR SEMI-RECESSED LIGHTING FIXTURES (6' LENGTH MAXIMUM). USE LIQUID TIGHT METAL CONDUIT FOR ALL CONNECTIONS TO MOTORS AND OTHER EQUIPMENT SUBJECT TO VIRRATION AND IN AREAS SUBJECT TO MOISTURE

6. USE WATERTIGHT JOINTS WITH BURIED AND CONCRETE ENCASED CONDUIT. ALL BURIED CONDUITS OUTSIDE OF BUILDINGS SHALL HAVE A MINIMUM OF 24" OF COVER UNLESS SHOWN OTHERWISE. METAL CONDUITS BURIED IN EARTH SHALL BE PAINTED (TWO COATS) WITH HEAVY ASPHALTUM PAINT

7. SUPPORT RUNS OF CONDUIT AS DETAILED IN THE APPROPRIATE TABLE OF THE NATIONAL ELECTRICAL CODE (NEC). 8. INSTALL EXPOSED RUNS OF CONDUIT AND CONDUIT ABOVE LAY-IN CEILINGS PARALLEL OR PERPENDICULAR TO THE WALLS, STRUCTURAL MEMBERS OF INTERSECTIONS OF VERTICAL PLANES AND CEILINGS. PROVIDE RIGHT ANGLE TURNS USING FITTINGS OR SYMMETRICAL BENDS. SUPPORT CONDUITS WITHIN 1" OF ALL CHANGES IN DIRECTION. 9. IF CONDUIT IS SUSPENDED, IT SHALL BE SUPPORTED ON TRAPEZE HANGERS WHICH USE "ALL-THREAD" RODS FROM

THE STRUCTURAL STEEL. THE USE OF CEILING SUPPORT WIRE OR SIMILAR MATERIAL WILL NOT BE ACCEPTED. 10.INSTALL EMPTY CONDUIT FOR FUTURE USE AS INDICATED ON THE DRAWINGS. CONDUIT SHALL BE COMPLETE WITH JETLINE OR PULL ROPE, JUNCTION/OUTLET BOXES, TILE RINGS AND APPROPRIATE COVER PLATES. 11.PROVIDE PITCHPOCKETS WHERE CONDUITS PENETRATE THE ROOF.

12.THREAD LUBRICATION/SEALANT IS REQUIRED ON OUTDOOR AND UNDERGROUND THREADED METAL JOINTS. 13.INSTALL FIRE SEAL FITTINGS WHERE CONDUITS PENETRATE CONCRETE FLOOR SLABS OR MASONRY WALLS 14.HORIZONTAL PORTION OF CONDUIT EXPOSED ON THE ROOF AND FEEDING EQUIPMENT SHALL NOT BE MORE

THAN 5'-O" UNLESS THE WRITTEN APPROVAL FROM ARCHITECT OR ENGINEER IS OBTAINED.

1. IN FINISHED AREAS WHERE BRANCH CIRCUITS CANNOT BE CONCEALED DUE TO EXISTING CONDITIONS. THE USE OF SURFACE MOUNTED RACEWAYS MAY BE PERMITTED. E.C. SHALL CONTACT ENGINEER/ARCHITECT FOR APPROVAL PRIOR TO INSTALLATION. USE SURFACE METAL RACEWAY, CONSTRUCTED OF ENAMELED. SHEET METAL CHANNEL WITH FITTED COVER, COLOR & FINISH BY ARCHITECT. FURNISH STANDARD COUPLINGS, FITTINGS, BOXES, CONNECTORS, ELBOWS AND OTHER ACCESSORIES FOR A 100% COMPLETE INSTALLATION. EQUAL TO WIREMOLD OR APPROVED.

