APPENDIX 1. FIGURES.

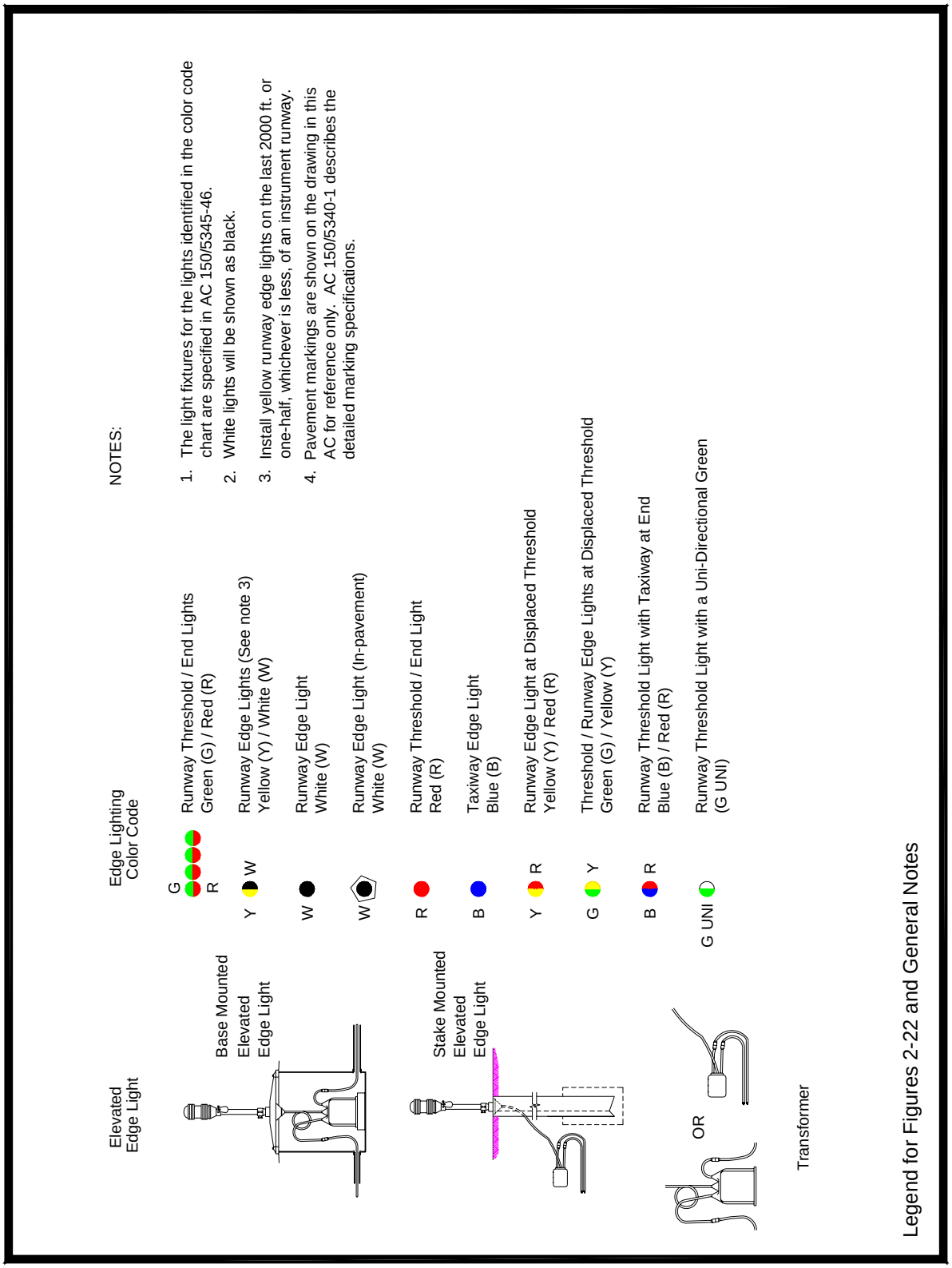


Figure 1. Legend and General Notes.

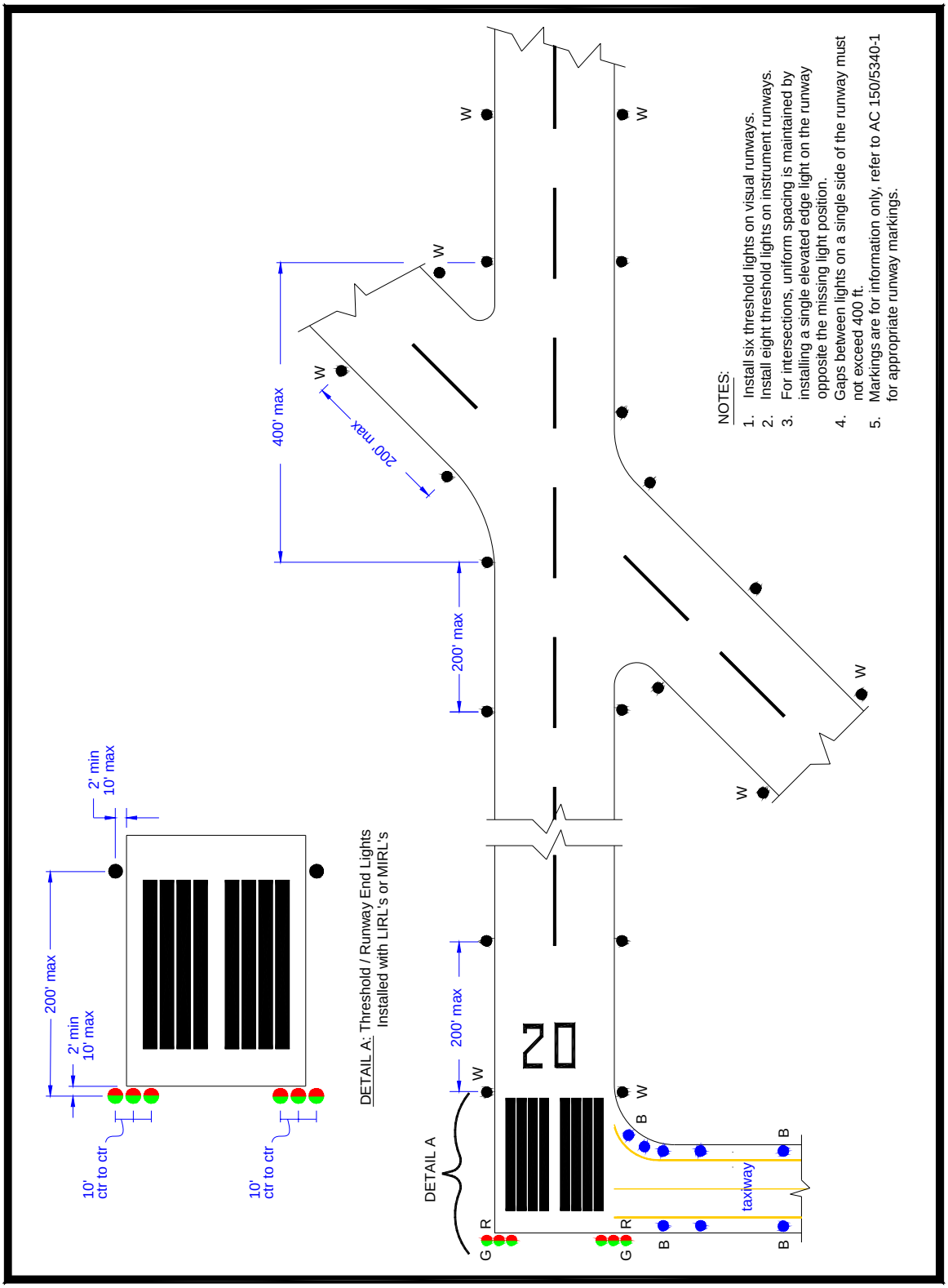


Figure 2. Runway and Threshold Lighting Configuration (LIRL & MIRL).

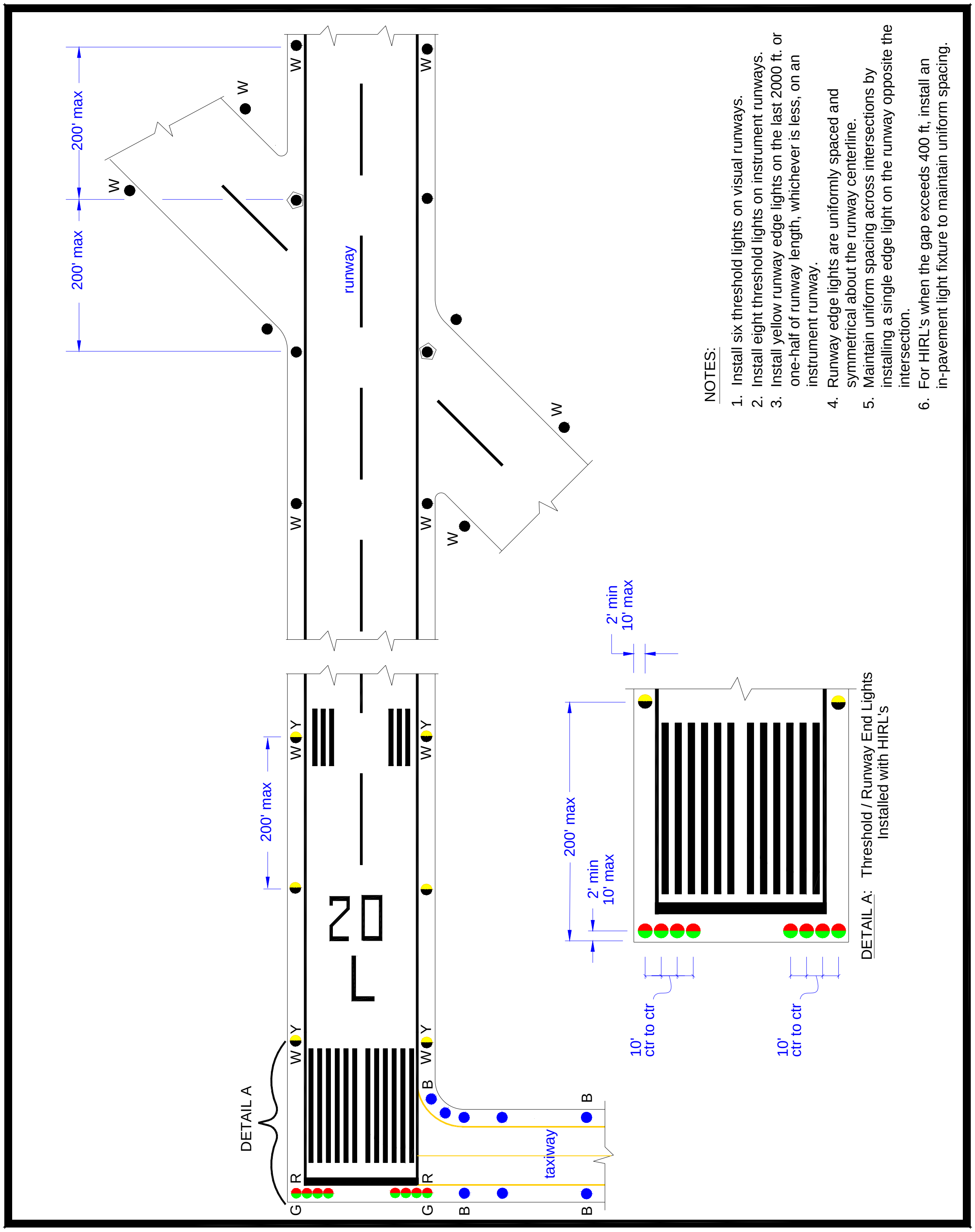


Figure 3. Runway and Threshold Lighting Configuration (HIRL).

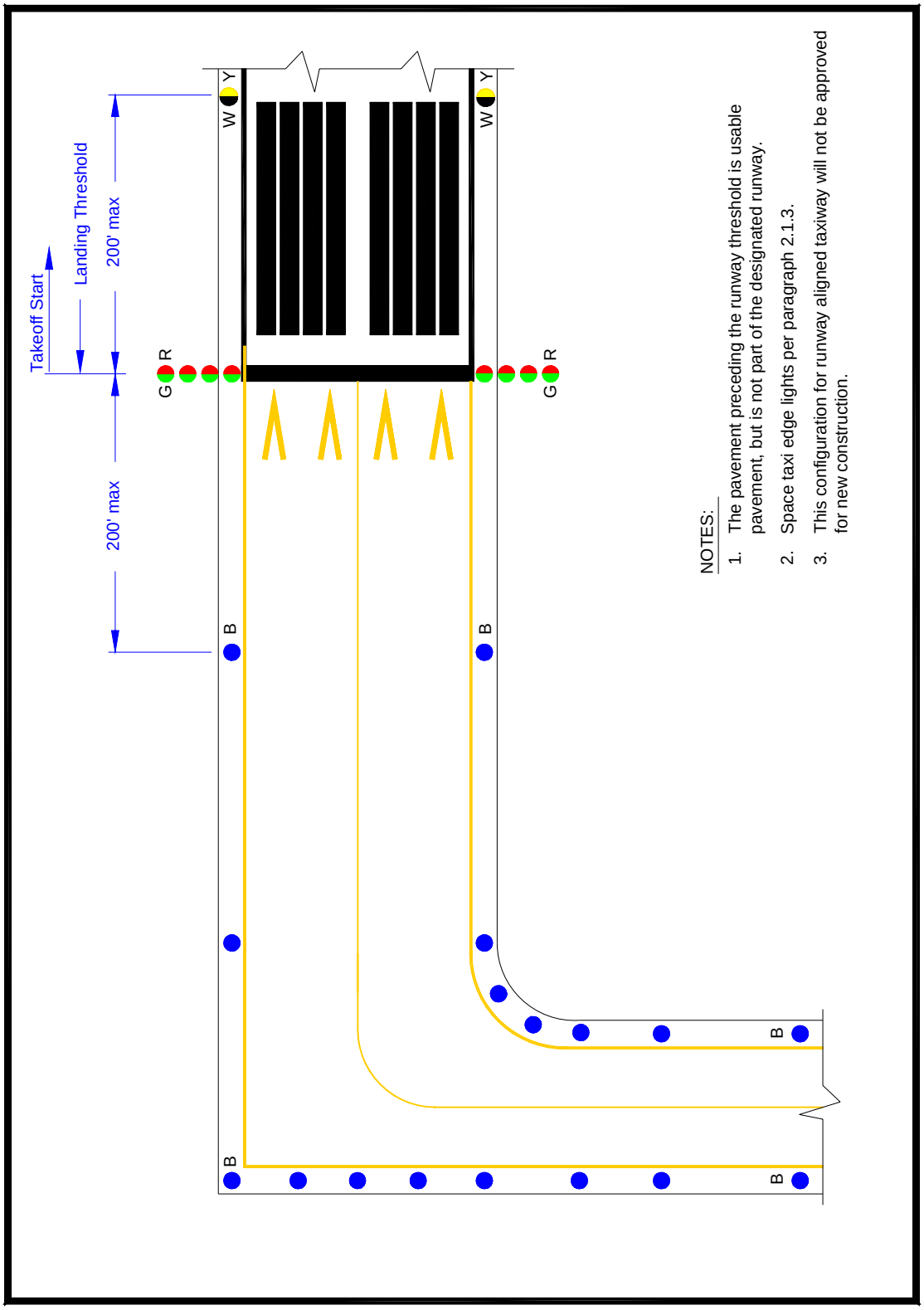


Figure 4. Runway with Taxiway at End.

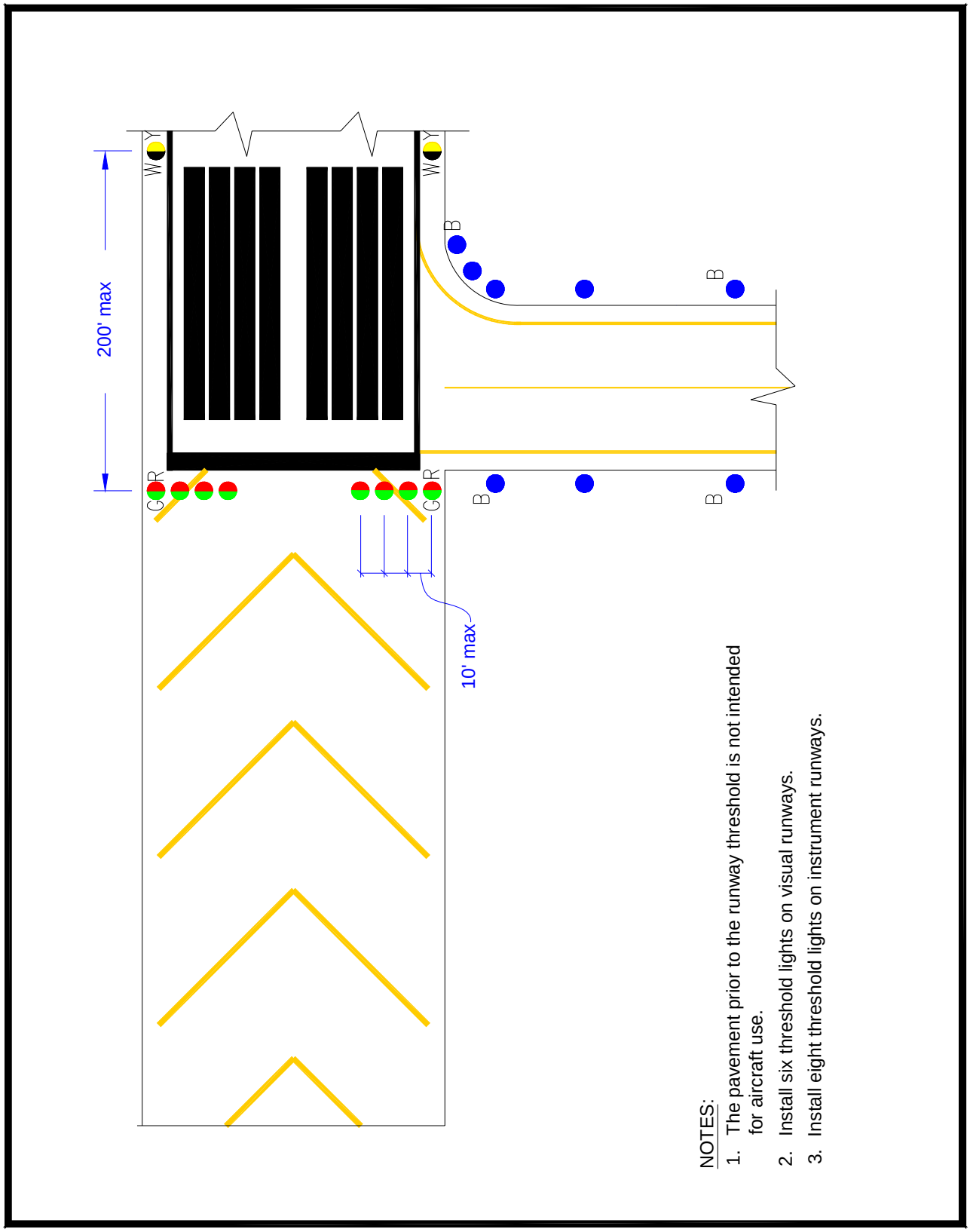


Figure 5. Runway with Blast Pad (No Traffic).

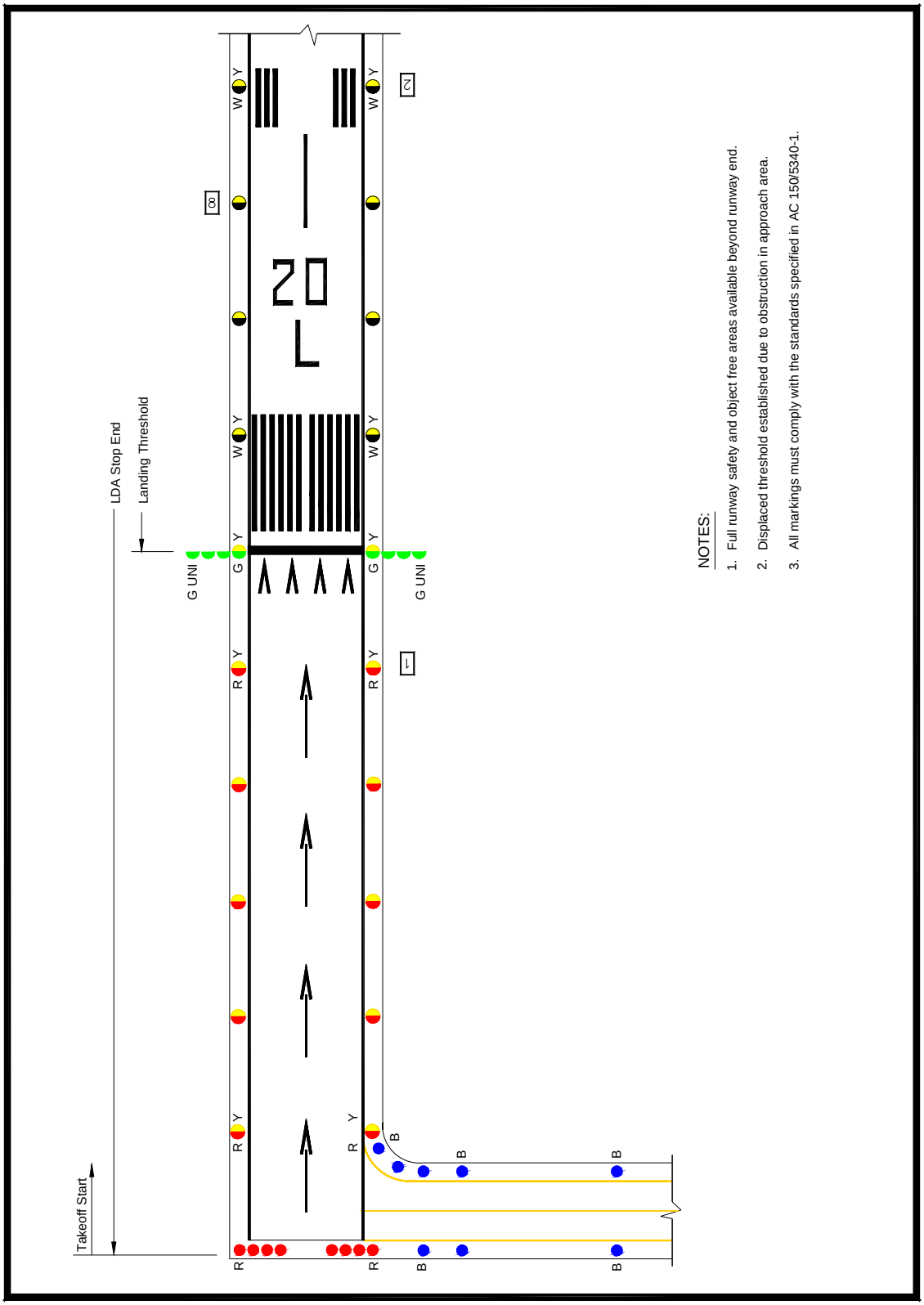


Figure 6. Lighting for Runway with Displaced Threshold.

