

# VILLAGE OF MINOOKA

## Construction Standards and Specifications for Street Lighting

### General Provisions

#### 1.1 GENERAL

- A. All developments shall include provisions for the construction of street lighting facilities in accordance with this Section.
- B. The street lighting plan shall show the location and direction of the pole and mast and the proposed routing of the electric cable and duct. The pole size, bracket size, and catalog numbers are to be shown on the street light plans. The street lighting plan and equipment submittals must be approved by the Village Engineer prior to the installation of any part of the system.
- C. Street lights shall be installed and in good working order immediately upon completion of the roadway base course, sanitary sewer, water mains, storm sewer, AT&T, ComEd and Nicor installations. The developer shall arrange with the ComEd to energize the street light system as soon as possible. The developer shall be responsible for all connection fees.
- D. The Village shall be billed for energy usage. Maintenance of the street light network within the development shall be the developer's responsibility until Village Board formally accepts subdivision improvements. The Village Board will not formally accept the street light network until they have operated for eighteen (18) months, receipt of as-built drawings and final approval by the Village Engineer. Reports of outages made to the Village in the interim will be addressed by the Village Public Works Department at the expense of the developer.
- E. As-built drawings shall include all lighting equipment, including but not limited to lighting units, conduit crossings, handholes, controllers, and ComEd service connection locations. As-built drawings shall be submitted on a flash drive and contain both red-lined PDF plans and an AutoCAD or MicroStation file with final locations plotted in state-plane coordinates.
- F. Street lighting materials and installation shall be in accordance with the current service rules and policies of ComEd in accordance with the National Electric Code, latest edition; Standard Specifications for Road and Bridge Construction by Illinois Department of Transportation; and the Electrical Manufacturers Association (NEMA); National Electrical Safety Code; an Informational Guide for Roadway Lighting by the American Association of State Highway and Transportation Officials; and American

National Standard Practice for Roadway Lighting, ANSI/IES RP-8 (latest edition) by Illuminating Engineering Society, approved by American National Standards Institute.

- G. A complete set of Shop Drawings shall be submitted to the Village Engineer including: pole, arm, luminaire, photoelectric control, lighting controller, unit duct, conduit, handholes, cable, ground rod, fuse holder located in pole, concrete, rebar, radius through foundation, anchor bolts, soil strength, unconfined compressive strength. Shop drawings shall be in electronic PDF format.

## **1.2 BASIC DESIGN STANDARDS**

### **A. Photometric Design and Pole Placement**

Street lighting shall be designed in accordance with the Illuminating Engineering Society (IES) RP-8, latest edition. Calculations shall be performed using photometric software such as AGi32 produced by Lighting Analysts, Inc. All calculations shall consider an R3 pavement type and a light depreciation factor of 0.7.

The levels defined in IES RP 8 are minimum acceptable levels and the design approach shall be to achieve but not significantly exceed these levels. Calculated lighting levels shall not exceed the values for the next higher roadway classification for the respective combination land use / pedestrian area. For example, if a roadway is determined to have a classification of Local/Low, the maximum levels for this roadway shall not exceed the classification of Collector/Low.”

Straight line calculations shall be performed using the luminance method and shall include veiling luminance calculations per RP-8. The calculation submittals shall include all typical pavement widths and lane configurations.

Intersection calculations shall use the actual project CADD geometry to produce calculation printouts in accordance with RP-8. The illuminance method shall be used.

Poles shall be located at all intersections and spaced per calculations performed in accordance with RP-8. The developer shall consult with the Village Engineer to assist with determining roadway and area classifications. Poles shall also be located at the ends of cul-de-sacs and at curves in roadway as required by the Village Engineer. Poles shall be set in the parkway a minimum of two (2) feet from the back of curb. Where the distance between the sidewalk and the curb is such that this location is impractical or where the sidewalk adjacent to the curb, the Village Engineer shall review and approve alternate locations for the pole.

In no cases shall light pole spacing exceed two hundred and twenty five feet (225')

Unless otherwise directed by the Village Engineer, the direction of the support arm shall be at right angles to the centerlines of the intersecting streets at a four (4) legged intersection. At 'T' intersections, a pole shall be provided on the centerline extended of

the terminating street at the top of the "T" with support arm extending toward the center of the intersection. Between intersections, mast arms shall be orientated at right angles to the centerline. In cul-de-sacs, lights shall be placed in the center median or if no center median is to be constructed, at the end of the cul-de-sac along the centerline extended.

Poles shall be located a minimum of 20 feet from existing or proposed parkway trees.

B. Illumination maximum points shall not exceed the following intensities:

At or behind a residential property line	0.5 foot-candle
At or behind a commercial property line	2.0 foot-candles

C. Type 1 lights shall be used on all residential local and neighborhood connectors. Type 2 lights shall be used on all residential collectors, minor arterials, and business and manufacturing areas.

D. Mounting height in residential shall be twenty-five (25) feet for all poles, unless otherwise approved by the Village Board.

E. Conductors shall be sized to the limit voltage drop to five percent (5%) at furthest light.

F. All electric cable shall be placed underground in a one and one quarter (1.25) inch minimum unit duct. Direct bury is not allowed. All pavement crossings (see 1.4, B.2) shall be in PVC schedule 80 or rigid galvanized steel conduit sleeves.

G. Electrical service shall be 120/240 Volt, single phase, three wire, 60 Hz.

H. Lighting controllers are required for all developments. This work shall conform to Section 825 of the Standard Specifications for Road and Bridge Construction except as modified herein. The contractor shall furnish and install a complete ground flush mount light control cabinet (traffic box) with foundation. The cabinet is to be constructed from aluminum and powder coated green with front cabinet door labeled "Village of Minooka Street Lighting". The cabinet shall have welded exterior seams. The opening shall have flanged lips and the door hinge shall be continuous. The door gasket shall be applied to full periphery. The door lock shall be a standard brass Corbin Lock. Two (2) keys shall be provided with cabinet. All lights shall be controlled via a photocell mounted to the cabinet overhang as shown on the detail drawings. Five (5) copies of as-built controller internal wiring schematics and parts lists shall be placed in a plastic sleeve inside the cabinet door. All controllers shall be metered. The meter shall be installed on the side of the cabinet in a meter socket. See detail drawings for additional information.

J. Each individual light shall have its own breakaway fuse kit with a fuse on the hot conductors and slugs on the neutral conductor.

- K. A hand hole shall be provided in each pole base for splicing purposes. The hand hole shall be located on the side opposite of traffic flow, eighteen (18) inches above finished grade.
- L. Each lighting unit shall have a concrete foundation meeting the minimum standards listed below unless otherwise approved by the Village:
  - 1. Minimum of twenty-four (24) inches in diameter
  - 2. Minimum foundation depth of six (6) feet. Soil conditions will determine the foundation depth. See table on the foundation detail drawings.
  - 3. Top of concrete foundation shall not exceed four (4) inches above grade nor be less than two (2) inches above grade. (This is to ensure anchor bolts are exposed to air to avoid corrosion).
  - 4. IDOT class SI concrete shall have a minimum compressive strength of 3,500 pounds per square inch in twenty-eight (28) days.
  - 5. Anchor bolts, nuts and washers shall be hot dipped galvanized for their entire length.
  - 6. The foundation shall be cast in place and allowed to cure a minimum of fourteen (14) days before light pole is erected. The top of the foundation shall be constructed level so that no shims or other leveling devices will be needed to set the light standard plumb on the foundation.
  - 7. A two (2) foot clear zone shall be maintained from pedestrian ways to any above ground obstructions.
  - 8. A two (2) foot clear zone shall be maintained from back of curb to the pole base.
  - 9. When offset foundations are necessary, shop drawings and structural calculations shall be submitted to the Village for review. A copy of the permit approving construction of the foundation over the affected utility shall be submitted to the Village.

### **1.3 MATERIAL SPECIFICATIONS AND DETAILS**

#### **A. Type 1 - Residential Lighting Units**

- 1. Pole – Aluminum light poles shall be one piece, 25' mounting height and tapered with eight (8) foot truss-style arm, and four (4) bolt mounting base with 10 to 11-inch bolt circle diameter. Poles shall be manufactured by Valmont, Hapco, or approved equal.

HAPCO Company  
26252 Hillman Highway  
Abingdon, Virginia 24210  
Phone: 540-628-7171 or Fax: 540-628-7707  
Pole/Truss Arm assembly, Cat. No. 31-181

Local Supplier:  
Englewood Electrical Supply 1801 Moen Ave.  
Joliet, IL 60435  
Phone: 815-725-3900

Manufacturer's Rep:  
KSA  
1220 Central Park Ave  
Hanover Park, IL 60133  
630-307-6955

Valmont Industries  
P. O. Box 358  
Valley, Nebraska 68064-0358  
Phone: 402-359-2201 or Fax: 402-359-4025  
Cat. No. 2208-45706-T4 (Pole), 1TA0832B (8ft. Truss Arm)

Local Supplier:  
Englewood Electrical Supply 1801 Moen Ave.  
Joliet, IL 60435  
Phone: 815-725-3900

Manufacturer's Rep: Lighting Solutions of Illinois  
401 S. Carlton Ave.  
Wheaton, IL 60187  
630-462-0230

2. All proposed luminaires shall have an LED light source. Luminaire wattage, lumen output, distribution type, and other variables shall be as determined by the photometric calculations. Type 1 Residential luminaires shall be either the Leotek GCJ or GCM series, or GE Evolve ERL1 or ERLH series.

In all cases the Type 1 Residential luminaire shall meet the following:

- a. Color temperature 4,000K
- b. Lumen output of at least 9,500 but not greater than 11,000
- c. Efficacy greater than or equal to 100 lumens per watt
- d. Type 2R, 3, or 4 light distribution
- e. BUG rating:
  - Backlight less than or equal to 3
  - Uplight shall be zero
  - Glare less than or equal to 2
- f. ANSI 7 pin photocell receptacle for future wireless controls and monitoring. Luminaire shall be installed with a shorting cap.
- g. Enhanced surge protection 10kV / 5kA
- h. Minimum 5-year manufacturer's warranty
- i. Minimum 3G vibration rating
- j. Operating temperature range -40 °C to +50 °C
- k. Minimum 100,000 hours lifetime at L70
- l. Contain no liquids or moving parts
- m. Dimmable Driver
- n. UL or ETL listing
- o. Minimum ingress rating IP66
- p. 4 bolt slipfitter

B. Type 2 – Business Manufacturing Light Standards and Brackets

1. Pole: Aluminum light poles shall be one piece, 30' mounting height and tapered with eight (8) foot truss-style arm and four (4) bolt mounting base. Mounting height shall be thirty (30) feet. Light standard shall be Hapco Cat. No. 31-529 or Valmont Industries equivalent.
2. All proposed luminaires shall have an LED light source. Luminaire wattage, lumen output, distribution type, and other variables shall be as determined by the photometric calculations. Type 2 Business and Manufacturing luminaires shall be either the Leotek GCL or GCM series, or GE Evolve ERLH or ERL2 series.

In all cases the Type 2 Business and Manufacturing luminaire shall meet the following:

- a. Color temperature 4,000K
- b. Lumen output of at least 16,000 but not greater than 20,000
- c. Efficacy greater than or equal to 100 lumens per watt

- d. Type 2R, 3, or 4 light distribution
- e. BUG rating:
  - Backlight less than or equal to 3
  - Uplight shall be zero
  - Glare less than or equal to 2
- f. ANSI 7 pin photocell receptacle for future wireless controls and monitoring. Luminaire shall be installed with a shorting cap.
- g. Enhanced surge protection 10kV / 5kA
- h. Minimum 5-year manufacturer's warranty
- i. Minimum 3G vibration rating
- j. Operating temperature range -40 °C to +50 °C
- k. Minimum 100,000 hours lifetime at L70
- l. Contain no liquids or moving parts
- q. Dimmable Driver
- r. Minimum ingress rating IP66
- m. 4 bolt slipfitter

C. Ornamental Lighting – Requires approval by the Village Board.

D. Breakaway Devices – Light standards installed in rural locations and urban locations with speed limits 40 MPH or greater shall be fitted with low profile transformer breakaway bases. Hapco A79402 (TB6-9”) or approved equivalent. Refer to Minooka Standard Details for additional information.

E. Vibration Requirements – There shall be no excessive vibrations in the shaft or mast arms under moderate wind pressure, where damage may result to the luminaire and/or its component parts, and/or mast arms. A dampening device, as an integral part of the shaft, may be installed in the shaft to alleviate such excessive vibrations. The proposed vibration dampening device may be required by the Village Engineer.

F. Wire and Cable

1. All conductors shall be in accordance with Section 1066 of the Standard Specifications for Road and Bridge Construction by the Illinois Department of Transportation, latest edition. Conductors shall be coated or uncoated stranded copper with XLP or EPR-USE insulation. Conductors No. 2 AWG or larger shall meet ASTM B 8. Uncoated conductors shall meet ASTM B 3. Conductors shall be different colors to designate hot and neutral wires. Colors for lighting circuits shall be black, red, and white.
2. Internal pole circuit cable shall be a minimum of #10 AWG size. The fuse kits shall be Tron HEB-AW-RLC-A or HEB- AW-RLC-B breakaway fuse holders with a ten (10) amp fuse and shall meet the specifications for splicing of 600-volt cable and wire.
3. The electric cable shall be contained within a minimum one and one quarter (1.25”) diameter conduit.

inch coilable high density polyethylene unit duct. The unit duct shall be one piece without splices. The unit duct may be formed by extruding it over the insulated conductors. The unit duct shall have a smooth inner core that does not adhere to the conductor insulation.