PULL & JUNCTION BOXES: I. INSTALL PULL AND JUNCTION BOXES WHERE SHOWN ON THE DRAWINGS, AND WHERE REQUIRED FOR CHANGES IN

DIRECTION, AT JUNCTION POINTS, AND TO FACILITATE WIRE PULLING. FURNISH BOX SIZES IN ACCORDANCE WITH NEC UNLESS LARGER BOXES ARE INDICATED. 2. PROVIDE STEEL BOXES AND REMOVABLE COVERS OF CODE GAGE, HOT ROLLED SHEET STEEL, HOT DIPPED

GALVANIZED INSIDE AND OUTSIDE, FOR ABOVE GROUND WORK. FURNISH WEATHERPROOF BOXES WHEN INSTALLED AROVE GROUND OUTSIDE 3. PROVIDE CAST IRON BOXES, HOT DIPPED GALVANIZED INSIDE AND OUTSIDE WHERE SHOWN ON THE DRAWINGS.

FURNISH REMOVABLE COVERS WITH GASKETS AND STAINLESS STEEL, BRASS OR BRONZE SCREWS. 4. PROVIDE CONCRETE BOXES FOR UNDERGROUND WORK UNLESS OTHERWISE INDICATED ON THE DRAWINGS. FURNISH STEEL FRAMES AND COVERS WITH THE COVER ATTACHED TO THE FRAME WITH HEXAGON HEAD, BRASS OR BRONZE CAP SCREWS, 3/8" DIAMETER. PROVIDE A RUBBER GASKET FOR SEALING BETWEEN THE COVER AND THE FRAME. PAINT THE COVER WITH TWO COATS OF HEAVY ASPHALTUM.

5. PROVIDE SIZE AS REQUIRED FOR NUMBER AND SIZE OF CONDUIT AND CONDUCTORS. COORDINATE DEPTH TO SUIT WALL DEPTH AND CONSTRUCTION. MAXIMUM NUMBER OF CONDUCTORS PERMITTED IN STANDARD BOXES SHALL BE AS LISTED IN N.E.C. INSTALL FLUSH RECESSED WHEREVER POSSIBLE AND SECURELY SUPPORTED FROM BUILDING CONSTRUCTION., O.Z./GEDNEY, CROUSE HINDS, T&B, STEEL CITY, RACO OR ACCEPTED EQUAL.

1. ALL GROUNDING AND GROUNDING CIRCUITRY SHALL MEET OR EXCEED THE REQUIREMENTS OF NEC 2014, ARTICLE 250. RACEWAY SYSTEMS WHICH INCLUDES ALL METAL CONDUIT, PULLBOXES, JUNCTION BOXES, ENCLOSURES, MOTOR FRAMES, ETC. SHALL BE MADE TO FORM A CONTINUOUS CONDUCTING, PERMANENT GROUND CIRCUIT OF THE LOWEST PRACTICAL IMPEDANCE TO ENHANCE THE SAFE CONDUCTION OF GROUND FAULT CURRENTS AND TO PREVENT OBJECTIONABLE DIFFERENCES IN VOLTAGE BETWEEN METAL CURRENT CARRYING PARTS OF THE ELECTRICAL SYSTEM. PROVIDE A GREEN GROUNDING CONDUCTOR IN ALL CIRCUITS, CONDUIT SYSTEM SHALL NOT BE USED AS THE EQUIPMENT GROUNDING CONDUCTOR. CONDUCTOR SIZE SHALL BE AS REQUIRED BY NEC, ARTICLE 250. ALL EQUIPMENT GROUND BUS. GROUND PADS. FRAMES. ENCLOSURES. ETC SHALL HAVE SURFACES AT THE POINT OF CONNECTION THOROUGHLY CLEANED AND BRIGHTENED JUST PRIOR TO ACTUALLY MAKING THE CONNECTION. TOUCH-UP DAMAGED PAINTED SURFACES. SPLICES IN WIRE OR CABLE GROUNDING CONDUCTORS ARE PROHIBITED. SOLDER PROHIBITED FOR CONNECTIONS 2. GROUND EACH OUTSIDE LIGHTING POLE SEPARATELY, REFER TO DRAWINGS.