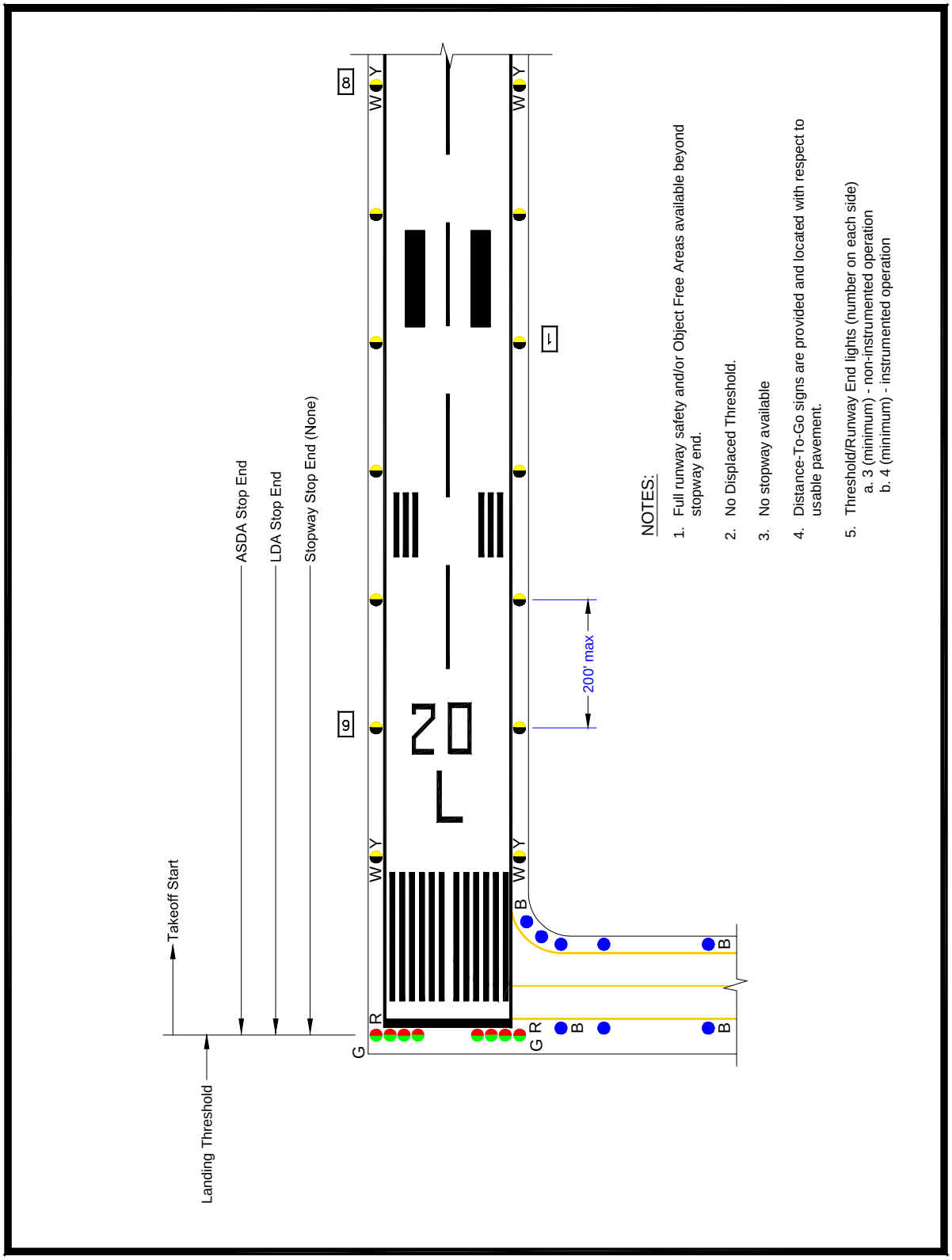


Figure 7. Normal Runway with Taxiway.

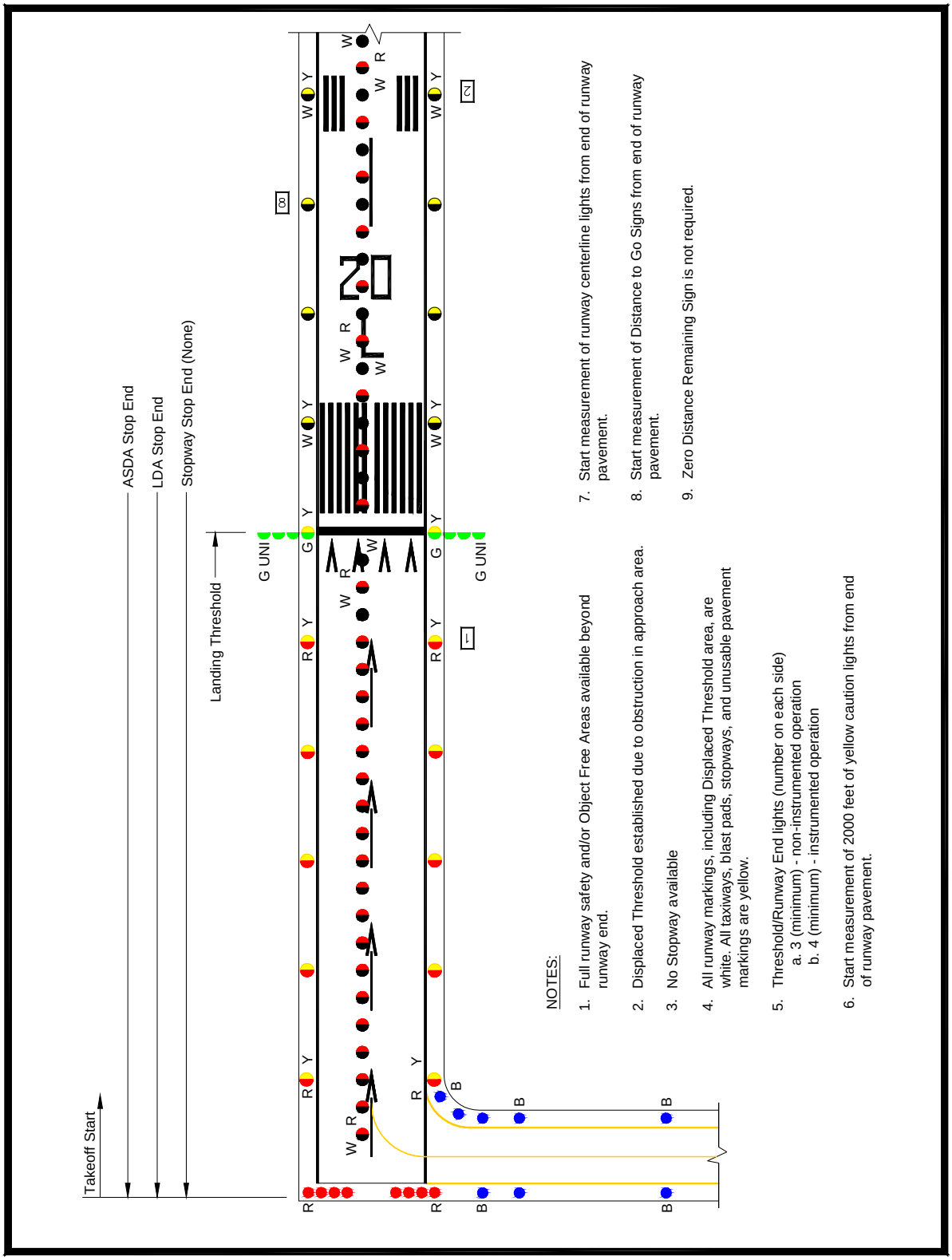


Figure 8. Lighting for Runway with Displaced Threshold.

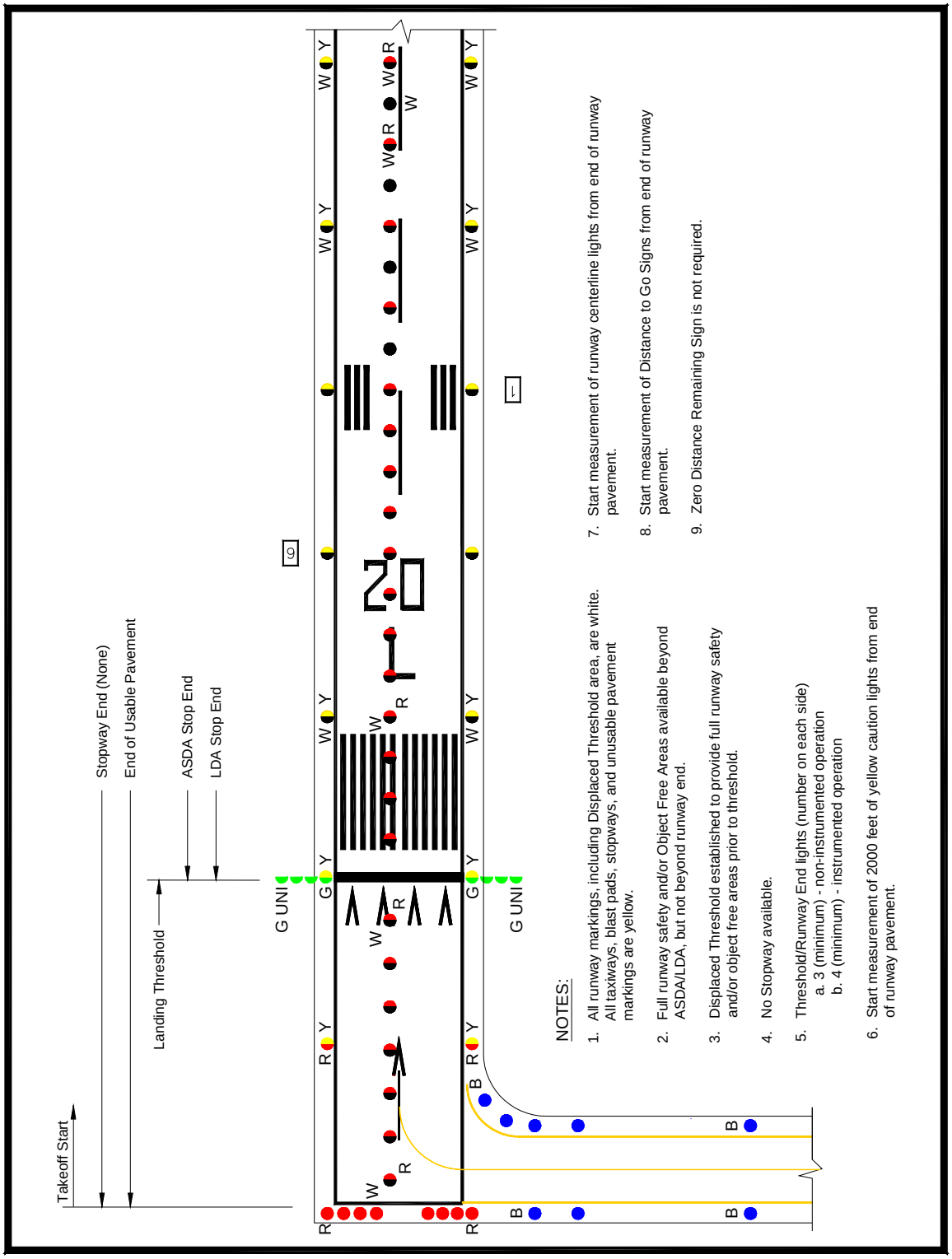


Figure 9. Lighting for Runway with Displaced Threshold/Usable Pavement.

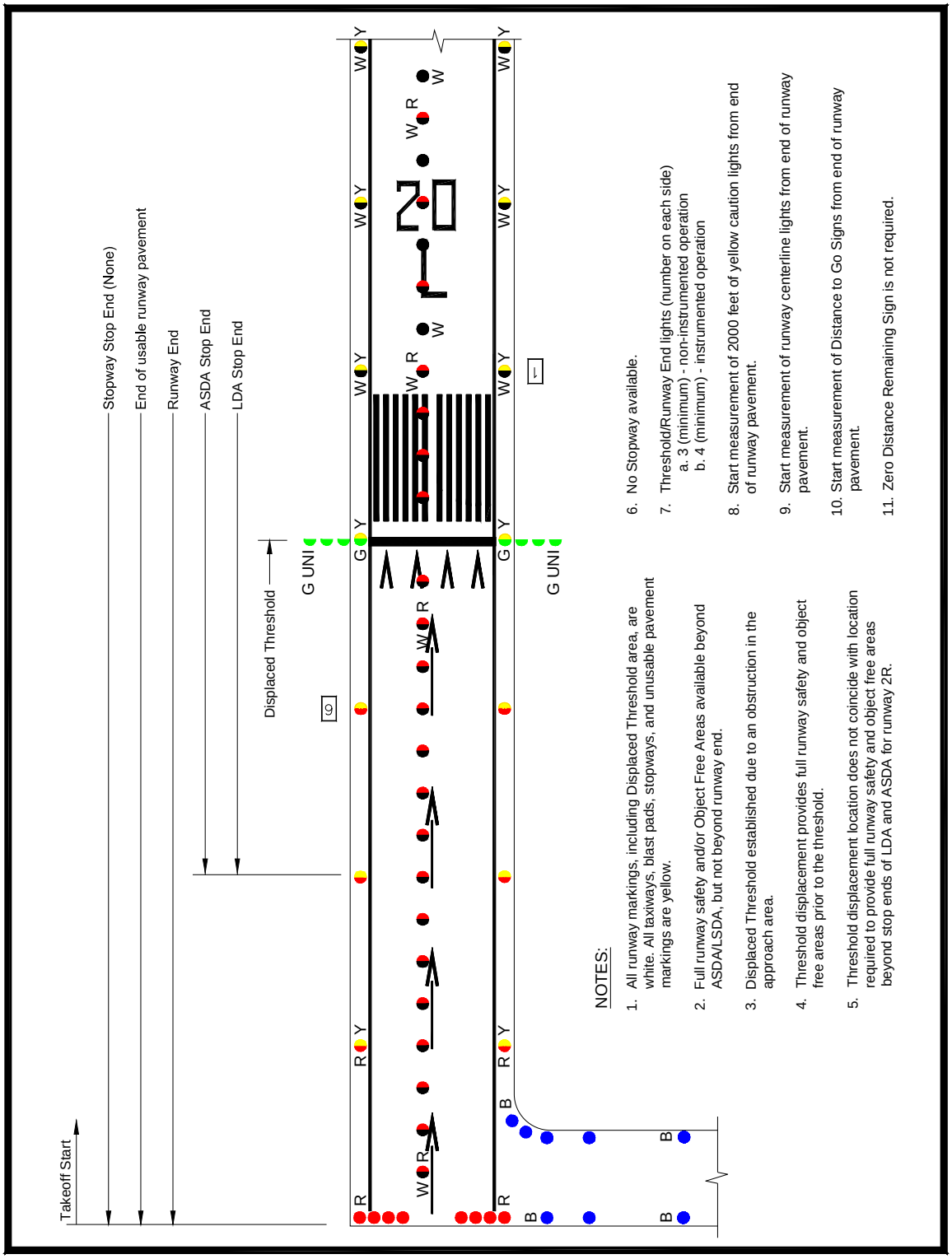


Figure 10. Lighting for Runway with Displaced Threshold not Coinciding with Opposite Runway End.

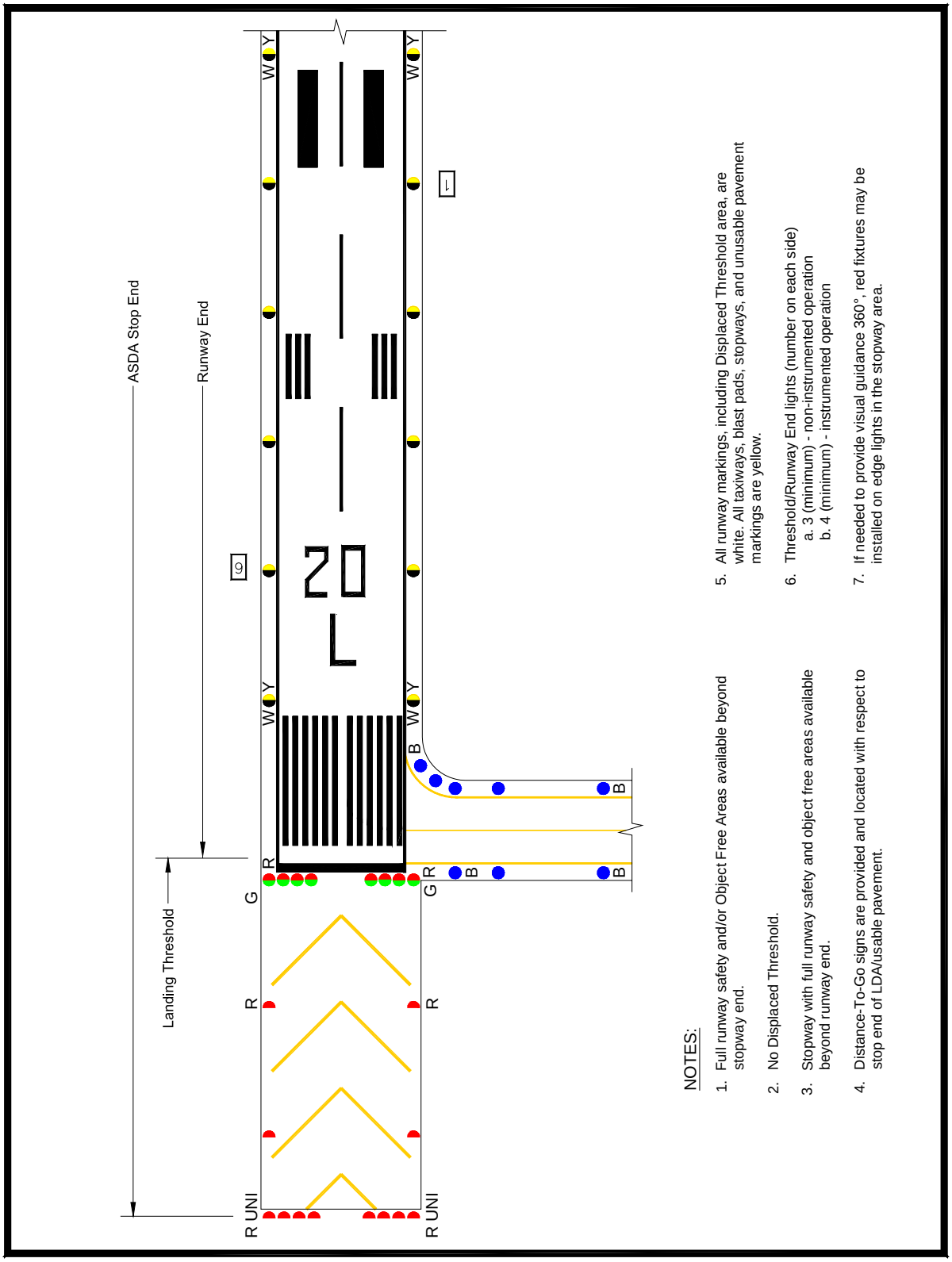


Figure 11. Lighting for Runway with Stopway.

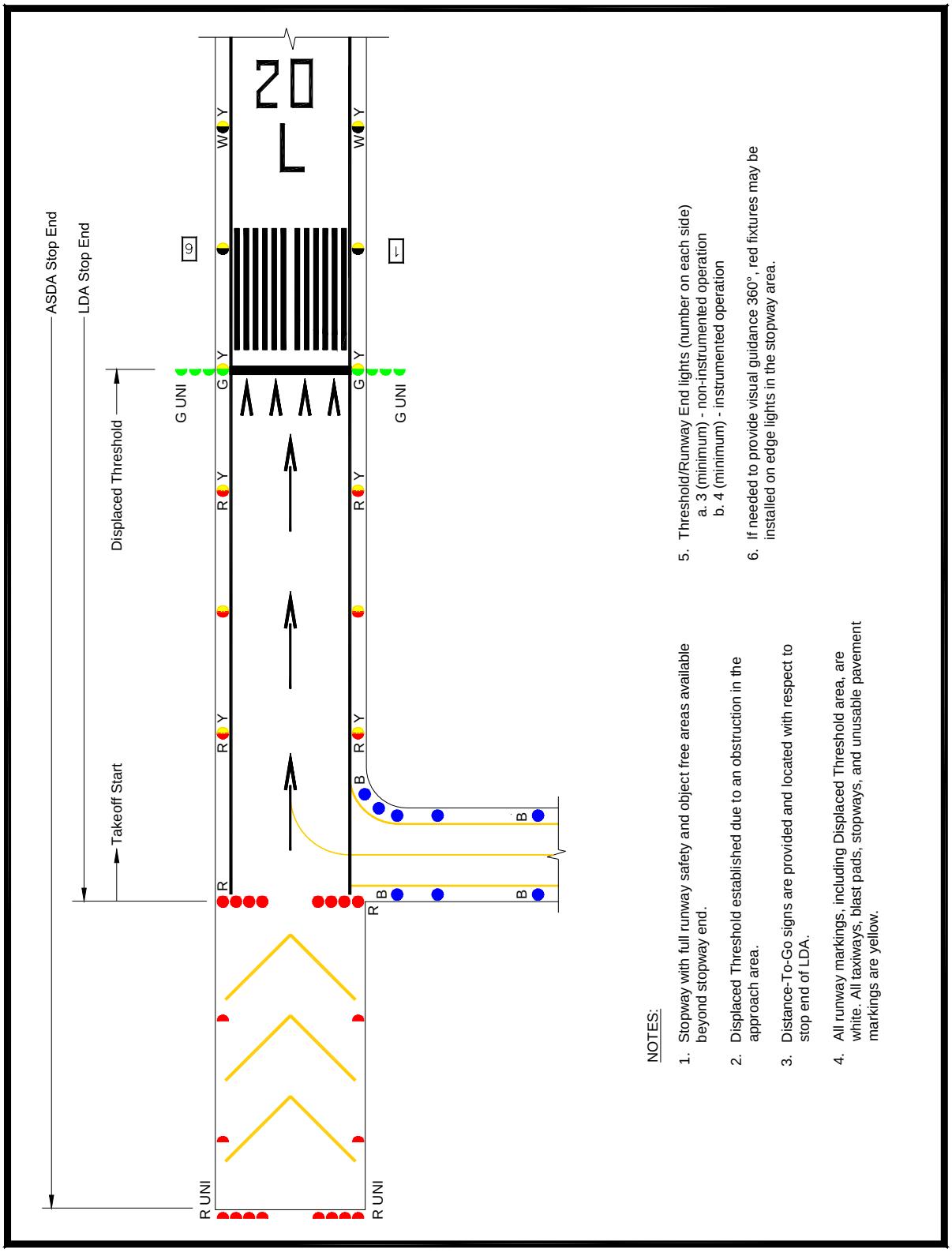


Figure 12. Lighting for Runway with Displaced Threshold & Stopway.