4. Pole to pole wiring shall be a minimum #6 AWG. Each duct shall contain a minimum of two hot conductors, one neutral conductor, and one insulated ground conductor. The neutral conductor size shall equal the hot conductors. The ground conductor may be one size smaller than the hot conductor, but shall not be smaller than #8 AWG..
5. Conductors shall be sized to limit the voltage drop at the furthest pole to five (5%) percent.
6. All wire shall be subject to an insulation test to ground after installation. The minimum acceptable resistance to ground shall be two hundred fifty thousand (250,000) ohms. Any section of wiring failing to pass the minimum insulation test for any reason or showing an obvious short circuit shall be rejected. All circuits shall be tested in the presence of the Village Engineer or Electrical Inspector.
7. Street crossings of conductors shall be installed in minimum two (2) inch Schedule 80 heavy wall rigid PVC conduit or rigid galvanized steel.

## 1.4 INSTALLATION REQUIREMENTS

### A. Grounding

All foundations shall contain a ten (10) foot long grounding rod three-quarter (3/4) inch in diameter. The grounding rod shall be attached to the internal grounding lug located within the pole by clamps and electrical grounding wire. The ground circuit shall be connected to the foundation reinforcing steel via an exothermic weld connection.

### B. Wire and Cable

1. The electric cable shall be continuous without splices between lighting controllers and light standards. No underground splices will be allowed. If the cable has been cut during construction, the cable duct shall be repaired, and the cable run replaced
2. All pavement crossings existing or future driveways, streets, sidewalks, paths, etc. shall be coordinated by the developer or contractor. No open cutting of curb and gutter or pavement shall be performed. Pavement crossing sleeves shall consist of rigid steel conduit or Schedule 80 PVC. All casings shall extend a minimum of two (2) feet beyond the back of curb.
3. The duct shall extend one (1) foot into the light standards and the cable shall be



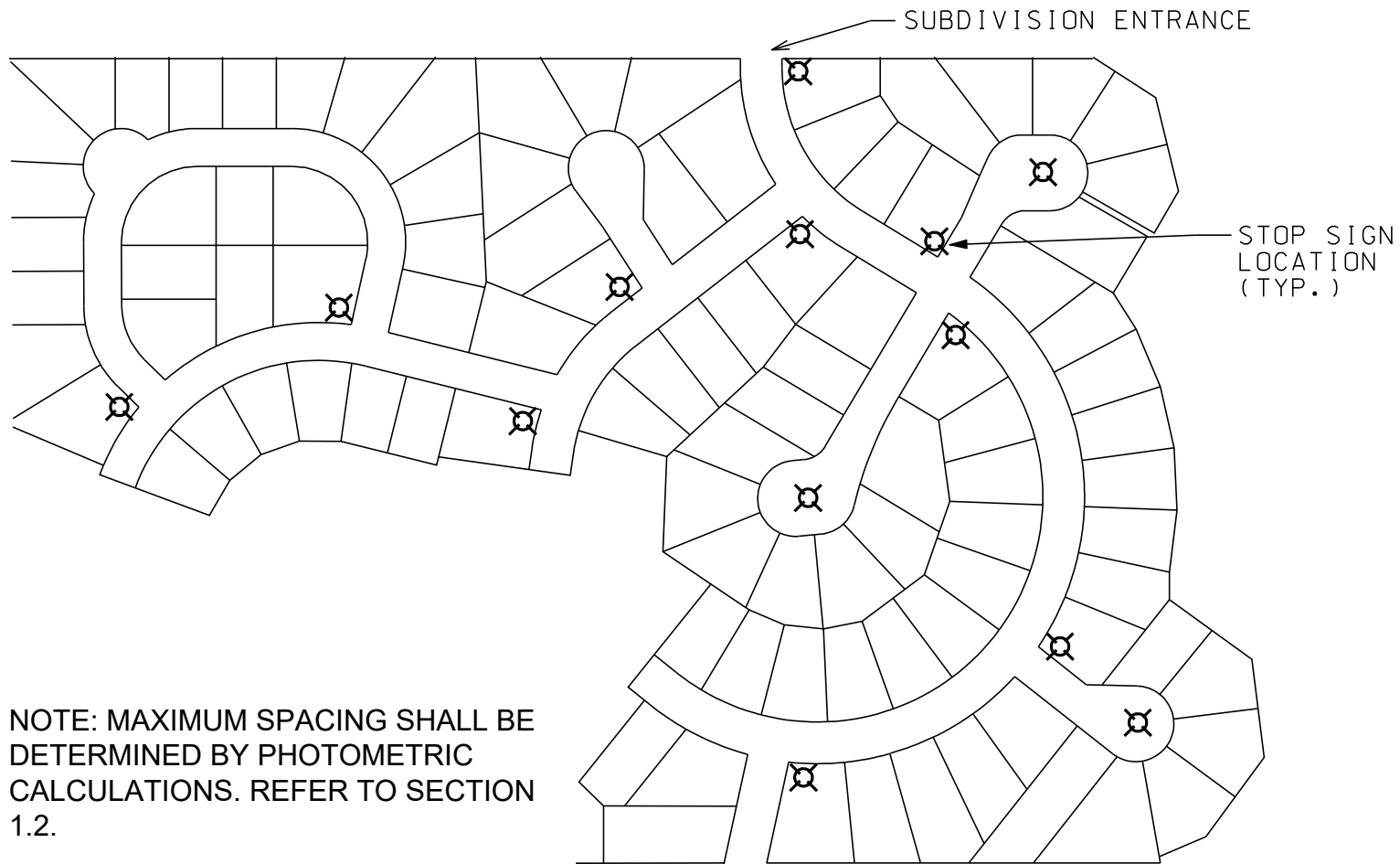
long enough for the splices to be withdrawn eighteen (18) inches out of the light standard hand holes. All electric cable and electric cable unit duct shall be buried underground at a minimum depth of thirty (30) inches below finished grade.

4. The cable duct shall be placed in the bottom of the trench after all loose stones have been removed and all protruding stones have been removed or covered with acceptable bedding material.
5. The trench shall be backfilled and thoroughly compacted to a density equal to the existing ground, or greater, in such a manner as not to injure the cable duct or the bare copper wire. No stone or rock greater than two (2) inches in maximum dimensions shall be allowed in any layer of backfill. No sod, frozen material, or any material which might cause settlement shall be placed as backfill. Deleterious substances, such as coal, lignite, shells, clay lumps and conglomerate, and cemented particles shall not exceed five percent (5%) by weight in any one sample of backfill material. Any material excavated from the trench may be used as backfill provided it does not conflict with the above and the material is acceptable to the Village Engineer.
6. Backfill from (1) one foot above conduit to roadway subgrade shall be compacted CA-7 and shall extend three (3) feet beyond the back of curb.
7. Red magnetic detectable warning tape shall be laid one (1) foot above the top of the buried conductors for the entire length of the conductor runs.

**VILLAGE OF MINOOKA  
SPECIFICATIONS FOR ROADWAY LIGHTING**

<b>Location</b>	<b>Mounting Height</b>	<b>Arm Length</b>	<b>Minimum Setback</b>	<b>Lumens</b>	<b>Voltage</b>	<b>Pole</b>	<b>Arm</b>	<b>Luminaire</b>
TYPE 1 Rural	25 ft.	8 ft.	13 ft. from edge of travelled lane to face of pole	9,500 to 11,000	120	Hapco 31-181 w/ breakaway device TB6-9" or Valmont Industries equivalent.	Truss arm	Leotek GCM series Or GE ERLH series
TYPE 1 Urban	25 ft.	8 ft.	3 ft. from face of curb to face of pole	9,500 to 11,000	120	Hapco 31-181 or Valmont Industries equivalent.	Truss arm	Leotek GCM series Or GE ERLH series
TYPE 2 Business Manufacturing Along Collectors and Minor Arterials	30 ft.	8 ft.	5 ft. from face of curb to face of pole in areas with curb. 11 ft from edge of travelled lane to face of pole in areas without curb.	16,000 to 20,000	120 or 240	Hapco 31-529 or Valmont Industries equivalent.	Truss arm	Leotek GCL series Or GE ERL2 series

# TYPICAL STREET LIGHTING SAMPLE FOR LIGHTING TYPE 1



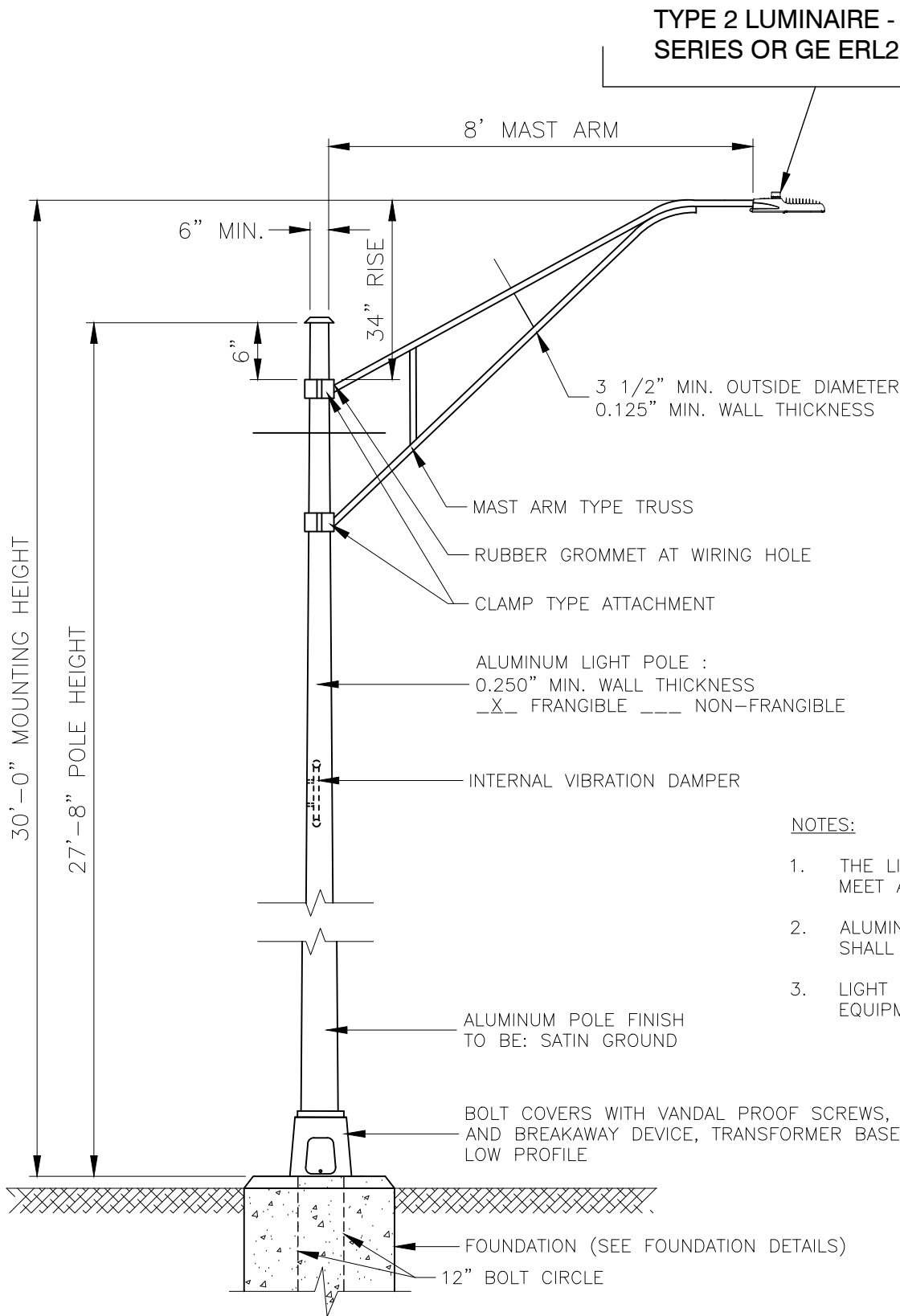
NOTE: MAXIMUM SPACING SHALL BE DETERMINED BY PHOTOMETRIC CALCULATIONS. REFER TO SECTION 1.2.

## GENERAL NOTES:

1. ALL WORK TO CONFORM TO THE NATIONAL ELECTRICAL CODE AND ANY APPLICABLE LOCAL CODES.
2. CONTRACTOR TO VERIFY LOCATION OF ALL UNDERGROUND UTILITIES BEFORE TRENCHING OR AUGERING.
3. BEFORE INSTALLING STANDARDS NEAR OVERHEAD FACILITIES CALL COMED. FOR APPROVAL OF LOCATION.
4. FOR LOCATION OF EXISTING UNDERGROUND ELECTRICAL CABLE CALL COMED.
5. SIZE ALL CONDUIT AS SPECIFIED ON DRAWINGS. MINIMUM SIZE SHALL BE 2".
6. ANY TREE TRIMMING REQUIRED AS DIRECTED BY THE ENGINEER SHALL BE PERFORMED BY THE CONTRACTOR, AND THE COST OF THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT.
7. CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO RESTORE ANY SPECIALIZED LANDSCAPING, (i.e. DECORATIVE ROCKS, SHRUBS, PLANTS, ECT.) OR SHALL REPLACE IT, THE COST OF WHICH SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT.

## TYPICAL LIGHTING NOTES

VILLAGE OF MINOOKA  
STANDARD DETAIL



**TYPE 2 LUMINAIRE - LEOTEK GCL SERIES OR GE ERL2 SERIES**

8' MAST ARM

6" MIN.