3. ALL CONDUITS SHALL CONTAIN A CODE-SIZED GROUND WIRE SIZE PER N.E.C. IN ADDITION TO THE CONDUCTORS SHOWN ON THE PLANS. WHERE CIRCUIT CONDUCTORS ARE INCREASED IN SIZE FOR VOLTAGE DROP, THE GROUND WIRE SIZE SHALL BE INCREASED PROPORTIONATELY. 4. WHERE AN ISOLATED, INSULATED GROUND IS REQUIRED A SEPARATE ISOLATED GREEN GROUND IN ADDITION TO THE

EQUIPMENT GROUND WIRE SHALL BE RUN FROM THE PANEL ISOLATED GROUND BUS TO THE ISOLATED GROUND CONNECTION OF THE DEVICE SERVED. IN NO CASE SHALL THE SYSTEM GROUND (GREEN WIRE AND ASSOCIATED OUTLET BOXES, CONDUIT AND BUILDING STEEL) BE ALLOWED TO CONTACT THE ISOLATED GROUND (GREEN WIRE WITH

5. AFTER INSTALLING GROUNDING SYSTEM BUT BEFORE PERMANENT ELECTRICAL CIRCUITRY HAS BEEN ENERGIZED, TEST FOR COMPLIANCE WITH REQUIREMENTS.

WIRING DEVICES

1. PROVIDE WIRING DEVICES, IN TYPES, CHARACTERISTICS. GRADES AND ELECTRICAL RATINGS FOR APPLICATIONS INDICATED WHICH ARE UL LISTED AND WHICH COMPLY WITH NEMA WD 1 AND OTHER APPLICABLE UL AND NEMA

2. WIRING DEVICE COLOR SHALL BE SELECTED BY ARCHITECT. UNLESS OTHERWISE INDICATED. 3. PROVIDE COVER OR DEVICE PLATES FOR OUTLET BOXES AS FOLLOWS UNLESS OTHERWISE NOTED:

a. FINISHED AREAS: THERMOPLASTIC - COLOR TO MATCH DEVICE b. UNFINISHED AREAS: ZINC COATED SHEET METAL, ALUMINUM, OR CAST METAL, AS APPROPRIATE FOR THE TYPE OF c. EXTERIOR AREAS: COPPER FREE ALUMINUM WITH GRAY, POWDER EPOXY FINISH, GASKET, WEATHERPROOF,

CROUSE-HINDS "WLRD" FOR DUPLEX RECEPTACLES AND "WLRS" FOR SINGLE RECEPTACLES OR EQUAL. d. TELEPHONE, COMMUNICATION, AND SIGNAL OUTLET PLATES, SHALL MATCH THOSE USED FOR RECEPTACLES AND SWITCHES. ALL OUTLET AND/OR JUNCTION BOXES SHALL BE COMPLETE WITH A COVER PLATE BY THIS

e. WHERE DEVICES ARE GANGED, THEY SHALL BE INSTALLED UNDER A COMMON COVERPLATE. 3. LOCATE SWITCHES AND WALL SWITCH SENSORS AT A MAXIMUM HEIGHT OF 4'-0" A.F.F., MEASURED TO CENTER OF BOX, OR NEAREST BLOCK COURSE (WITHIN A.D.A. REQUIREMENTS) UNLESS OTHERWISE INDICATED. THE LONG

DIMENSION OF THE SWITCHES SHALL BE VERTICAL. 4. LOCATE RECEPTACLES AT A MINIMUM HEIGHT OF 1"-6" A.F.F., MEASURED TO CENTER OF BOX, OR NEAREST BLOCK COURSE (WITHIN A.D.A. REQUIREMENTS), UNLESS NOTED OTHERWISE. THE LONG DIMENSION OF RECEPTACLES SHALL BE VERTICAL.