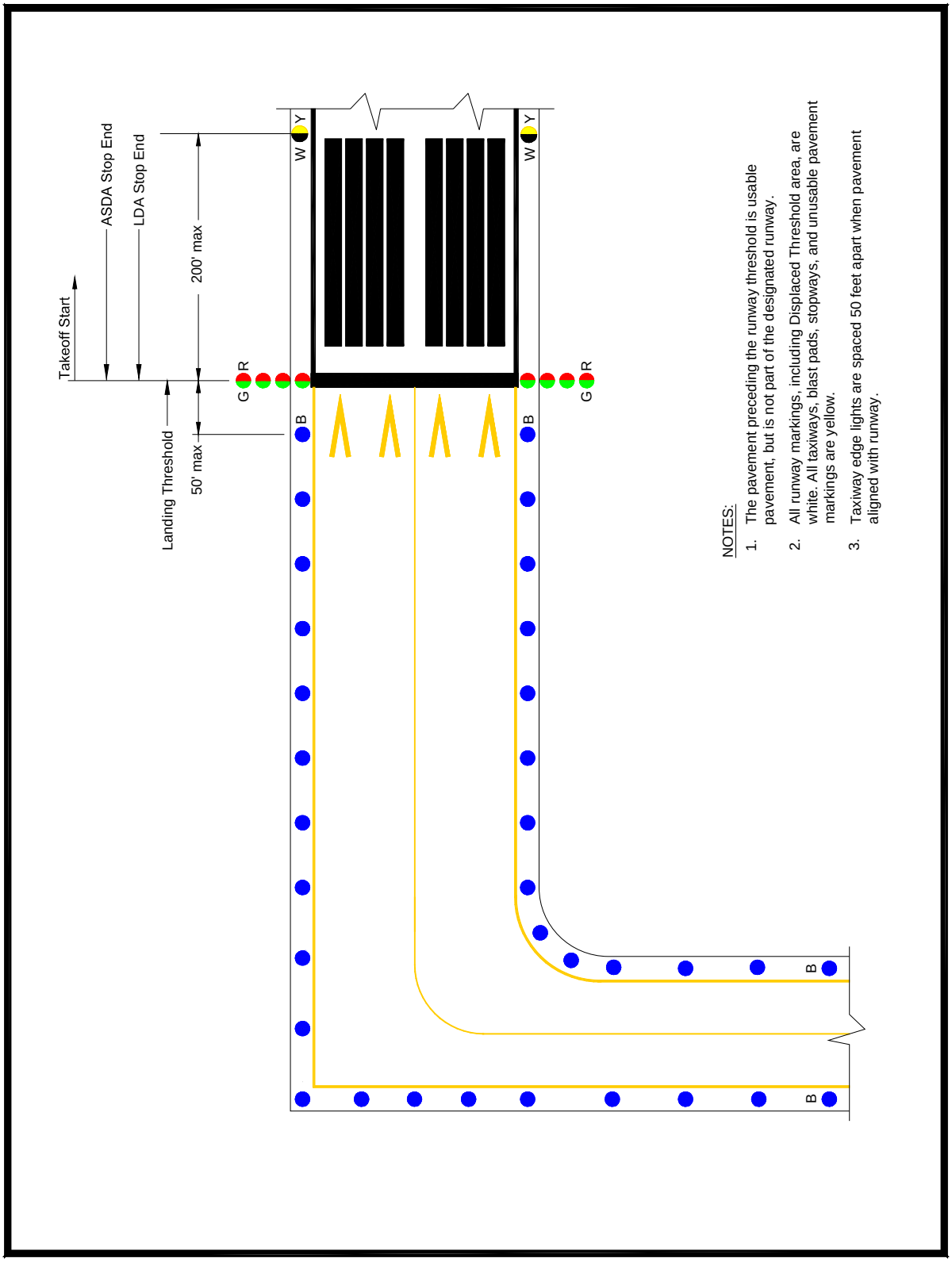


Figure 13. Runway with End Taxiway.

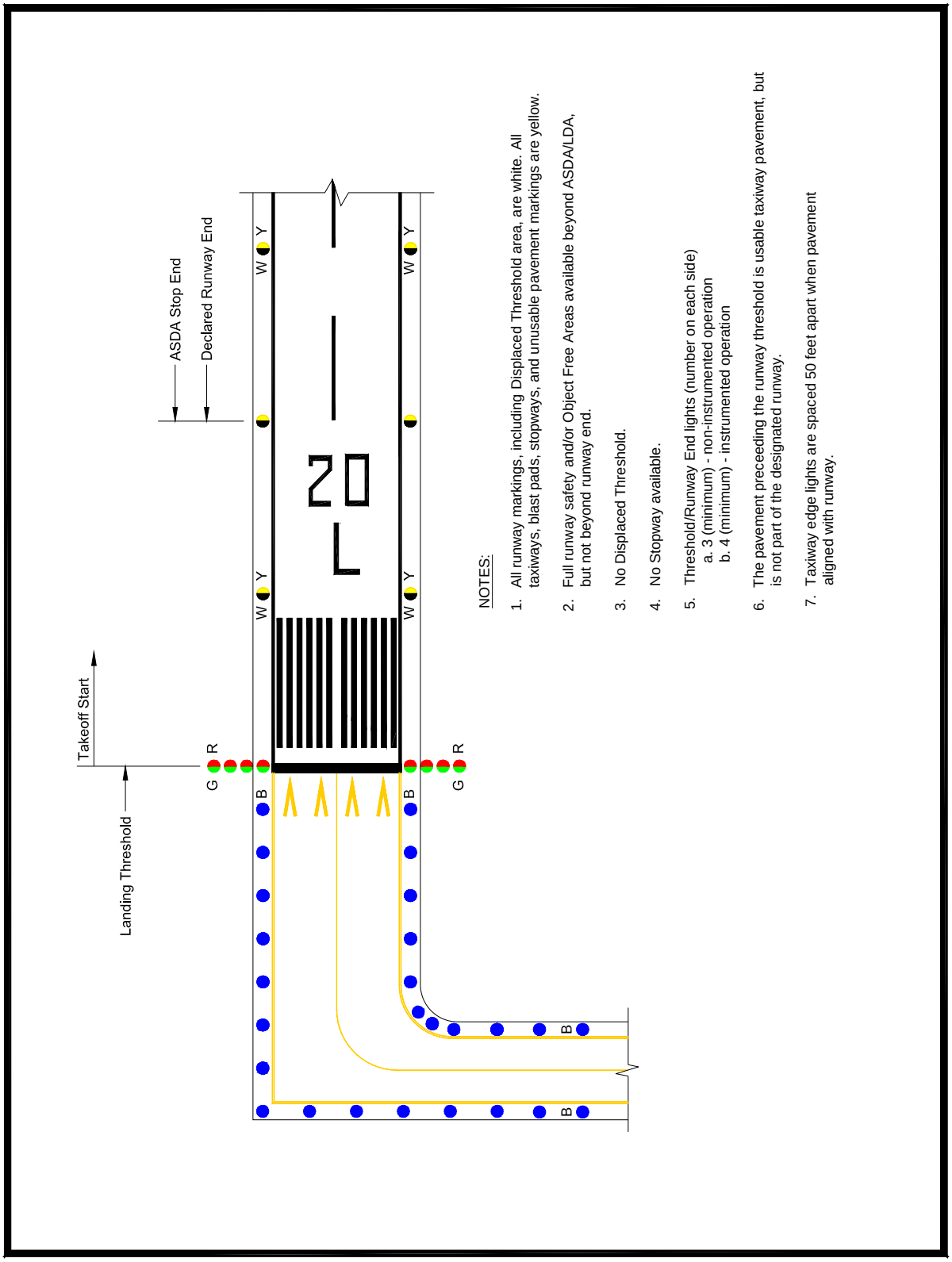


Figure 14. Lighting for Runway with End Taxiway and Shortened ASDA.

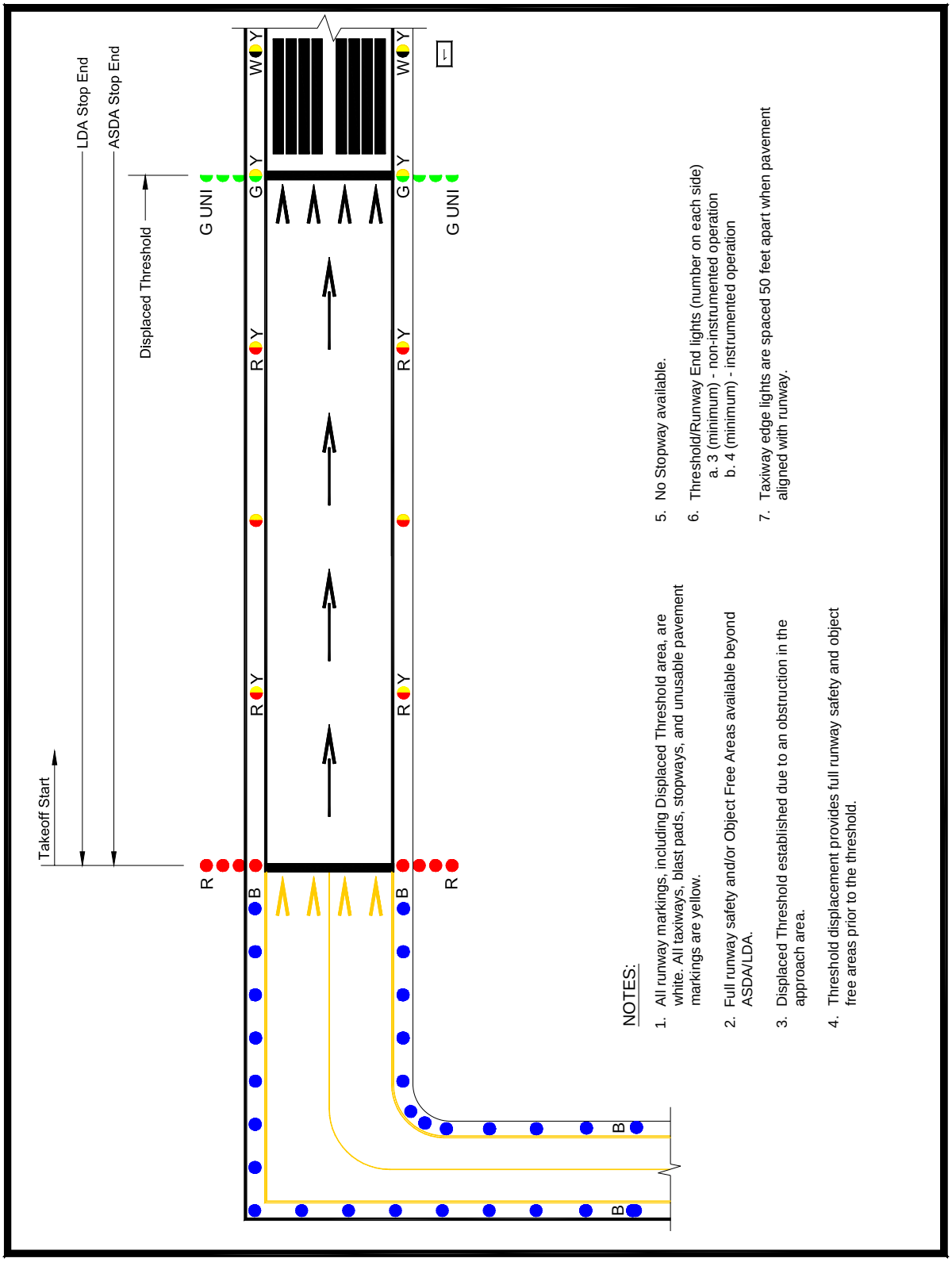


Figure 15. Lighting for Runway with End Taxiway and Displaced Threshold not Coinciding with Opposite Runway End.

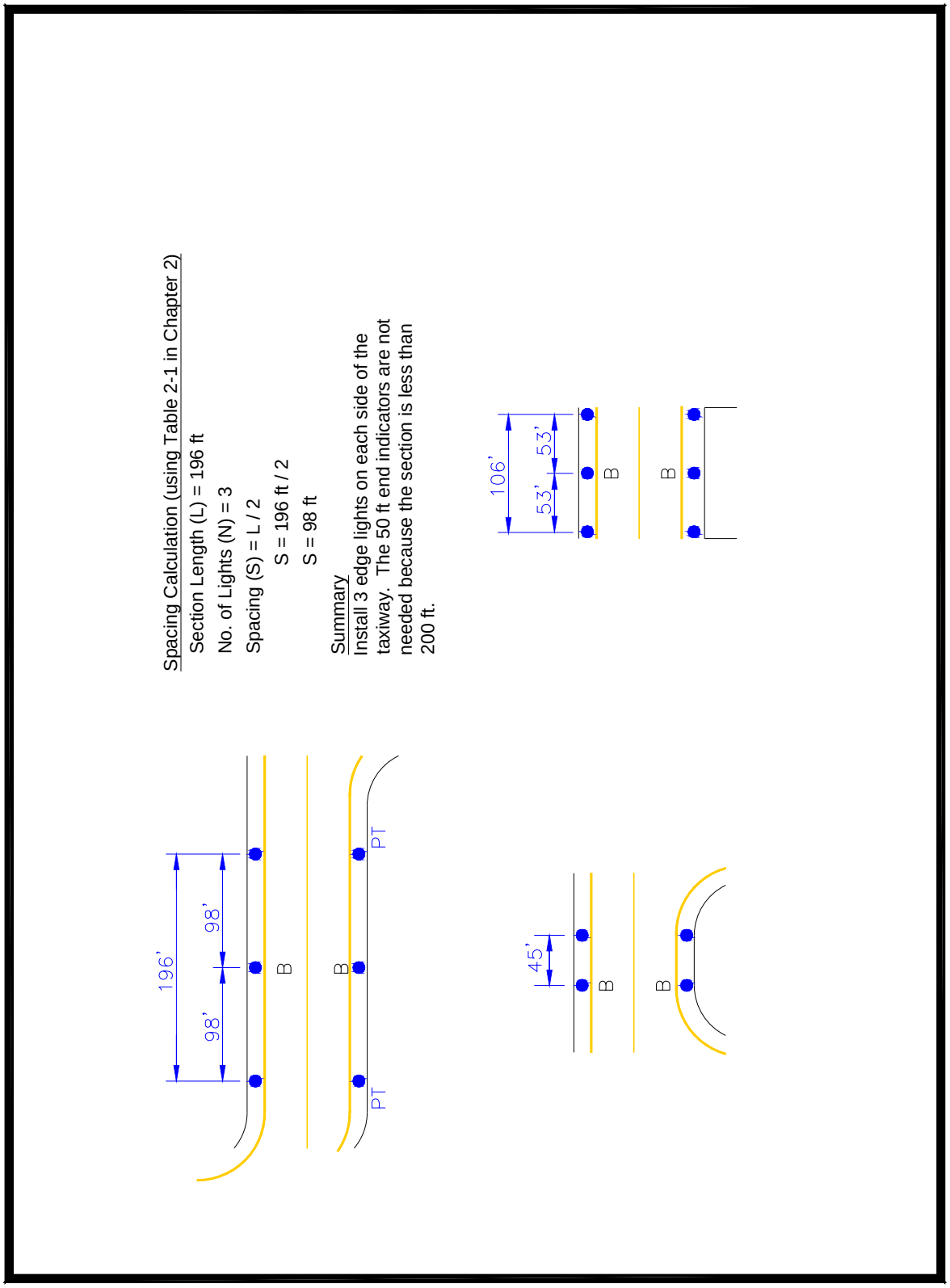
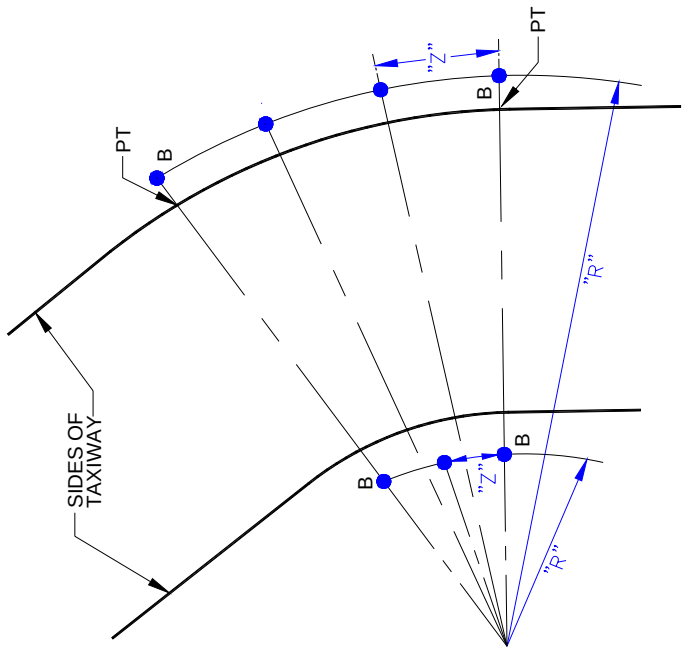


Figure 16. Typical Straight Taxiway Sections (Less Than 200 Feet (61 m)).



RADIUS "R" OF CURVE IN FEET	DIMENSION "Z" IN FEET	RADIUS "R" OF CURVE IN FEET	DIMENSION "Z" IN FEET
15	20	300	80
25	27	400	95
50	35	500	110
75	40	600	130
100	50	700	145
150	55	800	165
200	60	900	185
250	70	1000	200 MAX.

NOTES:

1. For radii not listed, determine "Z" spacing by linear interpolation.
2. "Z" is the arc length.
3. Uniformily space lights on curved edges. Do not exceed the values determined from the above table.
4. On curved edges in excess of 30 degrees arc, do not install less than three lights including those at the points of tangency (PT).

Figure 17. Spacing of Lights on Curved Taxiway Edges.

