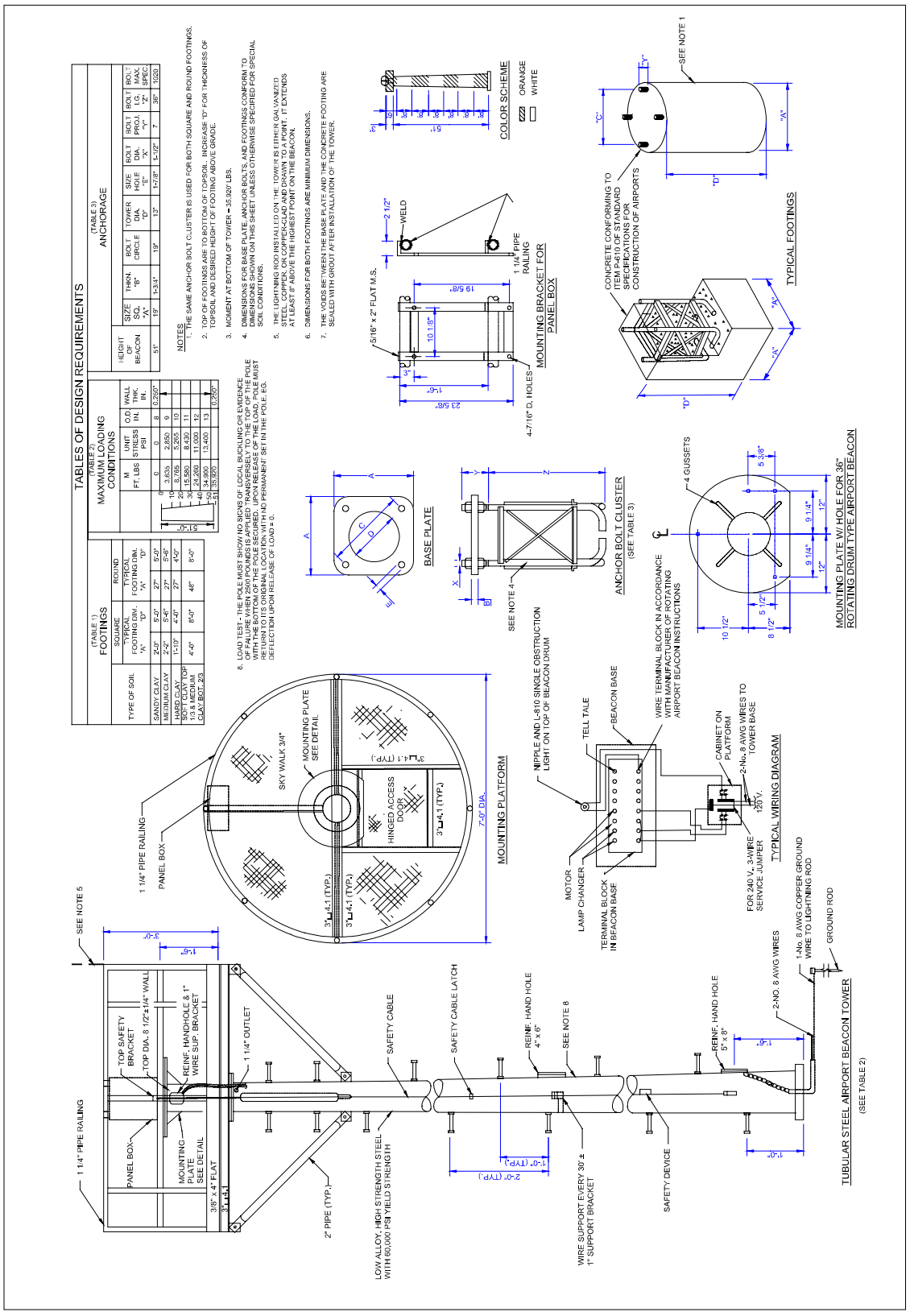


Figure 72. Typical Tubular Steel Beacon Tower.

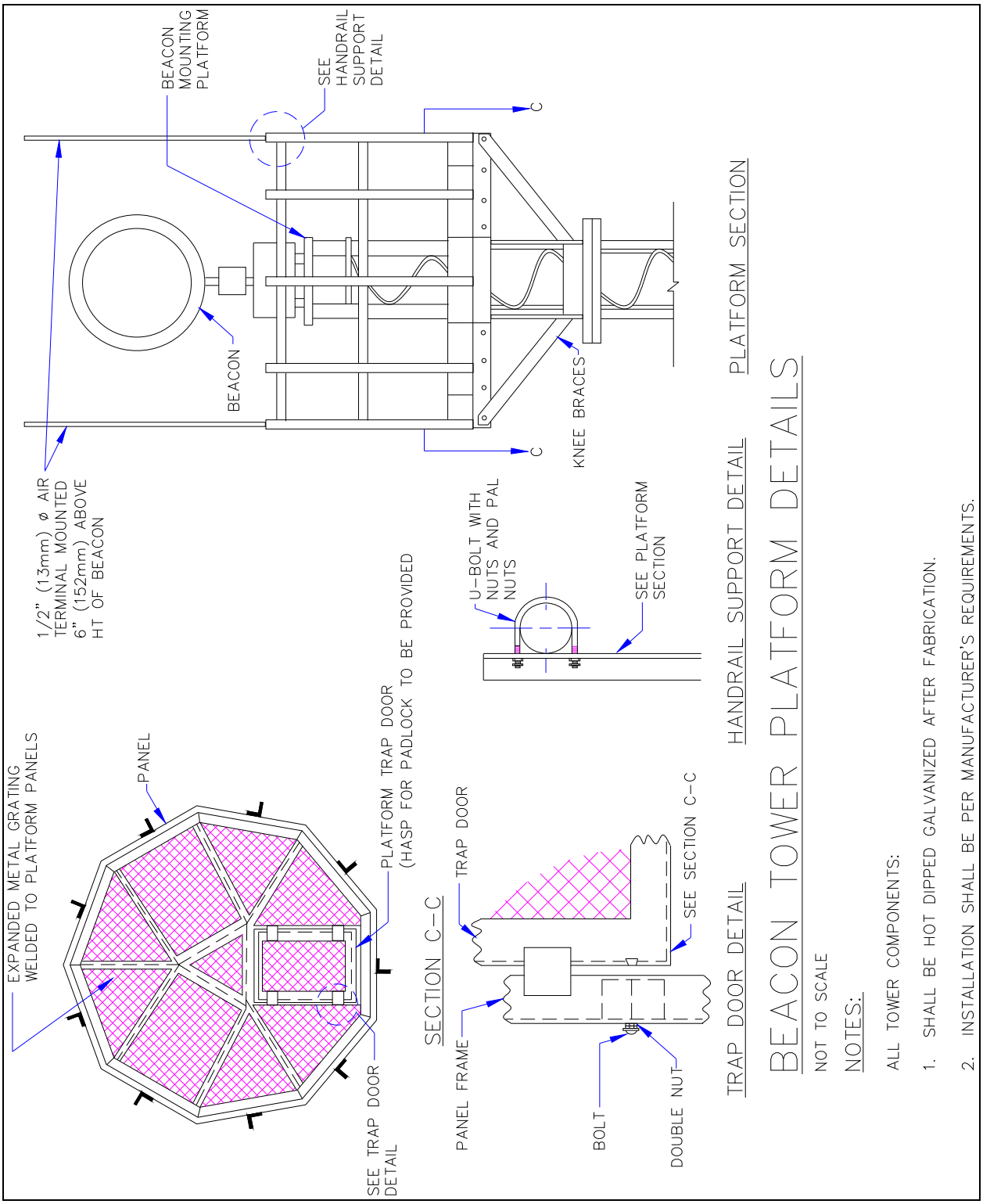


Figure 73. Typical Pre-fabricated Beacon Tower Structure.

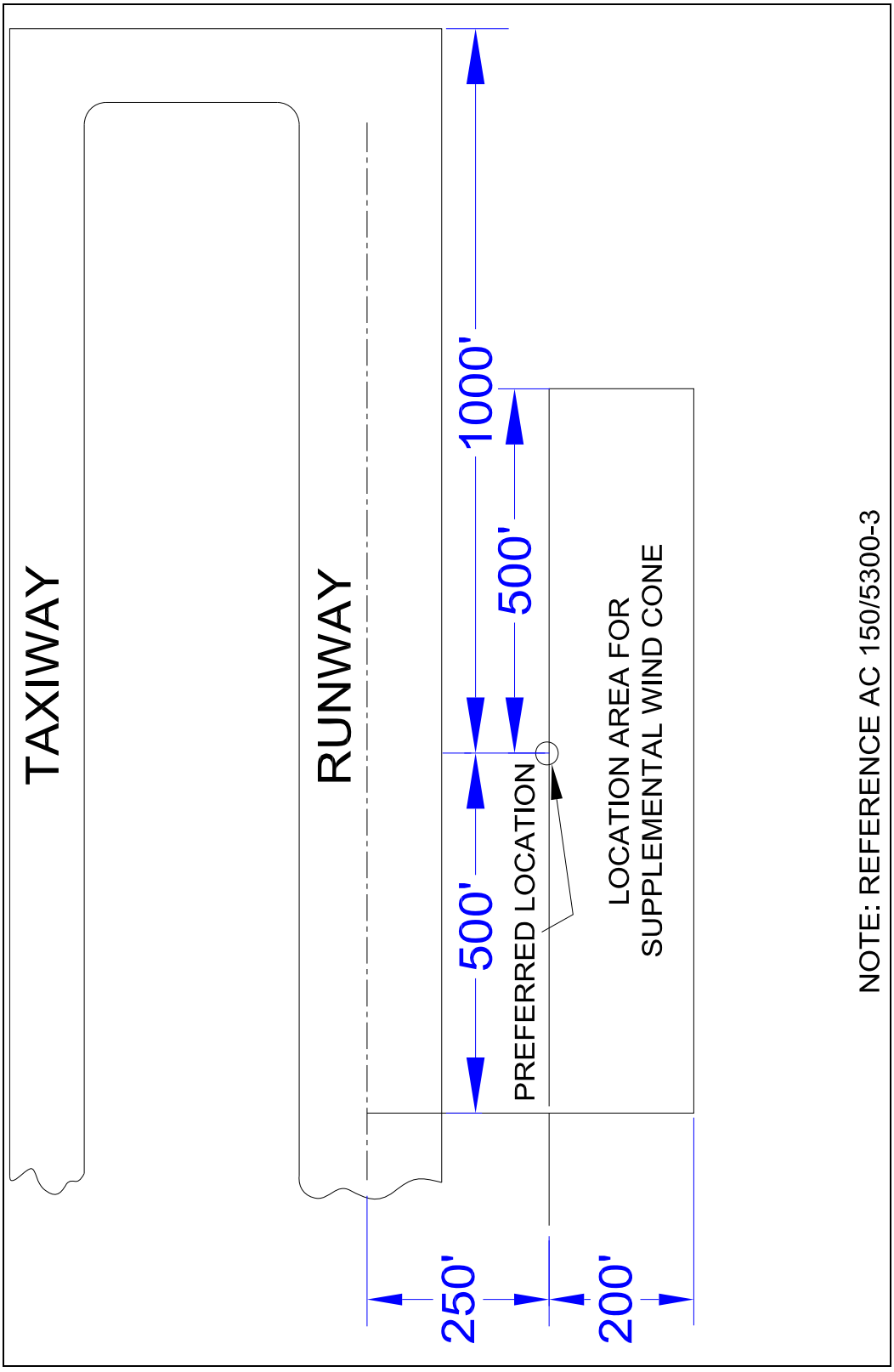


Figure 74. Typical Location of Supplemental Wind Cone.

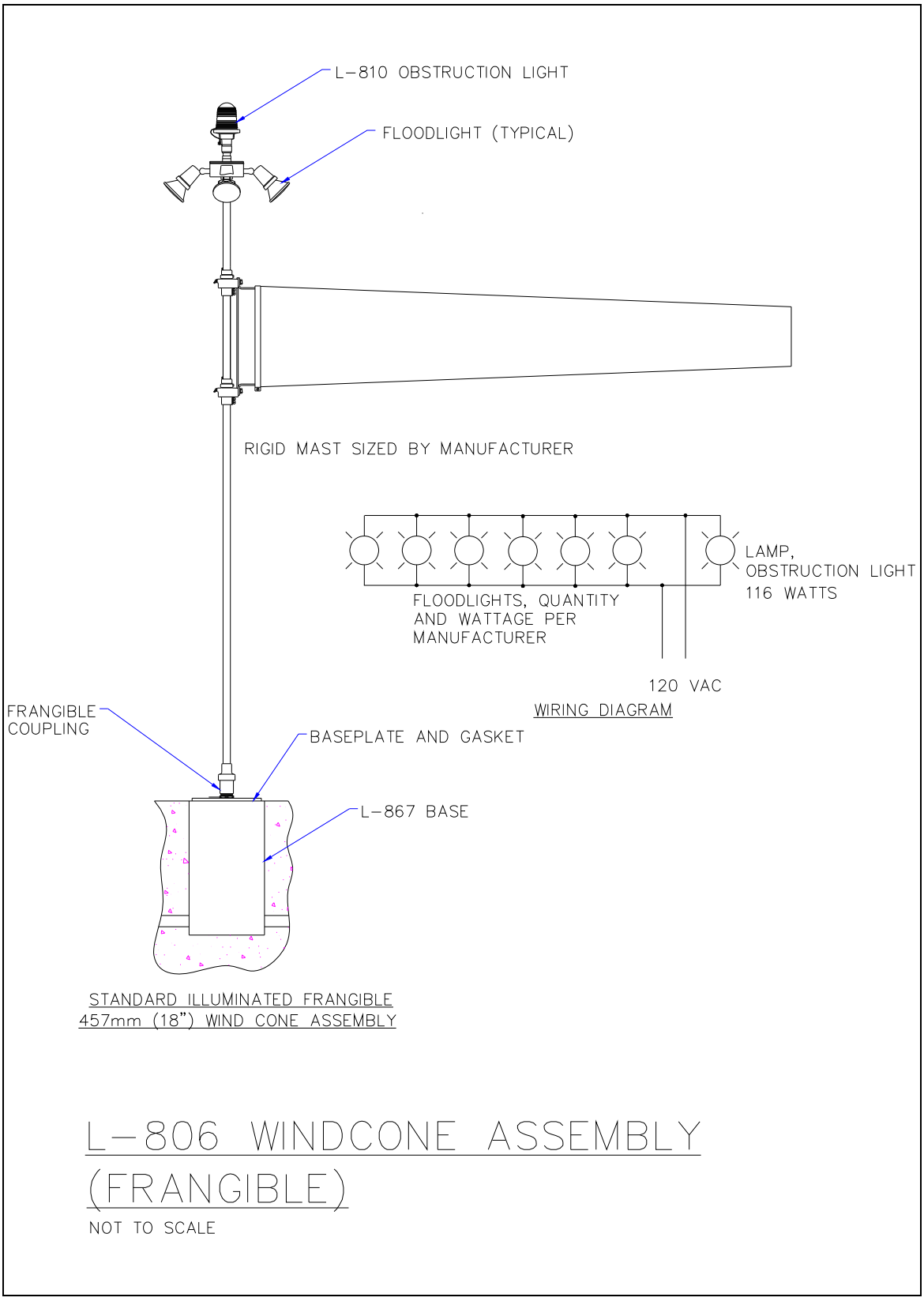


Figure 75. Externally Lighted Wind Cone Assembly (Frangible).

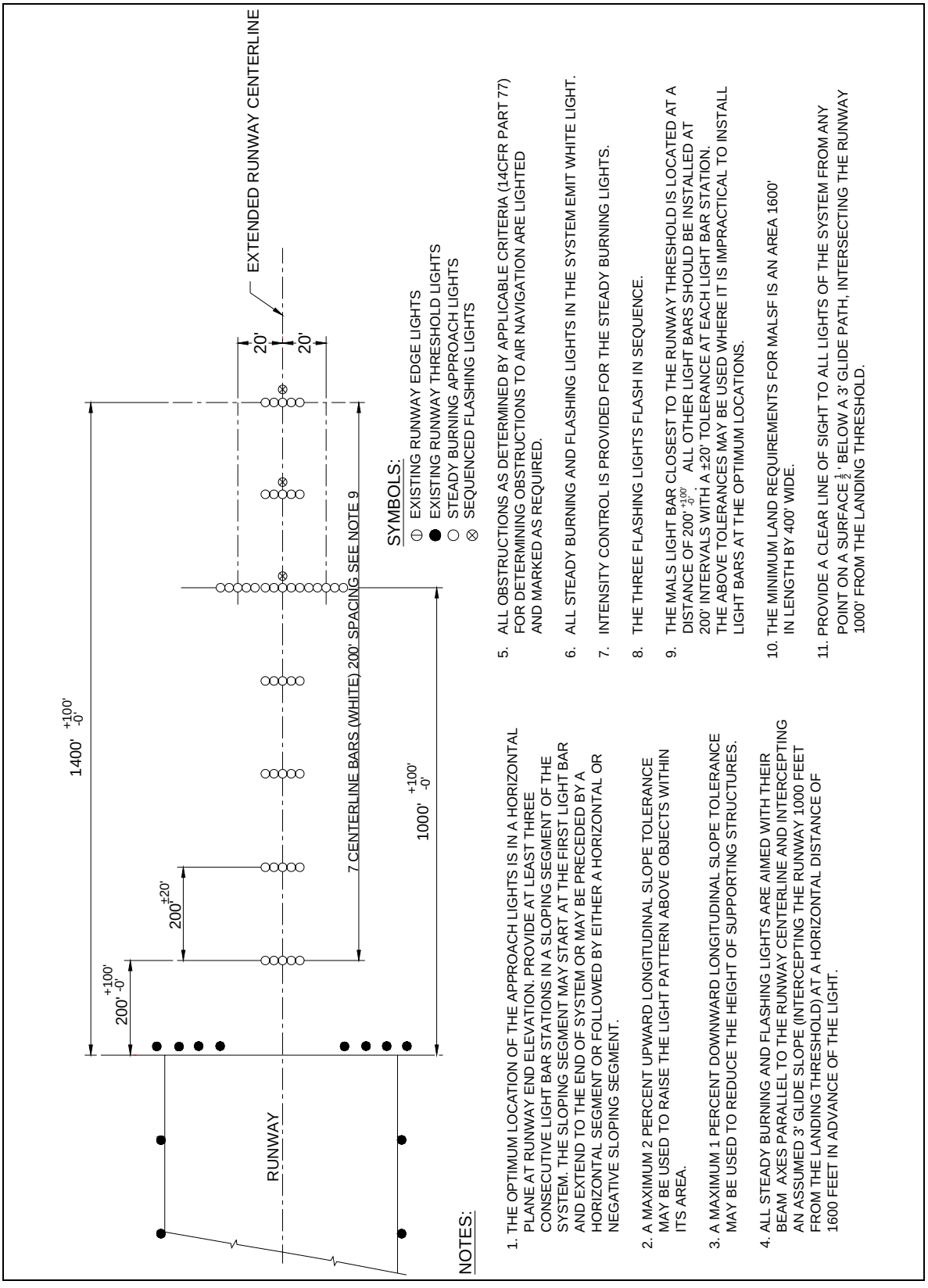


Figure 76. Typical Layout for MALSF.