<u>AUTOMATIC LIGHTING CONTROL DEVICES:</u>

1. ALL LIGHTING CONTROL DEVICES MUST BE SELECTED, INSTALLED AND WIRED TO MEET CURRENT LOCAL AND STATE ENERGY CODE REQUIREMENTS. WHEN LOCAL AND STATE CODES ARE NOT APPLICABLE THE 2015 IECC (INTERNATIONAL ENERGY CONSERVATION CODE) SHALL BE APPLIED. ANY DISCREPANCIES BETWEEN THESE DESIGN DOCUMENTS AND CURRENT ENERGY CODES MUST BE BROUGHT TO THE ENGINEERS ATTENTION PRIOR TO BID SUBMISSION.

2. PROVIDE SINGLE RELAY, DUAL TECHNOLOGY, 120/277 VOLT, WALL SENSOR SWITCH, UNLESS OTHERWISE INDICATED. BASIC PROGRAMMING SHALL INCLUDE MANUAL ON, AUTOMATIC OFF WITH THE OCCUPANCY SENSOR TIME DELAY SET FOR 15 MINUTES. REMAINING PROGRAMMING OPTIONS SHALL BE FACTORY DEFAULT UNLESS OTHERWISE INDICATED. ACCEPTABLE MANUFACTURERS INCLUDE SENSOR SWITCH, WATTSTOPPER OR APPROVED EQUAL.

3. PROVIDE SINGLE ZONE, DUAL TECHNOLOGY 120 OR 277 VOLT (AS REQUIRED) CEILING MOUNT OCCUPANCY SENSOR WITH 360 DEGREE VIEWING ANGLE, UNLESS OTHERWISE INDICATED. PROVIDE ALL REQUIRED POWER PACKS, SLAVE POWER PACKS, CONTROL UNITS, RELAYS, BACKBOXES, MOUNTING PLATES AND OTHER EQUIPMENT NECESSARY FOR PROPER SYSTEM OPERATION. BASIC PROGRAMMING SHALL INCLUDE OCCUPANCY SENSOR TIME DELAY SET FOR 15 MINUTES. REMAINING PROGRAMMING OPTIONS SHALL BE FACTORY DEFAULT UNLESS OTHERWISE INDICATED.ACCEPTABLE MANUFACTURES INCLUDE SENSOR SWITCH, WATTSTOPPER OR APPROVED EQUAL.

4. PROVIDE SINGLE ZONE, DUAL TECHNOLOGY 120 OR 277 VOLT (AS REQUIRED) CEILING MOUNT DIMMING AND PHOTOCONTROL OCCUPANCY SENSOR WITH 360 DEGREE VIEWING ANGLE, UNLESS OTHERWISE INDICATED. PROVIDE ALL REQUIRED POWER PACKS, SLAVE POWER PACKS, CONTROL UNITS, RELAYS, BACKBOXES, MOUNTING PLATES AND OTHER EQUIPMENT NECESSARY FOR PROPER SYSTEM OPERATION. BASIC PROGRAMMING SHALL INCLUDE OCCUPANCY SENSOR TIME DELAY SET FOR 15 MINUTES. REMAINING PROGRAMMING OPTIONS SHALL BE FACTORY DEFAULT UNLESS OTHERWISE INDICATED. ACCEPTABLE MANUFACTURES INCLUDE SENSOR SWITCH, WATTSTOPPER OR APPROVED EQUAL.

SAFETY SWITCHES & FUSES

1. SAFETY SWITCHES SHALL BE THE ENCLOSED HEAVY-DUTY TYPE (TYPE HD) WITH QUICK-MAKE, QUICK-BREAK MECHANISM AND EXTERNAL PAD LOCKABLE OPERATING HANDLE.

2. SAFETY SWITCHES SHALL BE RATED FOR 240 OR 600 VOLTS AS APPLICABLE. THEY SHALL BE HORSEPOWER RATED WHEN USED IN MOTOR CIRCUITS. 3. SAFETY SWITCHES SHALL BE FUSIBLE OR NON-FUSIBLE, 2, 3, OR 4 POLE AS INDICATED ON THE DRAWINGS. 4. SAFETY SWITCHES SHALL BE SINGLE THROW UNLESS OTHERWISE INDICATED ON THE DRAWINGS.