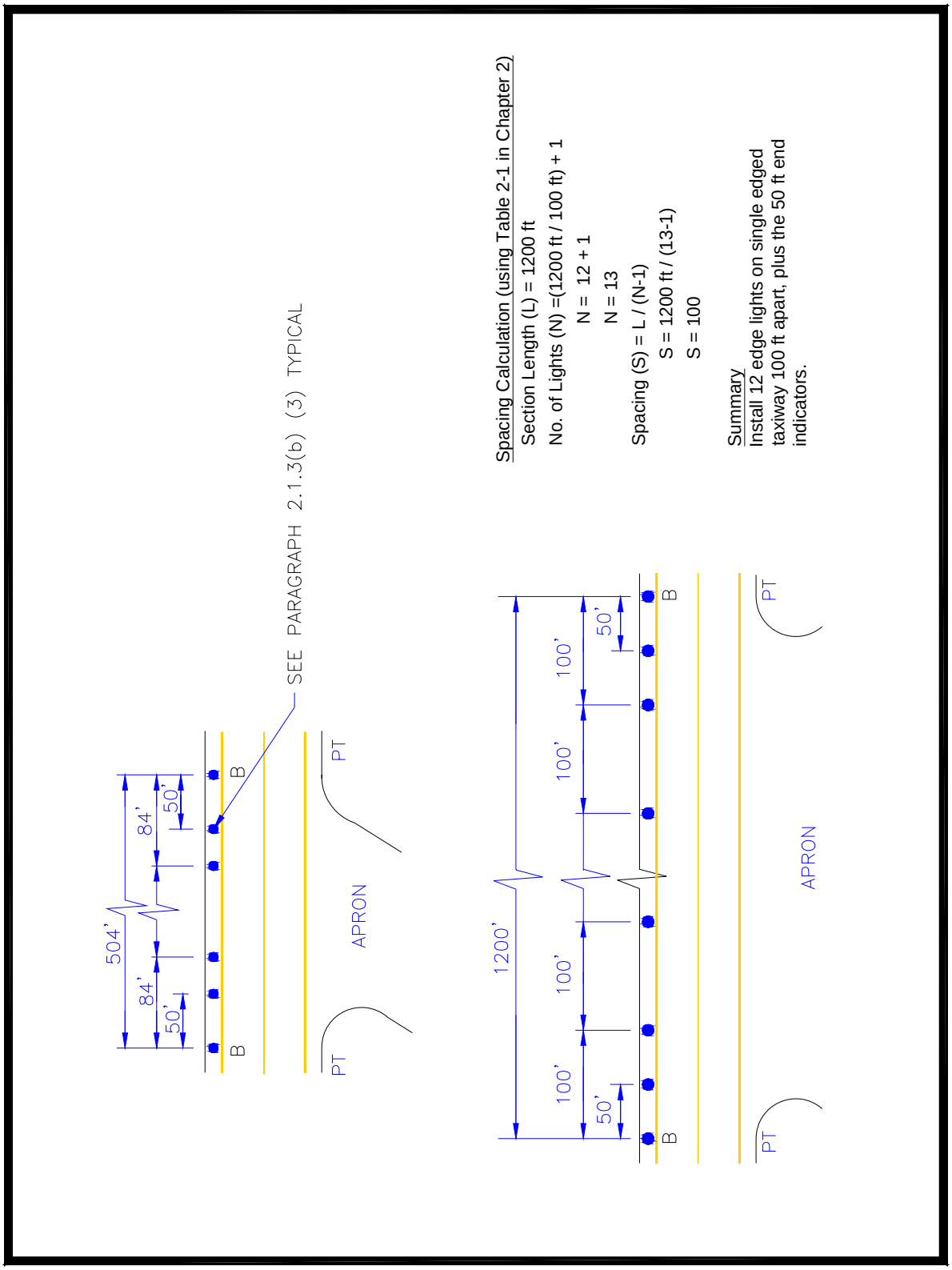
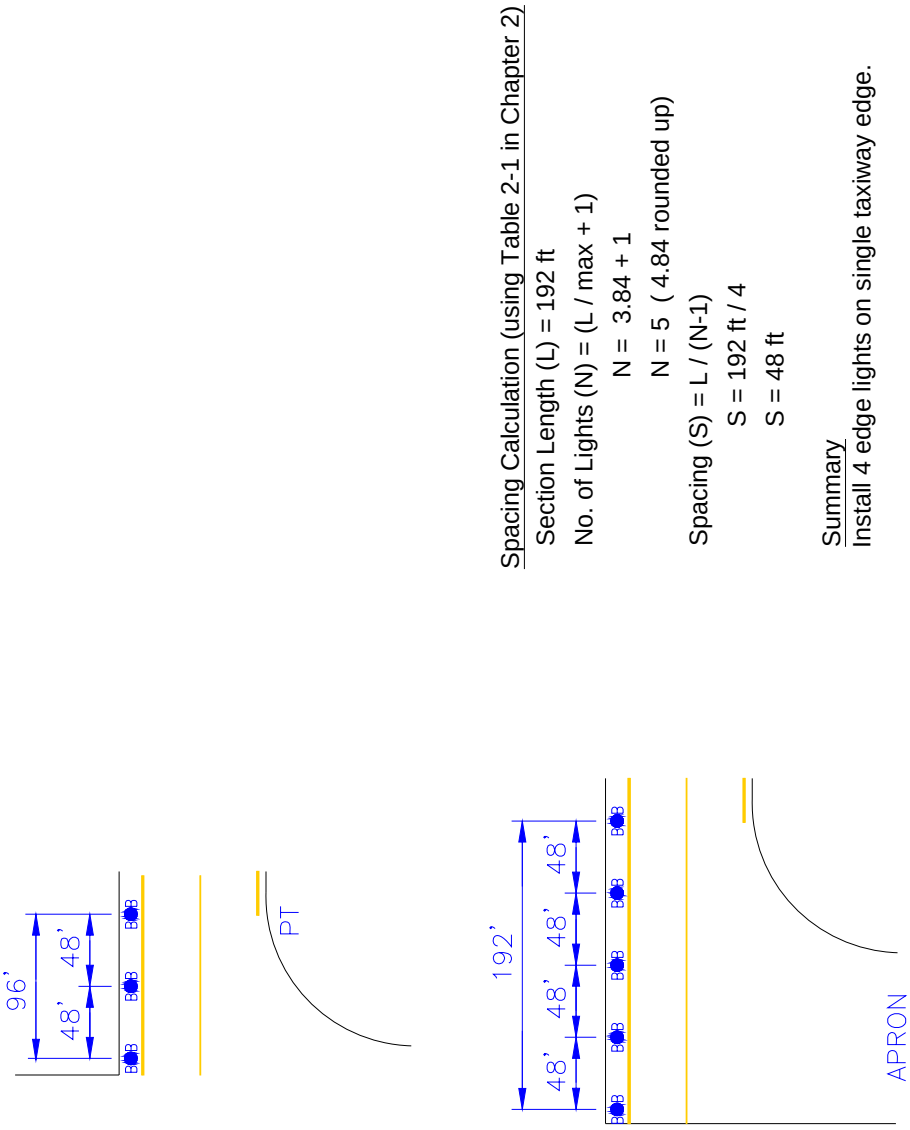


Figure 18. Typical Single Straight Taxiway Edges (More Than 200 Feet (61 m)).



Spacing Calculation (using Table 2-1 in Chapter 2)

Section Length (L) = 192 ft

No. of Lights (N) = (L / max + 1)

N = 3.84 + 1

N = 5 (4.84 rounded up)

Spacing (S) = L / (N-1)

S = 192 ft / 4

S = 48 ft

Summary

Install 4 edge lights on single taxiway edge.

Figure 19. Typical Single Straight Taxiway Edges (Less Than 200 Feet (61 m)).

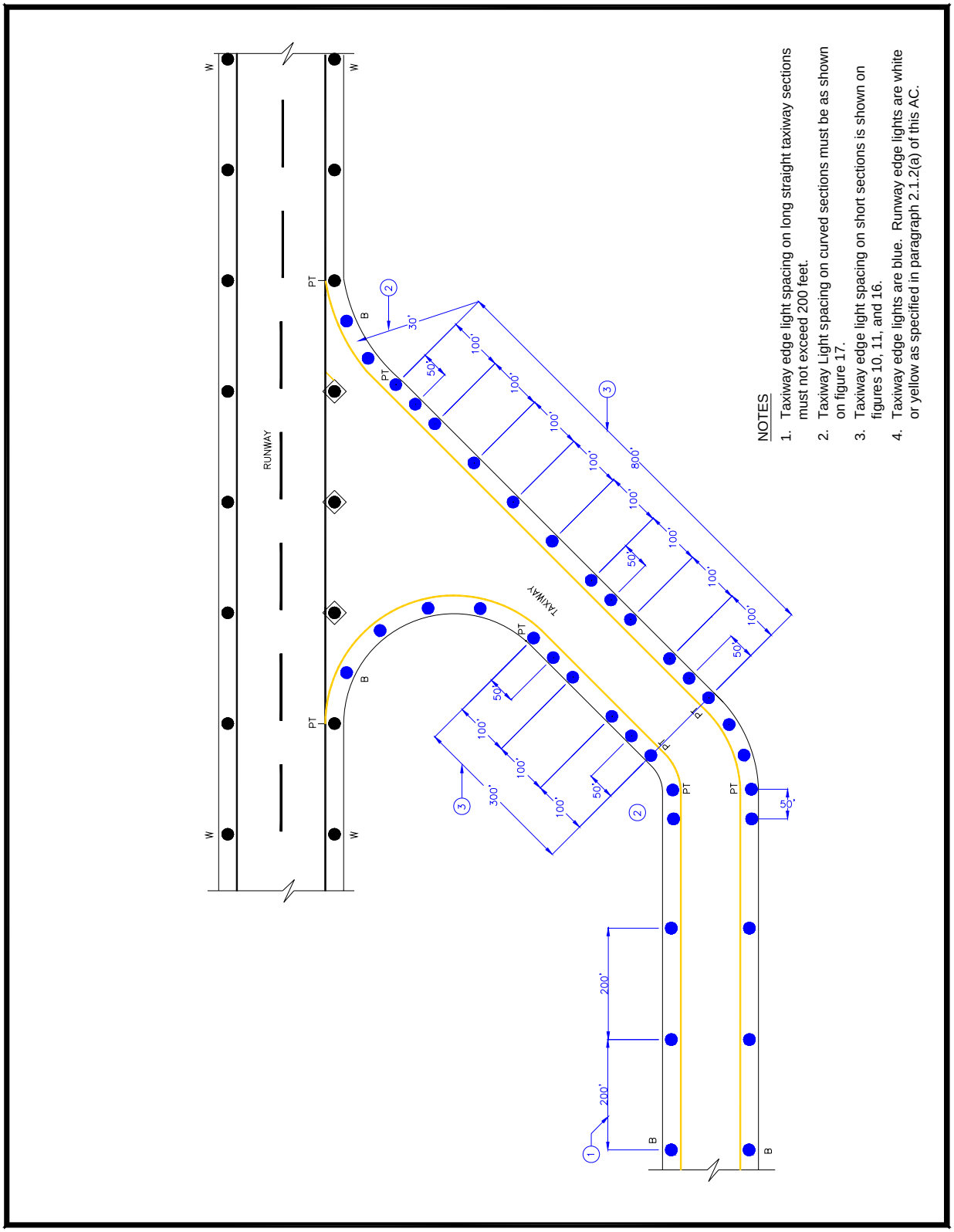


Figure 20. Typical Edge Lighting Configuration.

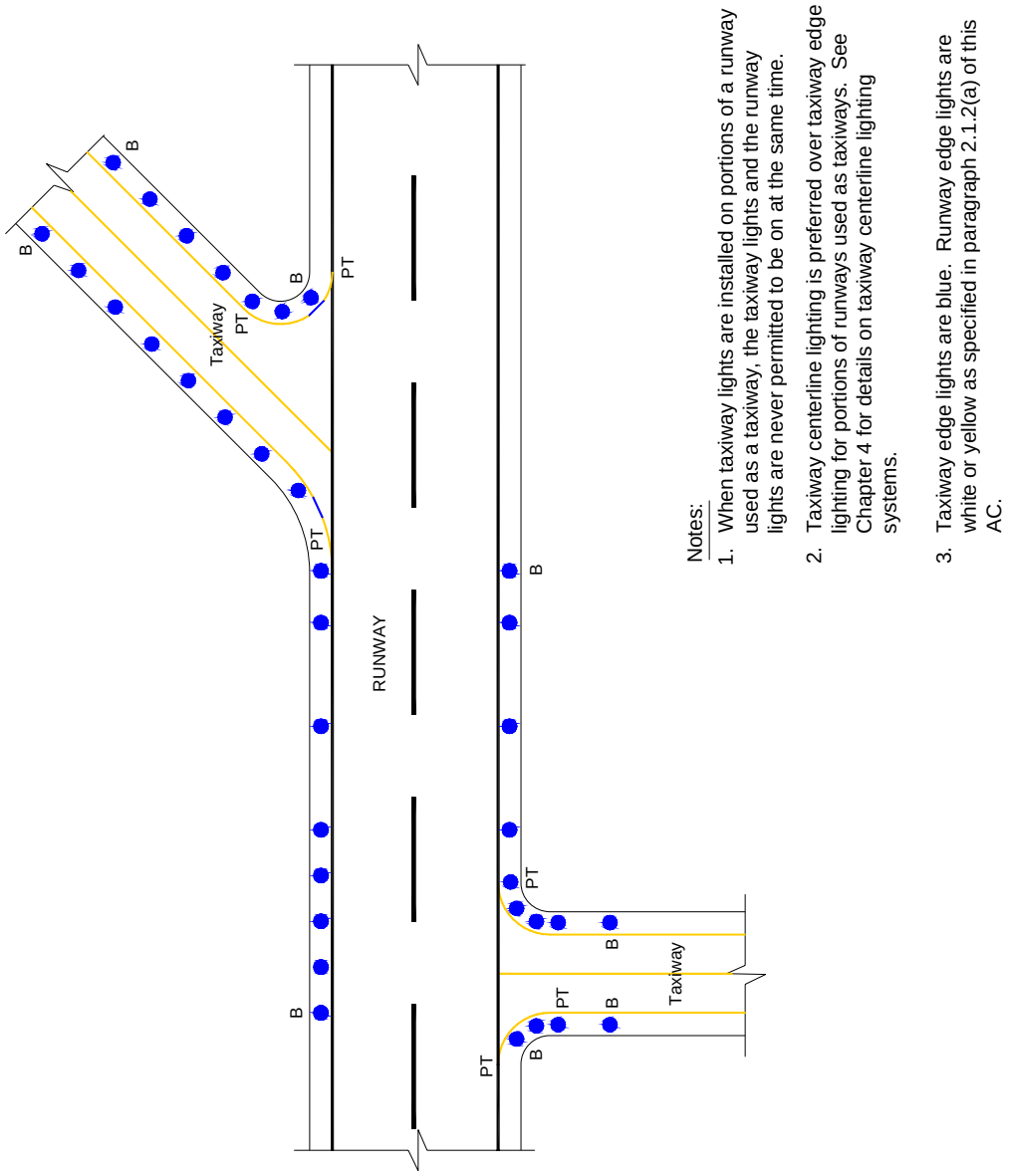


Figure 21. Typical Edge Lighting for Portions of Runways Used as Taxiway (When Taxiway Lights Are “On”).

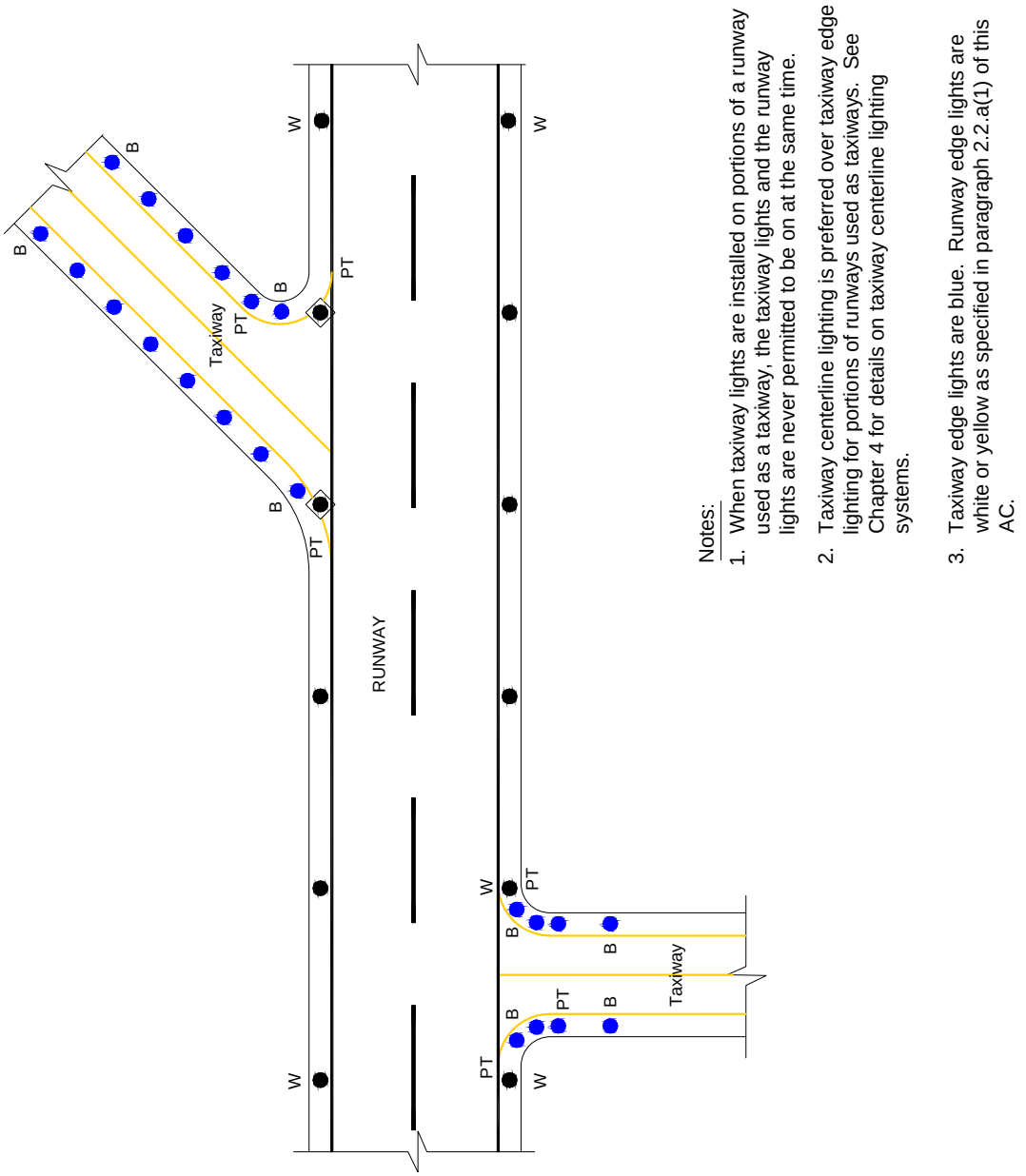


Figure 22. Typical Edge Lighting for Portions of Runways Used as Taxiway (When Runway Lights Are “On”).

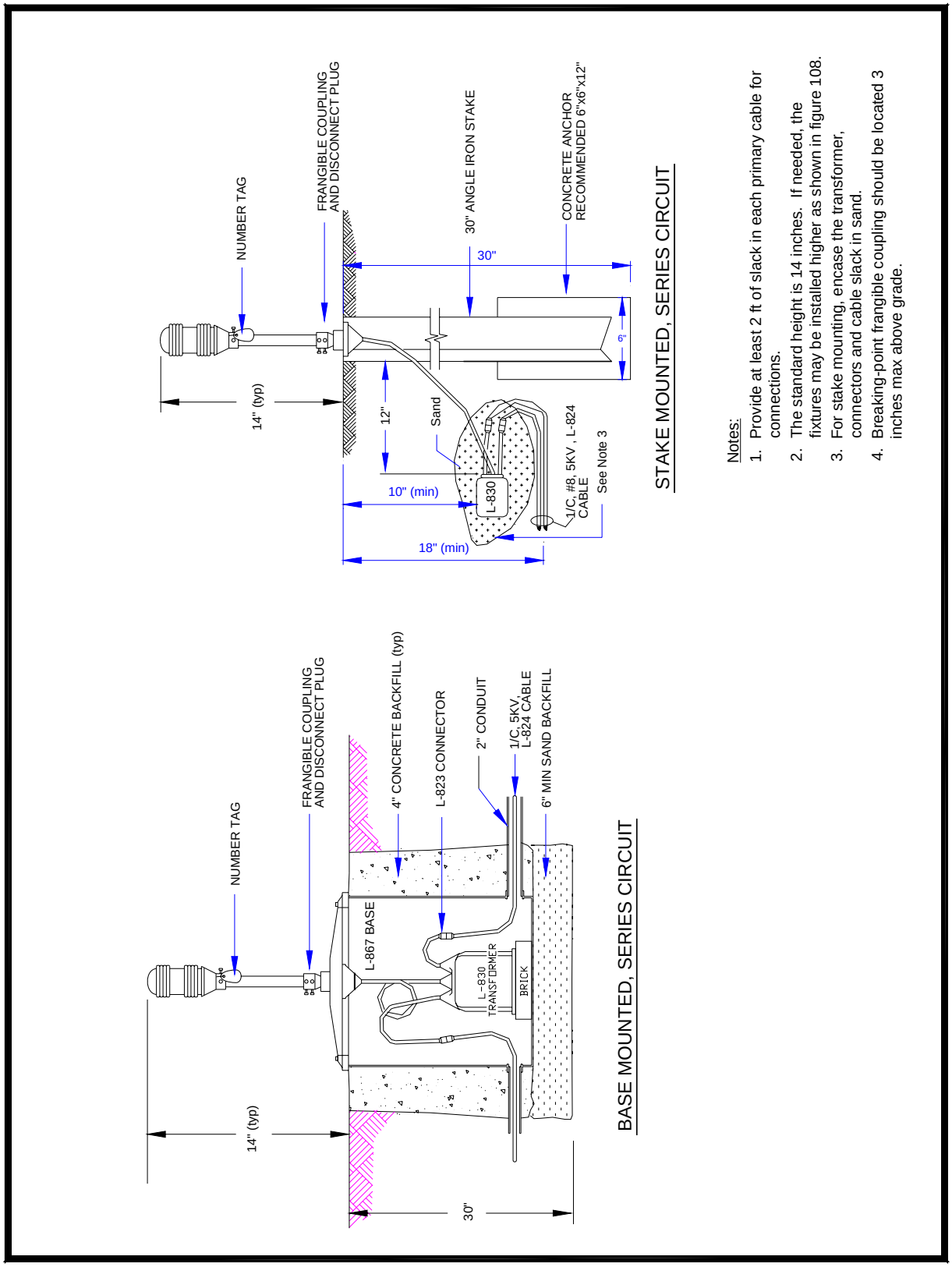


Figure 23. Light Fixture Wiring.

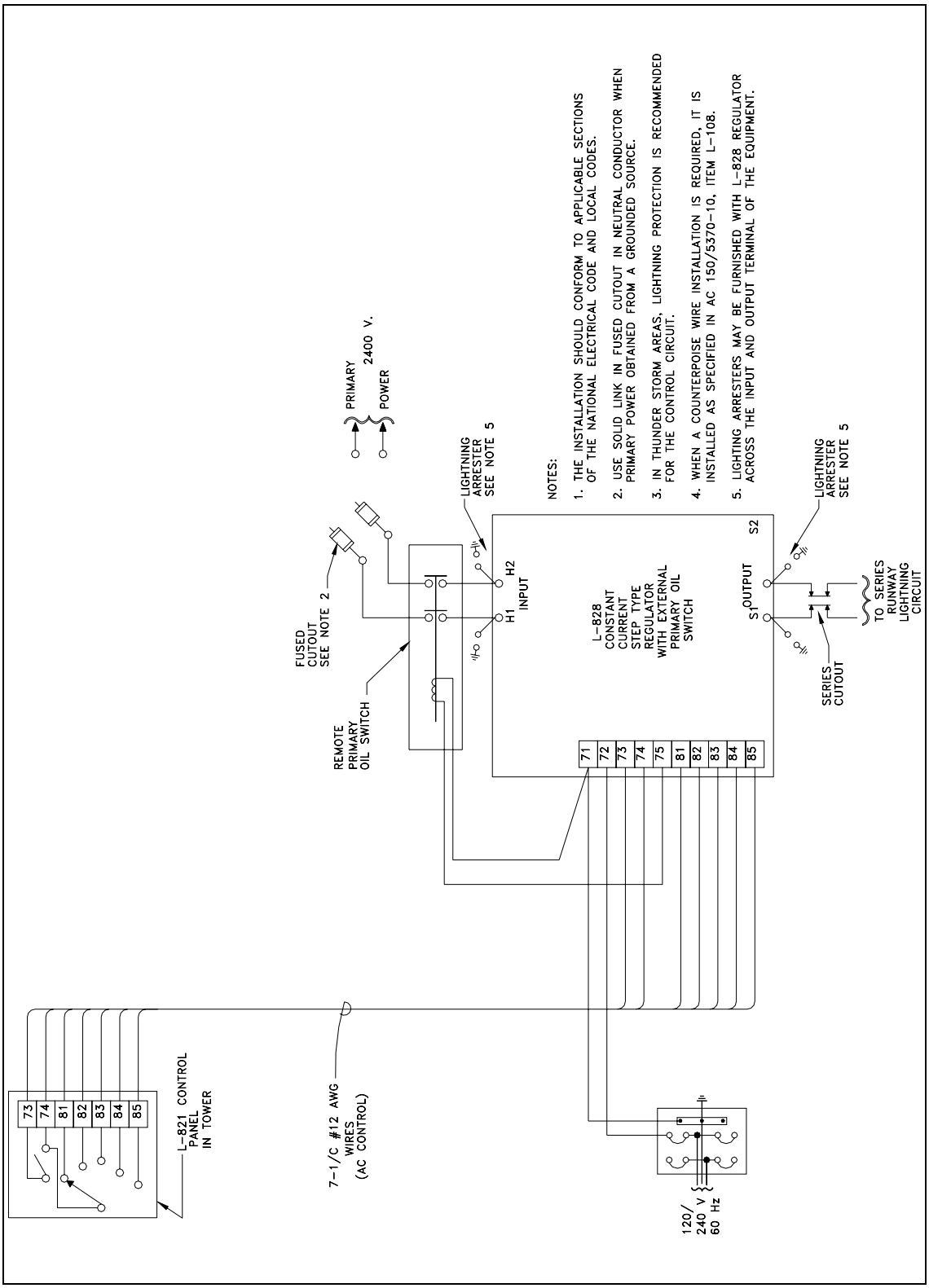


Figure 24. Typical Wiring Diagram Utilizing L-828 Step-type Regulator with External Remote Primary Oil Switch.