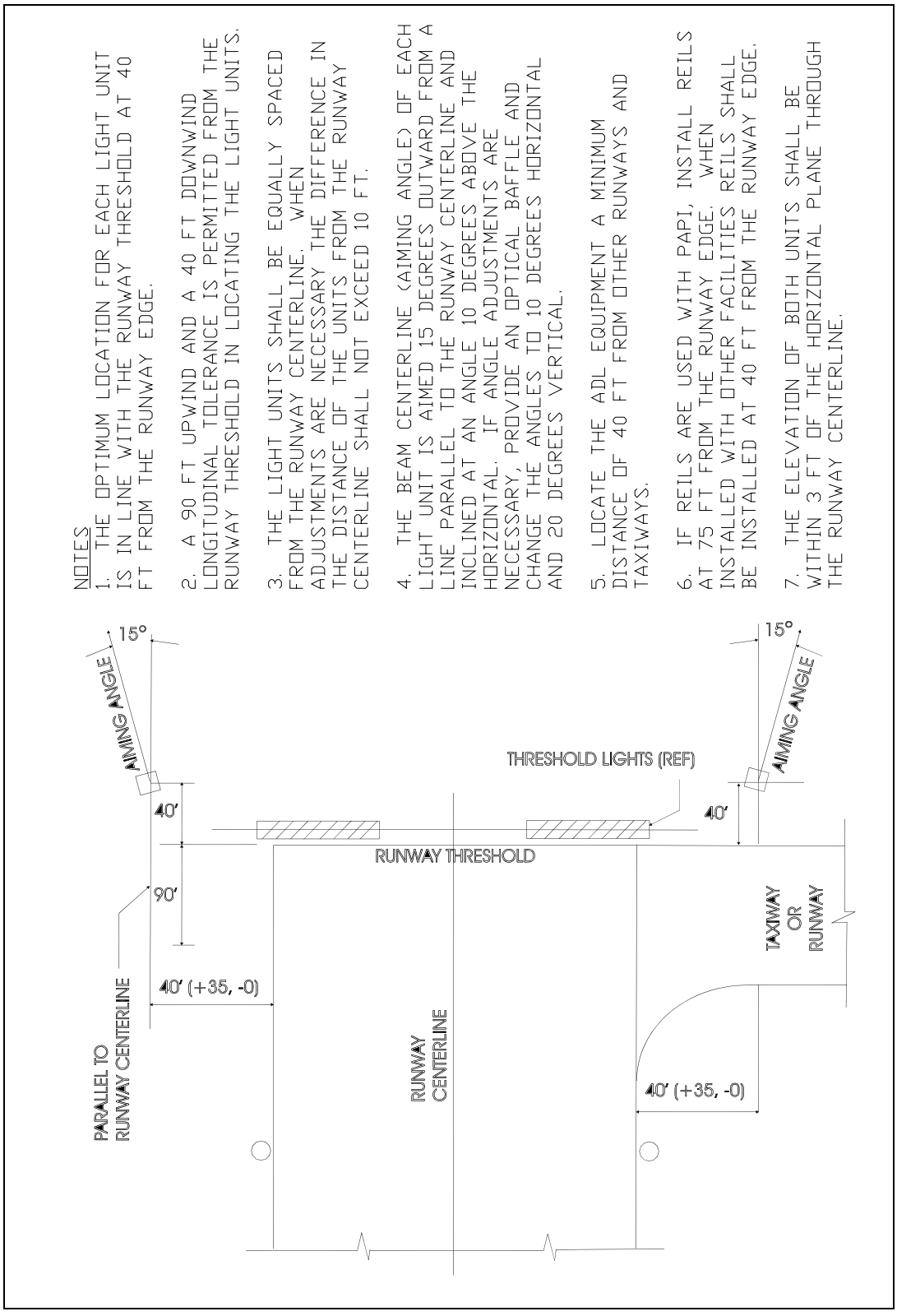


Figure 77. Typical Layout for Runway End Identifier Lights (REILs).

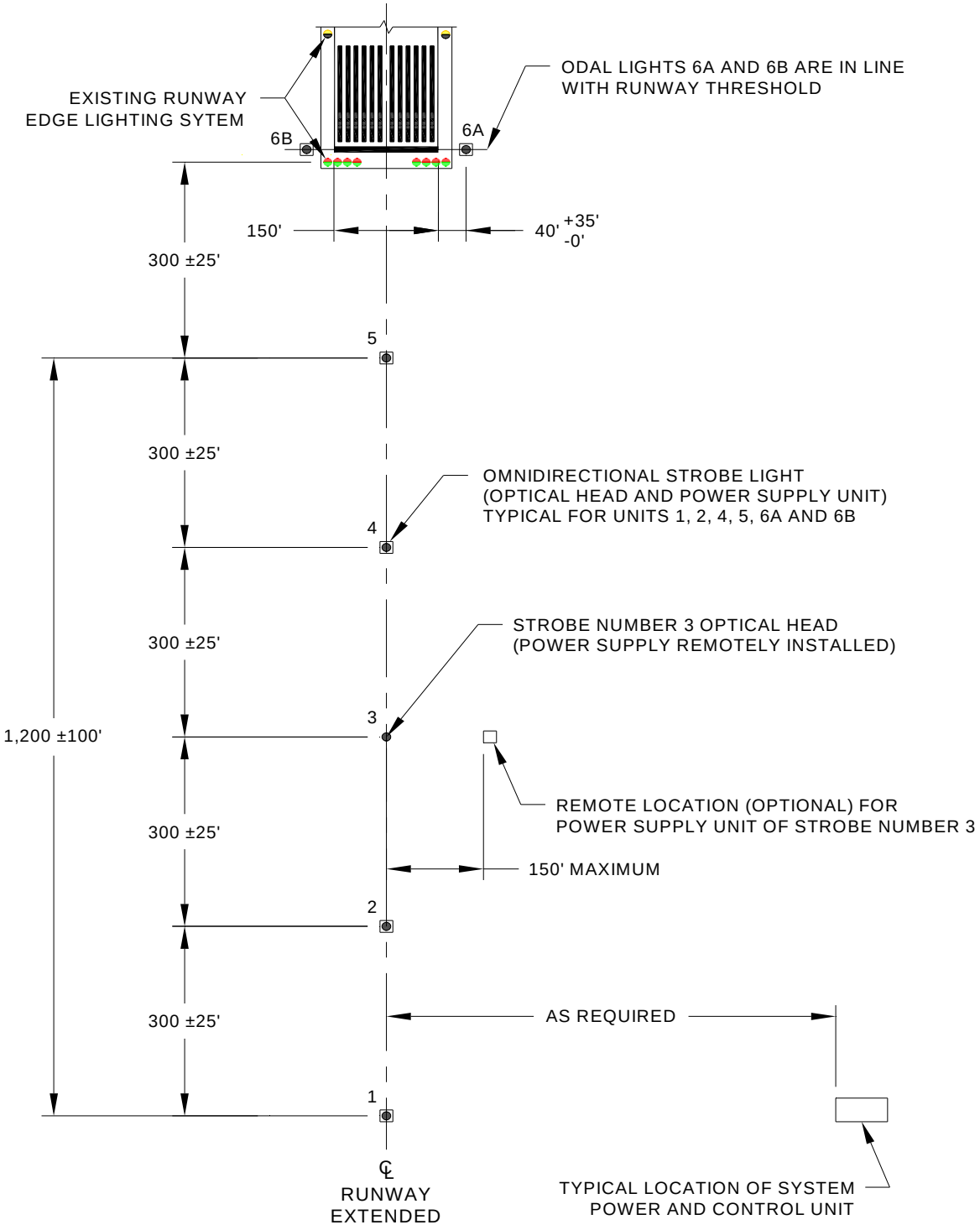
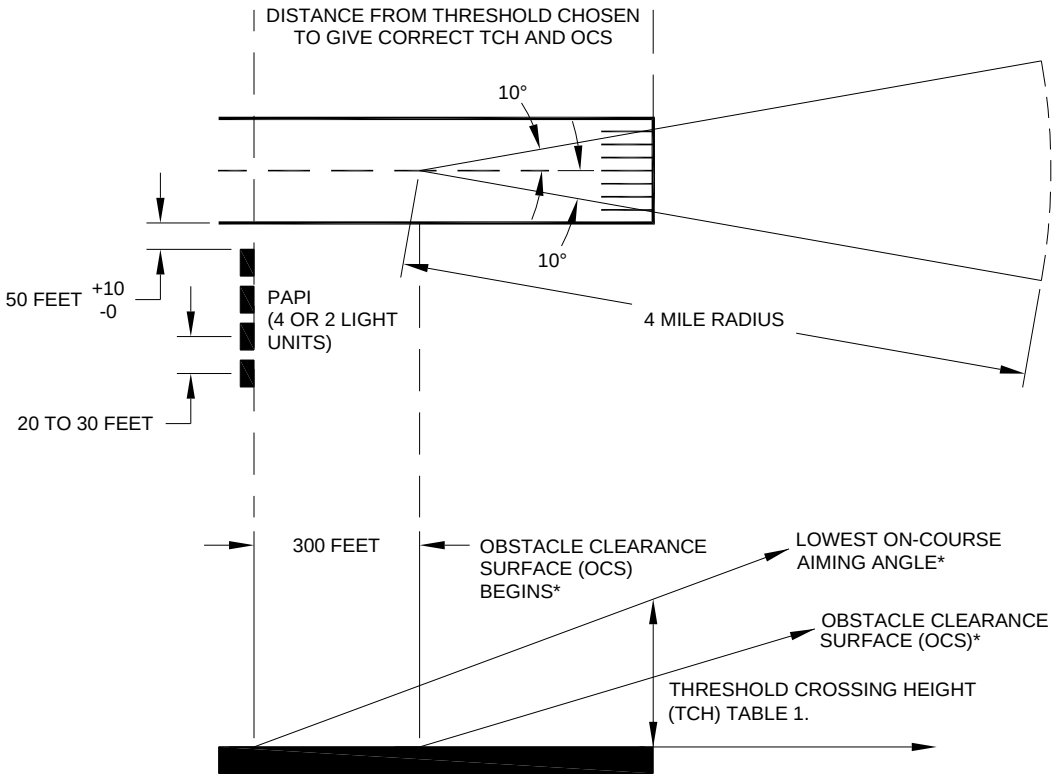


Figure 78. Typical ODALS Layout



PAPI OCS ANGLE = LOWEST ON-COURSE AIMING ANGLE - 1 DEGREE

NOTES:

1. THE VISUAL GLIDE PATH ANGLE IS THE CENTER OF THE ON-COURSE ZONE, AND IS A NOMINAL 3 DEGREES WHEN MEASURED FROM THE HORIZONTAL SURFACE OF THE RUNWAY.

   A. FOR NON-JET RUNWAYS, THE GLIDE PATH MAY BE RAISED TO 4 DEGREES MAXIMUM TO PROVIDE OBSTACLE CLEARANCE.

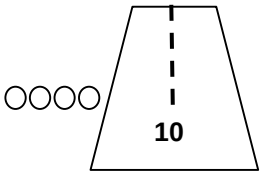
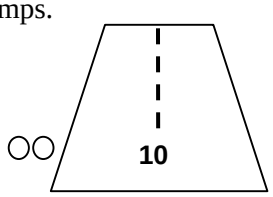
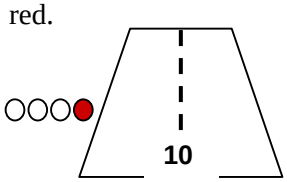
   B. IF THE PAPI GLIDE PATH IS CHANGED TO A HIGHER ANGLE FROM THE NOMINAL 3 DEGREES, IT MUST BE COMMUNICATED IN A NOTICE TO AIRMAN (NOTAM) AND PUBLISHED IN THE AIRPORT FACILITY DIRECTORY.

2. PAPI OBSTACLE CLEARANCE SURFACE (OCS).

   A. THE PAPI OCS PROVIDES THE PILOT WITH A MINIMUM APPROACH CLEARANCE.

   B. THE PAPI MUST BE POSITIONED AND AIMED SO NO OBSTACLES PENETRATE ITS SURFACE.
      (1) THE OCS BEGINS 300 FEET [90M] IN FRONT OF THE PAPI SYSTEM.
      (2) THE OCS IS PROJECTED INTO THE APPROACH ZONE DEGREE LESS THEN AIMING ANGLE OF THE THIRD LIGHT UNIT FROM THE RUNWAY FOR AN L-880 SYSTEM, OR THE OUTSIDE LIGHT UNIT FOR AN L-881 SYSTEM.

Figure 79. PAPI Obstacle Clearance Surface.

<table>
<tr>
<td>(1) Above correct glide path
All lamps white.
 
</td>
<td rowspan="2">(1) Above the correct glide path:
2 white lamps.
 
</td>
</tr>
<tr>
<td>(2) Slightly above correct glide path.
3 white, 1 red.
 
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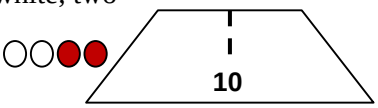
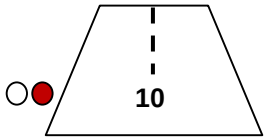
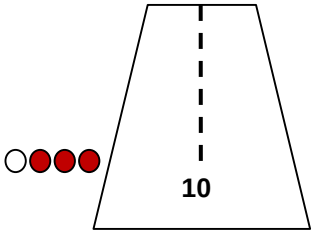
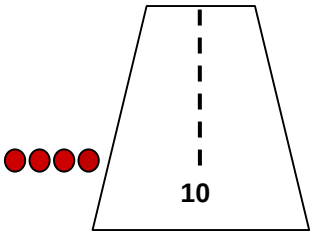
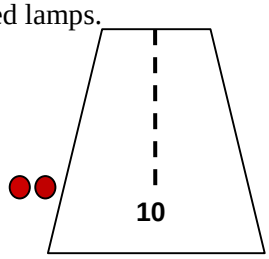
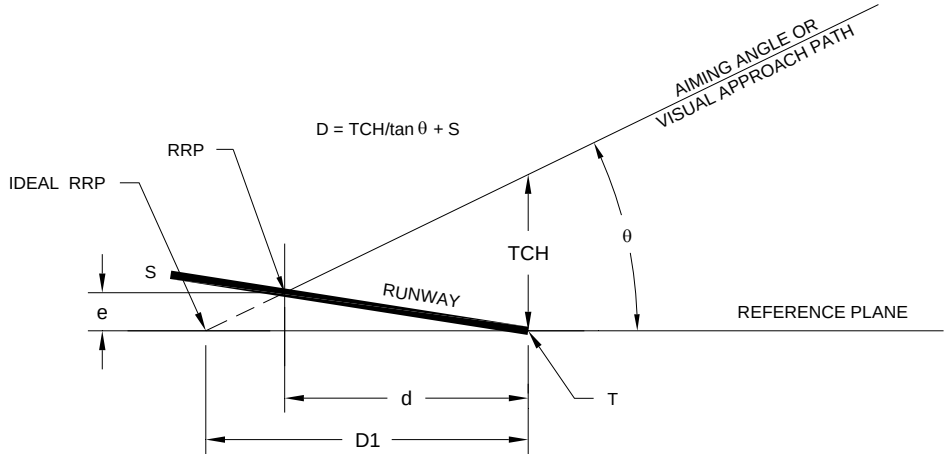
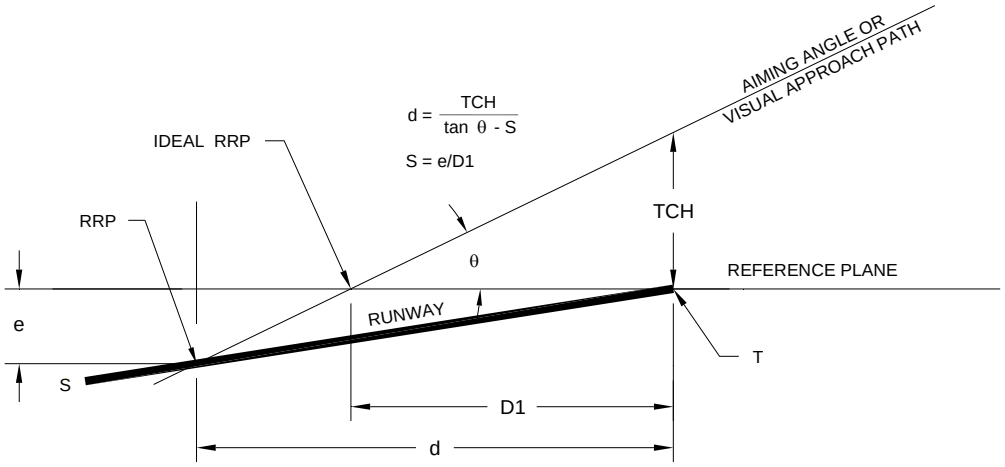
</tr>
<tr>
<td>(3) On the correct glide path.
Two white, two red.
 
</td>
<td rowspan="2">(2) On the correct glide path:
1 white, 1 red.
 
</td>
</tr>
<tr>
<td>(4) Slightly below the correct glide path.
1 white, 3 red.
 
</td>
</tr>
<tr>
<td>(5) Below the correct glide path:
All red.
 
</td>
<td>(3) Below the correct glide path:
Two red lamps.
 
</td>
</tr>
<tr>
<td>Type L-880</td>
<td>Type L-881</td>
</tr>
<tr>
<td colspan="2">NOTE: The PAPI is a system of either four or two identical light units placed on the left of the runway in a line perpendicular to the centerline. The boxes are positioned and aimed to produce the visual signal shown above.</td>
</tr>
</table>

Figure 80. PAPI Signal Presentation.



Siting station displaced toward threshold



Siting station displaced from threshold

SYMBOLS:

D1 = ideal (zero gradient) distance from threshold

RWY = runway longitudinal gradient

TCH = threshold crossing height

T = threshold

e = elevation difference between threshold and RRP

RRP = runway reference point (where aiming angle or visual approach path intersects runway profile)

d = adjusted distance form threshold

θ = aiming angle

S = percent slope of runway = e/d
(S is used in decimal form in the equations)

Figure 81. Correction for Runway Longitudinal Gradient.

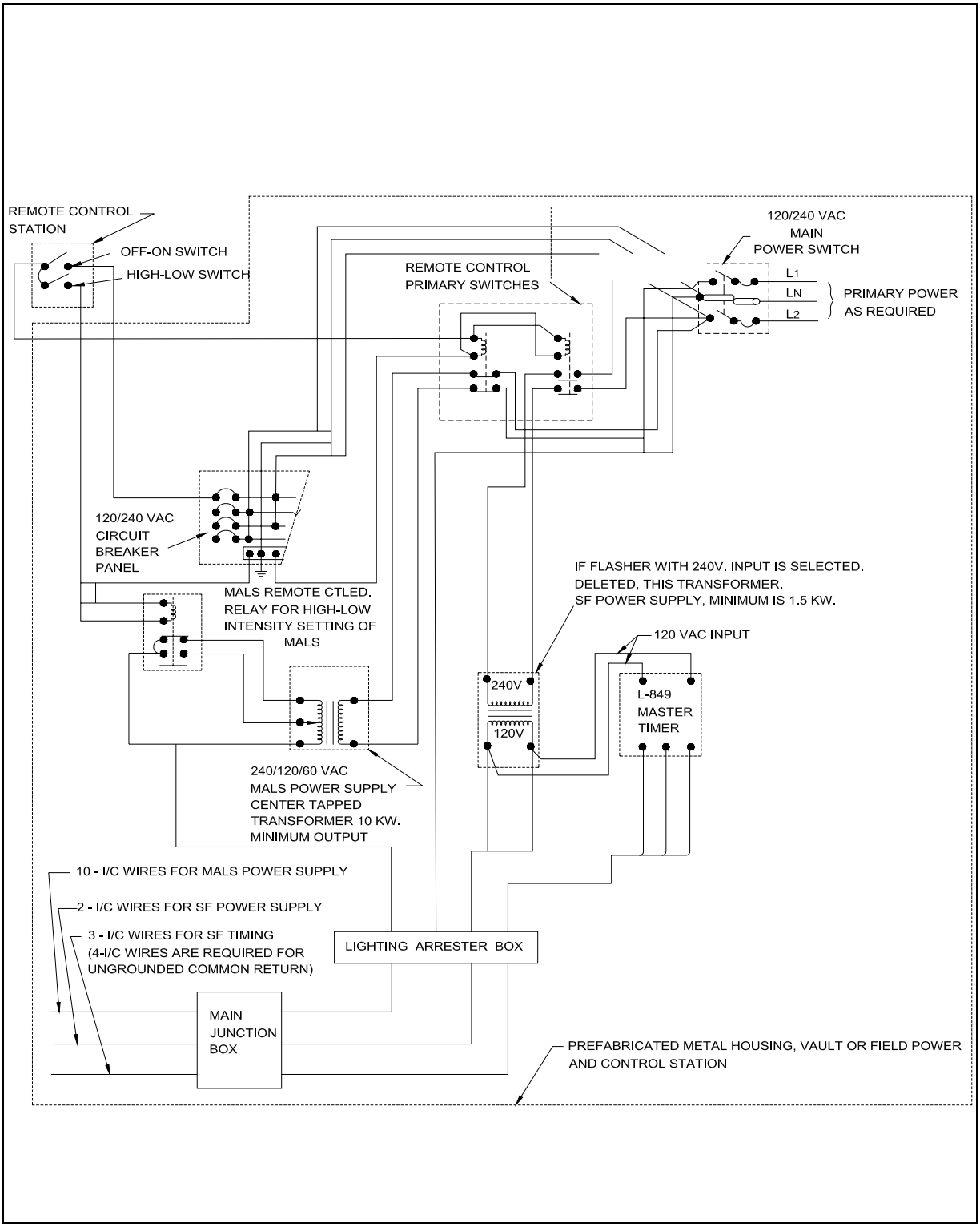


Figure 82. General Wiring Diagram for MALSF with 120-Volt, AC Remote Control.