5. ENCLOSURES SHALL BE NEMA 1 INDOORS AND NEMA 3R OUTDOORS UNLESS OTHERWISE INDICATED ON 6. MANUFACTURER SHALL BE SQUARE D, SIEMENS, OR CUTLER-HAMMER. ALL SAFETY SWITCHES SHALL BE BY

ONE MANUFACTURER. 7. MOUNT THE SAFETY SWITCHES SECURELY BETWEEN 3' X 6' LEVELS ABOVE THE FLOOR UNLESS OTHERWISE

INDICATED ON THE DRAWINGS. 8. SWITCHES ON BLOCK WALLS SHALL BE MOUNTED ON A 3/4" PLYWOOD BACKBOARD, WHERE LOCATED INDOORS.

1. THE CONTRACTOR SHALL FURNISH A COMPLETE SET OF FUSES FOR ALL SWITCHES, PLUS FUSIBLE EQUIPMENT FURNISHED BY OTHER TRADES. UNLESS INDICATED OTHERWISE ON PLANS, THE FUSES SHALL BE OF THE

a. FUSES 601 TO 6000 AMPS SHALL BE UL CLASS. TRADE TYPE SHALL BE KRP-C AS MANUFACTURED BY THE BUSSMANN COMPANY. b. FUSES 1/10 TO 600 AMPS SHALL BE UL CLASS RK1. TRADE TYPE SHALL BE LOW PEAK LPS-RK (600V) AND LPN-RK (250V) AS MANUFACTURED BY BUSSMANN COMPANY.

c. ALL OTHER FUSES SHALL BE DUAL-ELEMENT CURRENT-LIMITING TYPE WITH 200,000 AMPERES SYMMETRICAL INTERRUPTING CAPACITY.

d. FUSES SHALL BE MANUFACTURED BY BUSSMANN, GOULD-SHAUMUTT, OR RELIANCE. e. SPARE FUSES AMOUNTING TO A DUPLICATE SET OF EACH SIZE INSTALLED SHALL BE TURNED OVER TO THE

OWNER UPON COMPLETION OF THE PROJECT. PROVIDE AND PLACE IN A SPARE FUSE CABINET SIMILAR TO

f. THIS CONTRACTOR SHALL REPLACE ALL FUSES BLOWN DURING CONSTRUCTION.

MOTOR CONTROLLERS:

1. TYPE A (FULL VOLTAGE, NON-MAGNETIC, SINGLE PHASE): TOGGLE SWITCH, STAINLESS STEEL ENCLOSURE, THERMOPLASTIC COVERPLATE; SIEMENS CLASS SMF SERIES, OR ACCEPTED EQUAL. 2. TYPE A1 (FULL VOLTAGE, NON-MAGNETIC SINGLE PHASE): SIMILAR TO TYPE A ABOVE, EXCEPT WITH RED PILOT

LIGHT; SIEMENS CLASS SMF SERIES, OR ACCEPTED EQUAL. 3. TYPE B (FULL VOLTAGE MAGNETIC): NEMA 1 ENCLOSURE WITH PILOT LIGHT; SIEMENS CLASS 14 SERIES WITH AUXILIARY CONTACTS. OR ACCEPTÉD EQUAL.

4. TYPE B1 (FULL VOLTAGE, COMBINATION MAGNETIC): FUSIBLE DISCONNECT SWITCH TYPE, NEMA 1 ENCLOSURE,

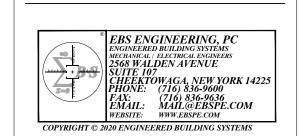
PILOT LIGHT AND HOA IN COVER; SIEMENS CLASS 17 SERIES WITH AUXILIARY CONTACTS, OR ACCEPTED EQUAL.

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