34" RISE

3 1/2" MIN. OUTSIDE DIAMETER  
0.125" MIN. WALL THICKNESS

MAST ARM TYPE TRUSS

RUBBER GROMMET AT WIRING HOLE

CLAMP TYPE ATTACHMENT

ALUMINUM LIGHT POLE :  
0.250" MIN. WALL THICKNESS  
  X   FRANGIBLE   NON-FRANGIBLE

INTERNAL VIBRATION DAMPER

ALUMINUM POLE FINISH  
TO BE: SATIN GROUND

BOLT COVERS WITH VANDAL PROOF SCREWS,  
AND BREAKAWAY DEVICE, TRANSFORMER BASE,  
LOW PROFILE

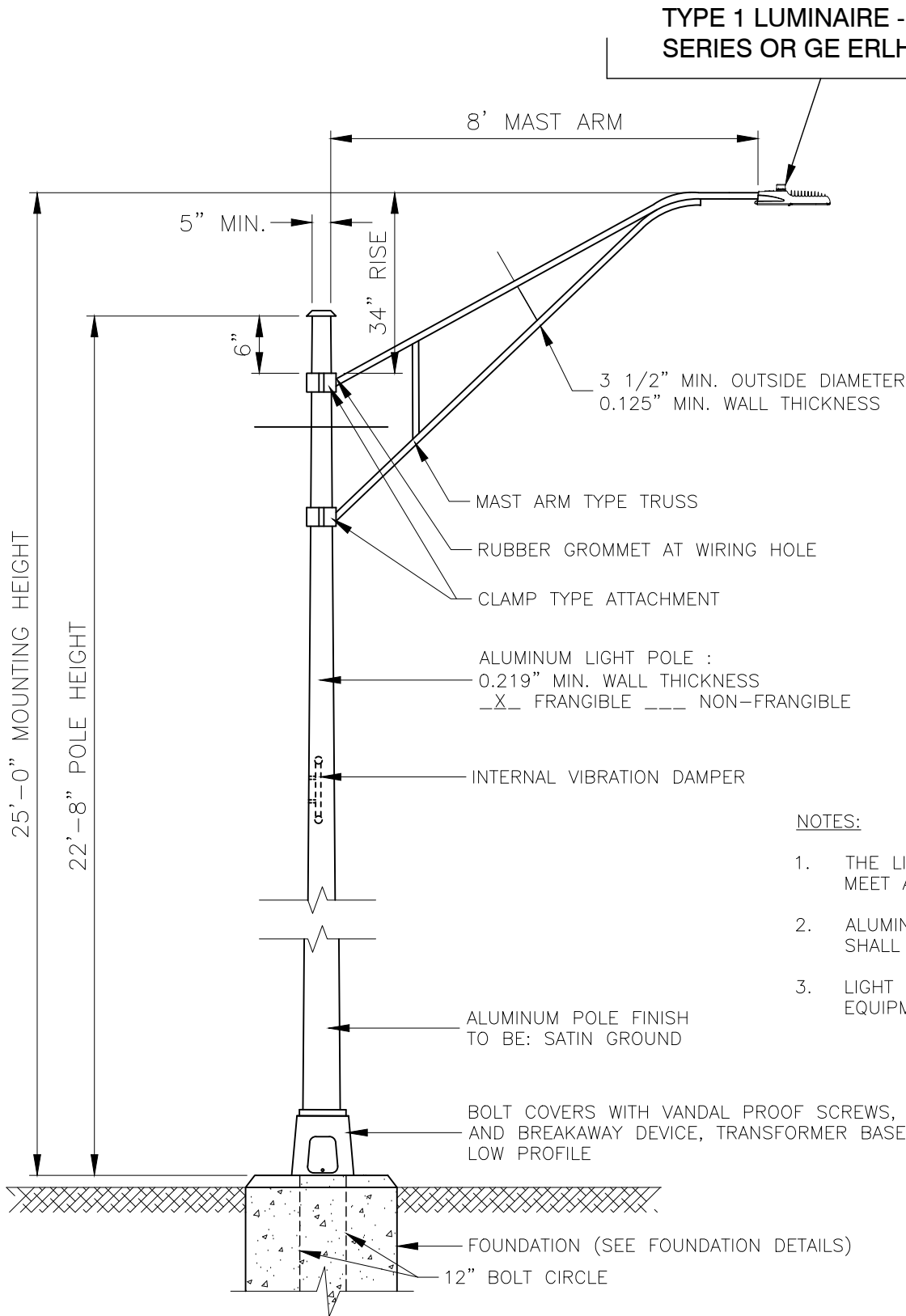
FOUNDATION (SEE FOUNDATION DETAILS)  
12" BOLT CIRCLE

NOTES:

1. THE LIGHTING UNITS SHALL MEET AASHTO DESIGN CRITERIA.
2. ALUMINUM ALLOY 6063-T6 SHALL BE USED.
3. LIGHT POLE AND ASSOCIATED EQUIPMENT TO BE U.L. LISTED

**TYPICAL POLE INSTALLATION, TYPE 2**  
**30' MOUNTING HEIGHT**

**VILLAGE OF MINOOKA**  
**STANDARD DETAIL**



TYPE 1 LUMINAIRE - LEOTEK GCM SERIES OR GE ERLH SERIES

8' MAST ARM

5" MIN.

34" RISE

6"

3 1/2" MIN. OUTSIDE DIAMETER  
0.125" MIN. WALL THICKNESS

MAST ARM TYPE TRUSS

RUBBER GROMMET AT WIRING HOLE

CLAMP TYPE ATTACHMENT

ALUMINUM LIGHT POLE :  
0.219" MIN. WALL THICKNESS  
  X   FRANGIBLE   NON-FRANGIBLE

INTERNAL VIBRATION DAMPER

25'-0" MOUNTING HEIGHT  
22'-8" POLE HEIGHT

ALUMINUM POLE FINISH  
TO BE: SATIN GROUND

BOLT COVERS WITH VANDAL PROOF SCREWS,  
AND BREAKAWAY DEVICE, TRANSFORMER BASE,  
LOW PROFILE

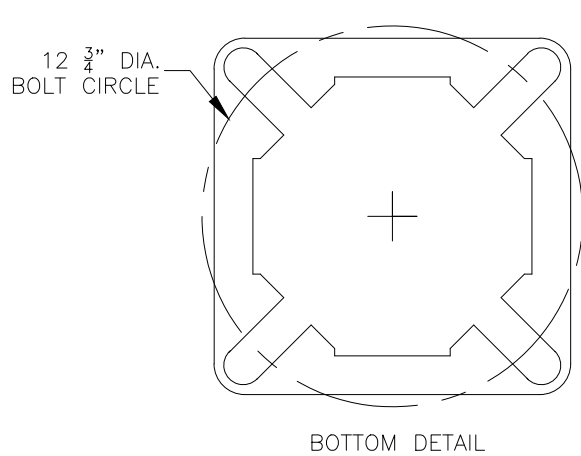
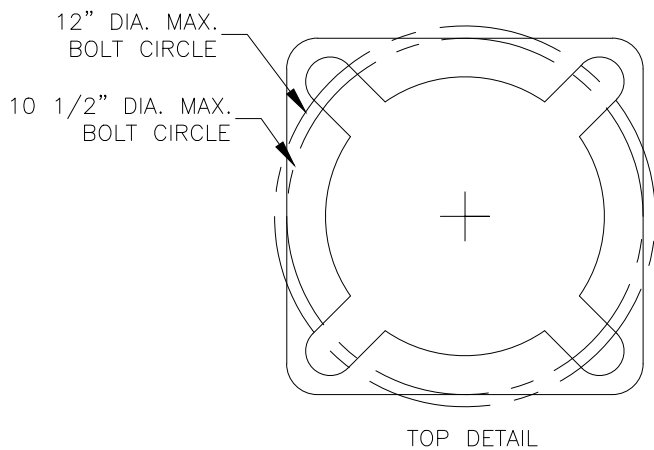
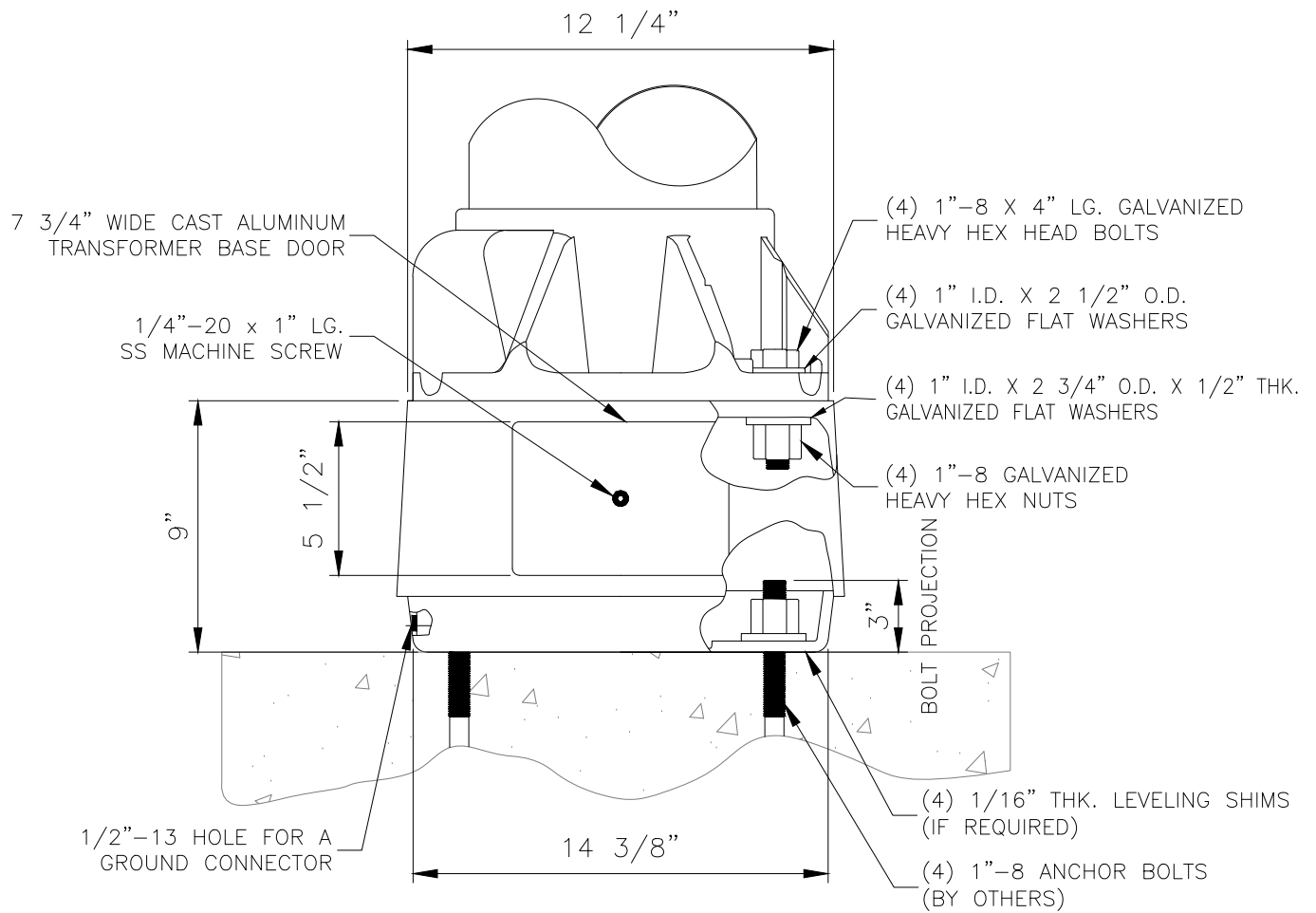
FOUNDATION (SEE FOUNDATION DETAILS)  
12" BOLT CIRCLE

NOTES:

1. THE LIGHTING UNITS SHALL MEET AASHTO DESIGN CRITERIA.
2. ALUMINUM ALLOY 6063-T6 SHALL BE USED.
3. LIGHT POLE AND ASSOCIATED EQUIPMENT TO BE U.L. LISTED

**TYPICAL POLE INSTALLATION, TYPE 1**  
**25' MOUNTING HEIGHT**

**VILLAGE OF MINOOKA**  
**STANDARD DETAIL**

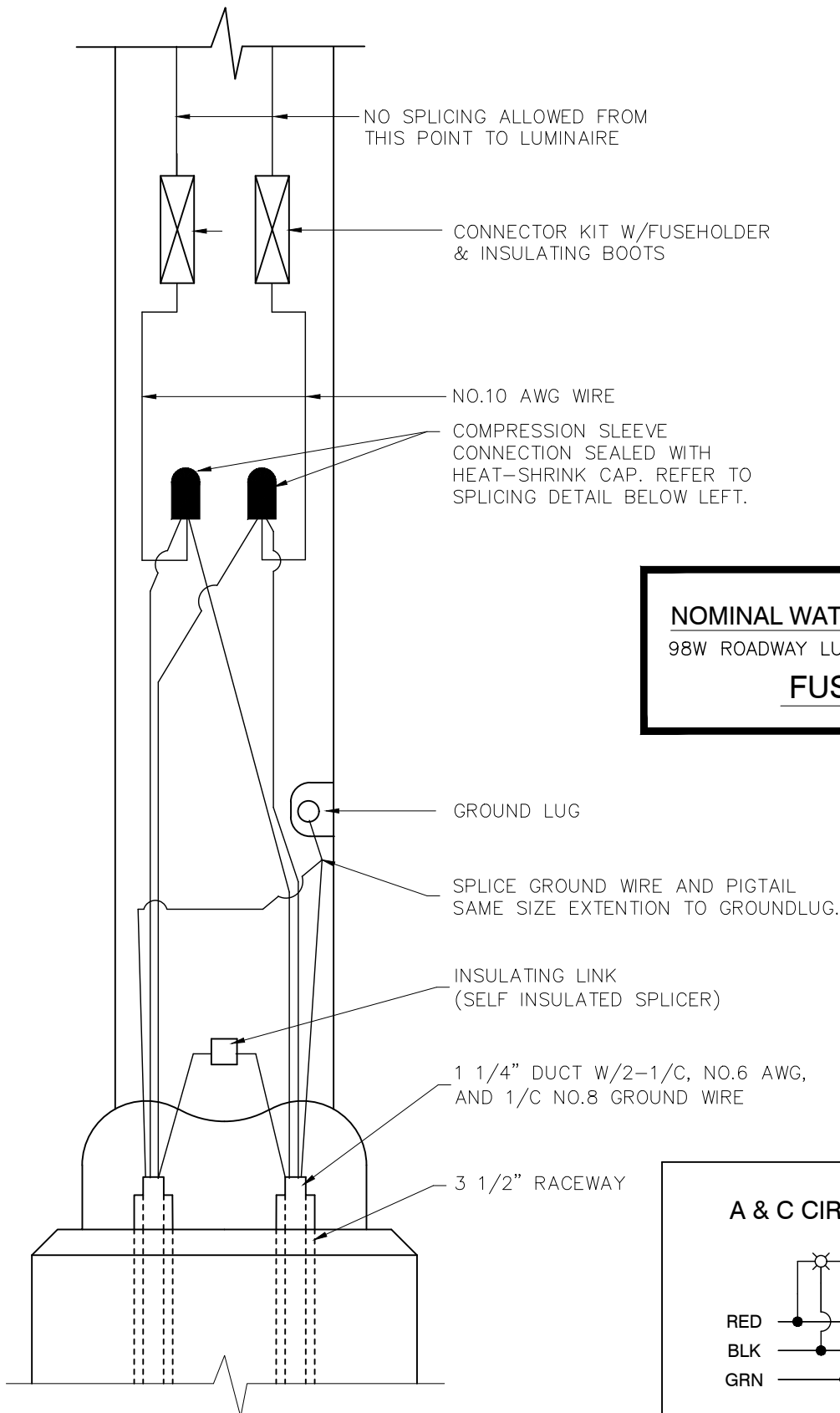


IMPORTANT NOTE:

TRANSFORMER BASE AND LIGHTPOLE  
TO BE LEVELED AS ONE UNIT. USING  
LEVELING SHIMS IF REQUIRED.