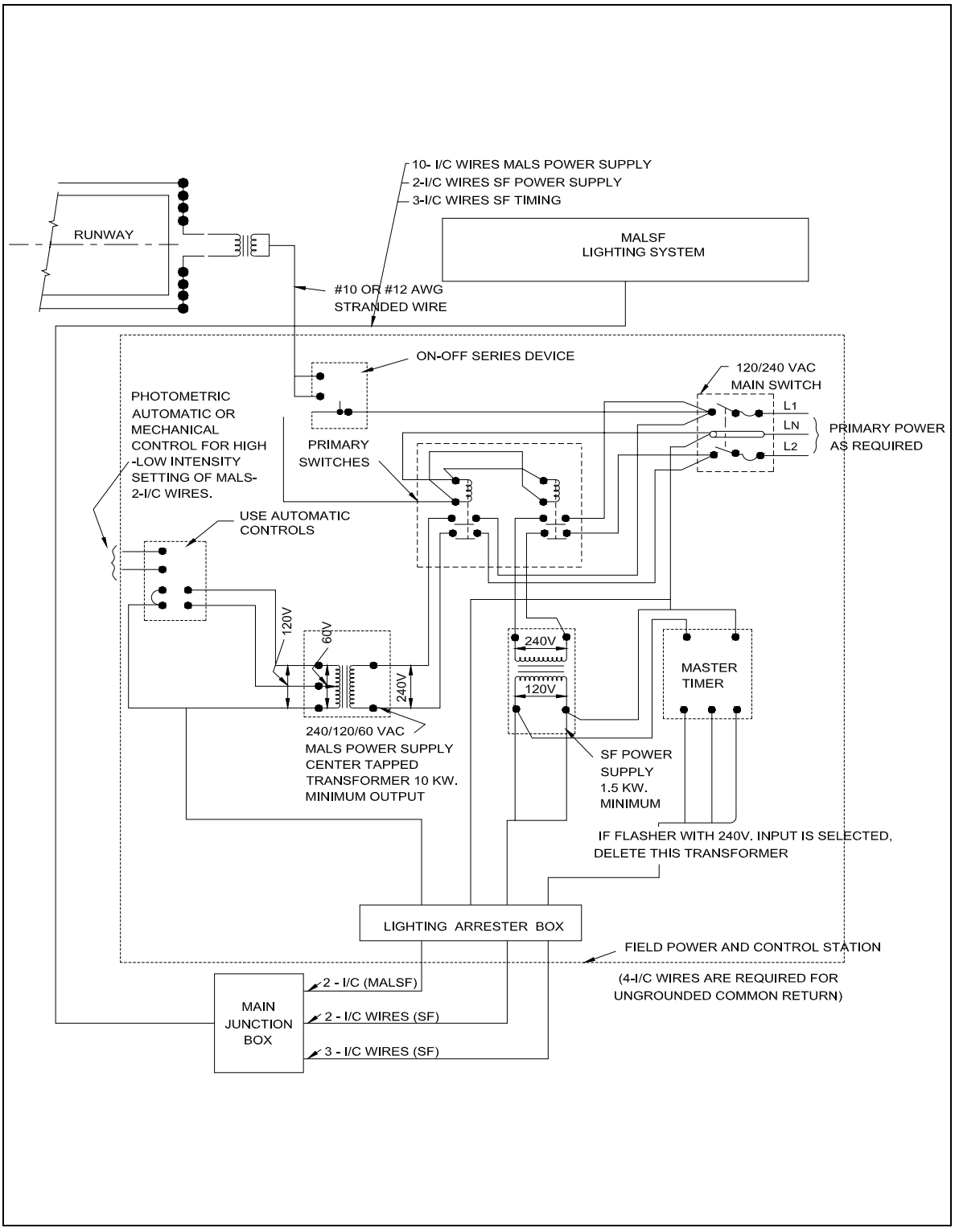
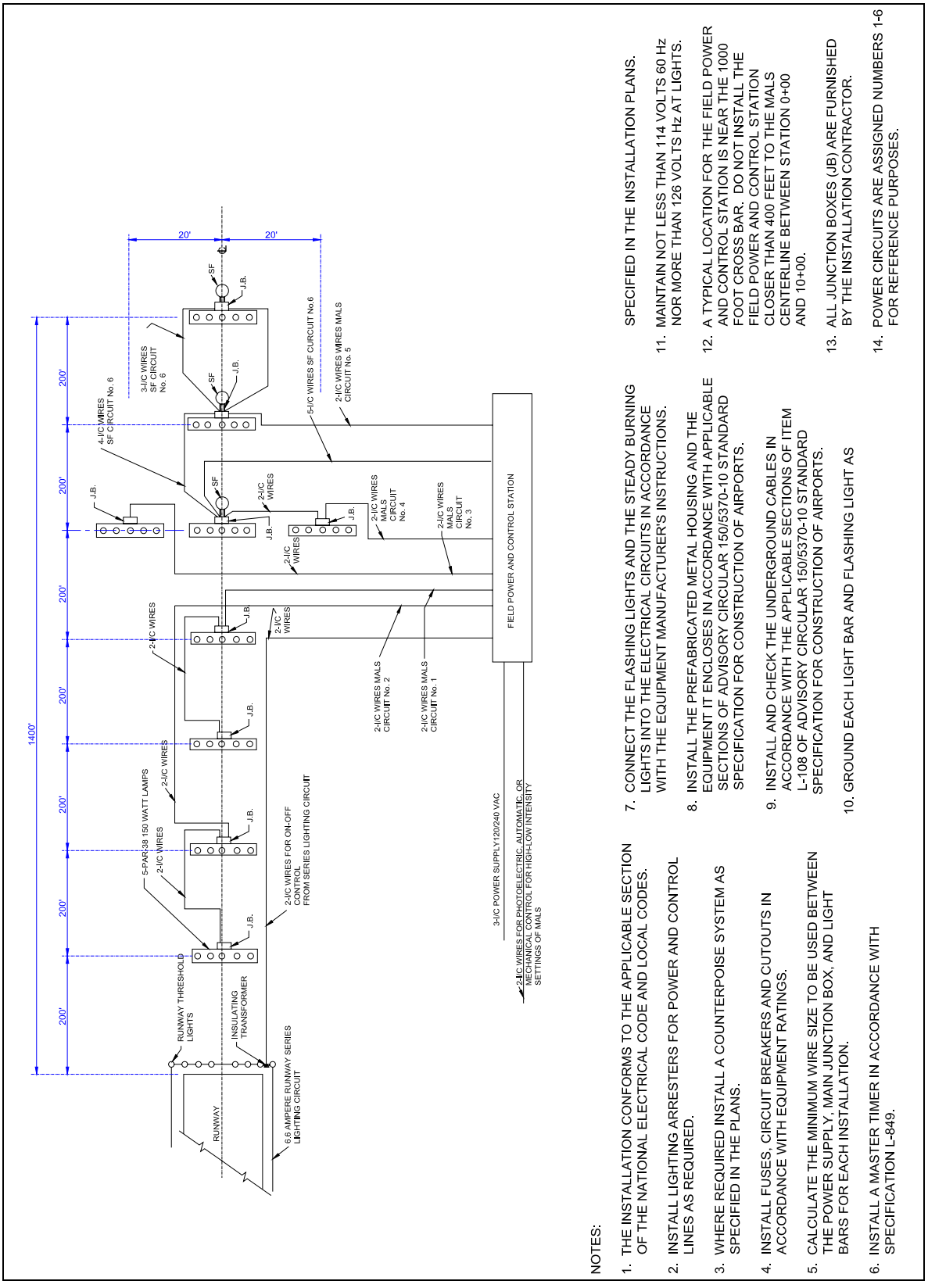


Figure 83. Typical Wiring Diagram for MALSF Controlled from Runway Lighting Circuit.



NOTES:

1. THE INSTALLATION CONFORMS TO THE APPLICABLE SECTION OF THE NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. INSTALL LIGHTING ARRESTERS FOR POWER AND CONTROL LINES AS REQUIRED.
3. WHERE REQUIRED INSTALL A COUNTERPOISE SYSTEM AS SPECIFIED IN THE PLANS.
4. INSTALL FUSES, CIRCUIT BREAKERS AND CUTOUTS IN ACCORDANCE WITH EQUIPMENT RATINGS.
5. CALCULATE THE MINIMUM WIRE SIZE TO BE USED BETWEEN THE POWER SUPPLY, MAIN JUNCTION BOX, AND LIGHT BARS FOR EACH INSTALLATION.
6. INSTALL A MASTER TIMER IN ACCORDANCE WITH SPECIFICATION L-849.
7. CONNECT THE FLASHING LIGHTS AND THE STEADY BURNING LIGHTS INTO THE ELECTRICAL CIRCUITS IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S INSTRUCTIONS.
8. INSTALL THE PREFABRICATED METAL HOUSING AND THE EQUIPMENT IT ENCLOSES IN ACCORDANCE WITH APPLICABLE SECTIONS OF ADVISORY CIRCULAR 150/5370-10 STANDARD SPECIFICATION FOR CONSTRUCTION OF AIRPORTS.
9. INSTALL AND CHECK THE UNDERGROUND CABLES IN ACCORDANCE WITH THE APPLICABLE SECTIONS OF ITEM L-108 OF ADVISORY CIRCULAR 150/5370-10 STANDARD SPECIFICATION FOR CONSTRUCTION OF AIRPORTS.
10. GROUND EACH LIGHT BAR AND FLASHING LIGHT AS SPECIFIED IN THE INSTALLATION PLANS.
11. MAINTAIN NOT LESS THAN 114 VOLTS 60 Hz NOR MORE THAN 126 VOLTS Hz AT LIGHTS.
12. A TYPICAL LOCATION FOR THE FIELD POWER AND CONTROL STATION IS NEAR THE 1000 FOOT CROSS BAR. DO NOT INSTALL THE FIELD POWER AND CONTROL STATION CLOSER THAN 400 FEET TO THE MALS CENTERLINE BETWEEN STATION 0+00 AND 10+00.
13. ALL JUNCTION BOXES (JB) ARE FURNISHED BY THE INSTALLATION CONTRACTOR.
14. POWER CIRCUITS ARE ASSIGNED NUMBERS 1-6 FOR REFERENCE PURPOSES.

Figure 84. Typical Field Wiring Circuits for MALSF.

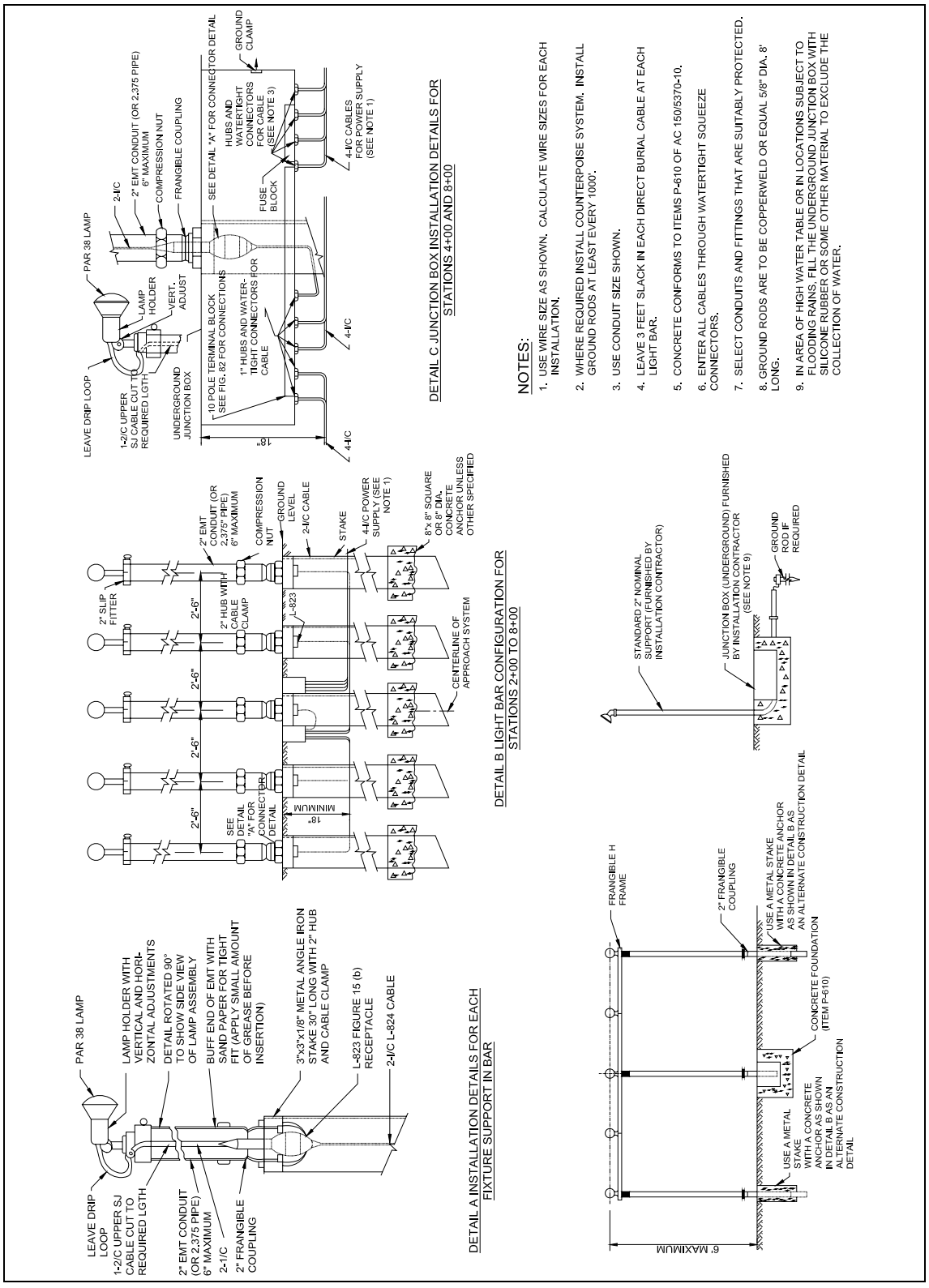


Figure 85. Typical Installation Details for Frangible MALS Structures – 6 foot (1.8 m) Maximum.