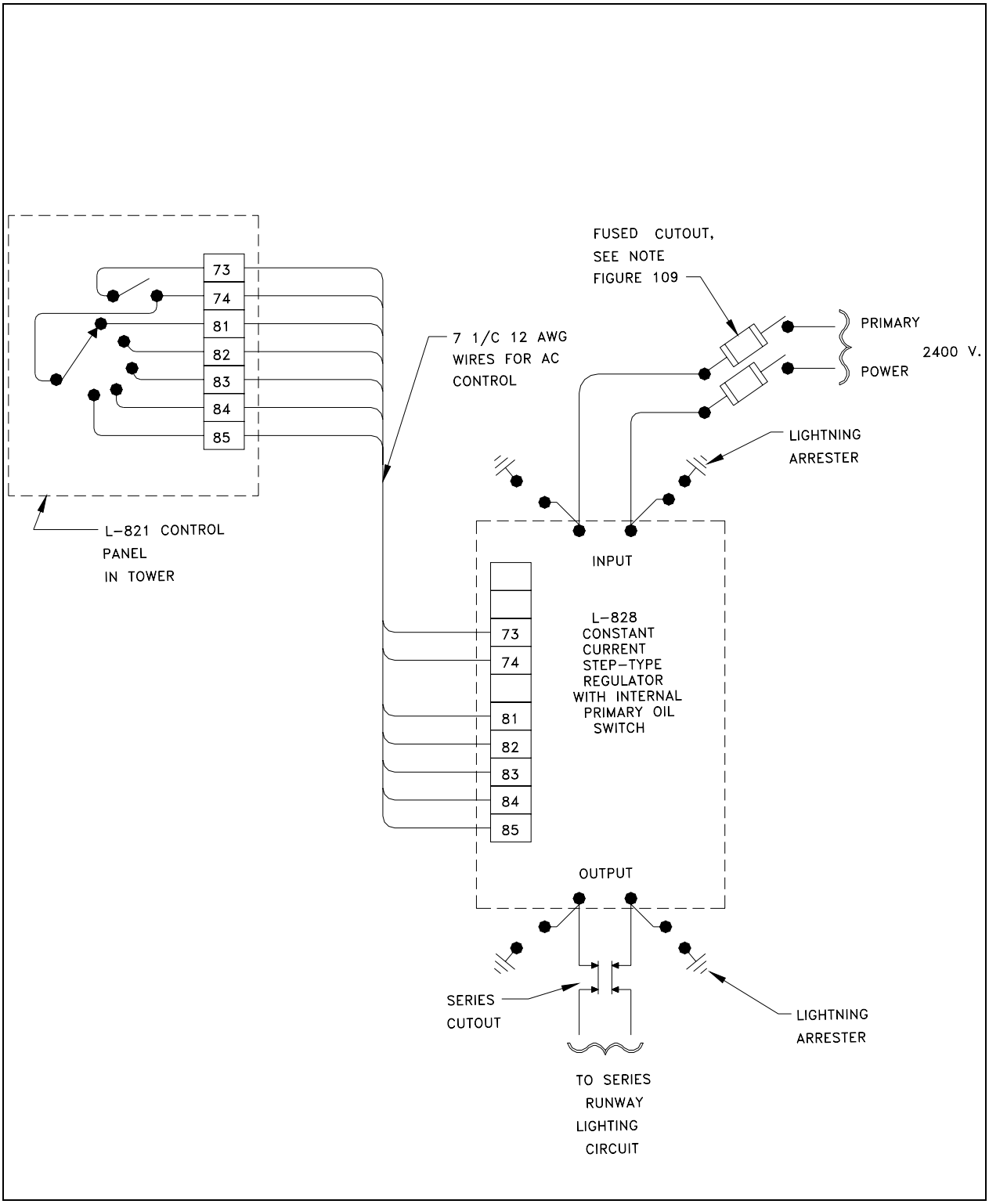


Figure 25. Typical Wiring Diagram Utilizing L-828 Step-type Regulator with Internal Control Power and Primary Oil Switch.

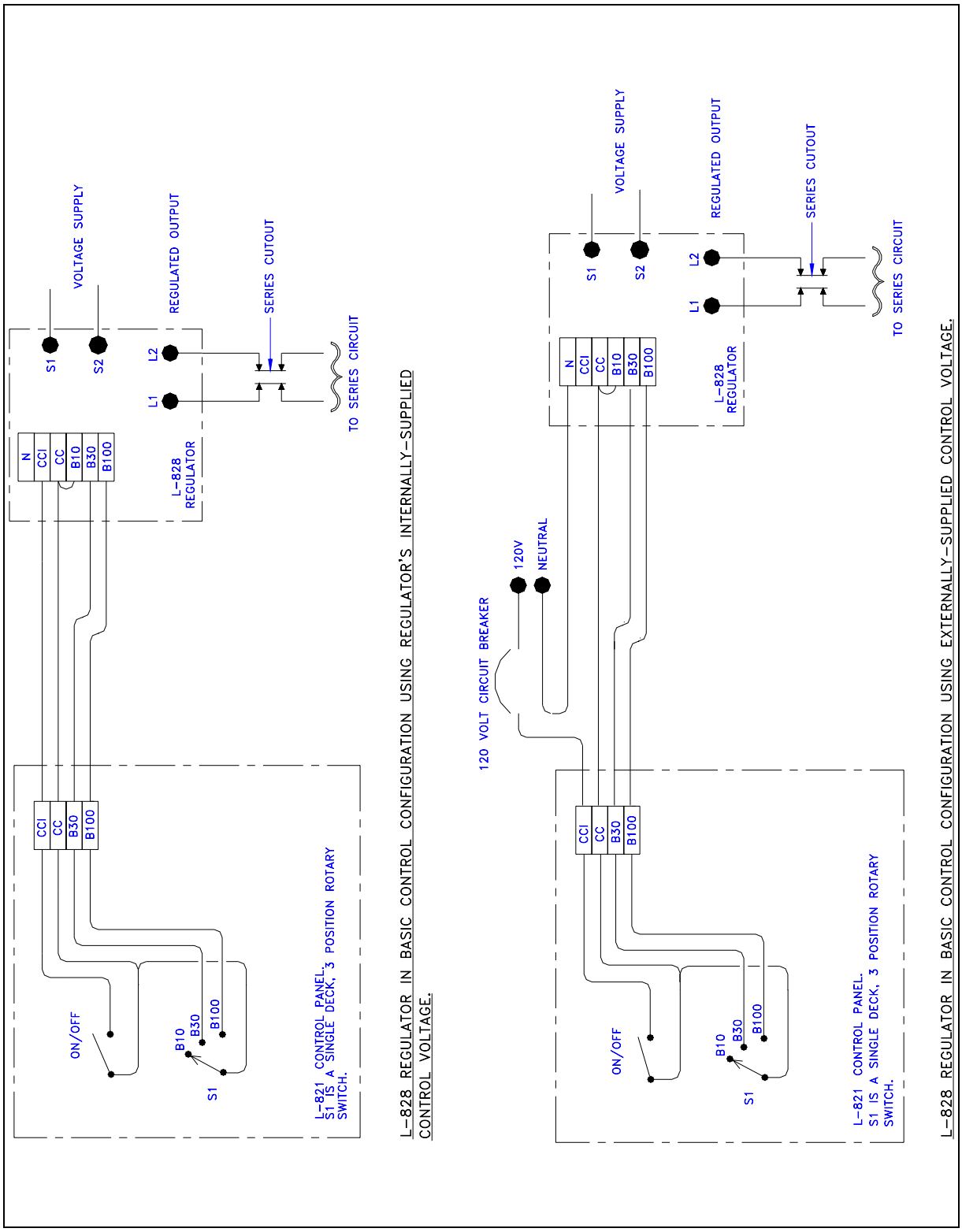


Figure 26. Typical Basic 120 VAC Remote Control System.

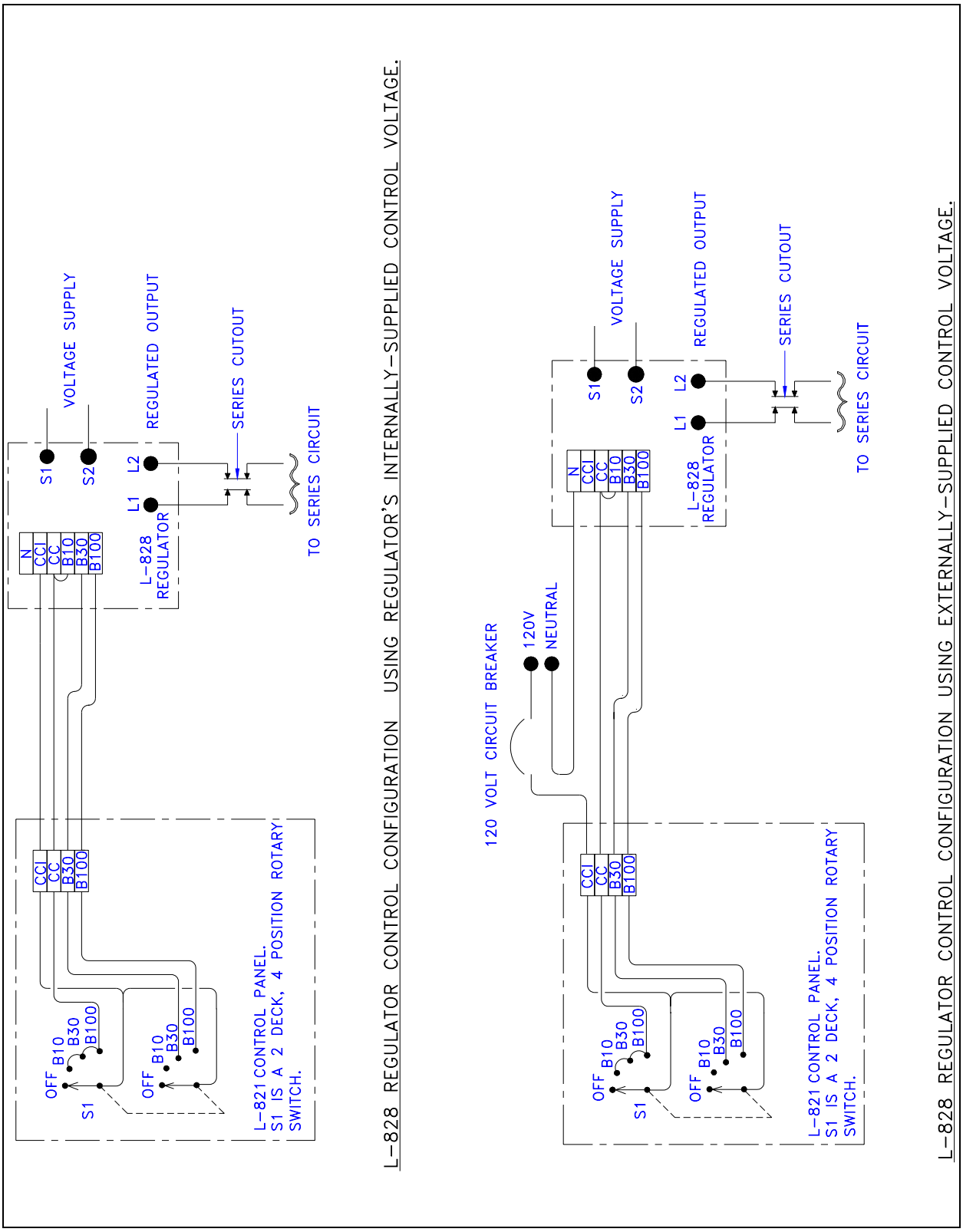


Figure 27. Alternative 120 VAC Remote Control System.

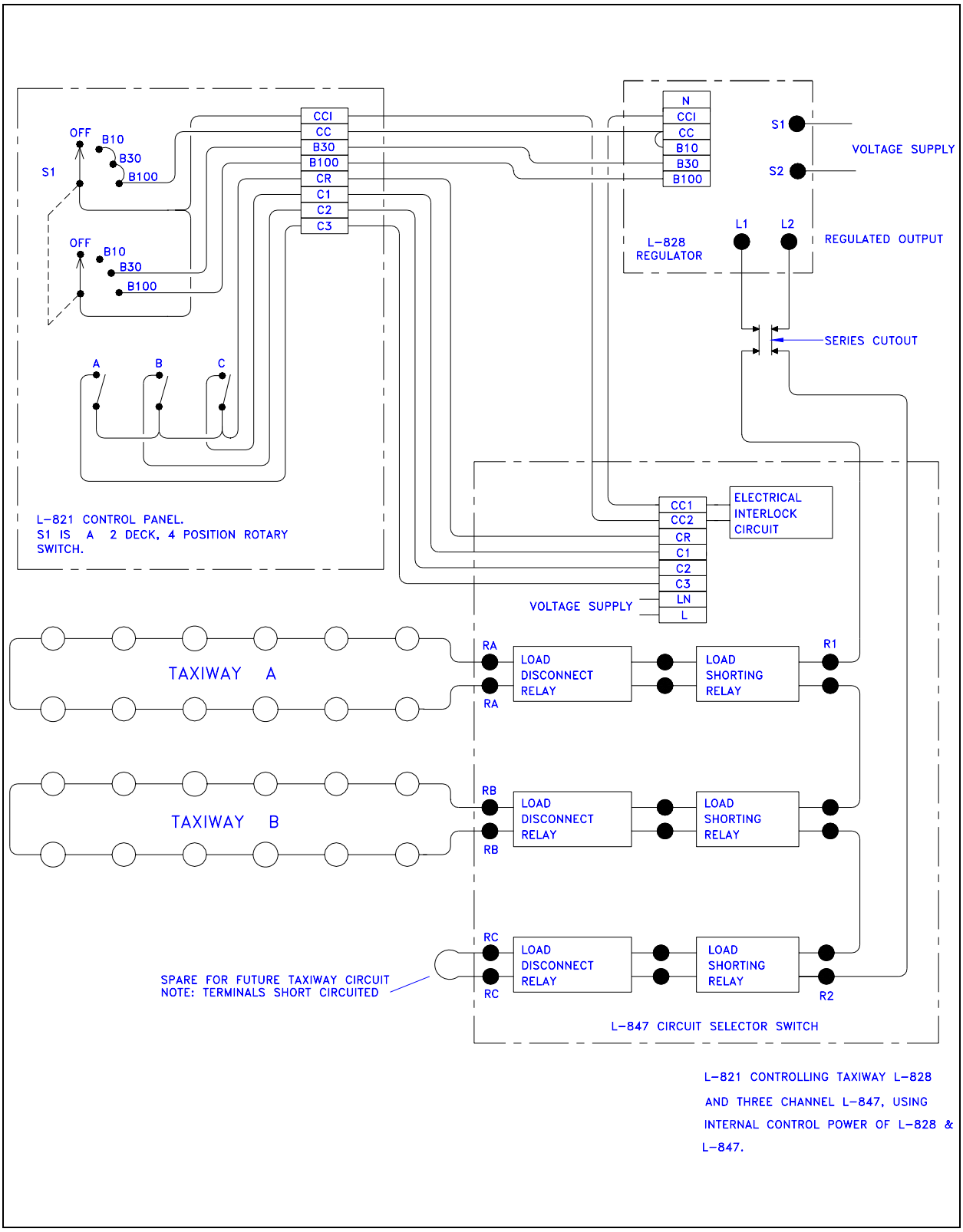


Figure 28. Typical 120 VAC Remote Control System with L-847 Circuit Selector Switch.

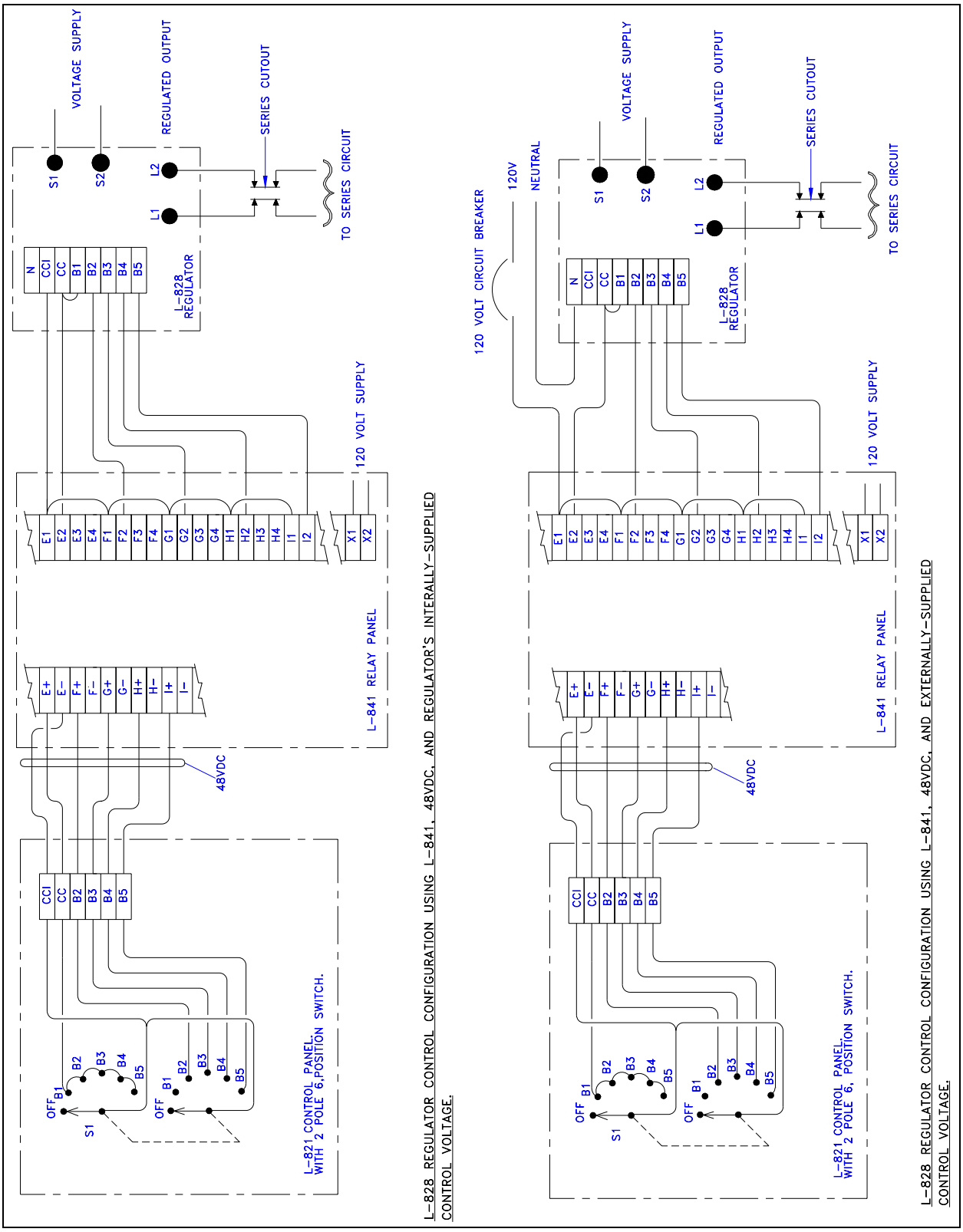


Figure 29. Typical 48 VDC Remote Control System with 5-Step Regulator and L-841 Relay Panel.