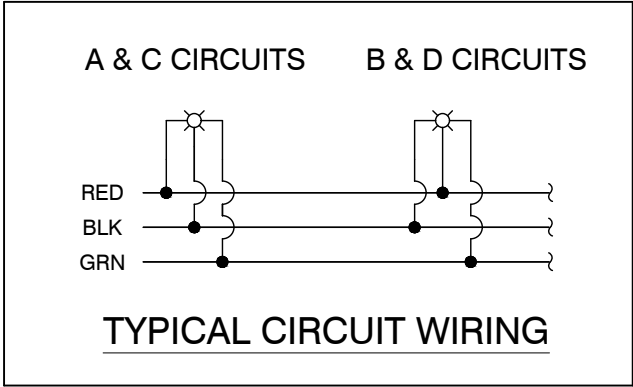
**BREAKAWAY TRANSFORMER BASE DETAIL**

**VILLAGE OF MINOOKA  
STANDARD DETAIL**



<u>NOMINAL WATTAGE</u>	<u>FUSE SIZE</u>
98W ROADWAY LUMINAIRE	2.0 AMP

**FUSE SIZE TABLE**



NOTE : ALLOW 36" LOOP OF CABLES TO INSURE SUFFICIENT SLACK FOR WITHDRAWAL OF THE CONNECTORS OUTSIDE OF THE POLE HANDHOLE

## POLE HANDHOLE WIRING DIAGRAM, 240 VOLT

(TYPICAL FOR SINGLE LUMINAIRE INSTALLATION)

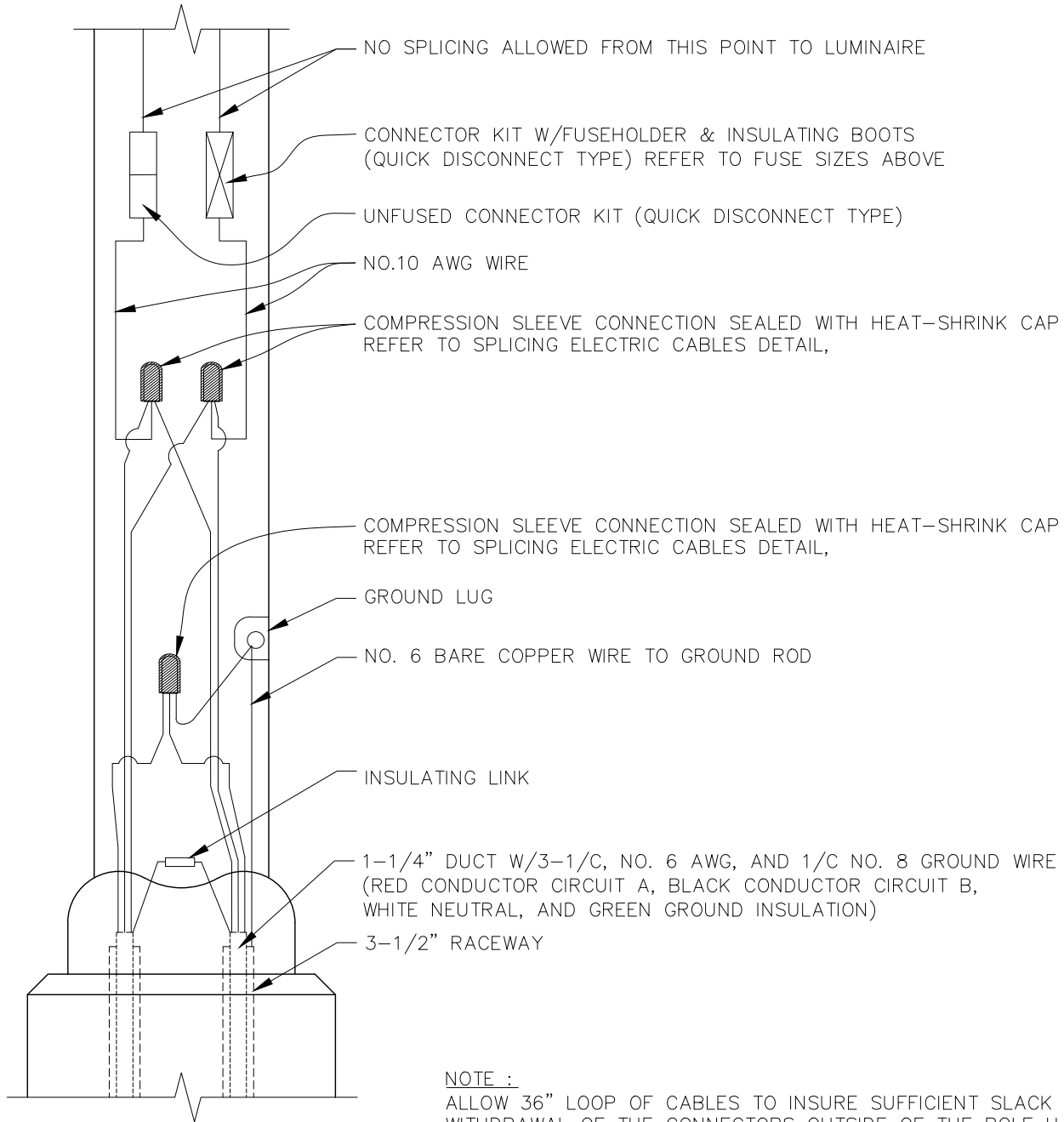
### VILLAGE OF MINOOKA STANDARD DETAIL



NOMINAL WATTAGE  
98

FUSE SIZE  
2.0 AMP

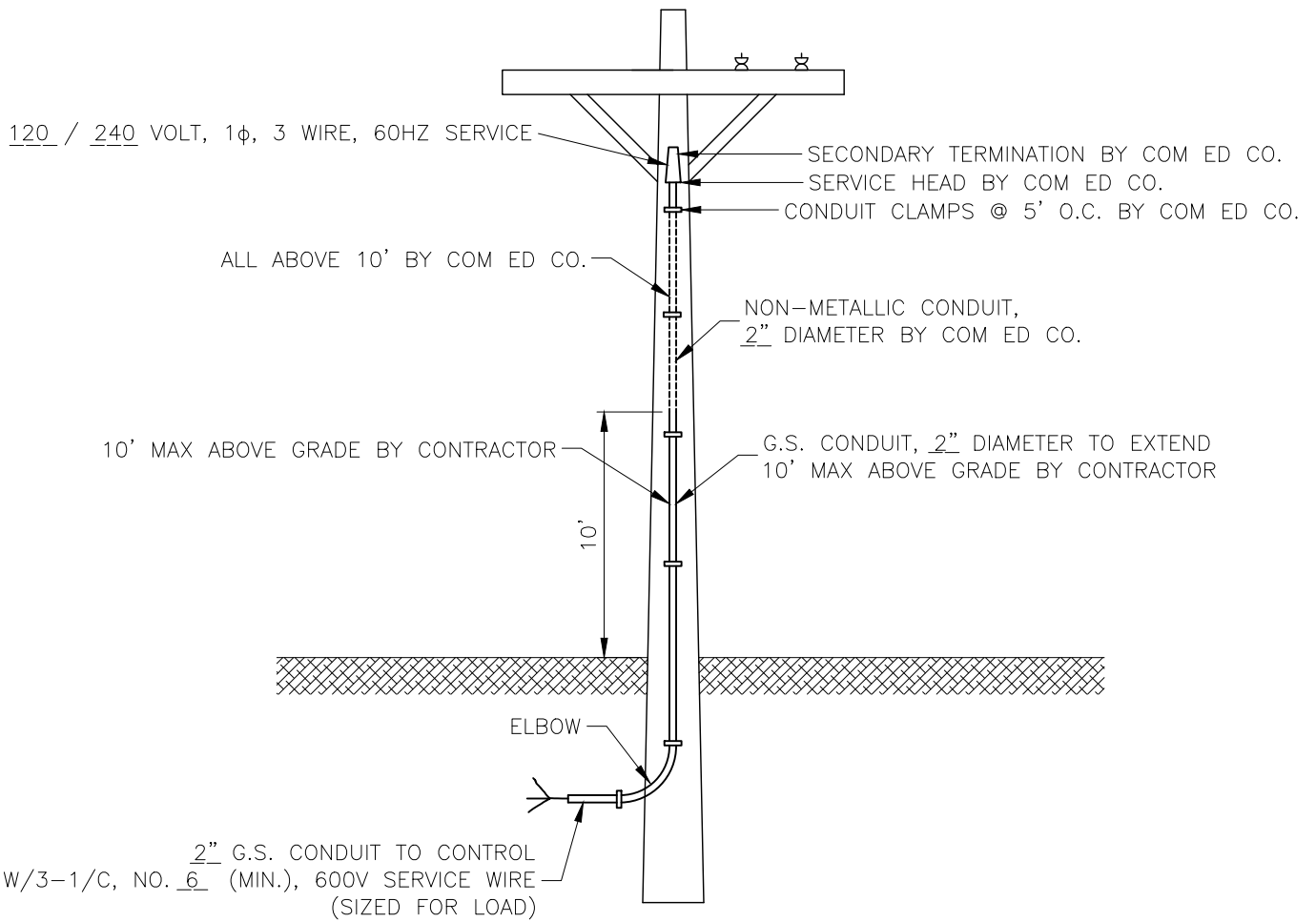
LUMINAIRE FUSE SIZE TABLE



POLE HANDHOLE WIRING DIAGRAM, 120 VOLT

(TYPICAL FOR SINGLE LUMINAIRE INSTALLATION)

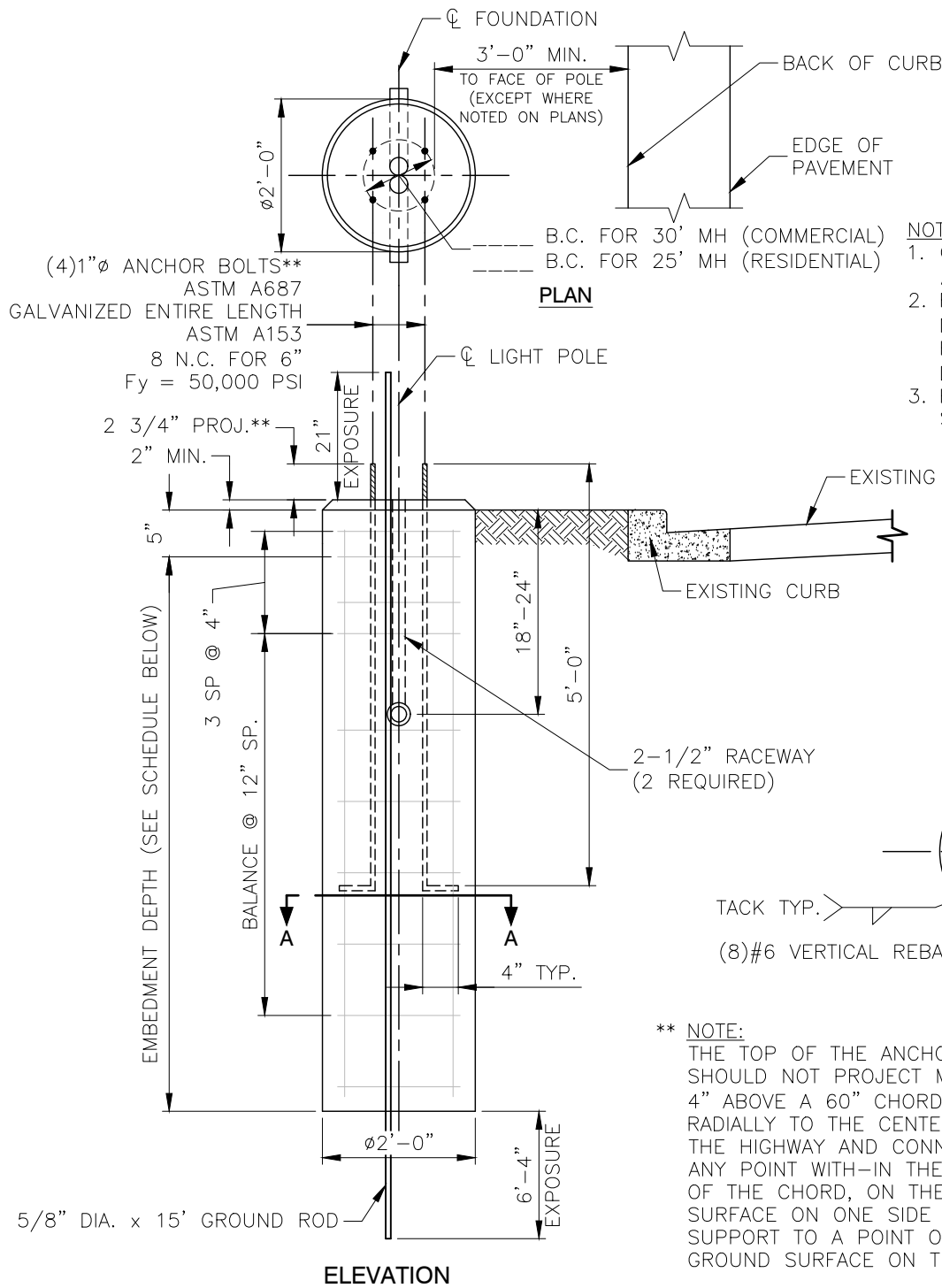
**VILLAGE OF MINOOKA  
STANDARD DETAIL**