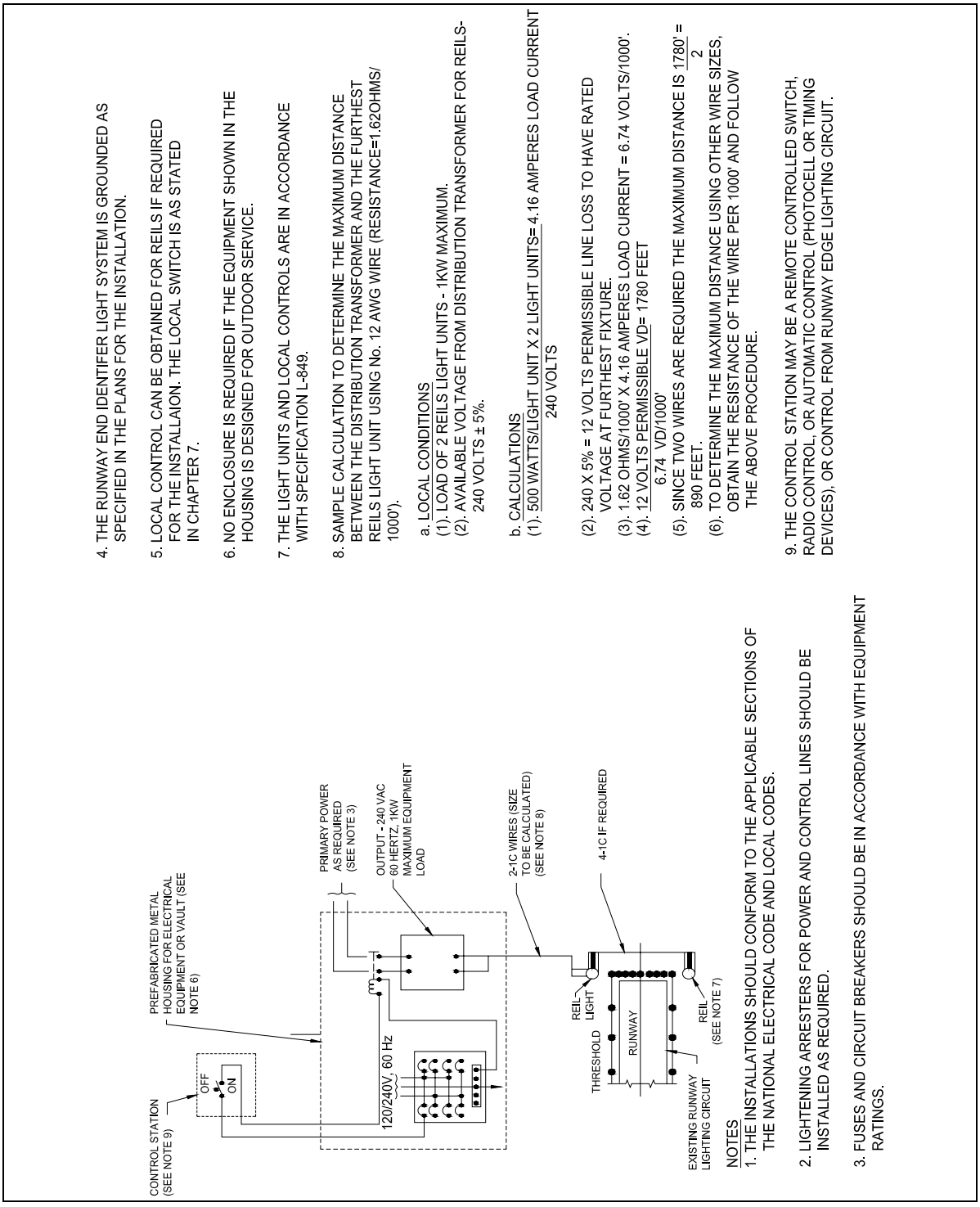


Figure 86. Typical Wiring for REILs Multiple Operation

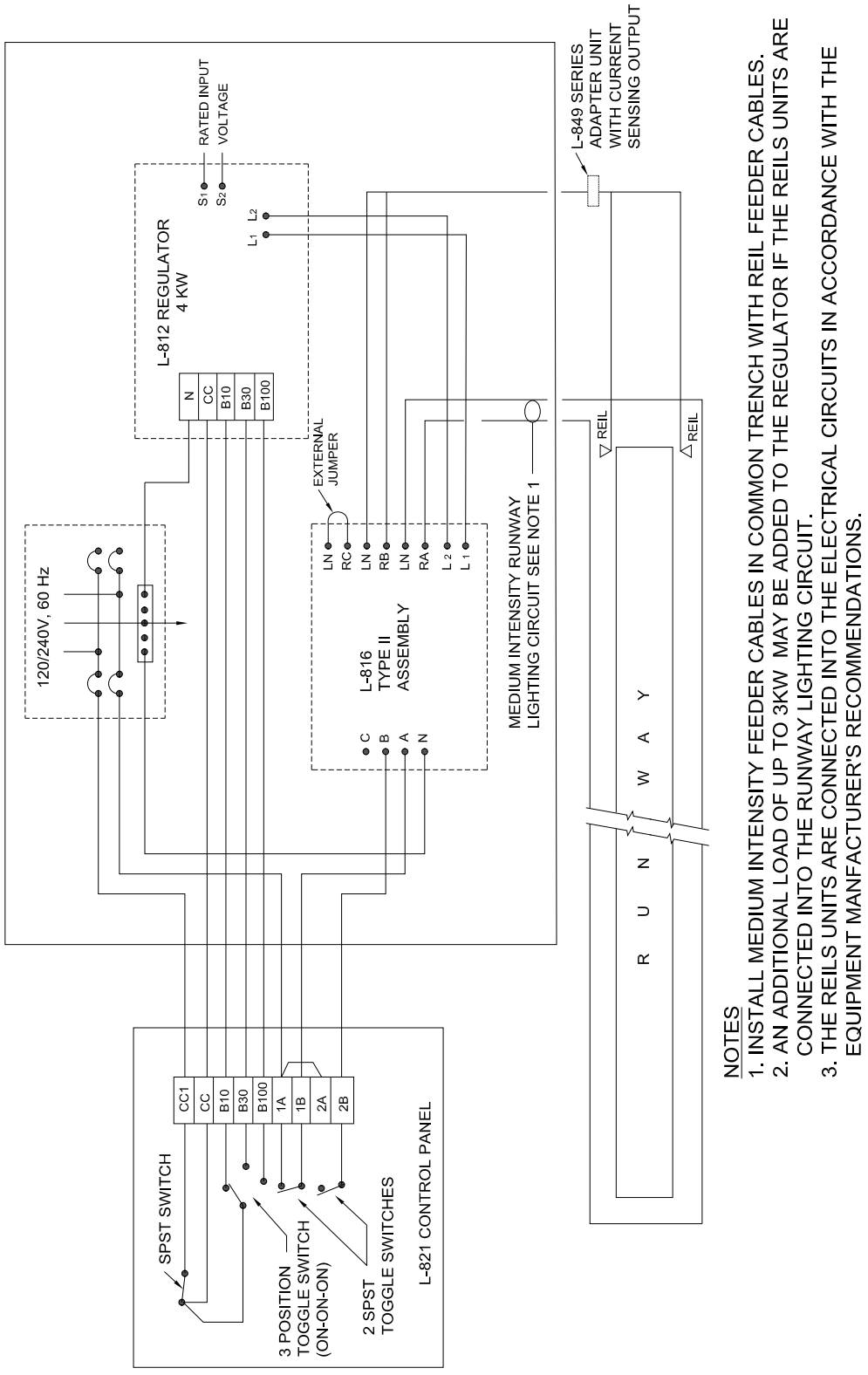


Figure 87. Typical Wiring for REIL Series Operation

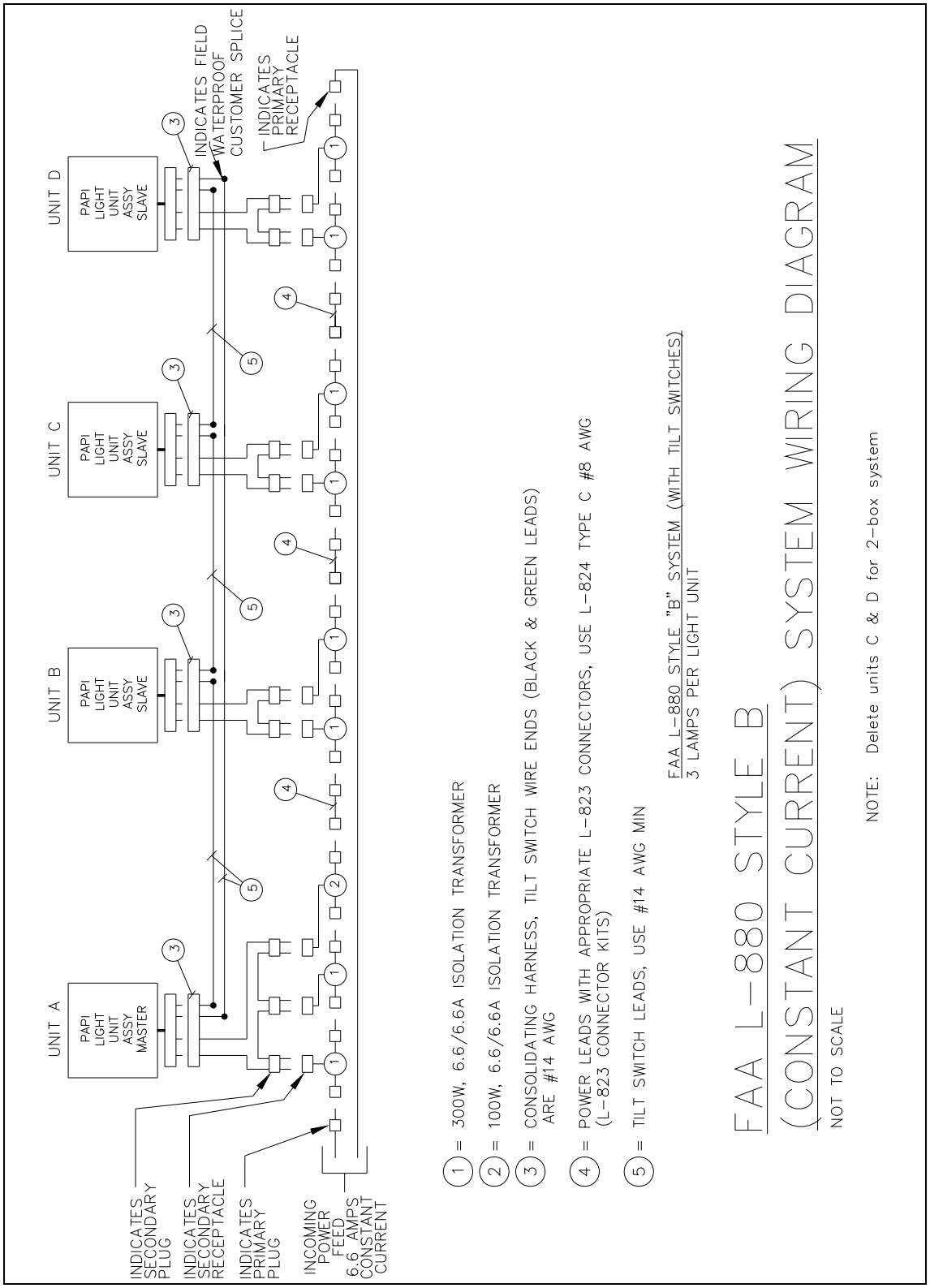


Figure 88. FAA L-880 Style B (Constant Current) System Wiring Diagram.

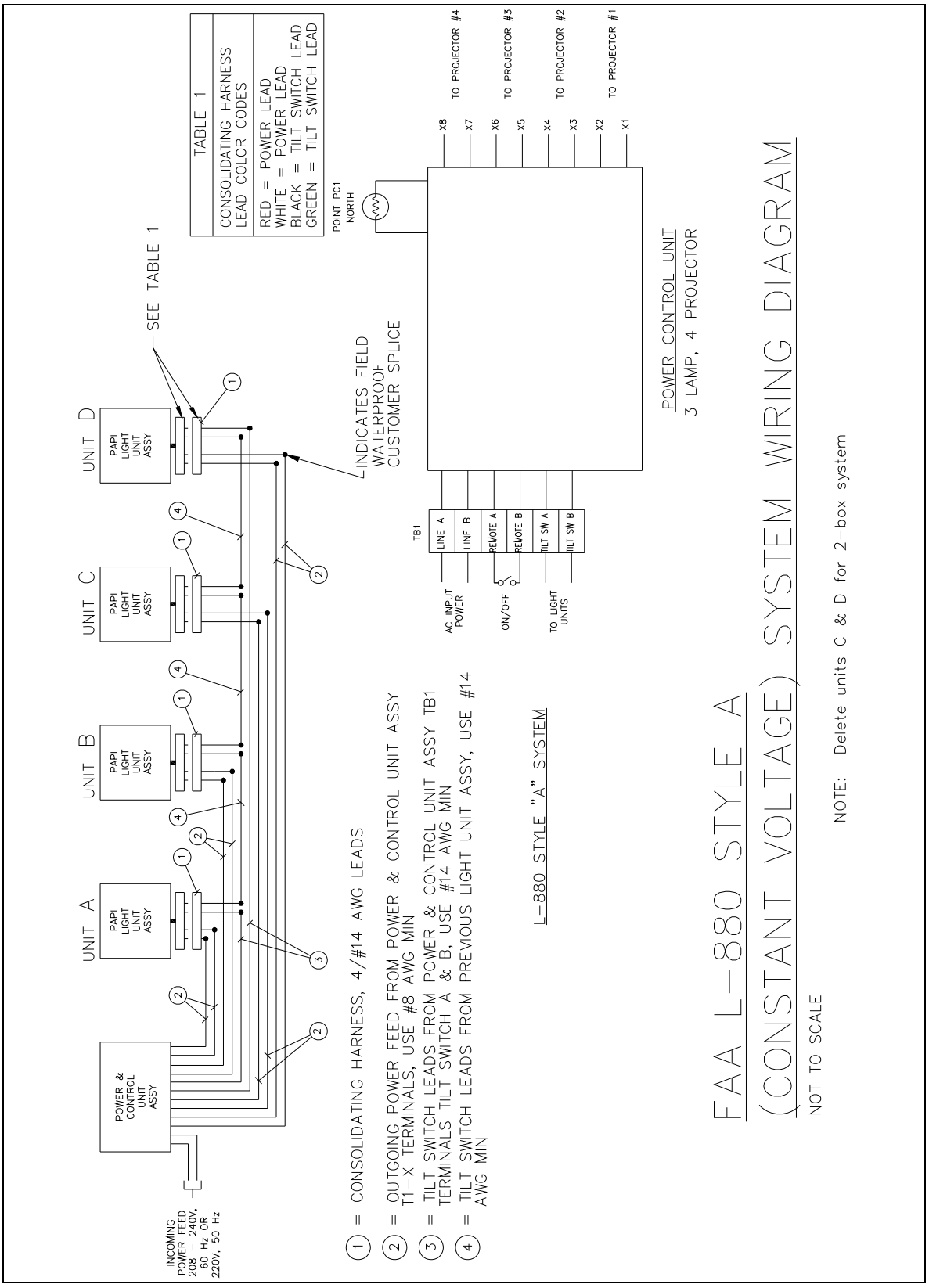


Figure 89. FAA L-880 Style A (Constant Voltage) System Wiring Diagram.

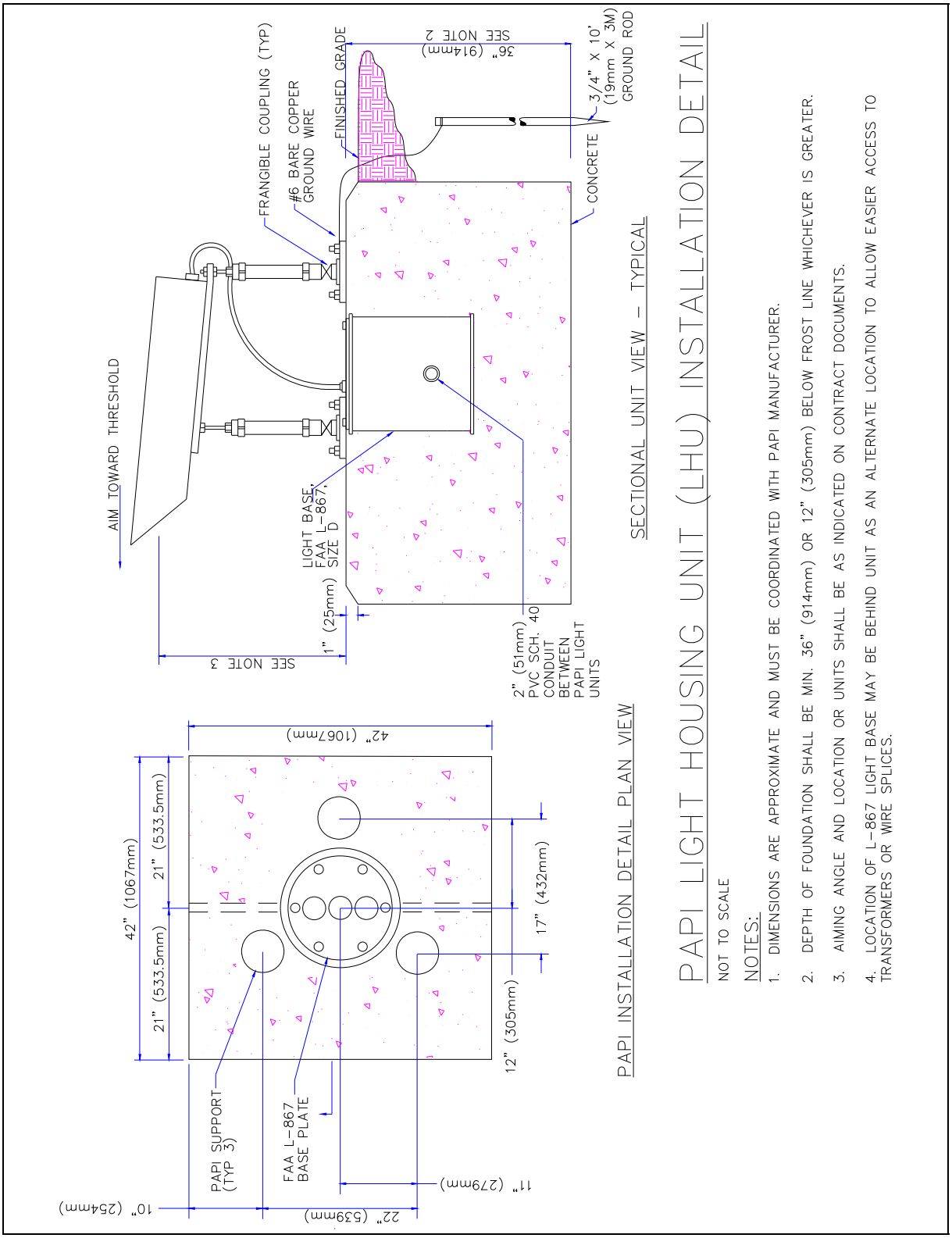


Figure 90. PAPI Light Housing Unit (LHU) Installation Detail.

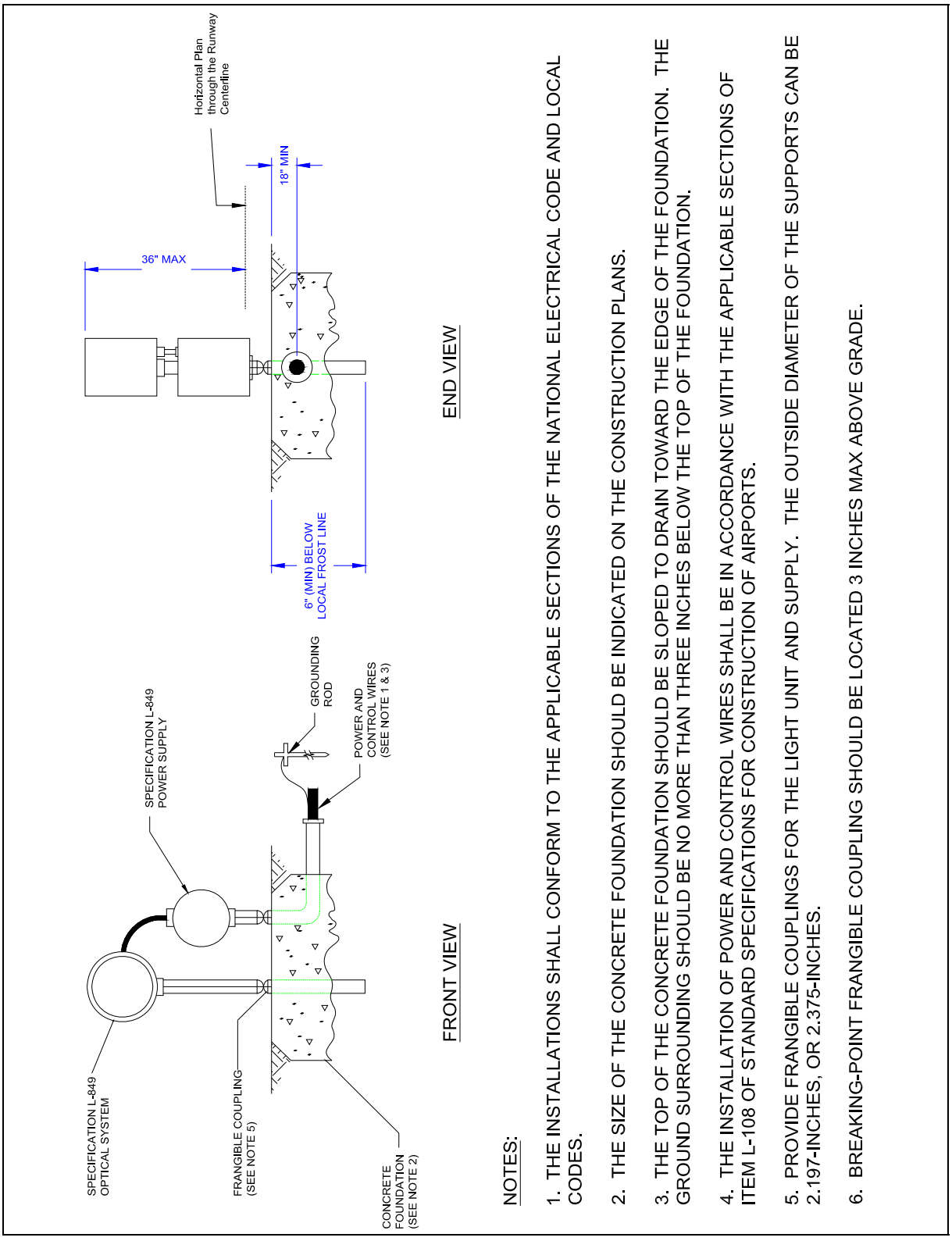


Figure 91. Typical Installation Details for Runway End Identifier Lights (REILs).