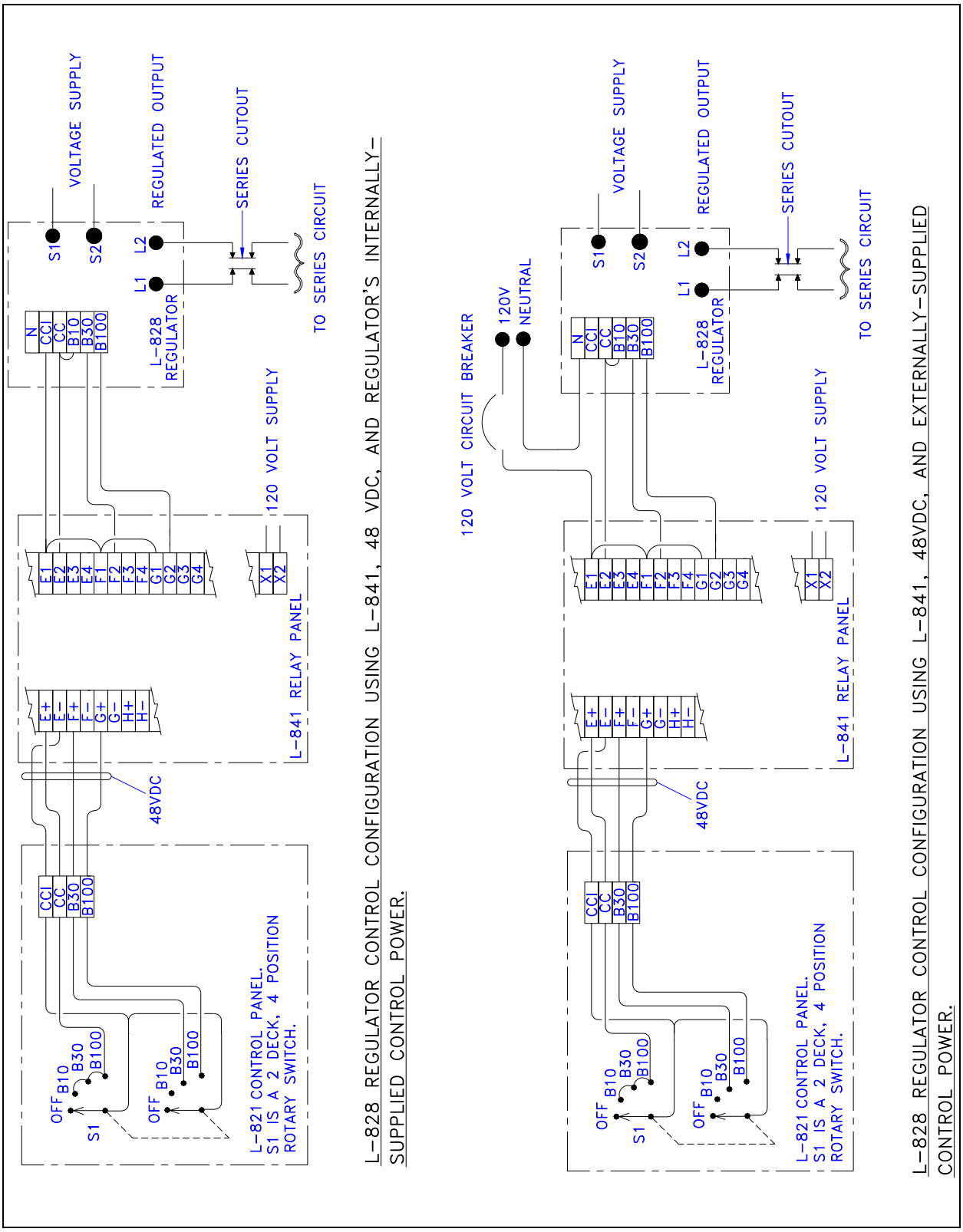


Figure 30. Typical 48 VDC Remote Control System with 3-Step Regulator and L-841 Relay Panel.

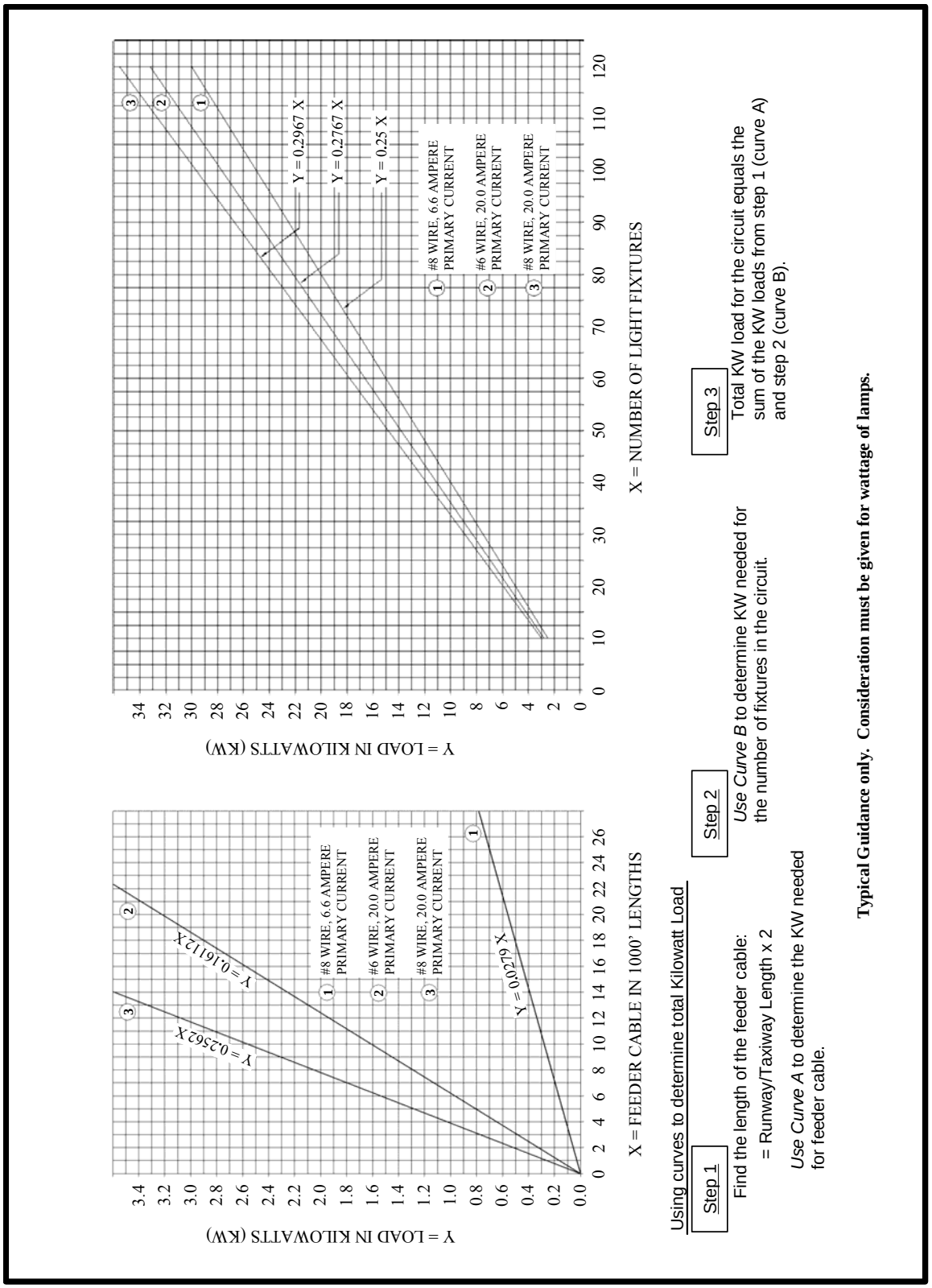
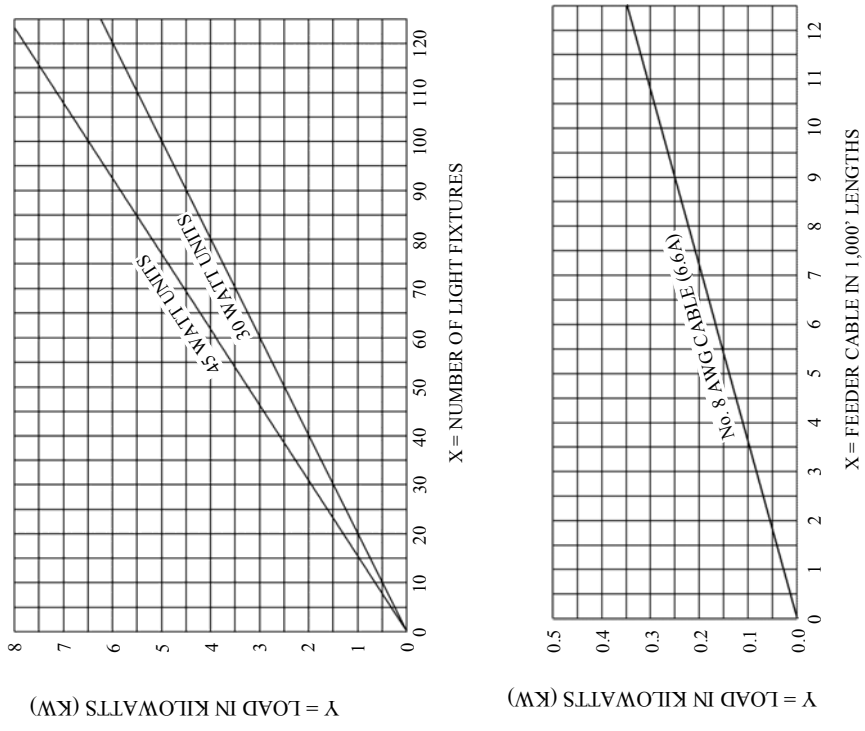


Figure 31. Curves for Estimating Loads in High Intensity Series Circuits.



Using curves to determine total Kilowatt Load

1. Computations based on actual circuit load tests.
2. In Curve A find kilowatt load (KW) for the total number of fixtures, using the applicable lines (i.e. 45 watt or 30 watt).
3. Basis for computing unit loads in Curve A:

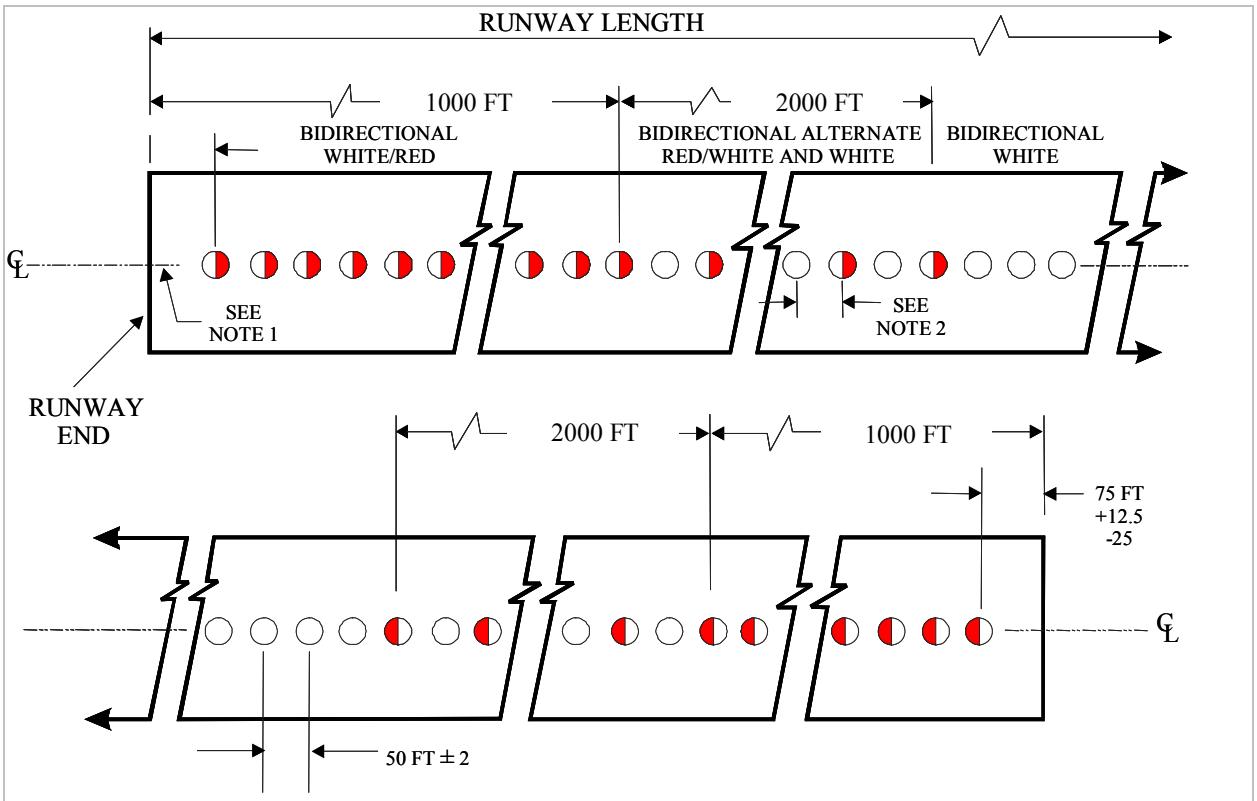
30/45 watt transformer with 45 watt lamp	54.7 watts
Cable loss, lamp tolerance, etc.	10.3 watts
Total estimated load per 45 watt unit	65.0 watts
30/45 watt transformer with 30 watt lamp	40.4 watts
Cable loss, lamp tolerance, etc.	9.6 watts
Total estimated load per 30 watt unit	50.0 watts

4. Basis for computing load per 1000 ft of No. 8 AWG cable in Curve B:

   $I^2R = (6.6A)^2 \times 0.6405$ ohms/1,000 ft = 27.9 watts/1000 ft

5. Total KW load per circuit equal the sum of the KW loads from curve A and curve B.

Figure 32. Curves for Estimating Loads in Medium Intensity Series Circuits.



NOTES:

1. THE RUNWAY CENTERLINE (RCL) LINE MAY BE OFFSET NOT MORE THAN 2 FT RIGHT OR LEFT OF THE RUNWAY CENTERLINE. THE LATERAL TOLERANCE FROM THE LINE OF LIGHTS IS ± 1 IN.
2. THE RCL SHALL BE EQUALLY SPACED AT 50 FT FOR FAA TYPE L-850A LIGHTS. THE LONGITUDINAL TOLERANCE IS ± 2 FT.

LEGEND:

○ BIDIRECTIONAL RCL - WHITE BOTH DIRECTIONS

◐ BIDIRECTIONAL RCL - RED IN DIRECTION OF SHADED SIDE, WHITE IN DIRECTION OF WHITE SIDE

Figure 33. Runway Centerline Lighting Layout.

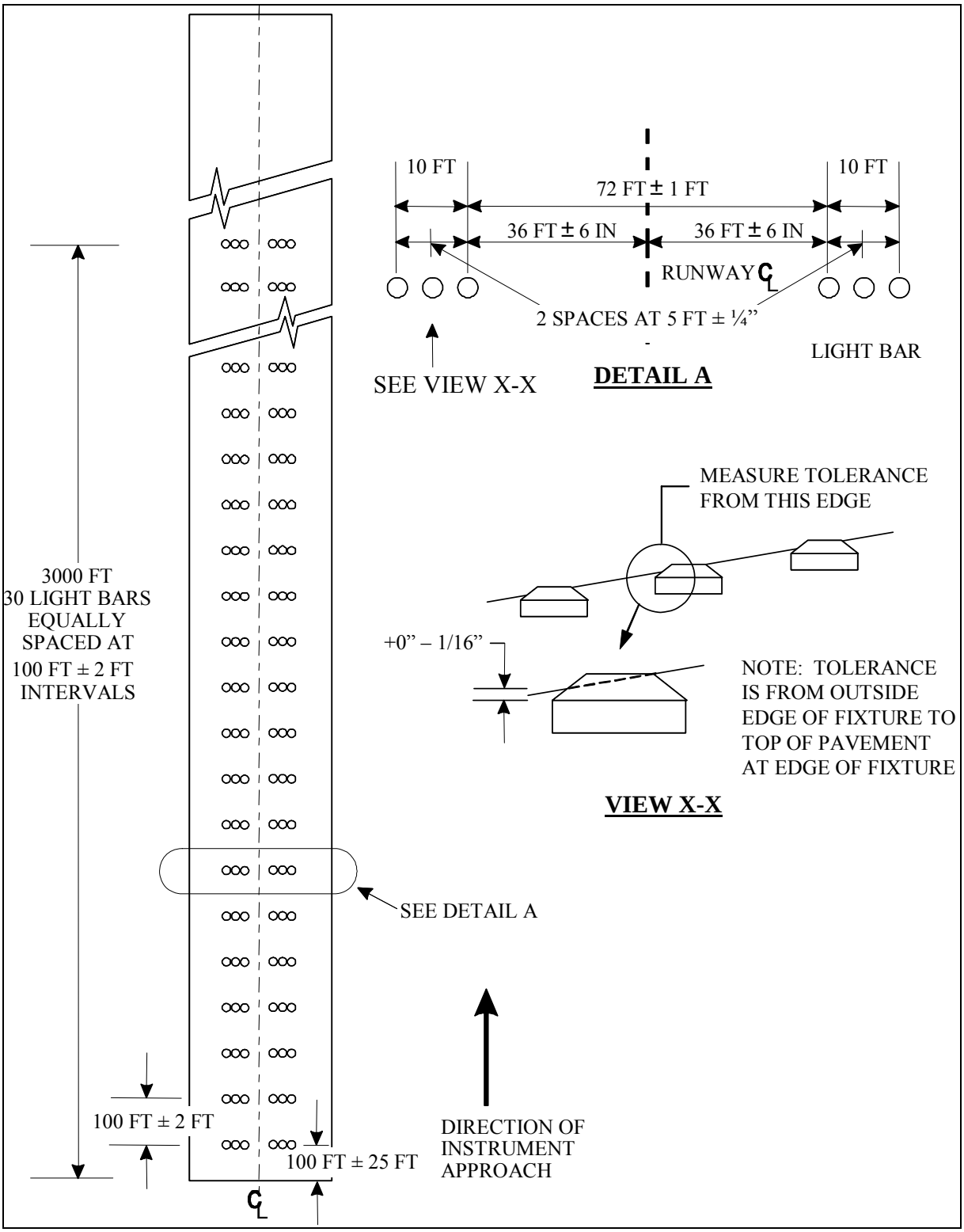
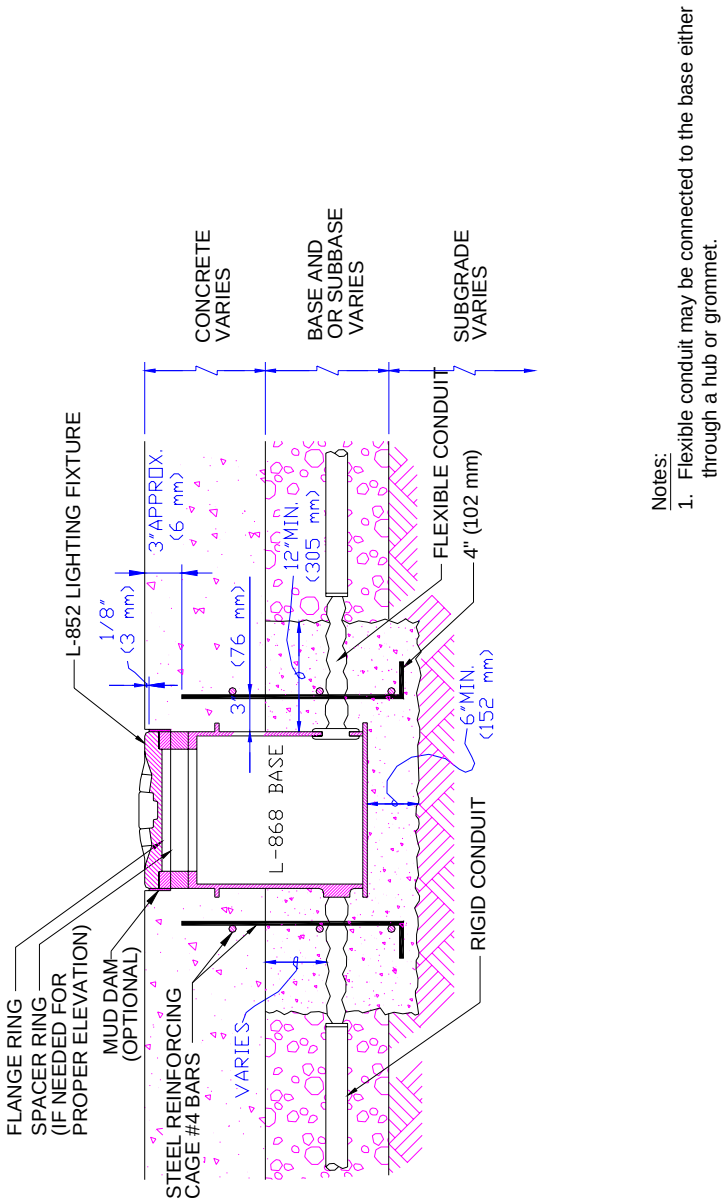


Figure 34. Touchdown Zone Lighting Layout.



Notes:
1. Flexible conduit may be connected to the base either through a hub or grommet.

Figure 35. Section Through Non-adjustable Base and Anchor, Base and Conduit System, Rigid Pavement.