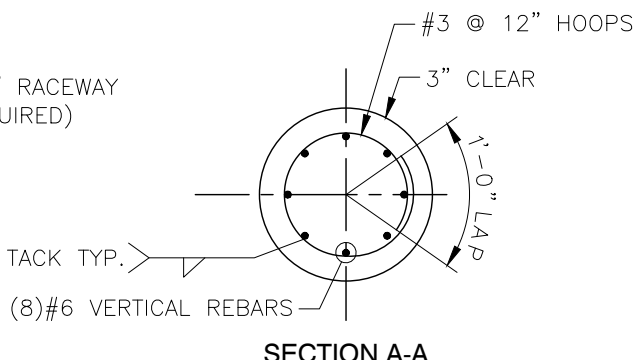
## ELECTRIC UTILITY SERVICE CONNECTION

(OVERHEAD)

VILLAGE OF MINOOKA  
STANDARD DETAIL



- NOTES:**
1. CONCRETE SHALL BE 3500 PSI AT 14 DAYS. (CLASS SI)
  2. REINFORCING BARS SHALL BE OF NEW BILLET STEEL (ASTM A615) HAVING  $F_y = 60,000$  PSI AND DEFORMED (ASTM A307)
  3. HOLE FOR THE FOUNDATION SHALL BE AUGURED



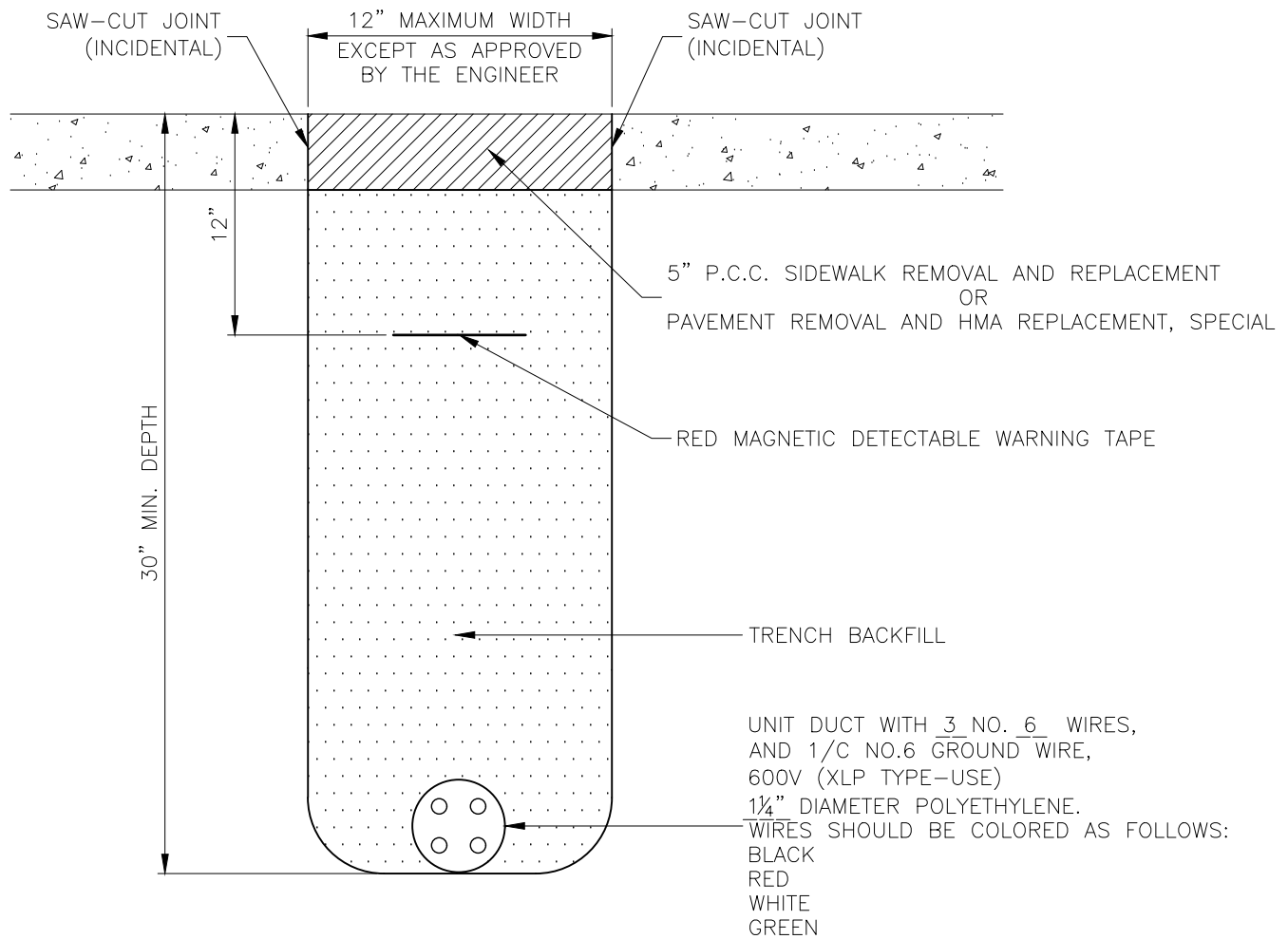
**\*\* NOTE:**  
 THE TOP OF THE ANCHOR BOLTS SHOULD NOT PROJECT MORE THAN 4" ABOVE A 60" CHORD ALIGNED RADIALLY TO THE CENTERLINE OF THE HIGHWAY AND CONNECTING ANY POINT WITH-IN THE LENGTH OF THE CHORD, ON THE GROUND SURFACE ON ONE SIDE OF THE SUPPORT TO A POINT ON THE GROUND SURFACE ON THE OTHER SIDE.

FOUNDATION SCHEDULE*						
TYPE OF SOILS		EMBEDMENT				
		MOUNTING HEIGHT				
DESCRIPTION	STANDARDS	25 FT.	30 FT.	35 FT.	40 FT.	50 FT.
SOFT CLAY	$Q_u = .25-.50$ T/FT. <sup>2</sup>	9'-0"	9'-0"	9'-8"	10'-6"	14'-0"
MEDIUM CLAY	$Q_u = .50-1.0$ T/FT. <sup>2</sup>	6'-6"	6'-6"	7'-0"	7'-6"	10'-0"
DENSE CLAY	$Q_u = 1.0-2.0$ T/FT. <sup>2</sup>	5'-6"	5'-6"	6'-0"	6'-6"	8'-6"
LOOSE SAND	$N = 4-10$	7'-0"	7'-0"	7'-8"	8'-4"	11'-0"
MEDIUM SAND	$N = 10-30$	6'-0"	6'-0"	6'-6"	7'-3"	9'-6"
DENSE SAND	$N = 30-50$	6'-0"	6'-0"	6'-0"	6'-6"	8'-6"

\* **NOTE:**  
 TOTAL FOUNDATION DEPTH EQUALS EMBEDMENT DEPTH (FROM SCHEDULE) PLUS 6".

**TYPICAL LIGHT POLE FOUNDATION**

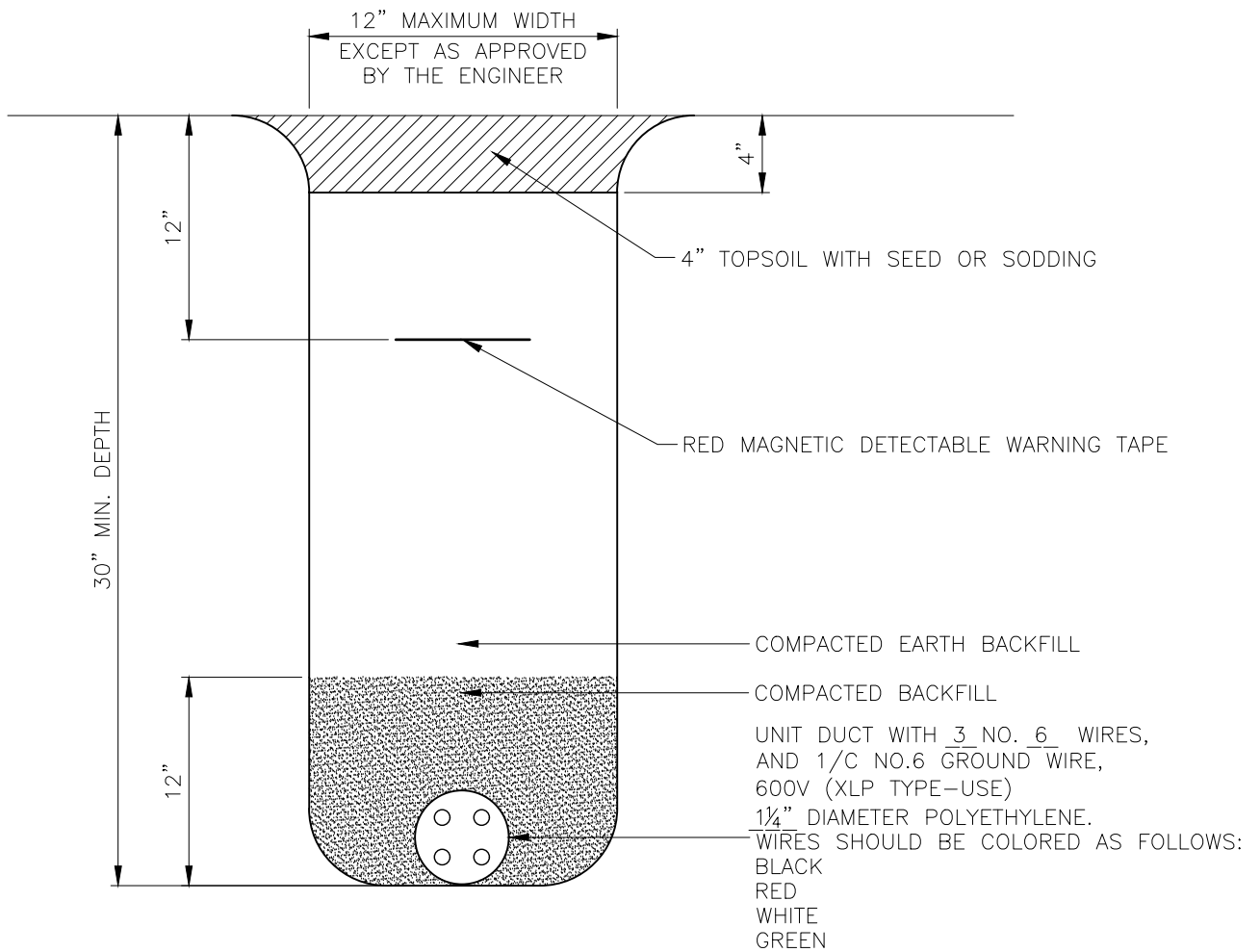
**VILLAGE OF MINOOKA  
 STANDARD DETAIL**



## TYPICAL TRENCH DETAIL FOR ELECTRIC CABLE

(UNDER PAVEMENT OR SIDEWALK)

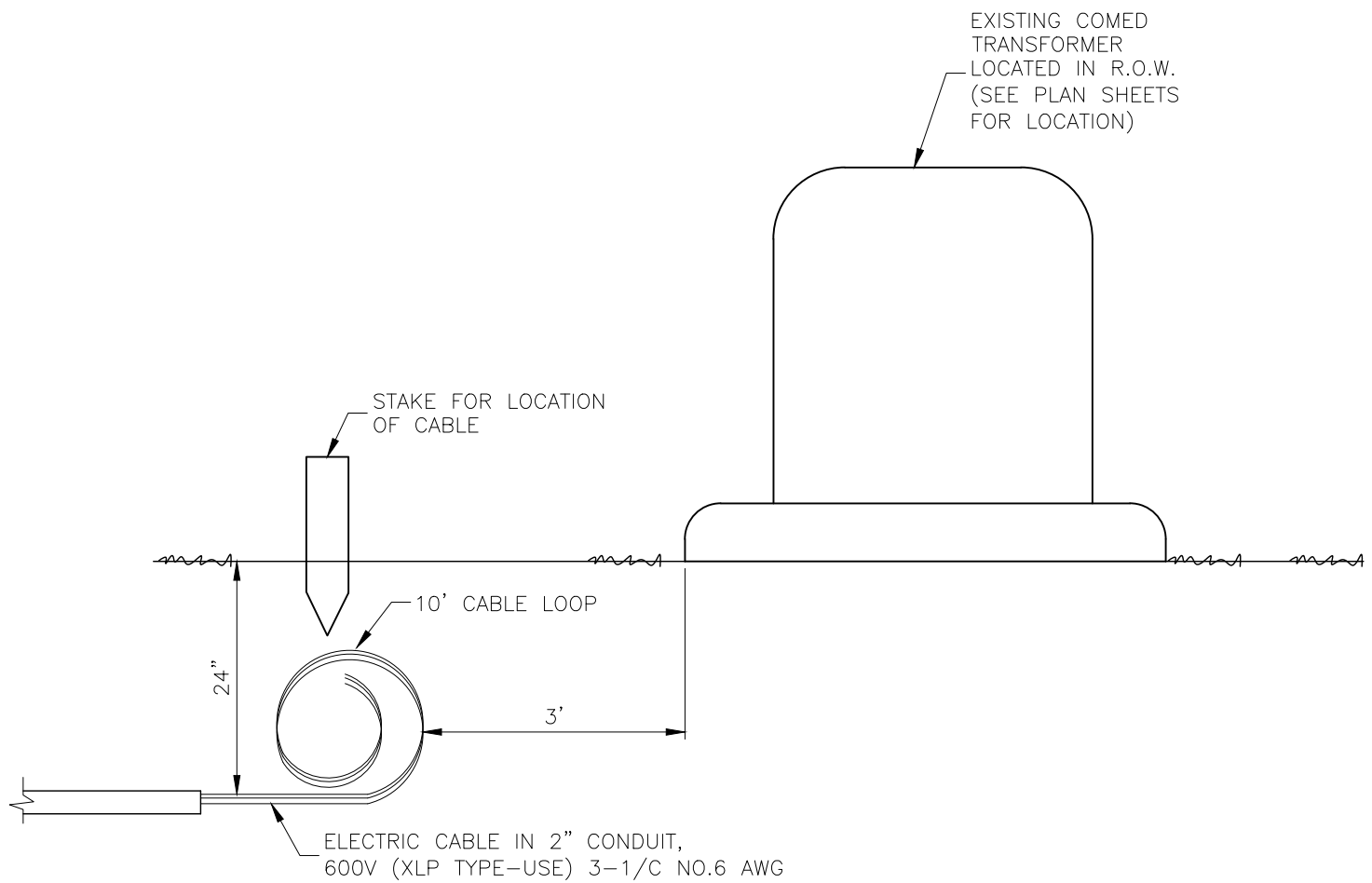
VILLAGE OF MINOOKA  
 STANDARD DETAIL



## TYPICAL TRENCH DETAIL FOR ELECTRIC CABLE

(UNDER LANDSCAPED AREA)