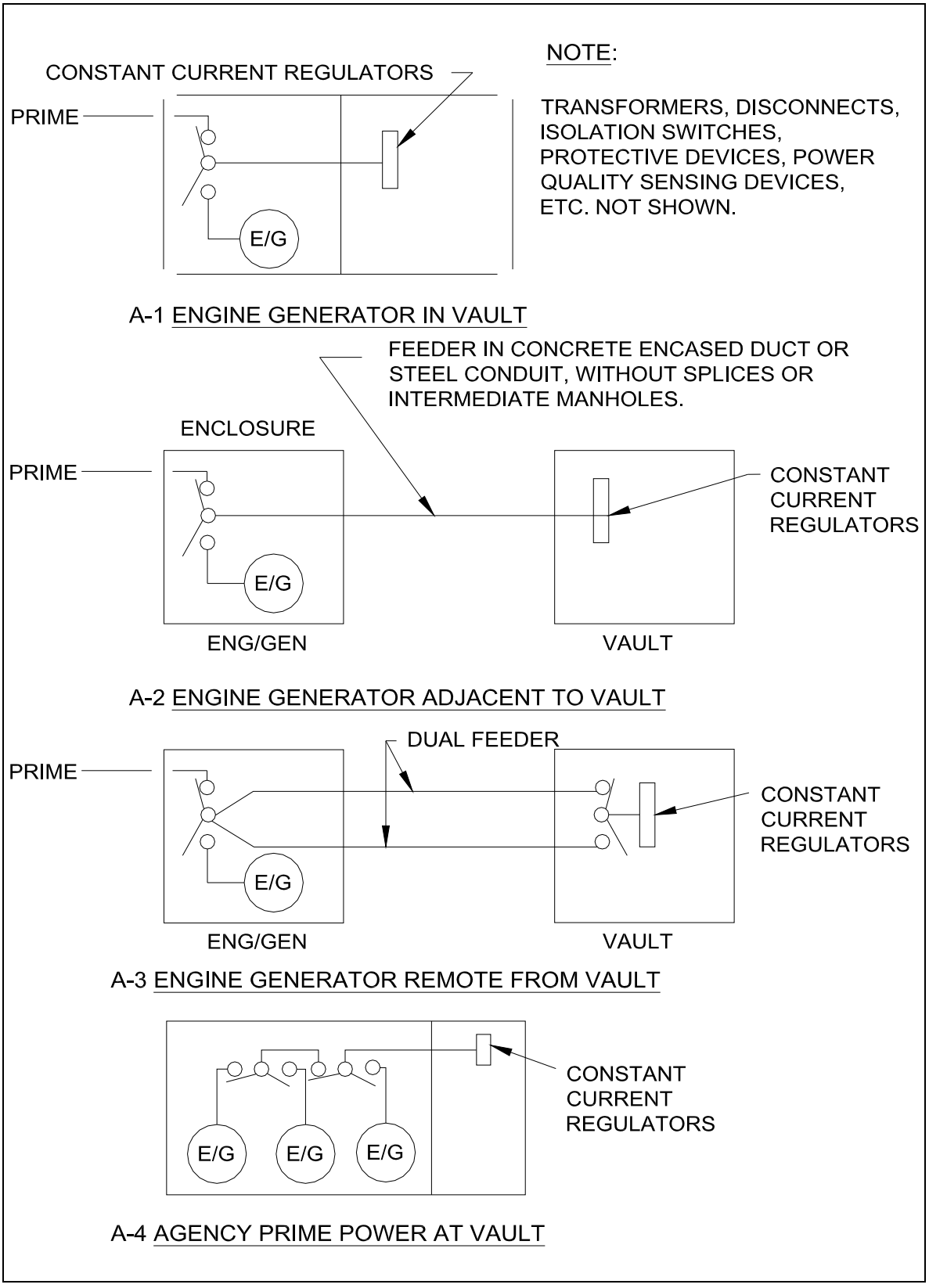
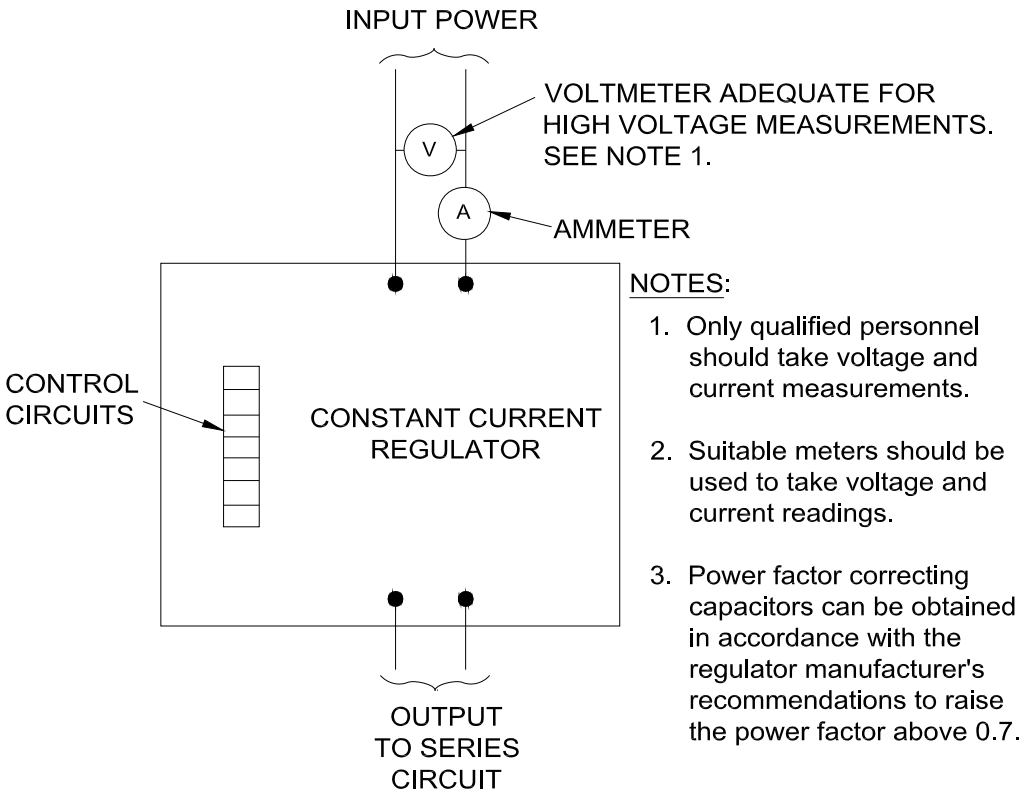


Figure 92. Configuration “A” Electrical Power.



NOTES:

1. Only qualified personnel should take voltage and current measurements.
2. Suitable meters should be used to take voltage and current readings.
3. Power factor correcting capacitors can be obtained in accordance with the regulator manufacturer's recommendations to raise the power factor above 0.7.

TYPICAL CALCULATIONS

1. Measured KVA
   a. Volts = 2400V
   b. Amperes = 17.0A
   c. KVA Input = $\frac{\text{Volts x Amperes}}{1000}$ $\frac{2400 \times 17.0}{1000}$ = 40.8KVA

2. Calculated KVA
   a. KW = 30
   b. Efficiency = 0.92 (obtain this value from applicable advisory circular for regulator, e.g., Specification L-828)
   c. Power Factor = 0.7 (same as note for b. above)
   d. KVA Input = $\frac{\text{KW}}{\text{Efficiency x Power Factor}}$ $\frac{30}{0.92 \times 0.7}$ = 46.6KVA

3. It is normal for the measured KVA to be less than the calculated KVA, however, the calculated KVA should be used for design purposes. The difference in the values can be caused by the regulator having a higher efficiency and power factor than the values used in the calculations or by the load on the regulator.

Figure 93. Typical KVA Input Requirements.

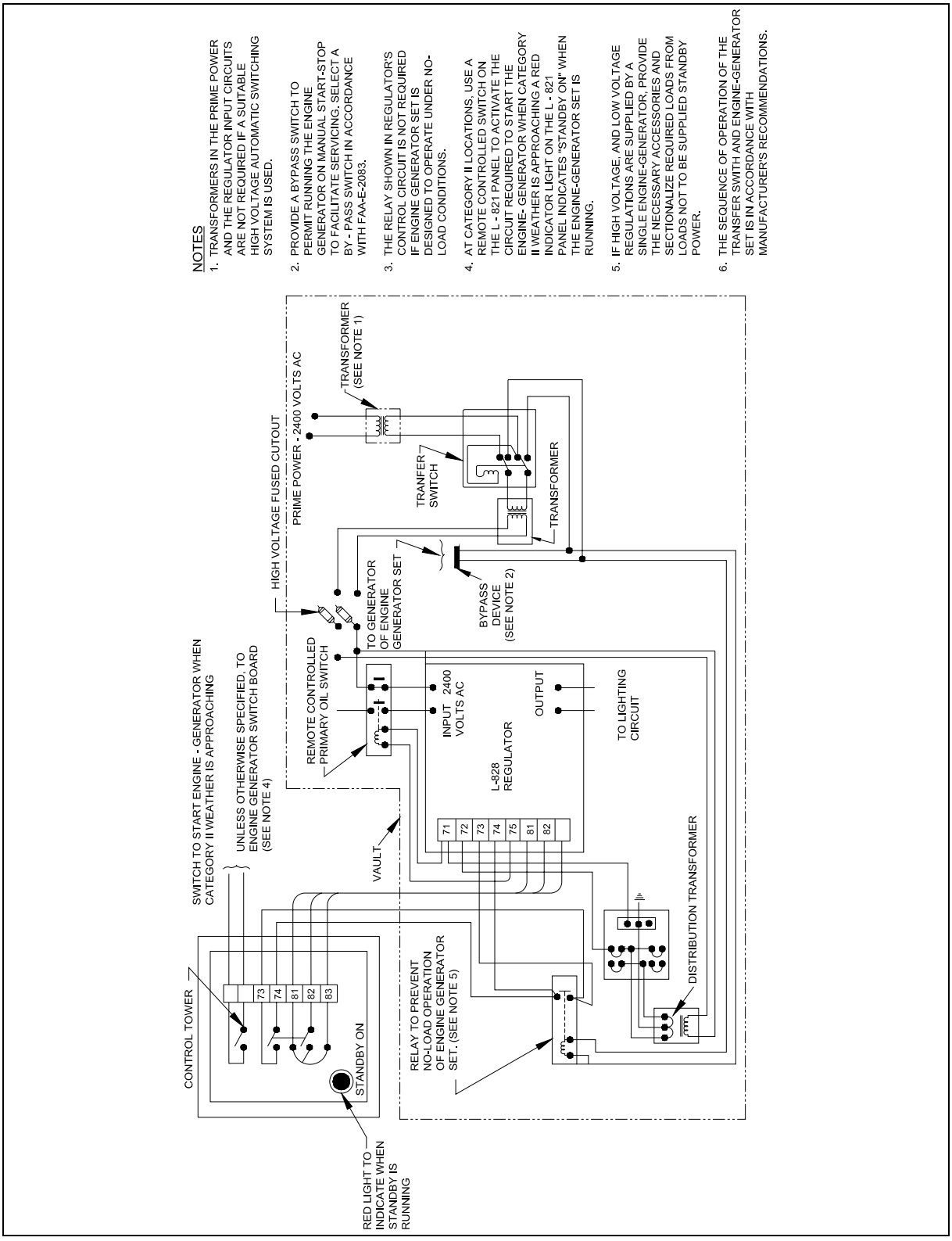


Figure 94. Typical Wiring Diagram for Configuration "A" Electrical Power.

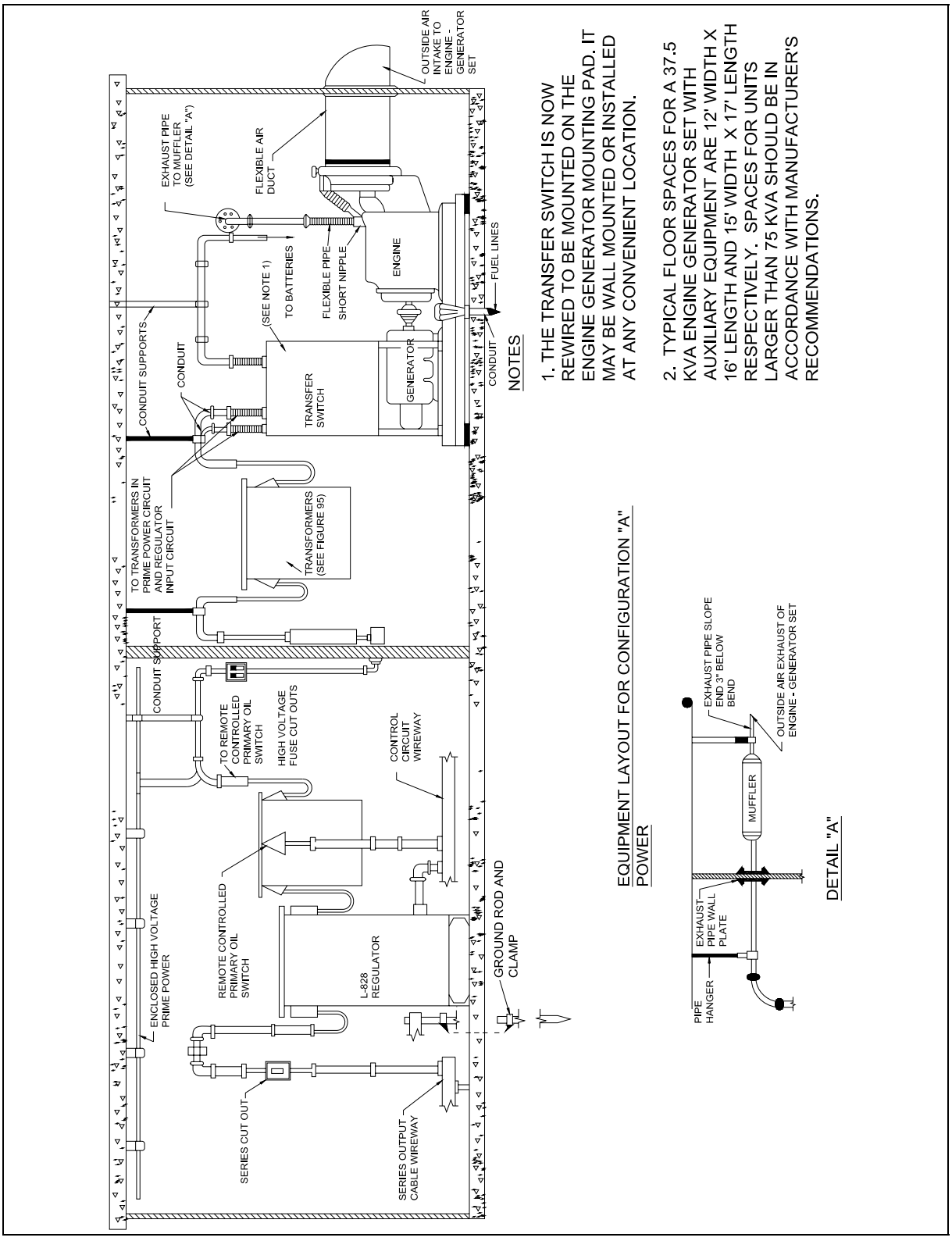


Figure 95. Typical Equipment Layout for Configuration “A” Electrical Power.

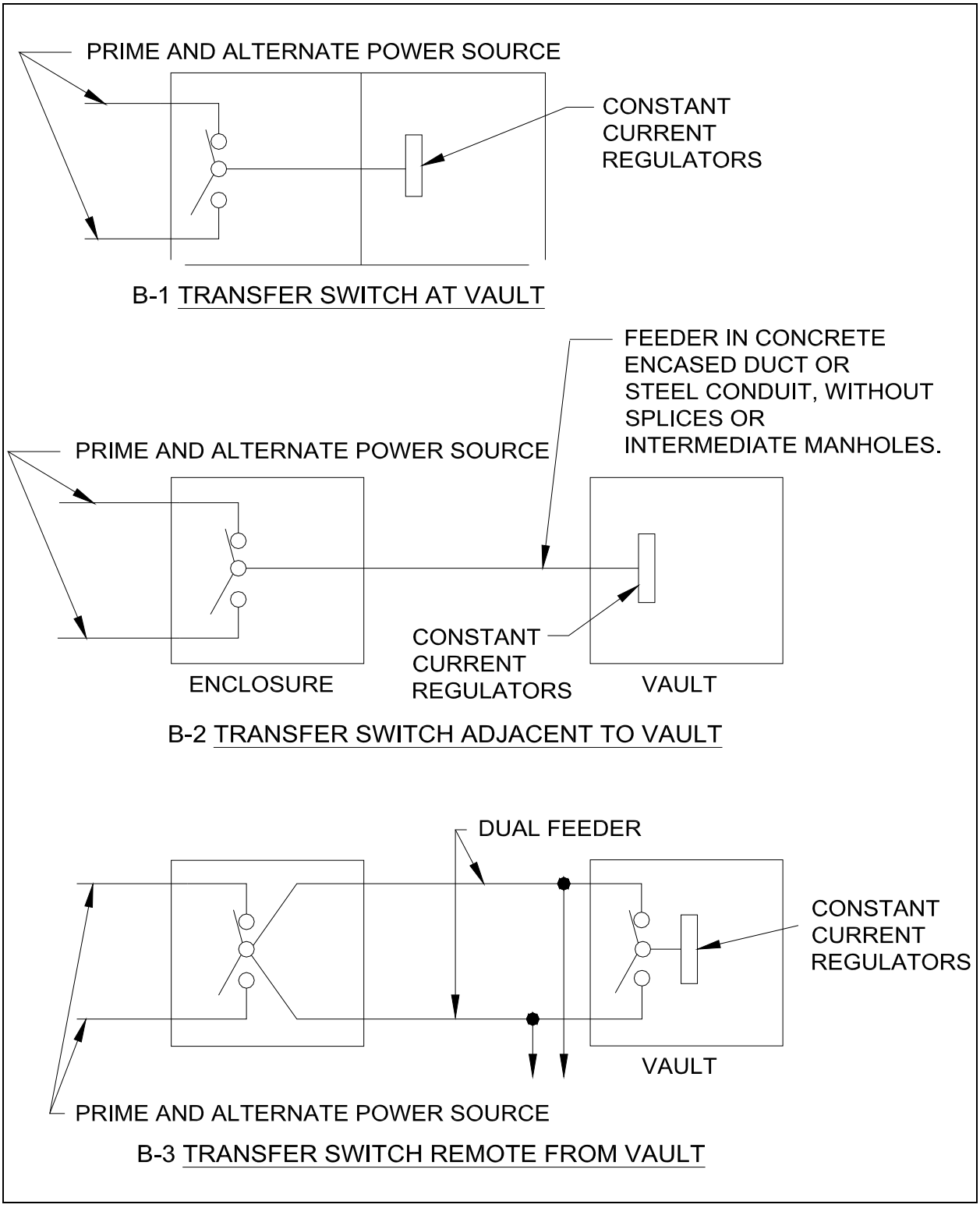


Figure 96. Configuration “B” Electrical Power.

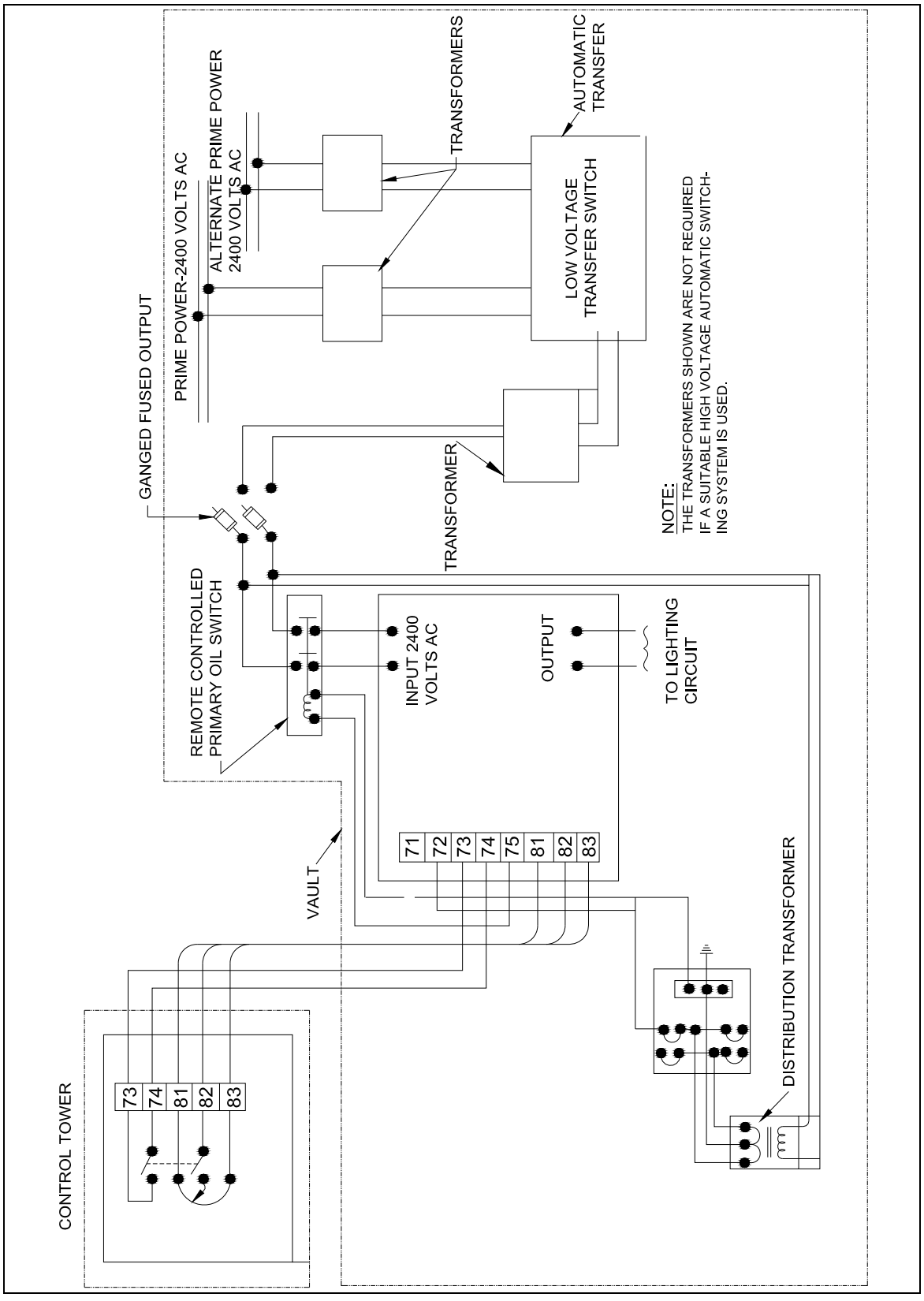


Figure 97. Typical Wiring Diagram for Configuration “B” Electrical Power.