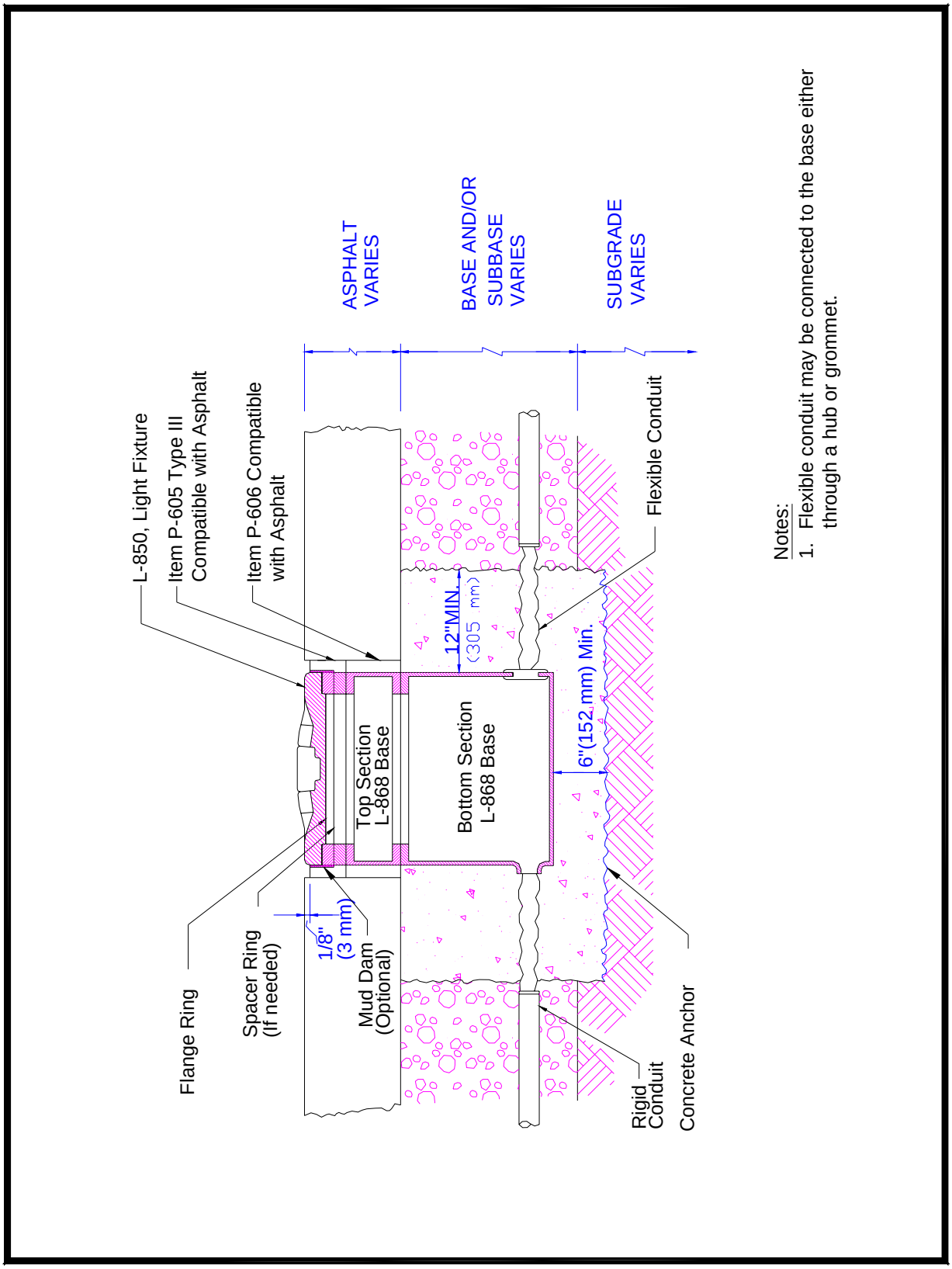


Figure 36. Section Through Non-adjustable Base and Anchor, Base and Conduit System, Flexible Pavement.

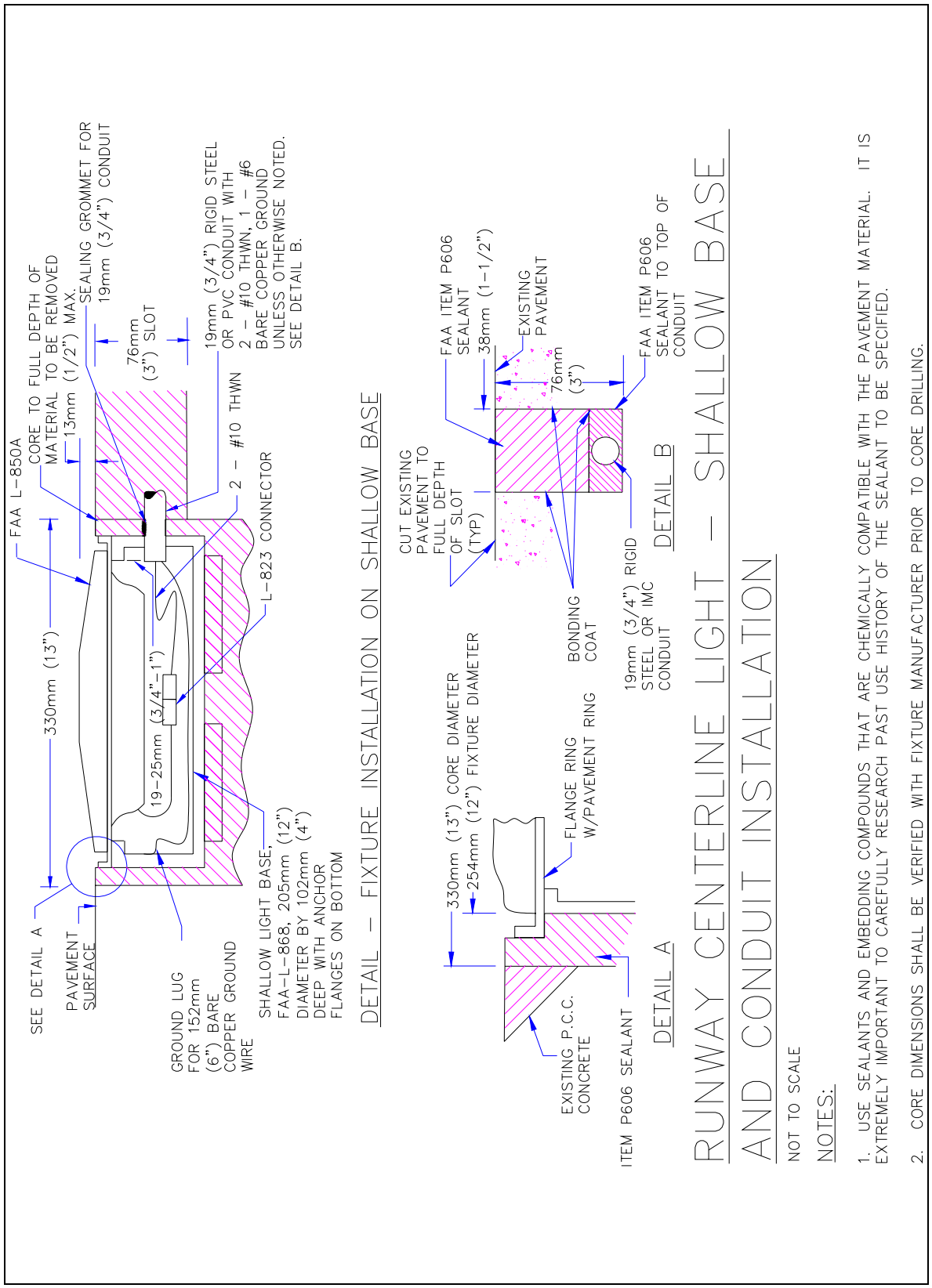


Figure 37. Runway Centerline Light – Shallow Base & Conduit Installation.

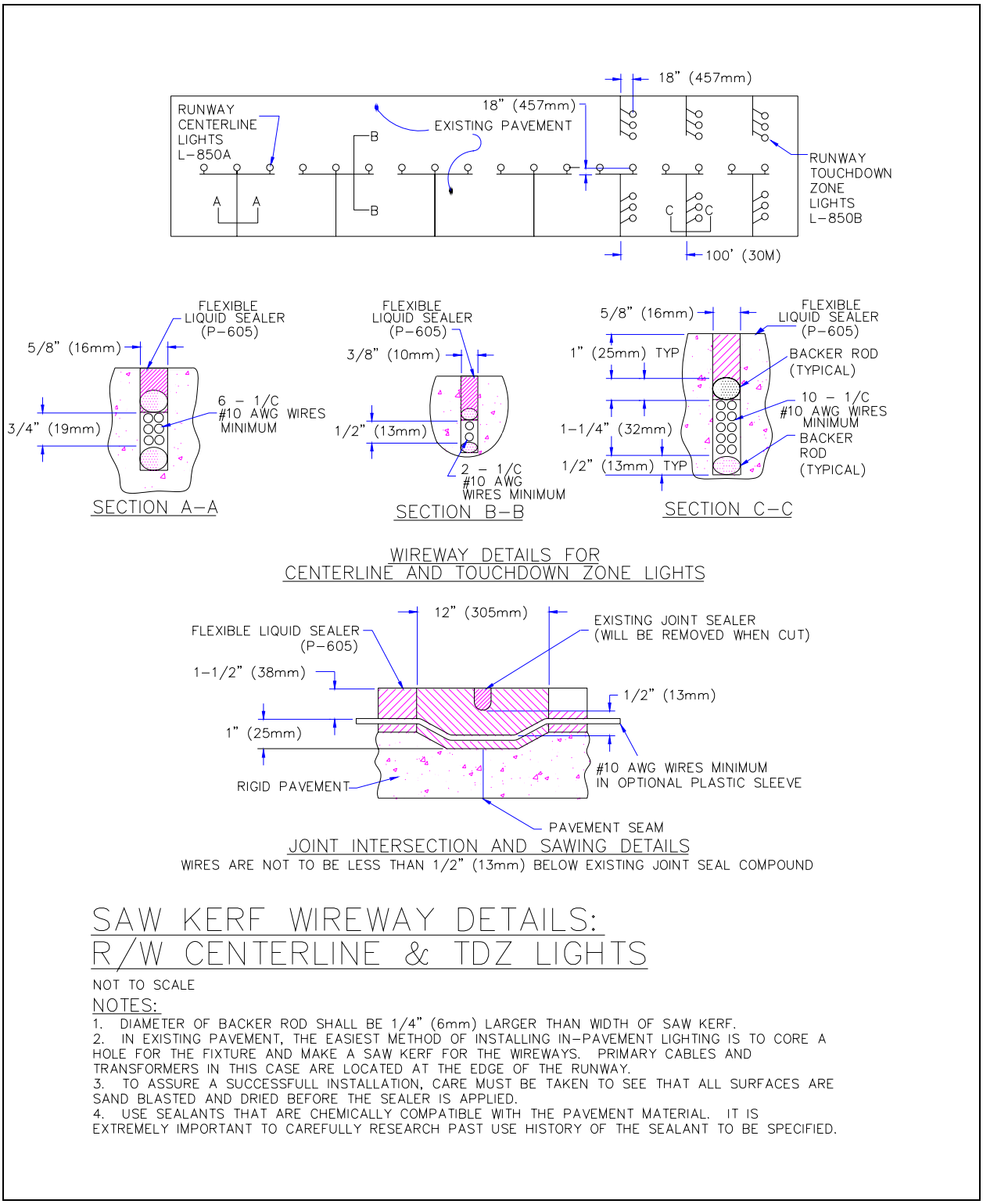


Figure 38. Saw Kerf Wireway Details.

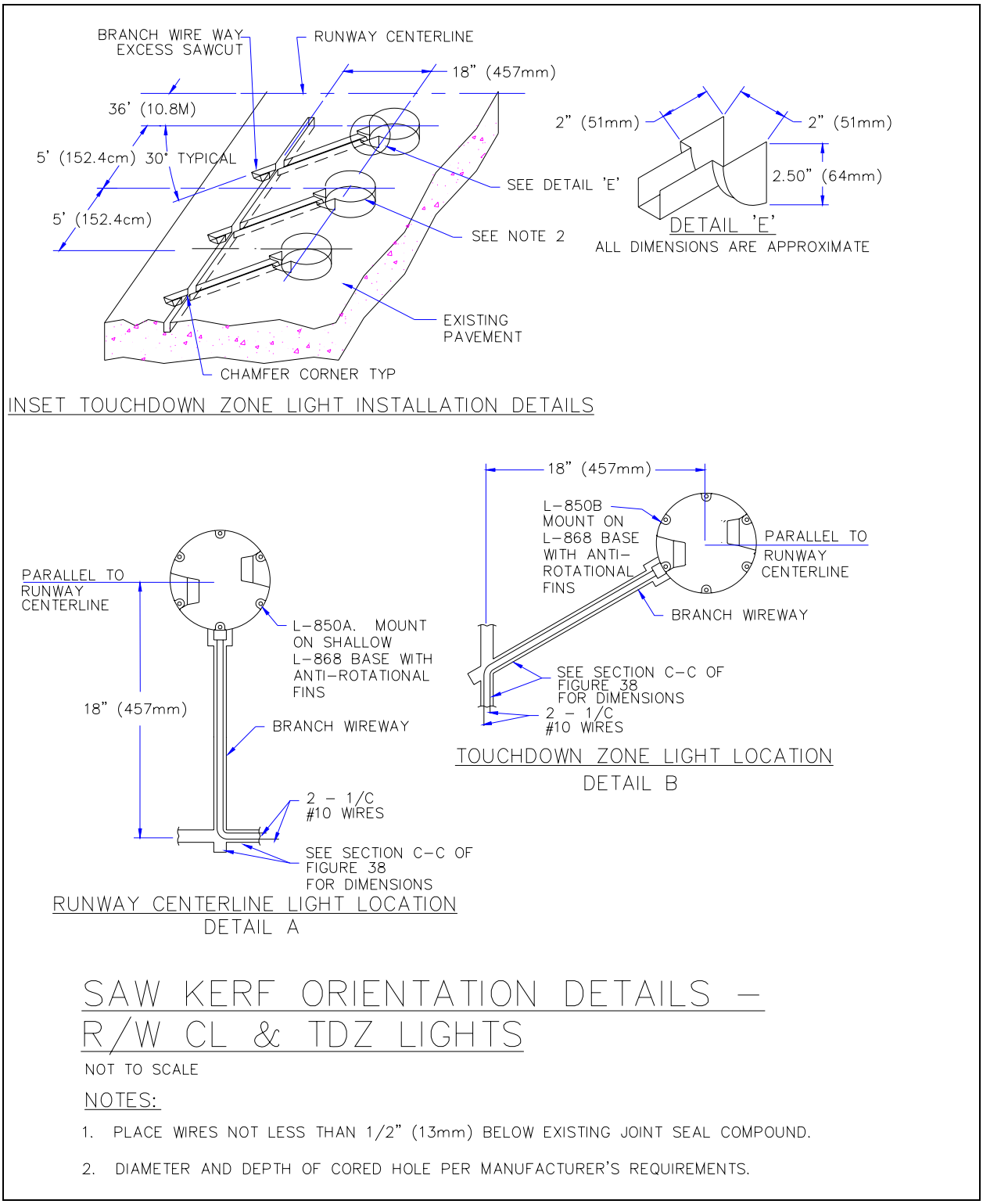


Figure 39. Saw Kerf Orientation Details – R/W Centerline and TDZ Lights.

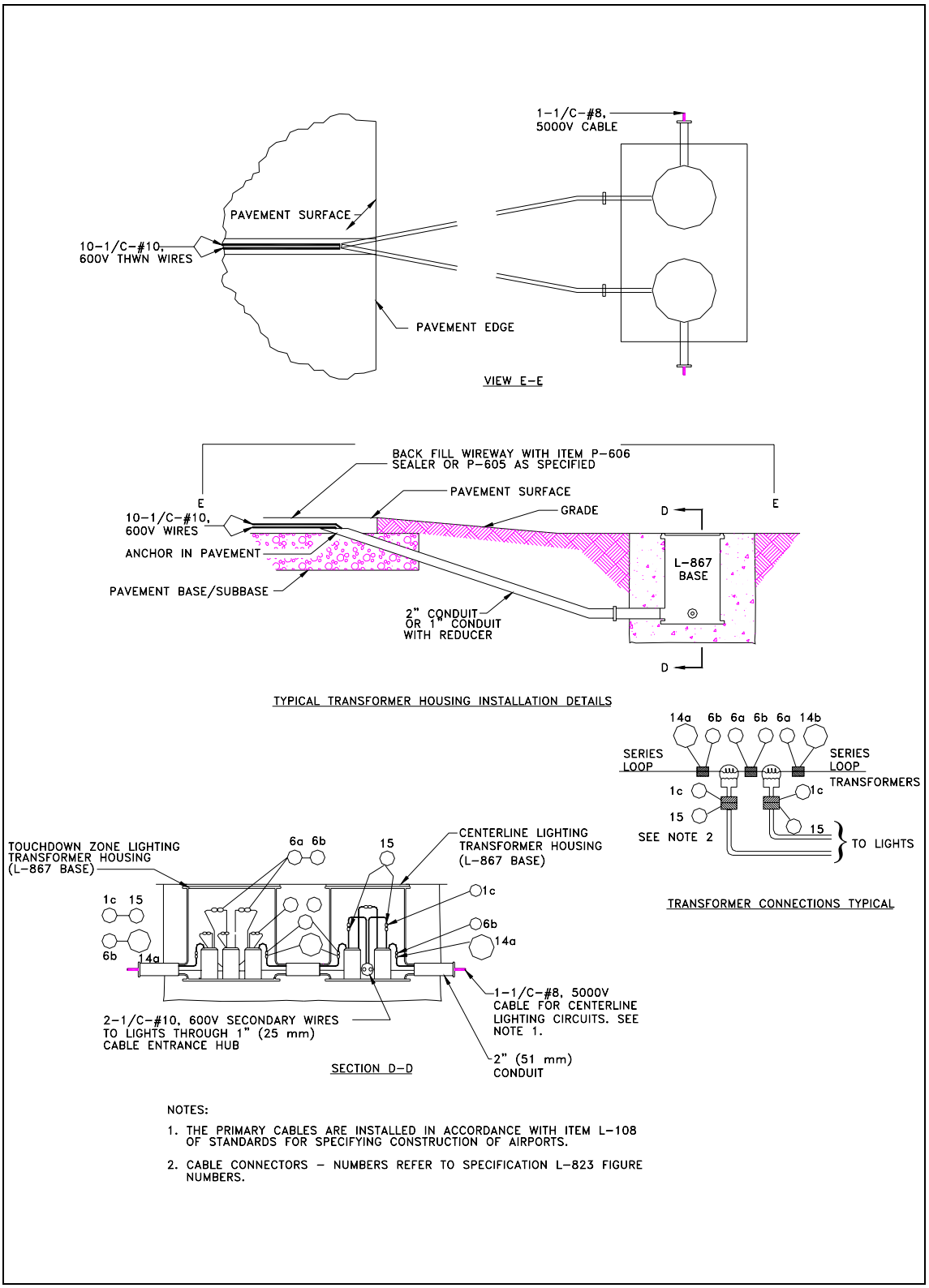


Figure 40. Transformer Housing Installation Details Inset Type Lighting Fixtures.

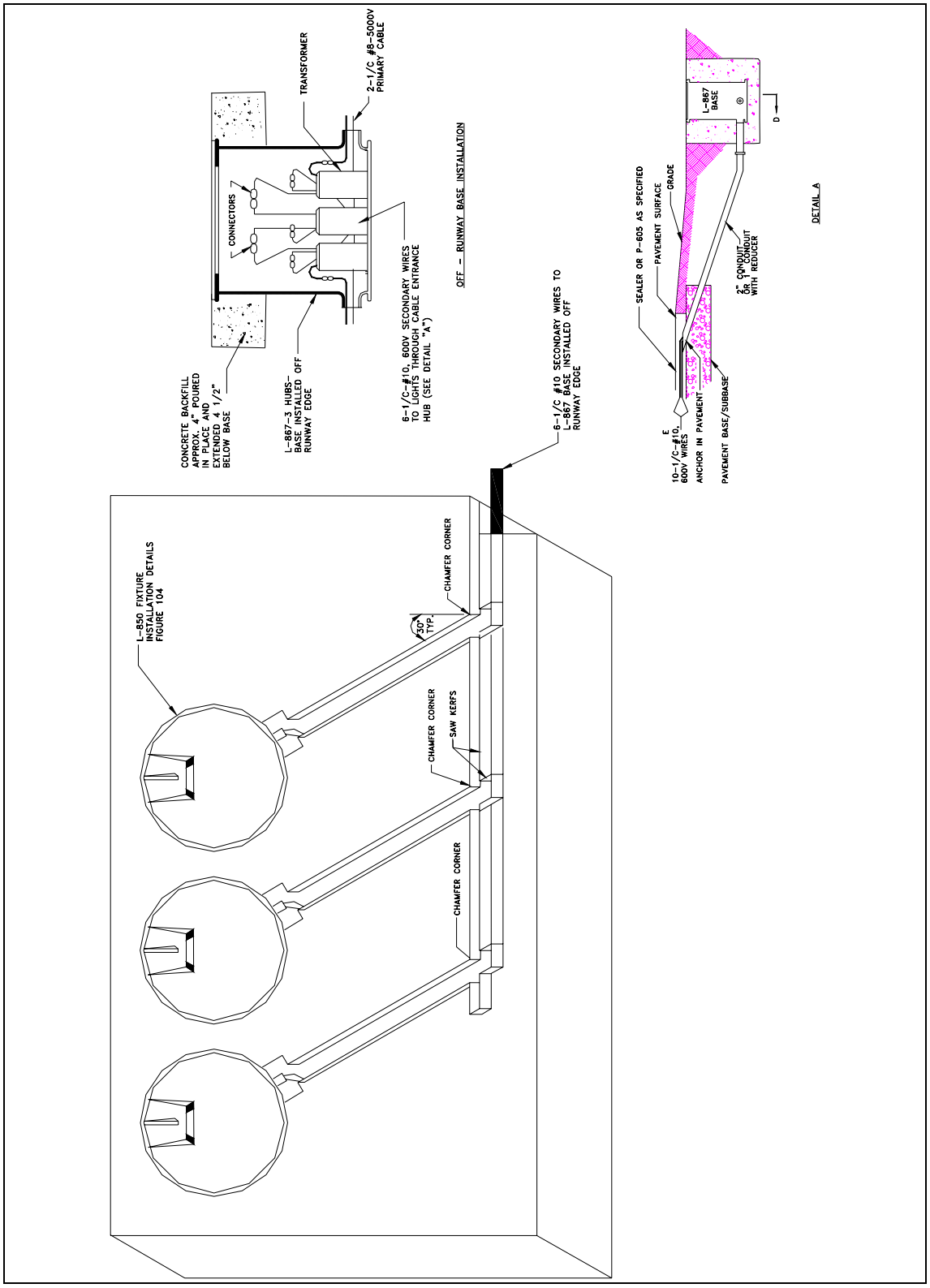


Figure 41. Typical Equipment Layout, Inset Type Lighting Fixtures.