VILLAGE OF MINOOKA  
STANDARD DETAIL

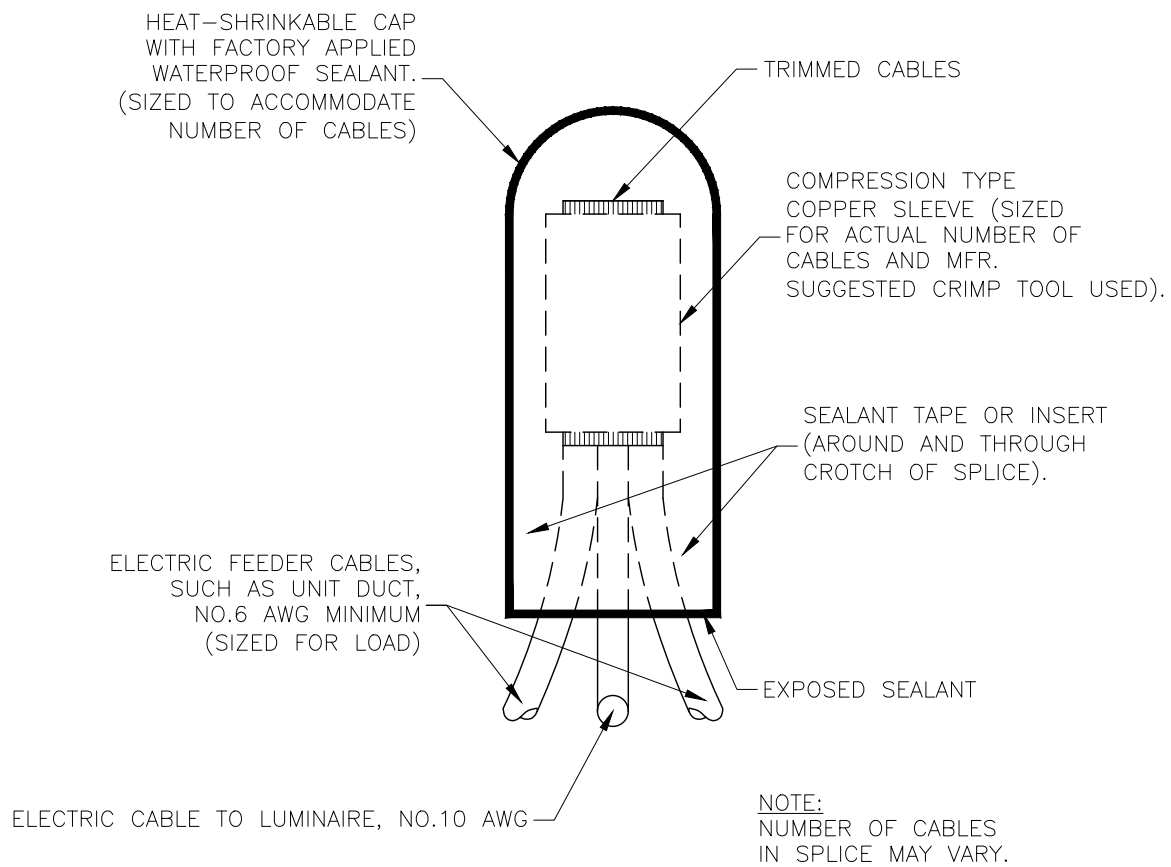


NOTE:  
 MINIMUM SIZE OF DUCT AND CONDUCTORS SHOWN ABOVE –  
 THESE SHOULD BE SIZED ACCORDING TO THE SYSTEM LOAD

# ELECTRIC UTILITY SERVICE CONNECTION

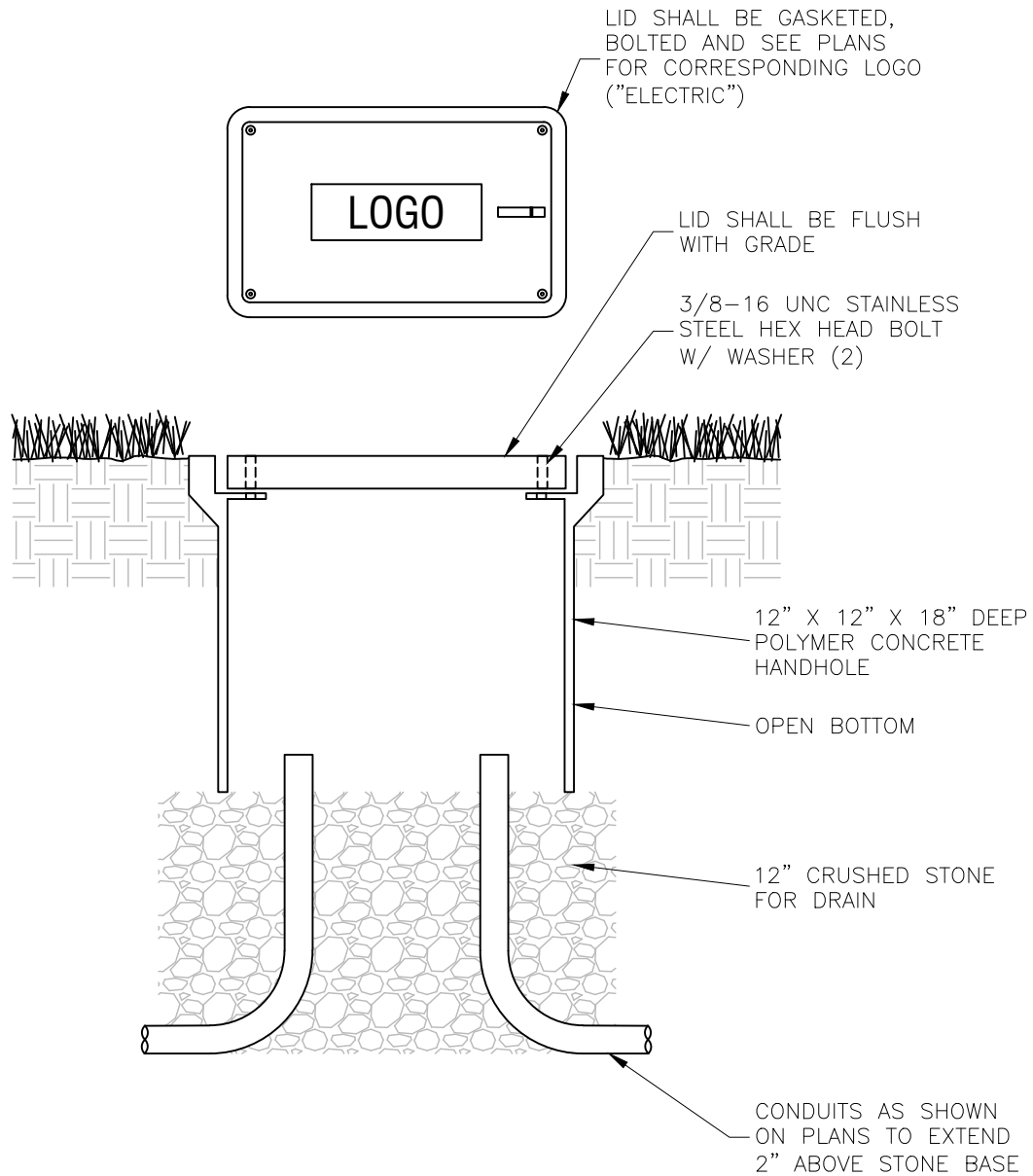
(UNDERGROUND)

VILLAGE OF MINOOKA  
 STANDARD DETAIL



## SPLICING ELECTRIC CABLES BASIC MATERIALS AND METHODS

VILLAGE OF MINOOKA  
STANDARD DETAIL



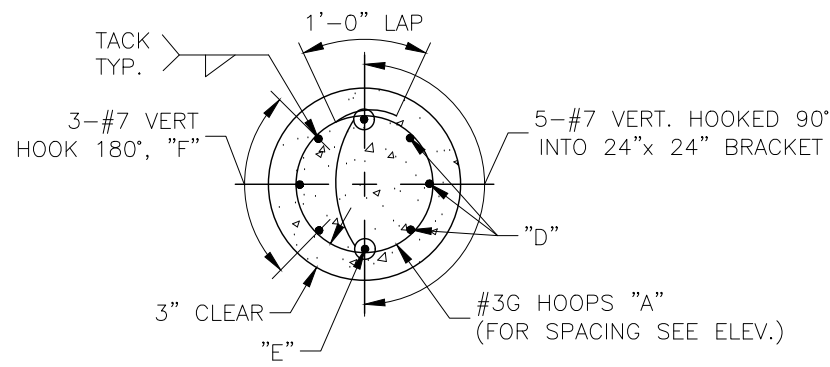
NOTES

1. NO SPLICING IN HANDHOLE UNLESS OTHERWISE SHOWN. ALL SPLICES SHALL BE WATERPROOF (SEE SPLICING DETAILS).
2. POLYMER CONCRETE HANDHOLE AND LID SHALL BE GREEN IN LANDSCAPED AREAS AND MATCH COLOR IN CONCRETE/BRICK AREAS.
3. BOX & LID SHALL MEET/EXCEED ANSI TIER 15 LOADING REQUIREMENTS, AND BE TESTED IN ACCORDANCE WITH THE LATEST EDITION OF THE ANSI/SCTE 77 "SPECIFICATION FOR UNDERGROUND ENCLOSURE INTEGRITY", AND THE PROVISIONS OF PARAGRAPHS 5.2.3 AND 5.2.4 OF WESTERN UNDERGROUND COMMITTEE GUIDE 3.6.