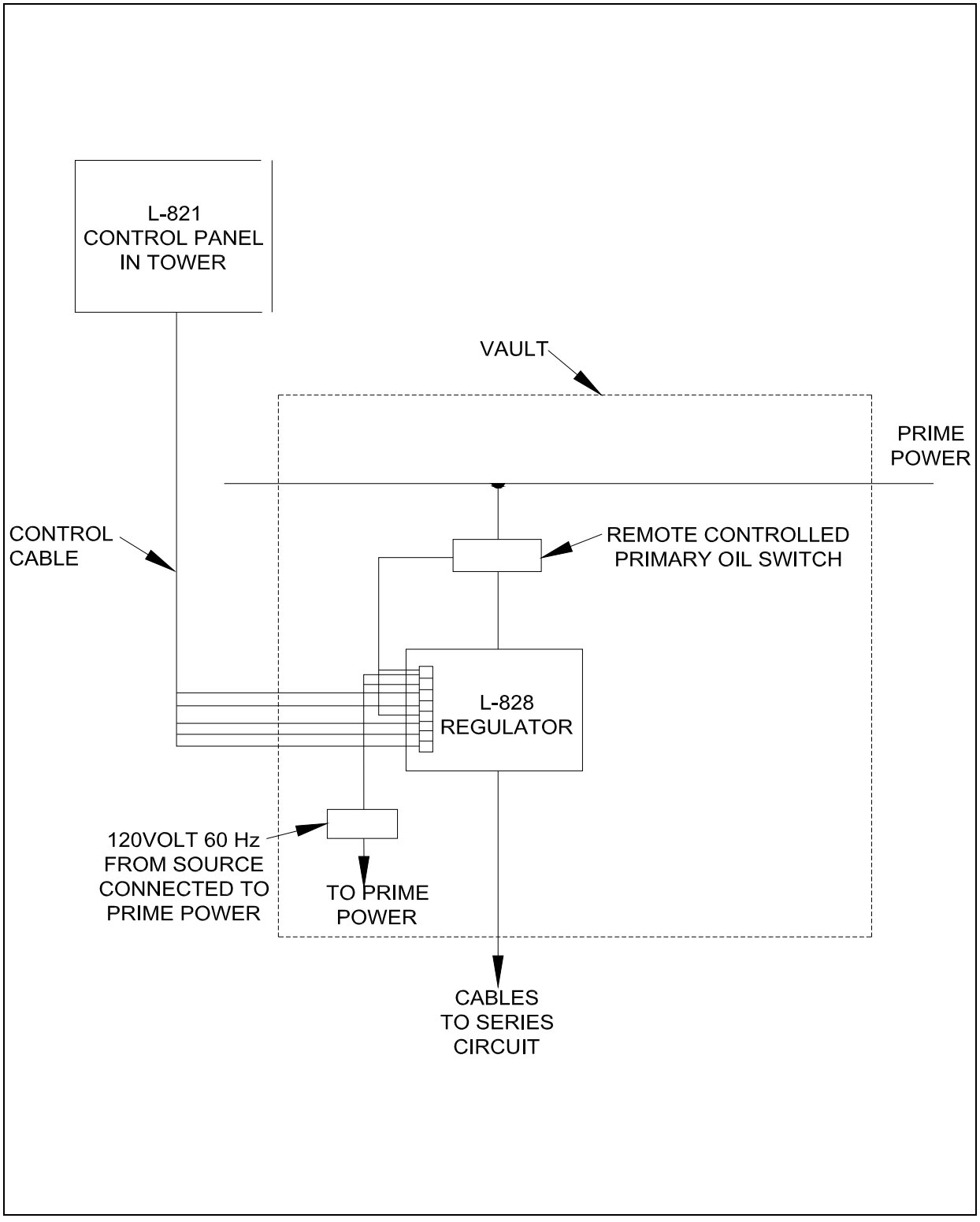


Figure 98. Typical Wiring Diagram for Configuration “C” Power.

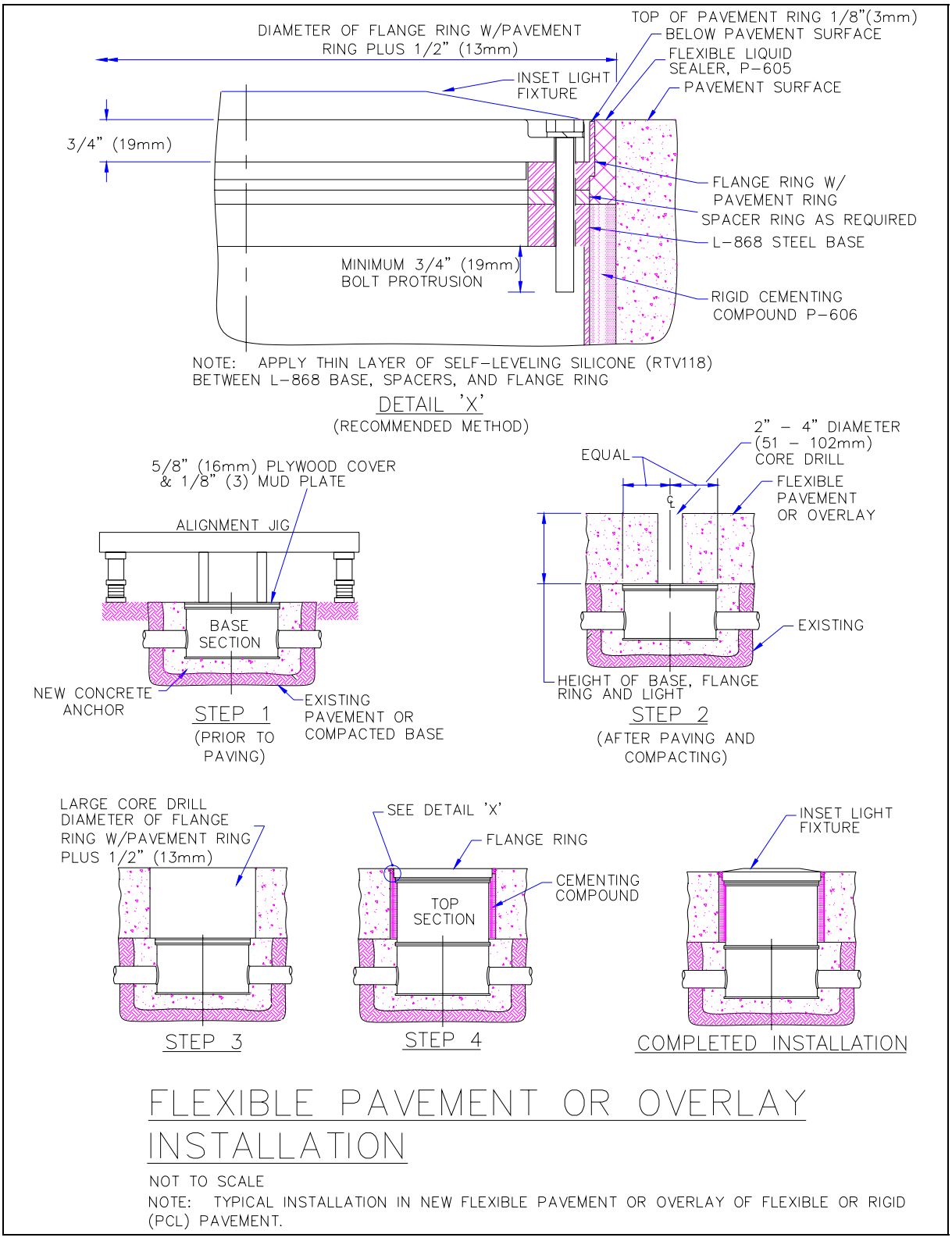


Figure 99. Flexible Pavement or Overlay Installation.

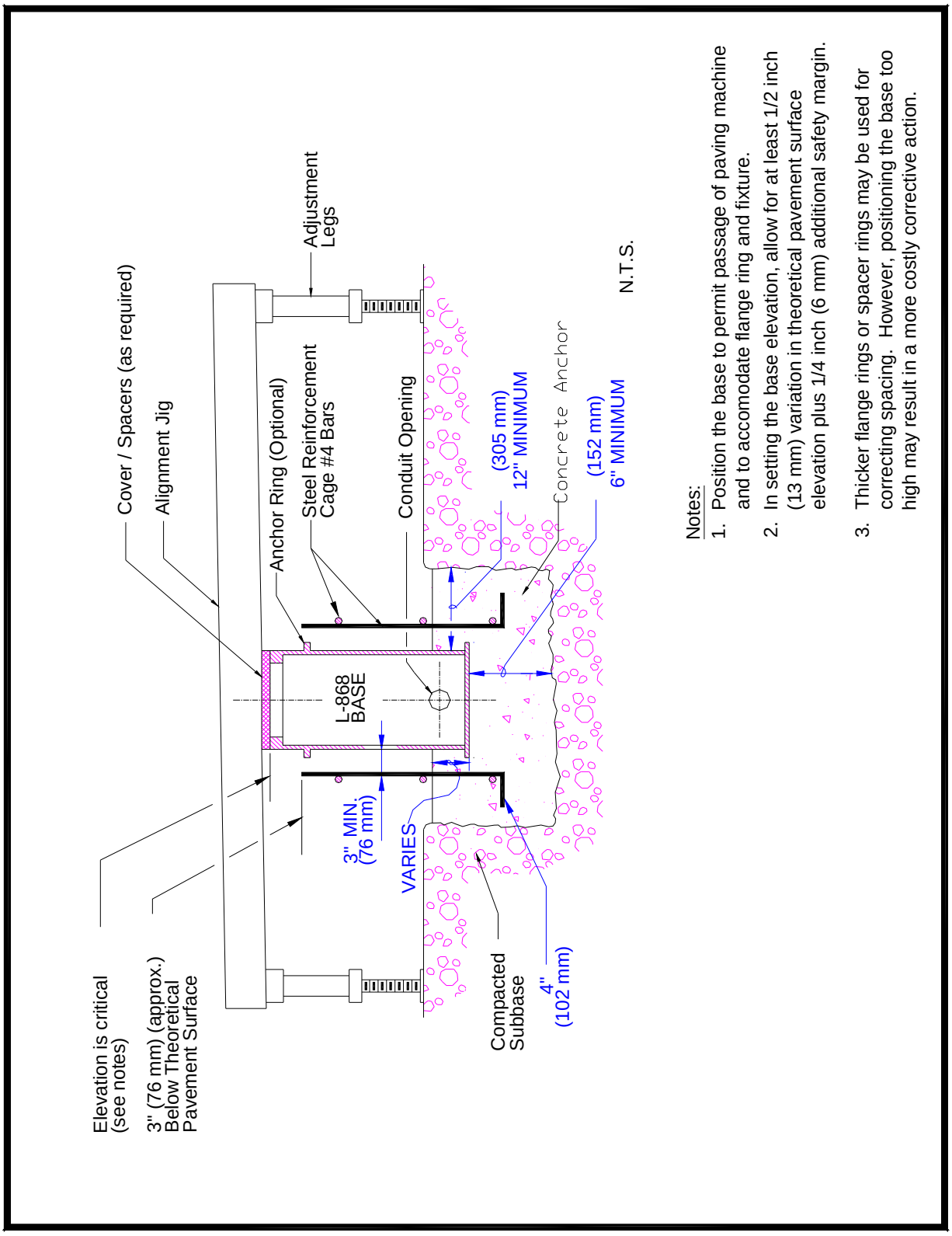


Figure 100. Use of Alignment Jig, No Reference Edge Available, Non-adjustable Base and Conduit System.

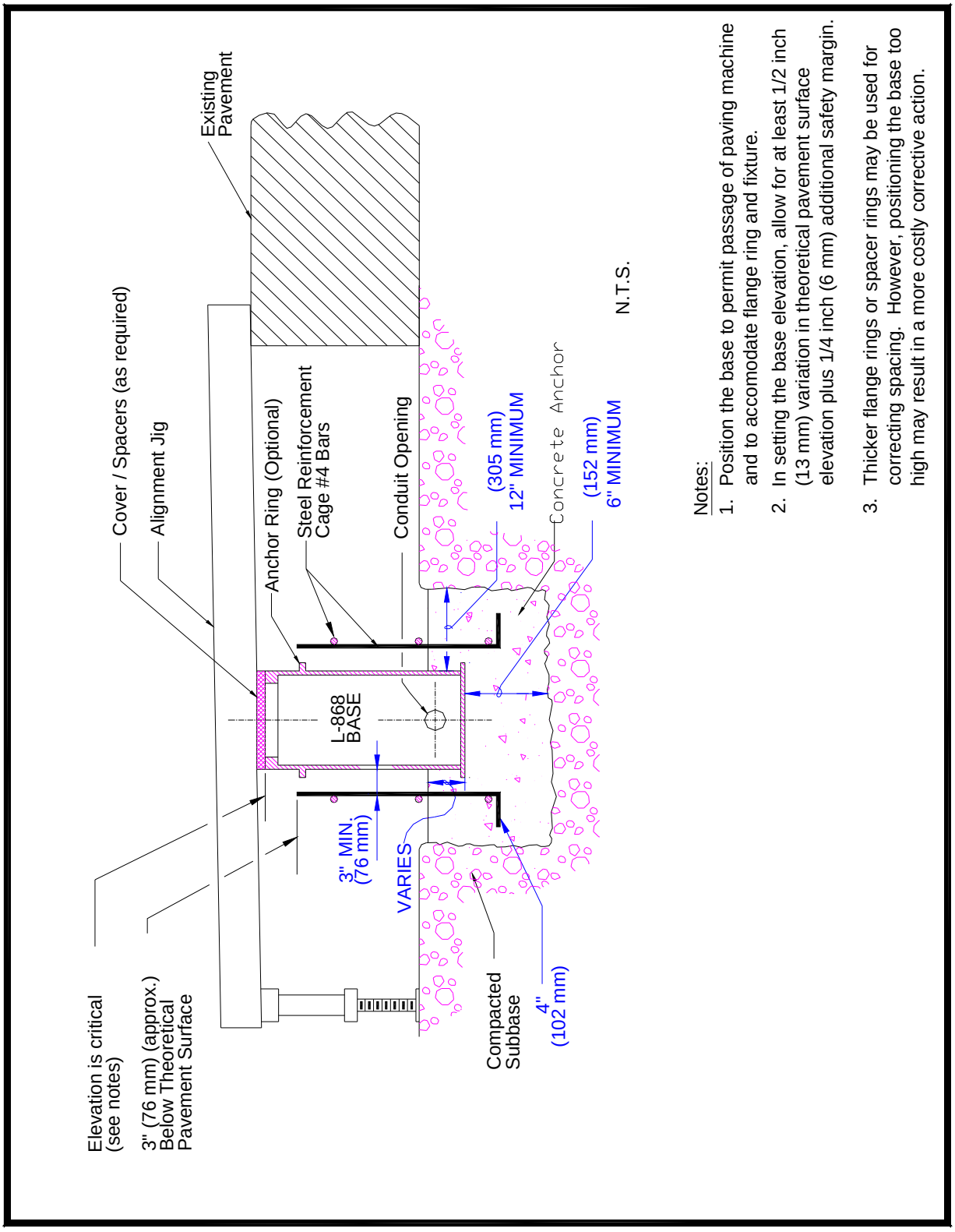


Figure 101. Use of Alignment Jig, Reference Edge Available, Non-adjustable Base and Conduit System.

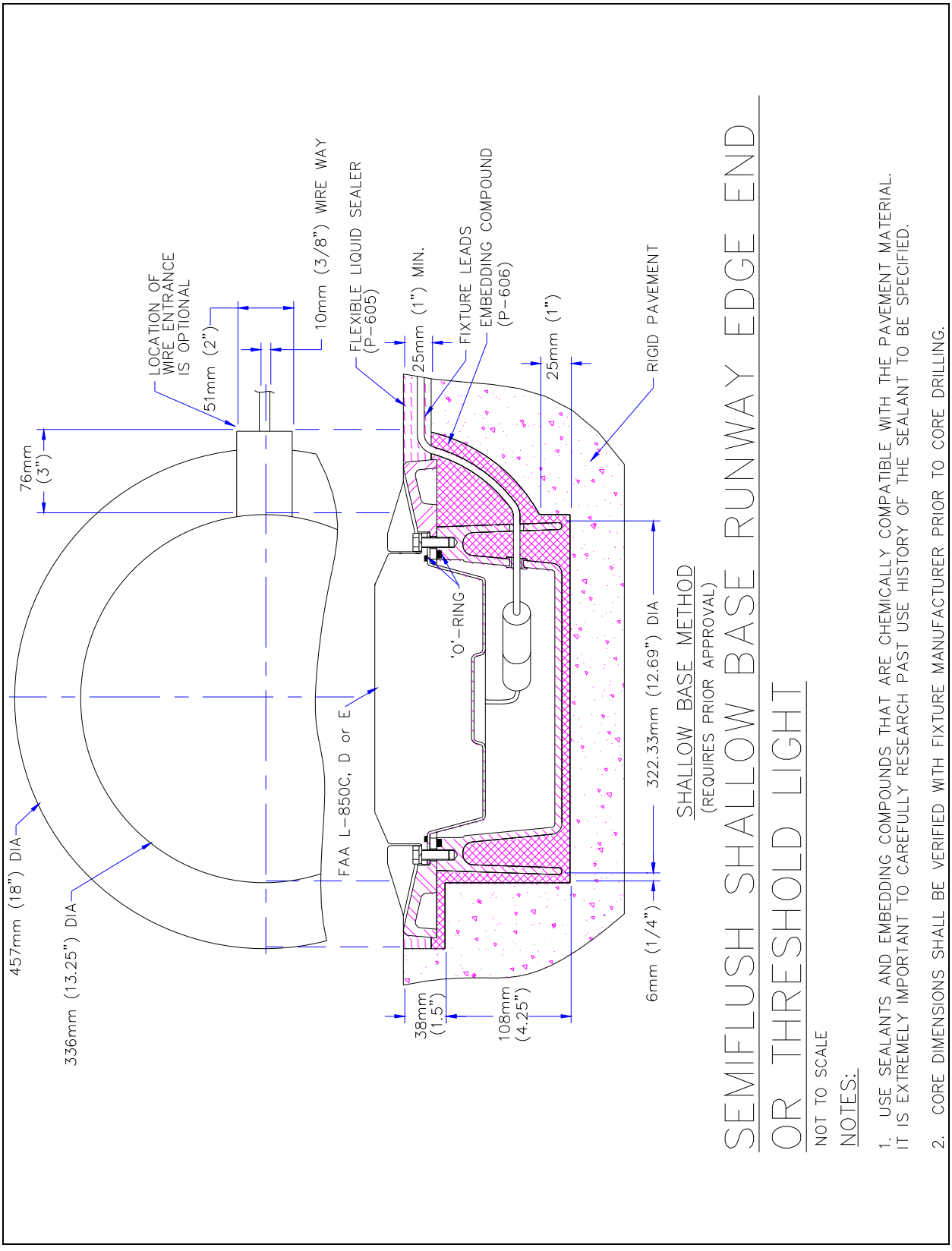


Figure 102. In-pavement Shallow Base Runway Edge End or Threshold Light.

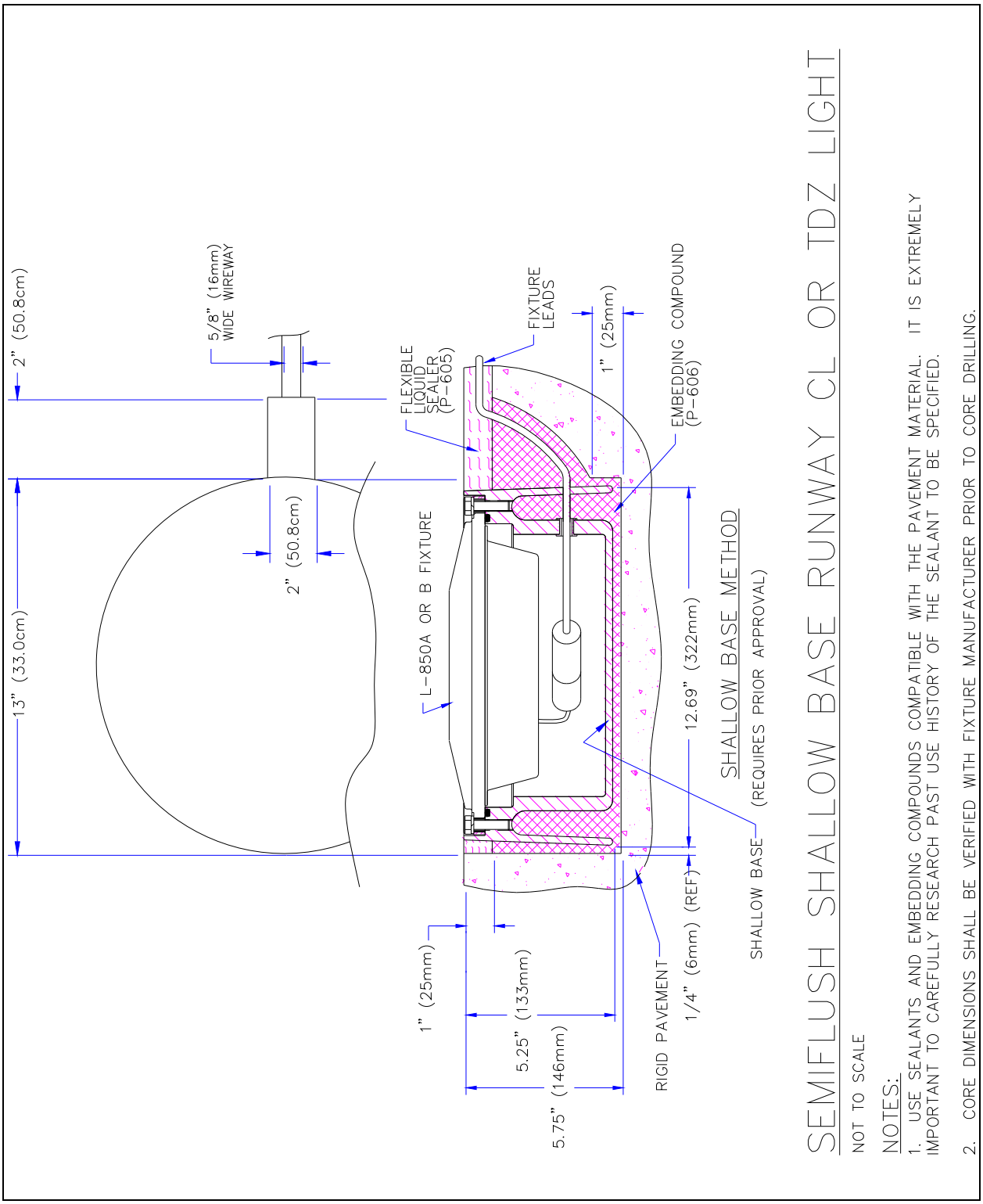
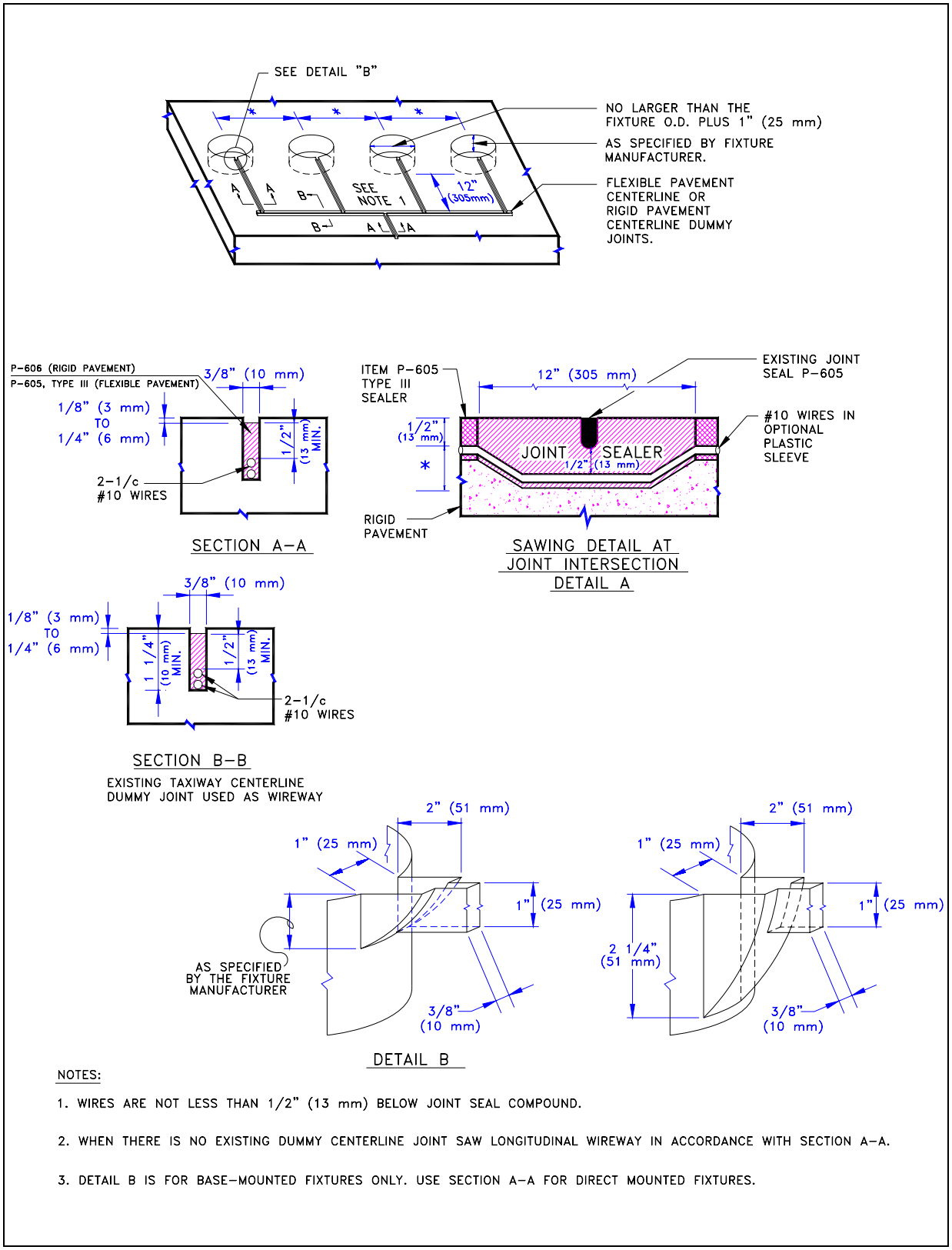


Figure 103. In-pavement Shallow Base Runway Centerline or TDZ Light.



NOTES:

1. WIRES ARE NOT LESS THAN 1/2" (13 mm) BELOW JOINT SEAL COMPOUND.
2. WHEN THERE IS NO EXISTING DUMMY CENTERLINE JOINT SAW LONGITUDINAL WIREWAY IN ACCORDANCE WITH SECTION A-A.
3. DETAIL B IS FOR BASE-MOUNTED FIXTURES ONLY. USE SECTION A-A FOR DIRECT MOUNTED FIXTURES.

Figure 104. Sawing and Drilling Details for In-Pavement Taxiway Centerline Lights.

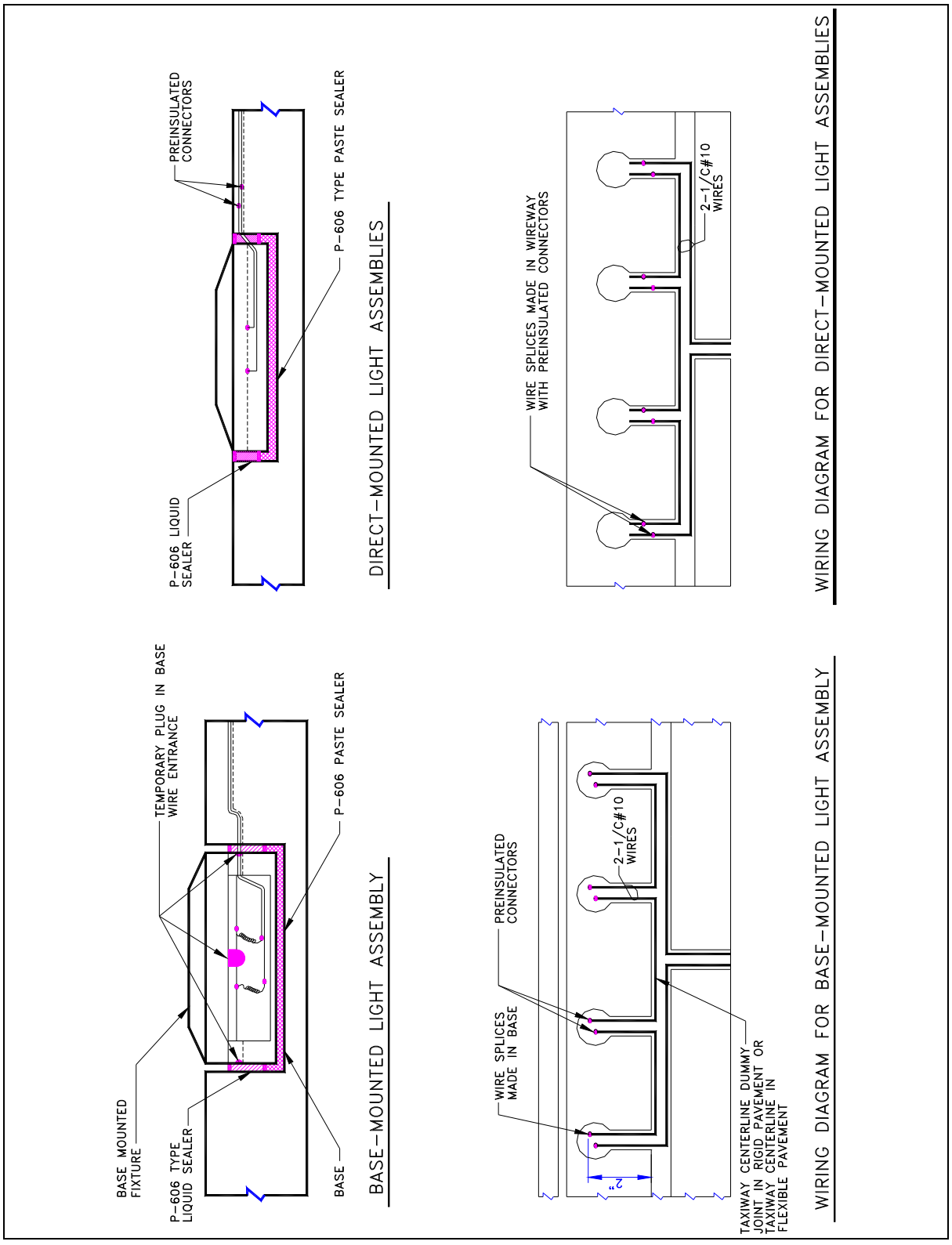
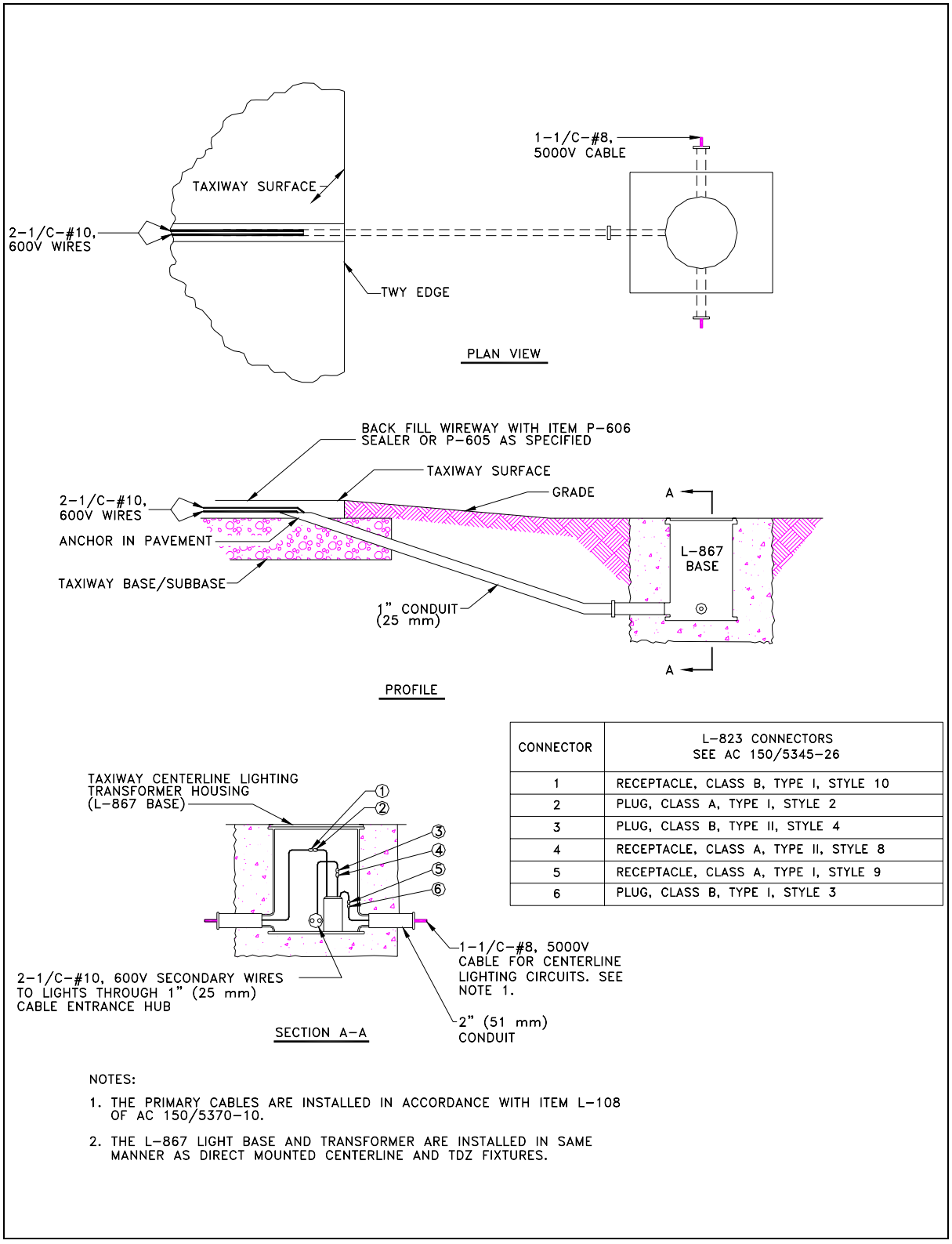


Figure 105. Wiring Details for Direct- and Base-Mounted Taxiway Centerline Lights.



CONNECTOR	L-823 CONNECTORS SEE AC 150/5345-26
1	RECEPTACLE, CLASS B, TYPE I, STYLE 10
2	PLUG, CLASS A, TYPE I, STYLE 2
3	PLUG, CLASS B, TYPE II, STYLE 4
4	RECEPTACLE, CLASS A, TYPE II, STYLE 8
5	RECEPTACLE, CLASS A, TYPE I, STYLE 9
6	PLUG, CLASS B, TYPE I, STYLE 3

NOTES:

1. THE PRIMARY CABLES ARE INSTALLED IN ACCORDANCE WITH ITEM L-108 OF AC 150/5370-10.
2. THE L-867 LIGHT BASE AND TRANSFORMER ARE INSTALLED IN SAME MANNER AS DIRECT MOUNTED CENTERLINE AND TDZ FIXTURES.

Figure 106. Typical Transformer Housing and Conduit Installation Details for Taxiway Centerline Lights.

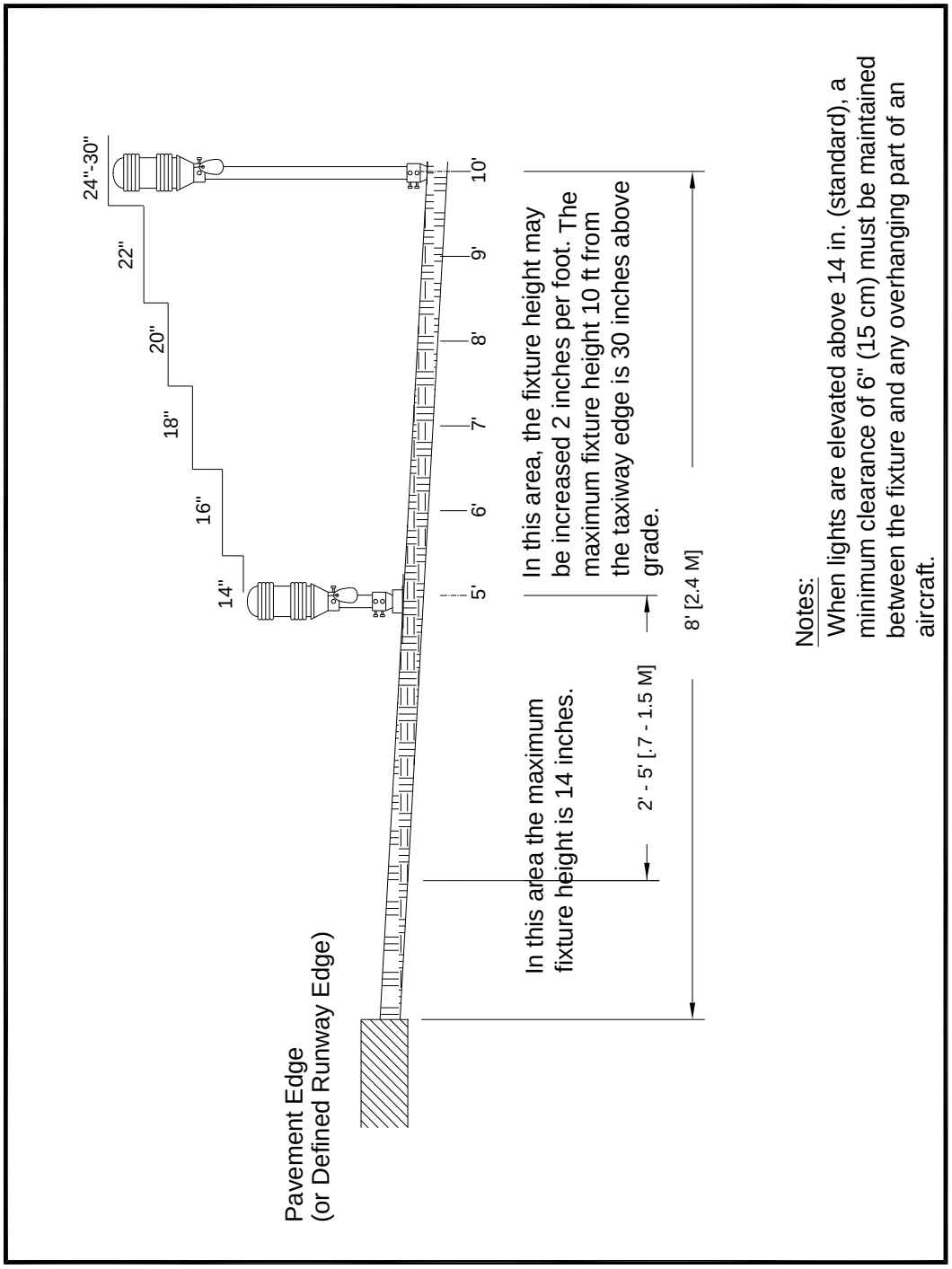


Figure 107. Adjustment of Edge Light Elevation for High Snowfall Areas.