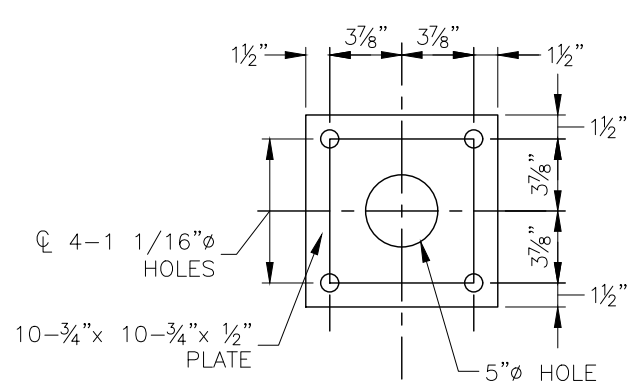
## COMPOSITE CONCRETE LIGHTING HANDHOLE

### VILLAGE OF MINOOKA STANDARD DETAIL

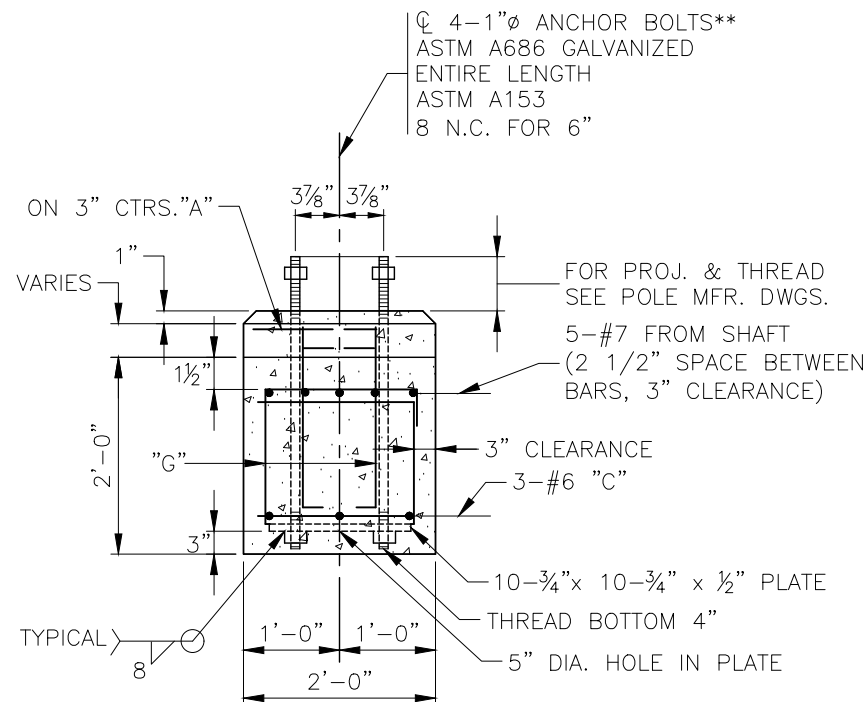




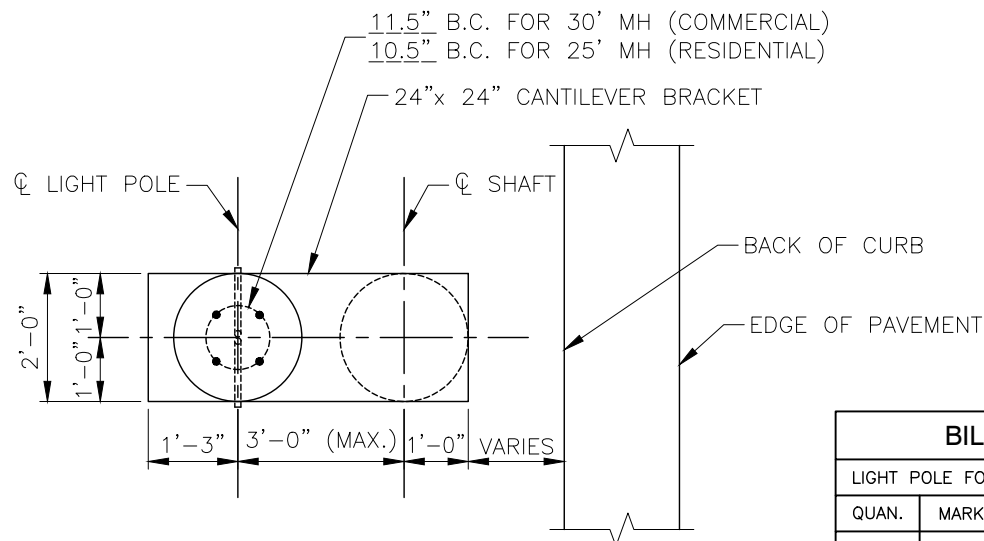
**SECTION A-A**



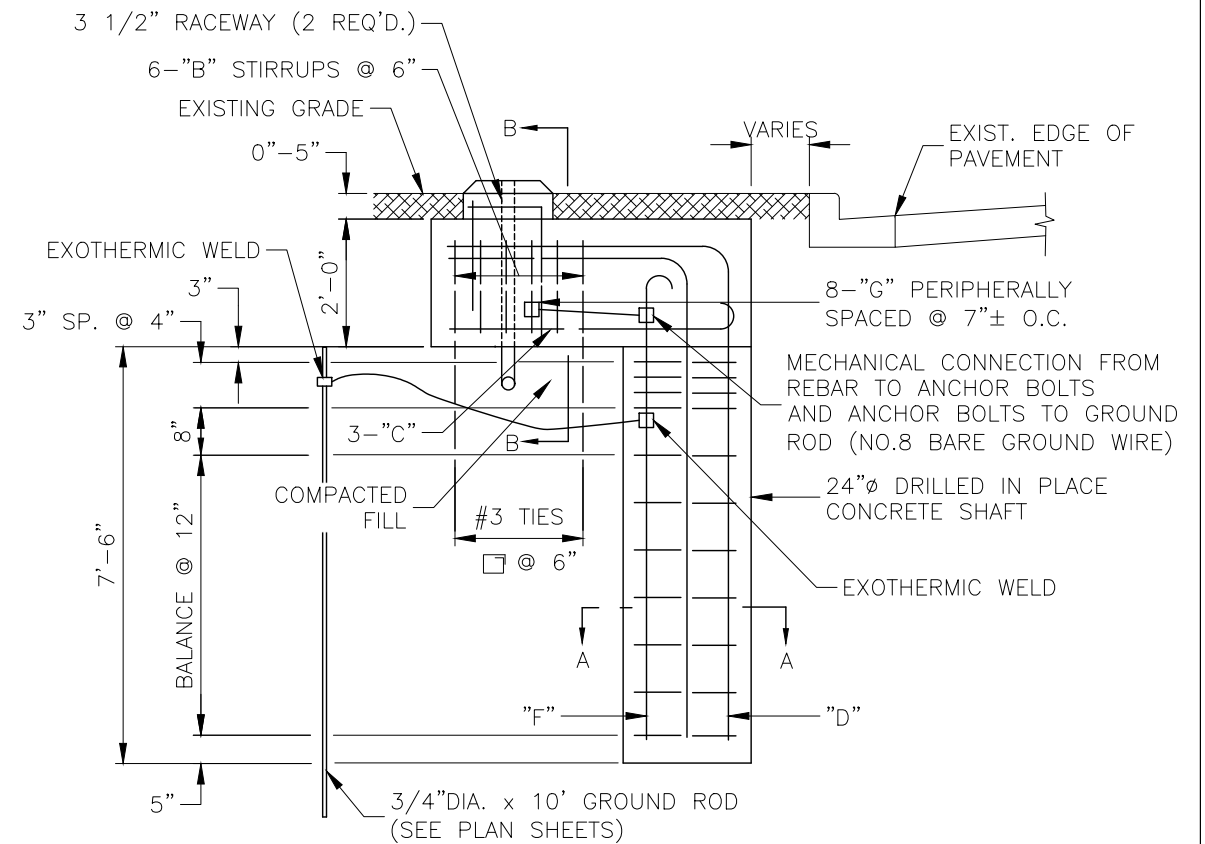
**ANCHOR BOLT PLATE**



**SECTION B-B**



**PLAN - CANTILEVERED BRACKET**

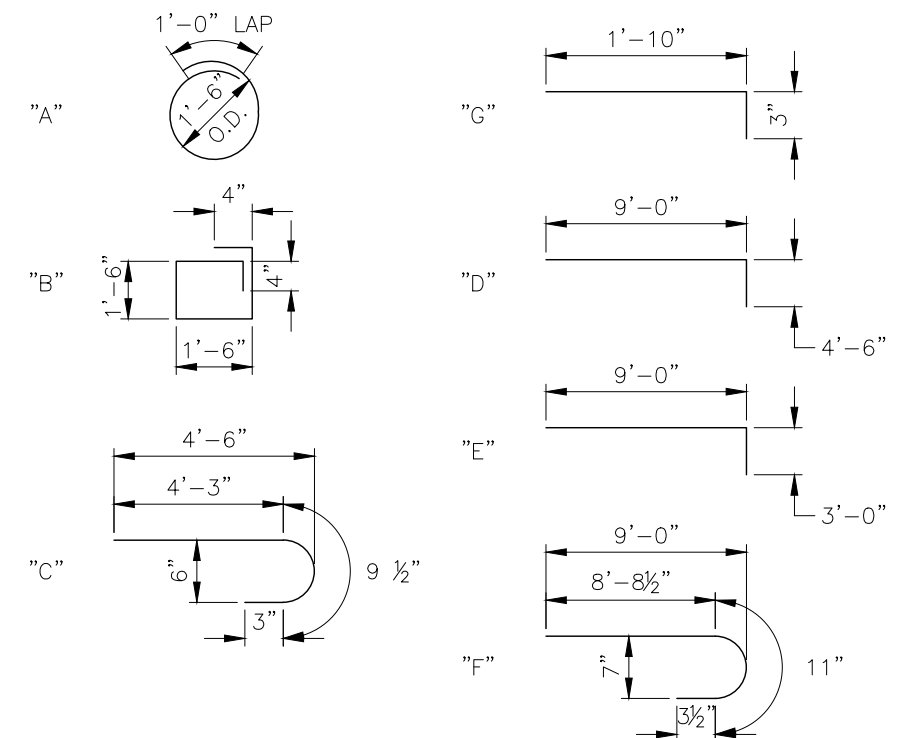


**ELEVATION**

**\*\* NOTE:**  
THE TOP OF THE ANCHOR BOLTS SHOULD NOT PROJECT MORE THAN 4" ABOVE A 60" CHORD ALIGNED RADIALLY TO THE CENTERLINE OF THE HIGHWAY AND CONNECTING ANY POINT WITHIN THE LENGTH OF THE CHORD, ON THE GROUND SURFACE ON ONE SIDE OF THE SUPPORT TO A POINT ON THE GROUND SURFACE ON THE OTHER SIDE.

- NOTES:**
1. CONCRETE SHALL BE 3500 PSI AT 14 DAYS. (CLASS SI).
  2. REINFORCING BARS SHALL BE OF NEW BILLET STEEL (ASTM A615) HAVING  $F_y = 60,000$  PSI AND DEFORMED (ASTM A307).
  3. HOLE FOR THE FOUNDATION (SHAFT) SHALL BE AUGURED.
  4. POLE FOUNDATION, OFFSET FOR THIS APPLICATION IS EQUIVALENT TO 13.5 LIN. FT. PER FOUNDATION.

BILL OF MATERIALS				
LIGHT POLE FOUNDATION, 24" DIAMETER, OFFSET				
QUAN.	MARK	SIZE	LENGTH	SHAPE
11	A	NO. 3	5'-9"	
6	B	NO. 3	6'-8"	
3	C	NO. 6	5'-3 1/2"	
8	G	NO. 6	2'-1"	
3	D	NO. 7	13'-6"	
2	E	NO. 7	12'-0"	
3	F	NO. 7	9'-11"	
REINFORCING BARS		LBS.	285	
CLASS X CONCRETE		CU. YDS.	1.7	
ANCHOR BOLTS		NO.	4	
ANCHOR BOLT PLATE		NO.	1	

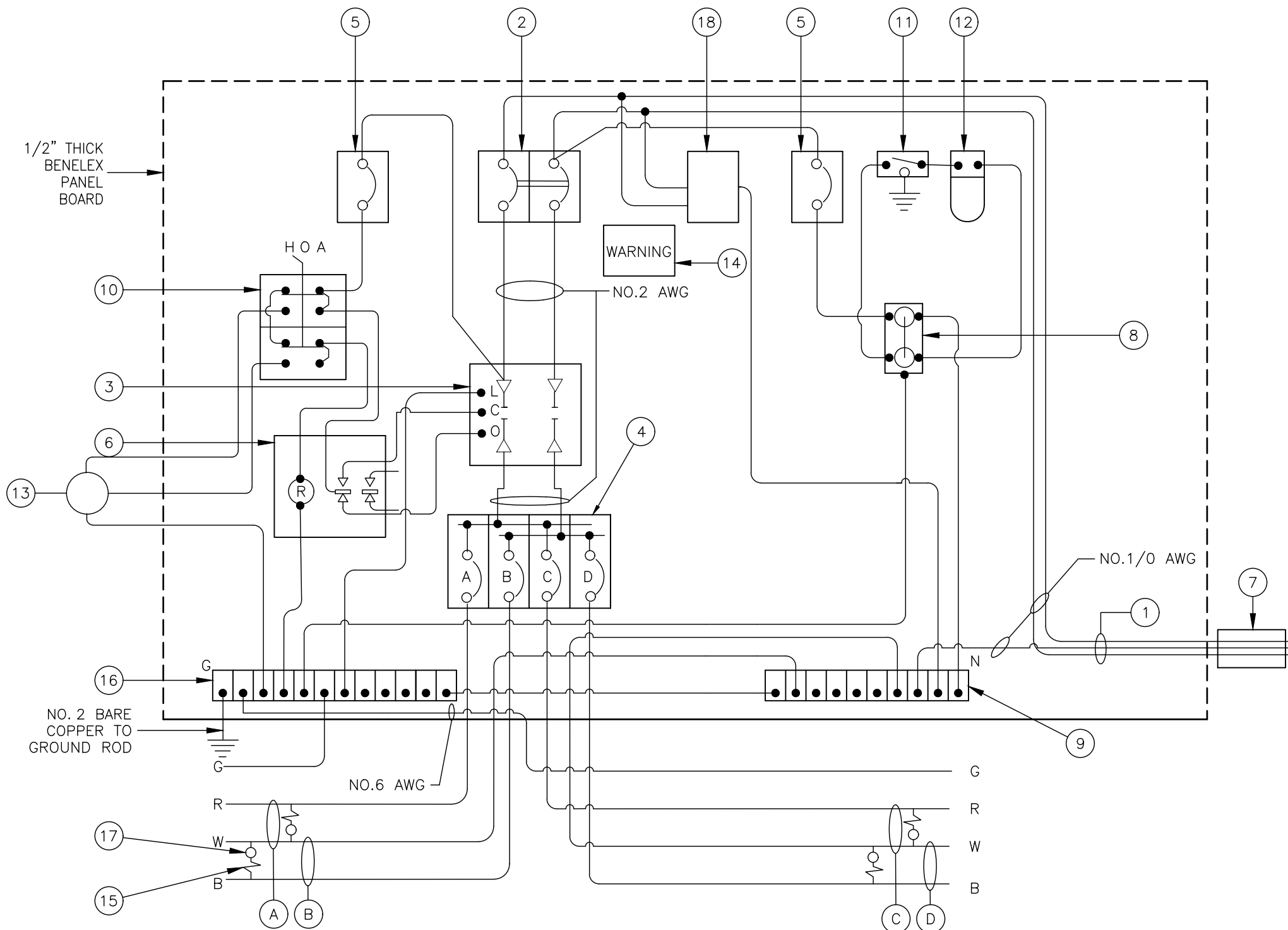


**OFFSET POLE FOUNDATION - DETAILS**

**TYPICAL LIGHT POLE OFFSET FOUNDATION**

**VILLAGE OF MINOOKA  
STANDARD DETAIL**

## CONTROLLER WIRING DIAGRAM LEGEND



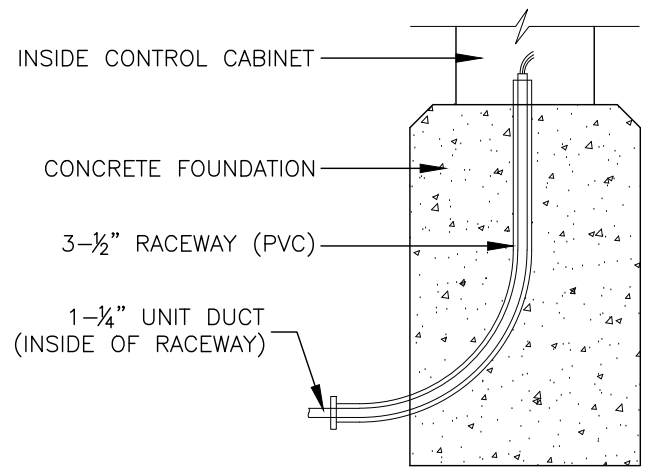
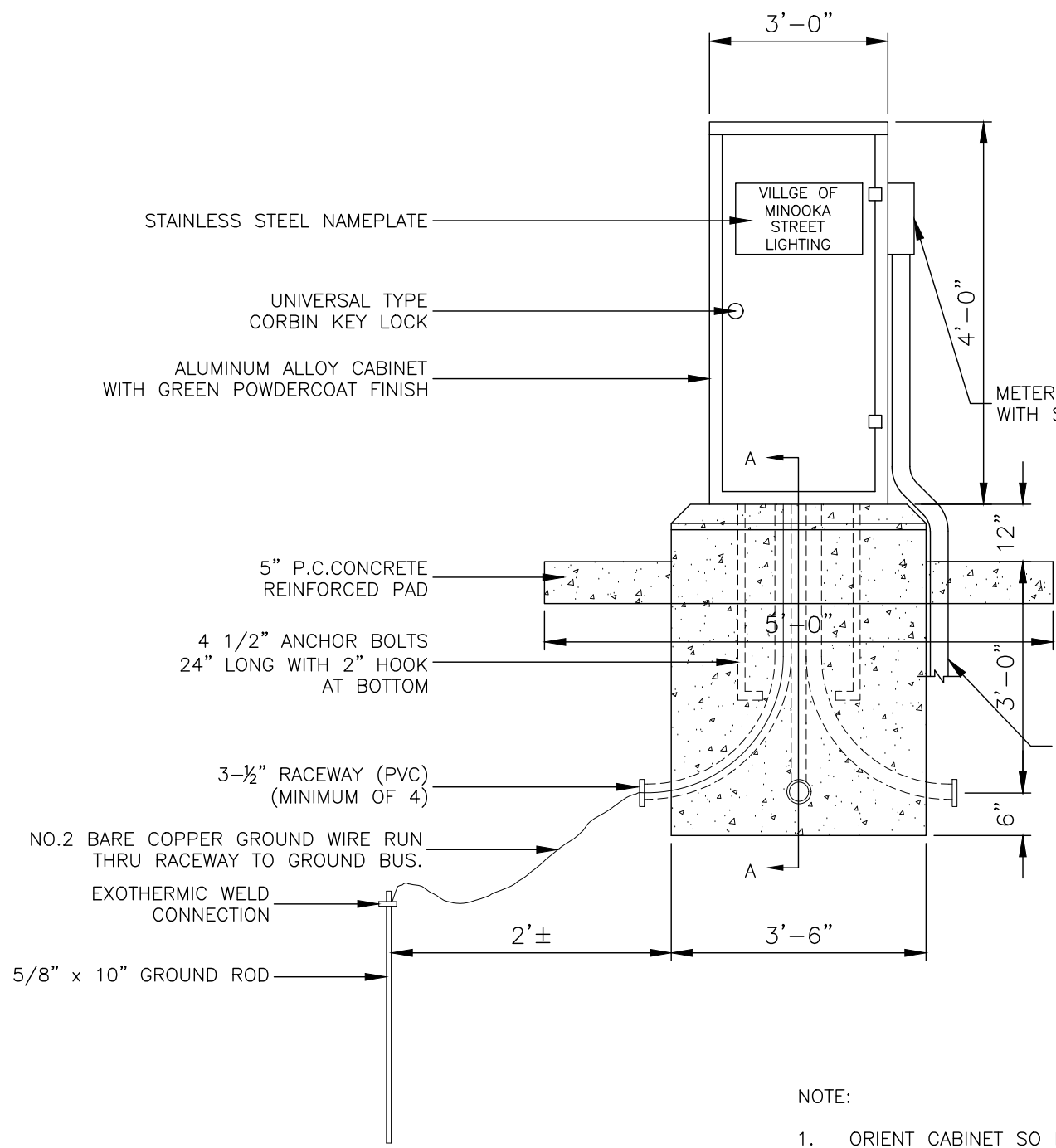
- ① 3-1/C, NO. 1/0, 600V SERVICE WIRE IN 2.5" DIA. GALVANIZED STEEL CONDUIT FOR 120/240 VOLT, 1 $\phi$ , 3 WIRE, 60HZ. SERVICE.
- ② (1) 100 AMP MAIN CIRCUIT BREAKER, 2 POLE, 600 VOLT, 100 AMP BASE, NON-INTERCHANGEABLE TRIP INTERRUPTING RATING NEMA - 14000 AMP AT 480 V.
- ③ (1) 100 AMP REMOTE CONTROL CONTACTOR SWITCH, ELECTRICALLY OPERATED, MECHANICALLY HELD, 2 POLE, 600 VOLT
- ④ (4) 30 AMP CIRCUIT BREAKER, 1 POLE, 120 VOLT, 100 AMP BASE, NON-INTER-CHANGEABLE TRIP RATING NEMA - 14000 AMP AT 240 VOLTS.
- ⑤ (2) 20 AMP CONTROL CIRCUIT-CIRCUIT BREAKER, 1 POLE, 120 VOLT, 100 AMP BASE, NON-INTERCHANGEABLE TRIP INTERRUPTING RATING NEMA 14000 AMP AT 240 V.
- ⑥ (1) 20 AMP, 1 POLE DOUBLE THROW, 120 VOLT RELAY
- ⑦ METER SOCKET, 1 $\phi$ , 3 WIRE, 100A
- ⑧ (1) 20 AMP, 120 VOLT DUPLEX GFCI RECEPTACLE MOUNTED IN BOX.
- ⑨ NEUTRAL BUS BAR, 1/4"x1"x12" MINIMUM LENGTH MOUNTED ON PANEL WITH LUGS.
- ⑩ 3 POSITION SELECTOR SWITCH, 120V.
- ⑪ SWITCH FOR LIGHTING FIXTURE MOUNTED IN BOX, 20 AMP.
- ⑫ WEATHER-PROOF LIGHTING FIXTURE WITH 1600 LUMEN, 120 V LED LAMP.
- ⑬ PHOTOCELL MOUNTED TO CABINET, 120 V. 1000 VA BALLAST RATING, 1-4 FC ON 3-12 FC OFF, 30 SECOND MINIMUM DELAY.
- ⑭ WARNING PLATE TO READ: WARNING, MAINTENANCE CIRCUIT IS LIVE WHEN MAIN BREAKER IS SWITCHED OFF
- ⑮ IN-LINE FUSEHOLDER WITH FUSE AS NOTED IN FUSE TABLE
- ⑯ GROUND BUS BAR 1/4"x1"x12" MINIMUM LENGTH MOUNTED ON PANEL WITH LUGS
- ⑰ LUMINAIRE
- ⑱ SURGE ARRESTER, UL LISTED, NEC 280 COMPLIANT, 1 $\phi$ , 3 WIRE 60 HZ. MAX. 3,405 JOULES
- A CIRCUIT (RED)
- B CIRCUIT (BLACK)
- C CIRCUIT (RED)
- D CIRCUIT (BLACK)

### GENERAL NOTES FOR CONTROL CABINET

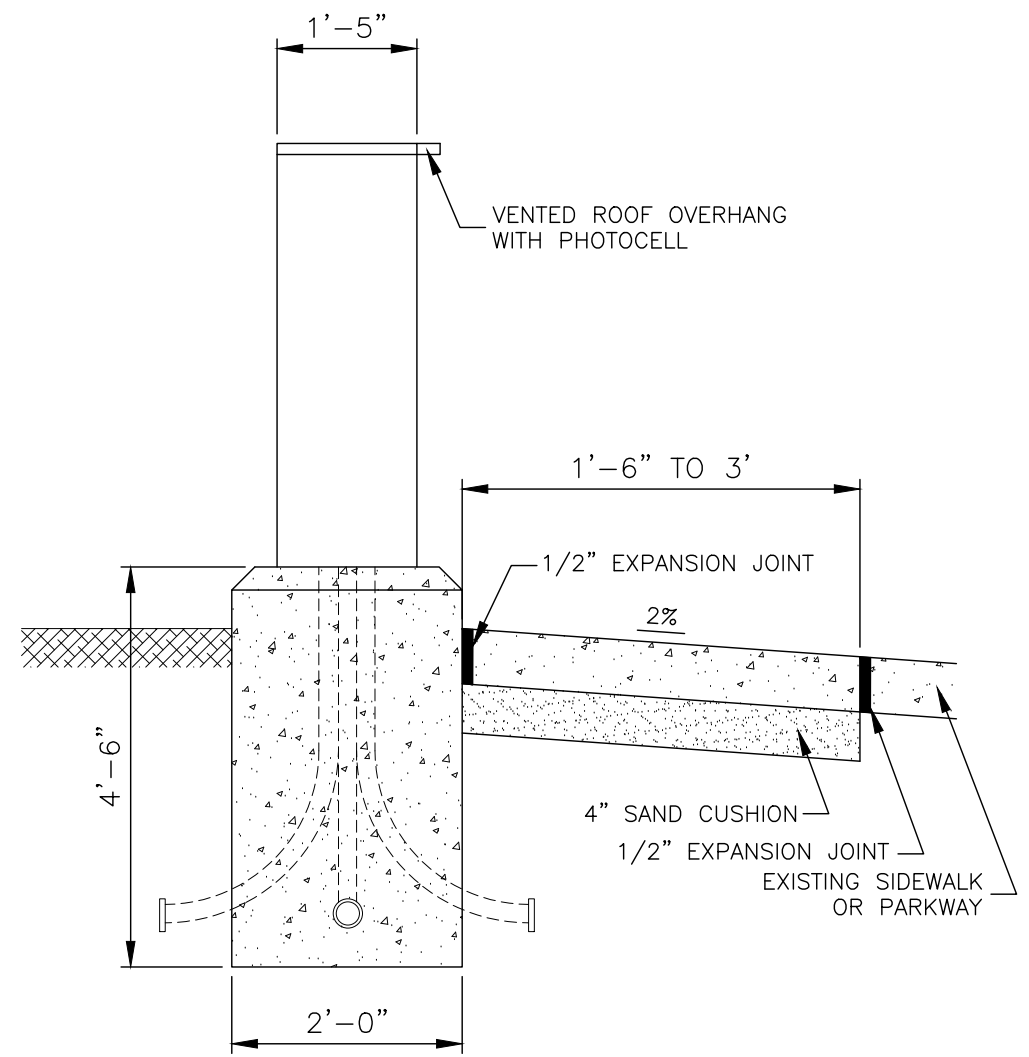
1. ENTIRE CONTROL CABINET SHALL BE GROUNDED.
2. ALL WIRING SHALL BE TAGGED WITH SELF-STICKING WIRE MARKERS.
3. GROUND BUS TO BE COLOR CODED GREEN, NEUTRAL BUS WHITE, AND BONDED TO CABINET ENCLOSURE, BY LISTED PRESSURE CONNECTORS OR LISTED CLAMPS.
4. ALL INTERNAL CONTROLLER WIRING TO BE NO.12 AWG UNLESS OTHERWISE SPECIFIED.
5. CABINET WIRING INSULATION TO BE TYPE XHHW OR APPROVED EQUAL.
6. THE CONTROLLER SHALL BE UL LISTED, NEMA 3R AND SUITABLE FOR USE AS SERVICE ENTRANCE.

## TYPICAL CONTROLLER WIRING DIAGRAM

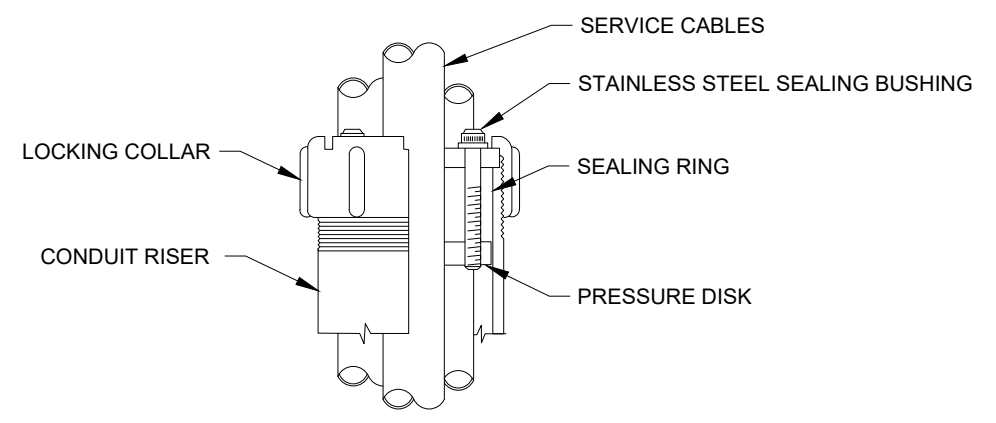
VILLAGE OF MINOOKA  
STANDARD DETAIL



SECTION A-A



- NOTE:
1. ORIENT CABINET SO DOOR OPENS AWAY FROM TRAFFIC.
  2. METER FITTING TO BE LOCATED ON THE SIDE OF THE CABINET CLOSEST TO SERVICE LOCATION.



SEALING BUSHING DETAIL

**TYPICAL CONTROL INSTALLATION**

**VILLAGE OF MINOOKA  
STANDARD DETAIL**