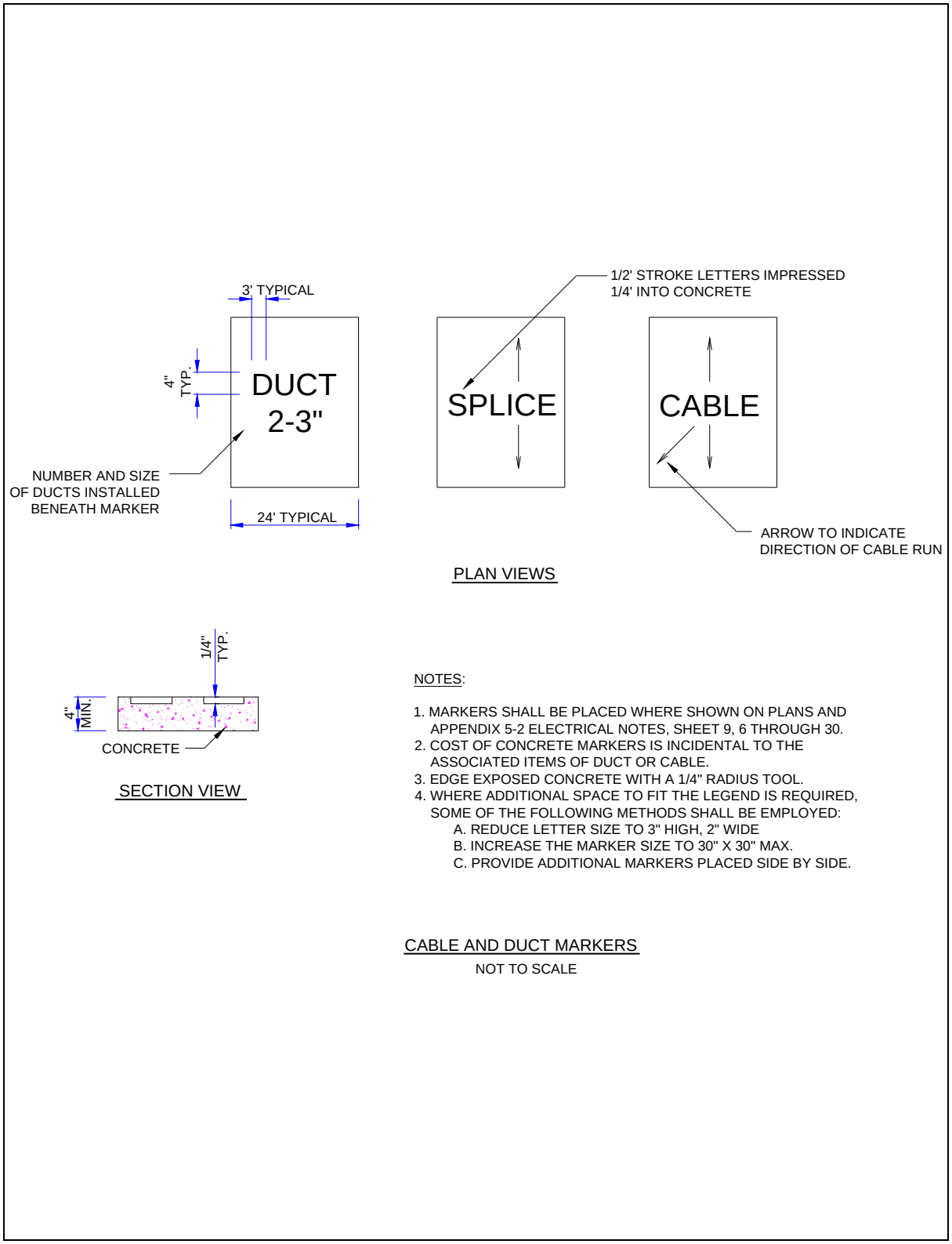


Figure 108. Cable and Duct Markers.

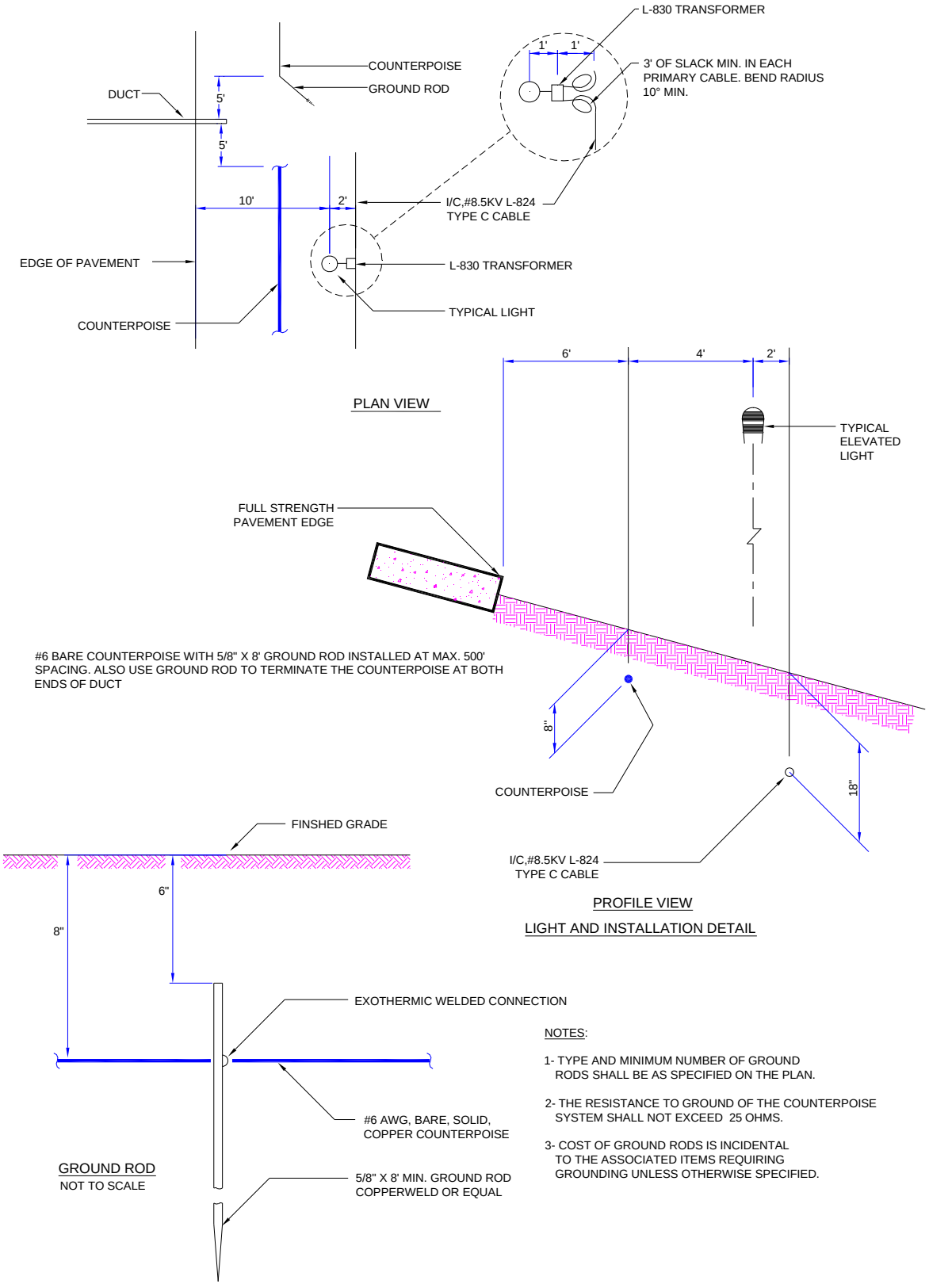


Figure 109. Counterpoise Installation.

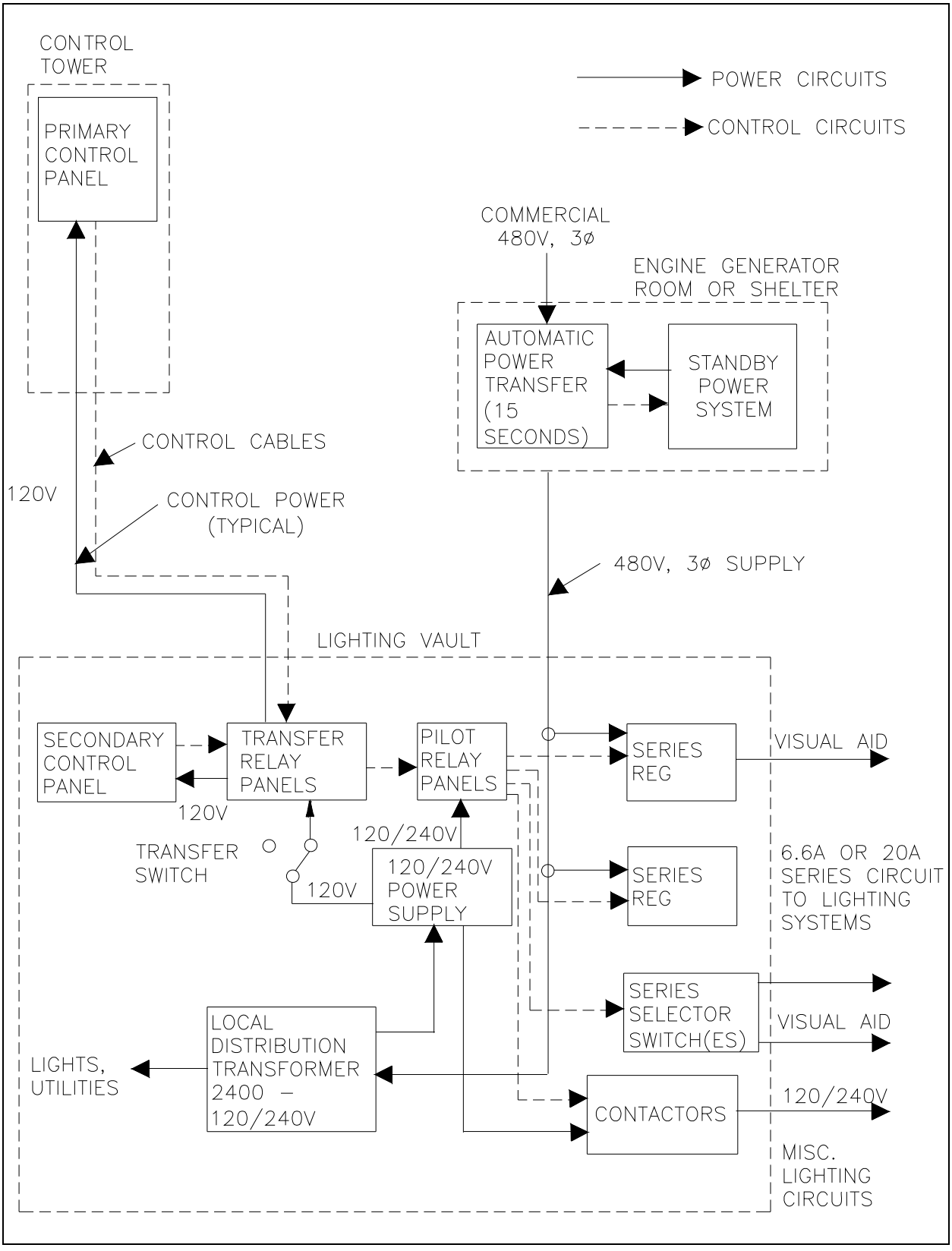


Figure 110. Power and Control System Block Diagram.

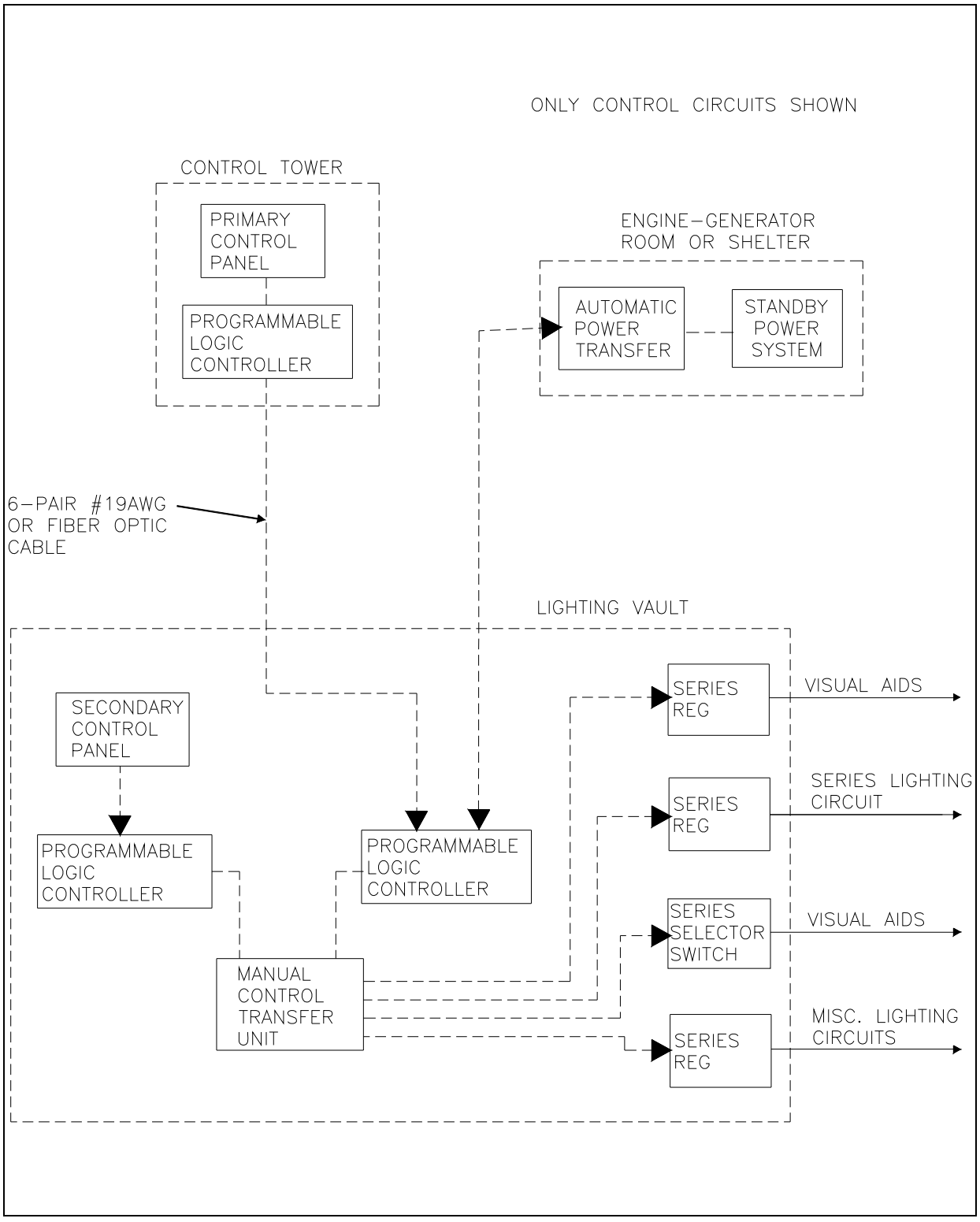


Figure 111. Typical PLC Control System Block Diagram.

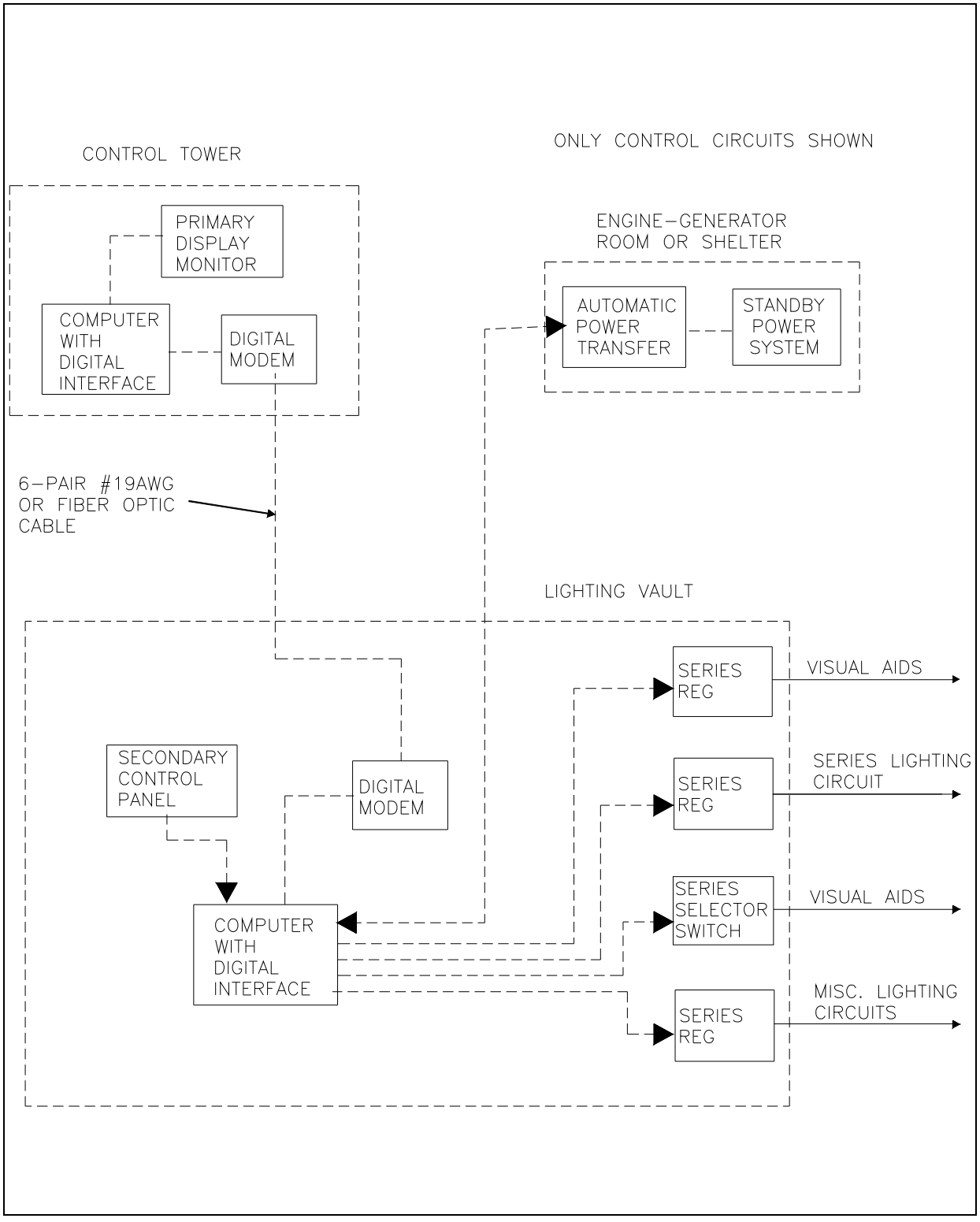


Figure 112. PC Control System Block Diagram.

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