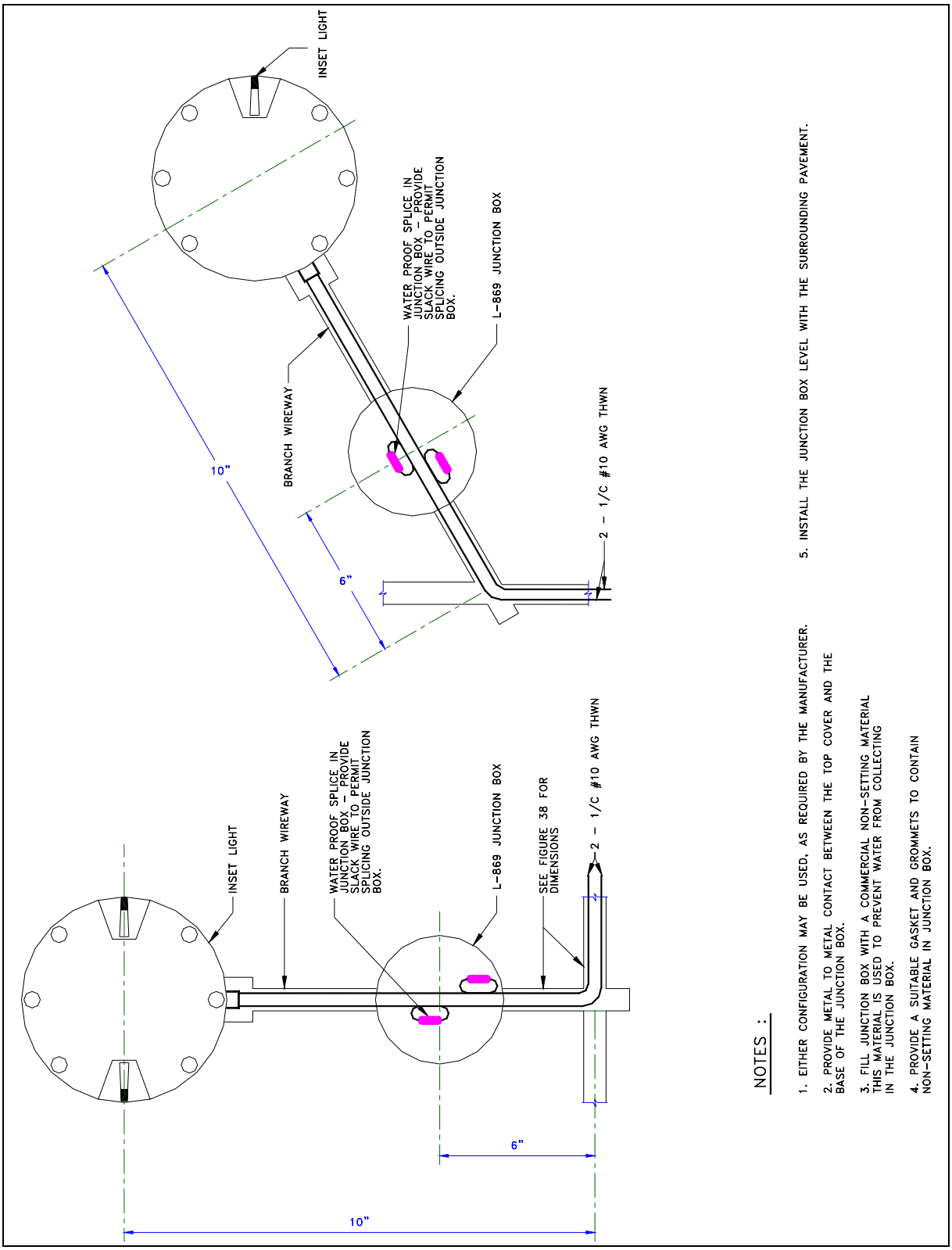


Figure 42. Junction Box for Inset Fixture Installation.

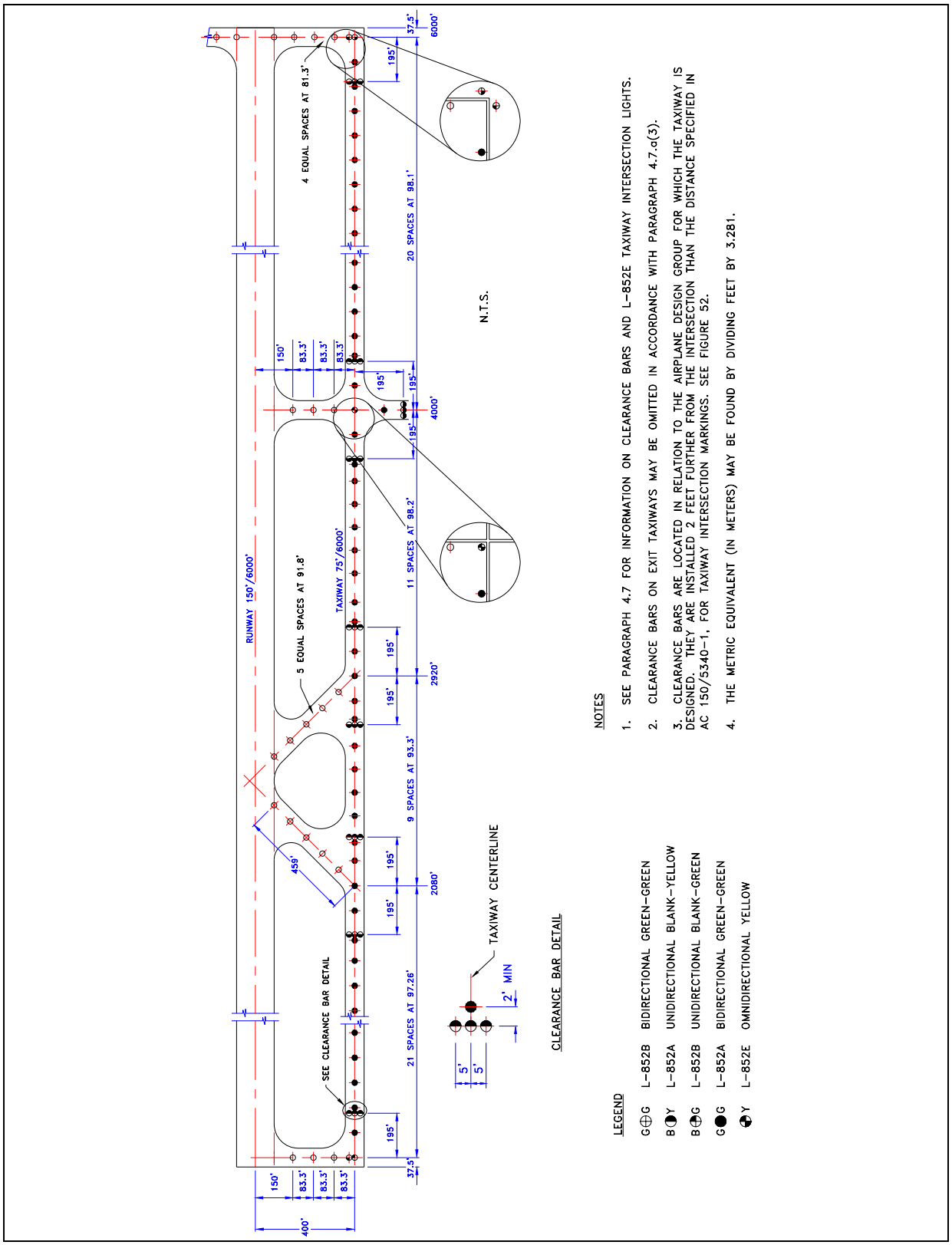


Figure 43. Typical Taxiway Centerline Lighting Configuration for Non-Standard Fillets (Centerline light spacing for operations above 1,200 feet (365 m) RVR).

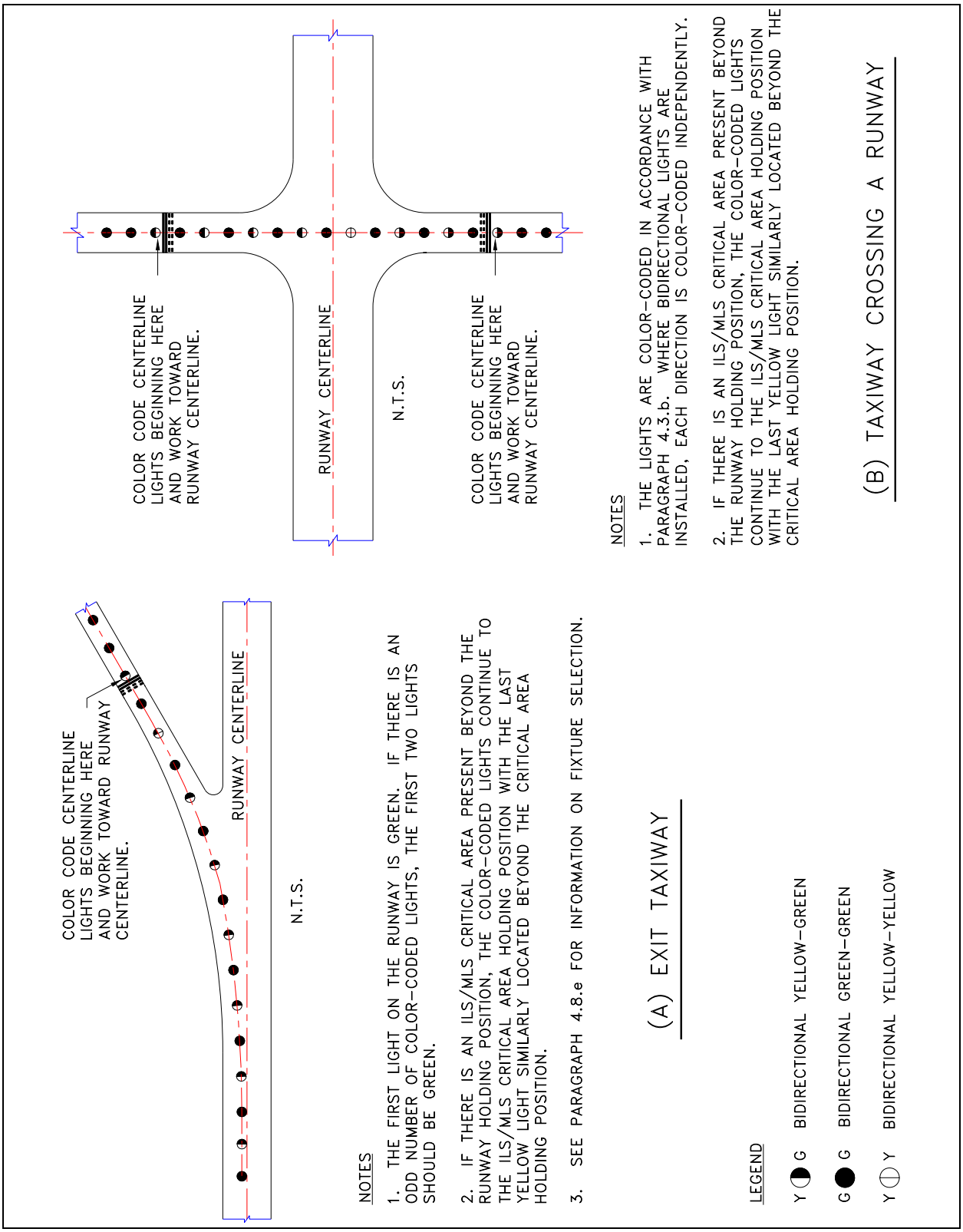


Figure 44. Color-Coding of Exit Taxiway Centerline Lights.

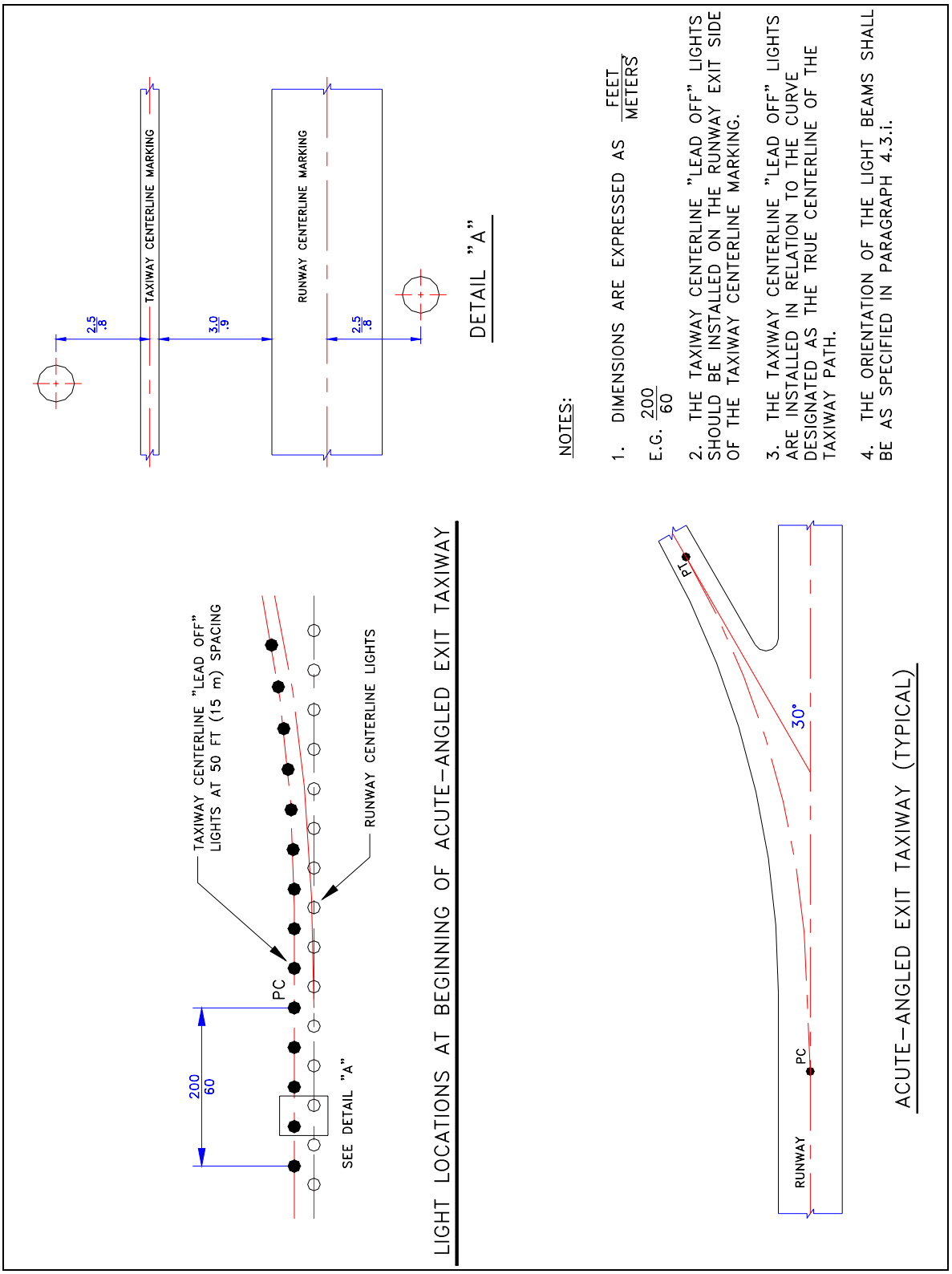


Figure 45. Taxiway Centerline Lighting Configuration for Acute-Angled Exits.

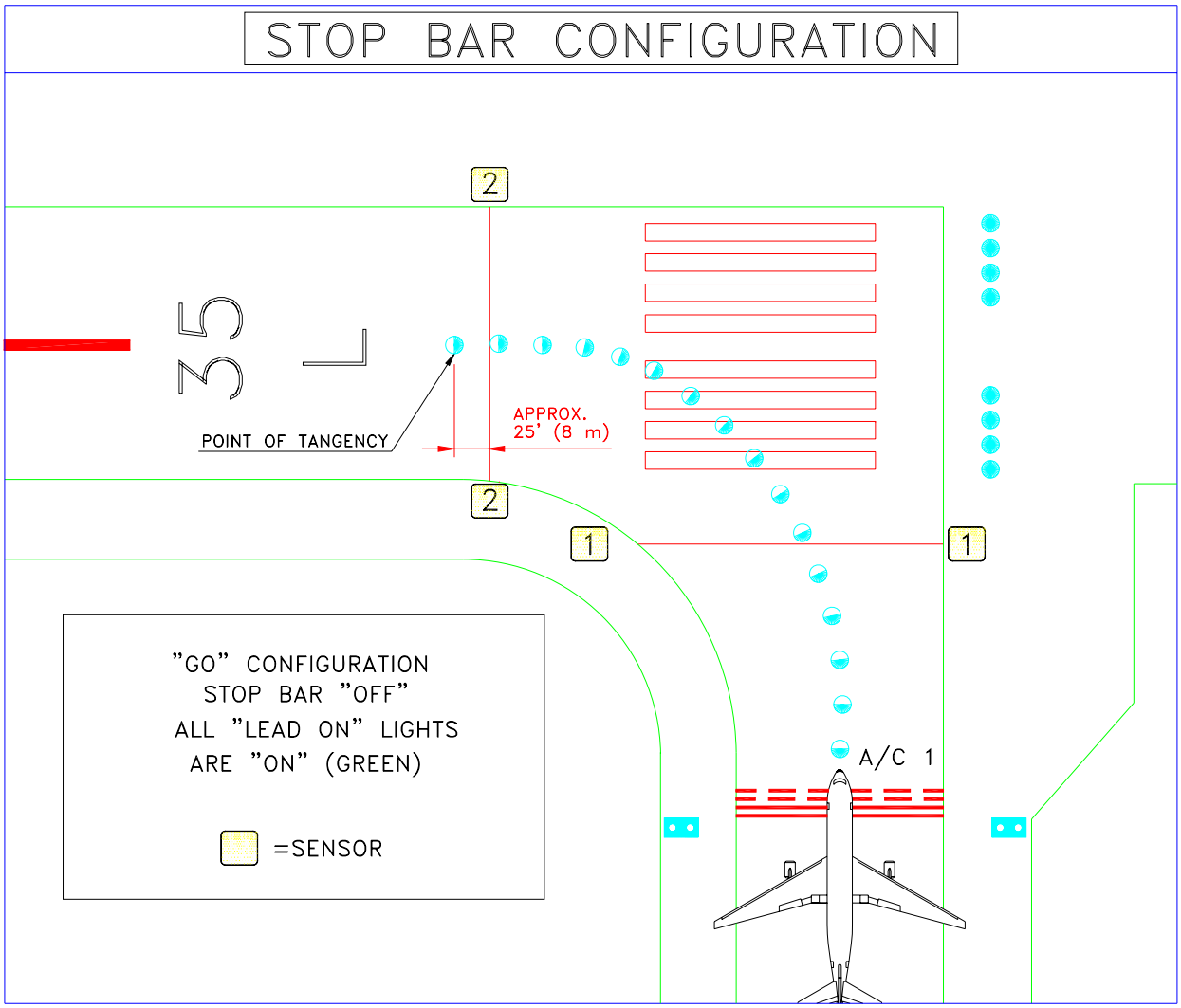


Figure 46. Controlled Stop Bar Design and Operation – "GO" Configuration.

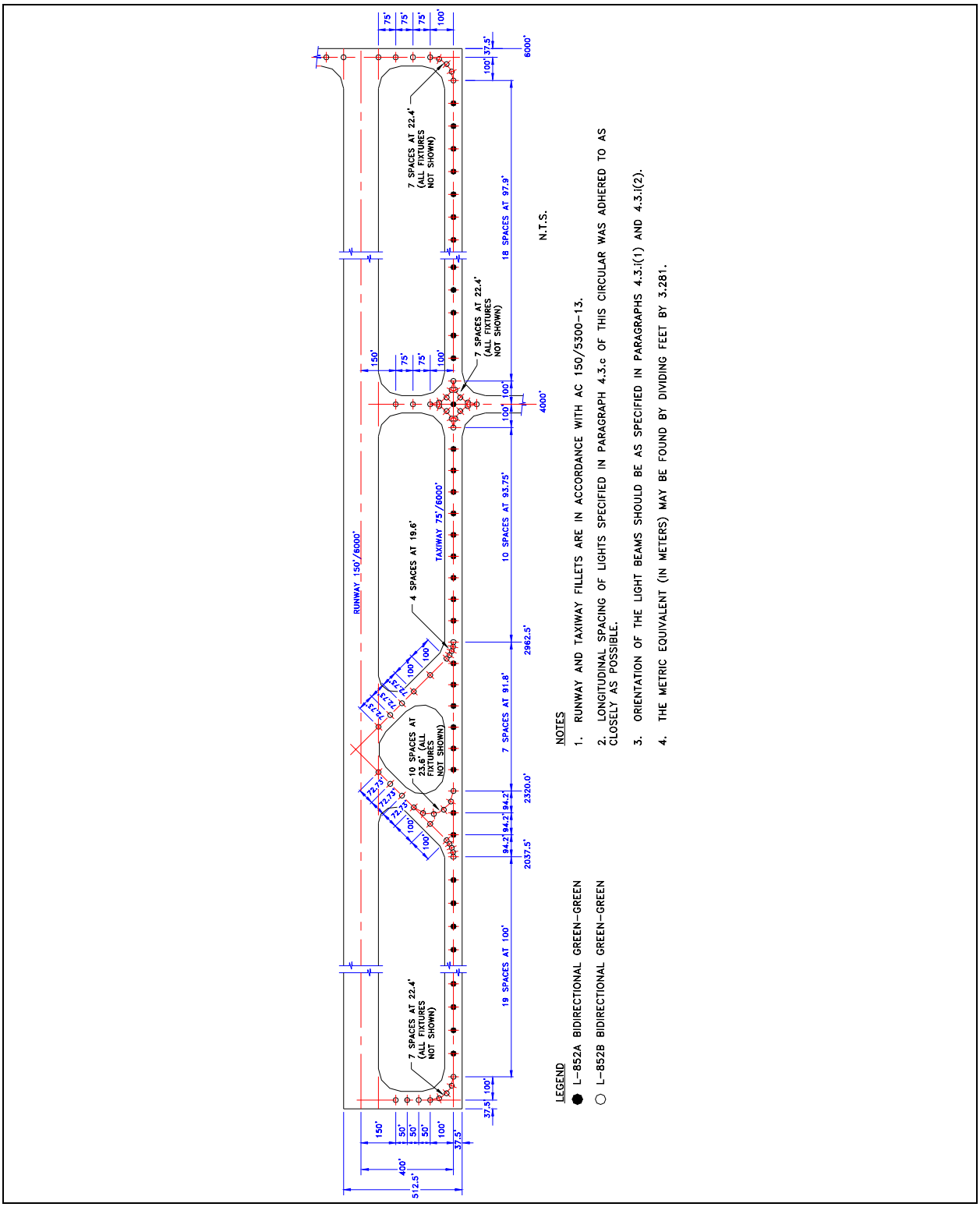
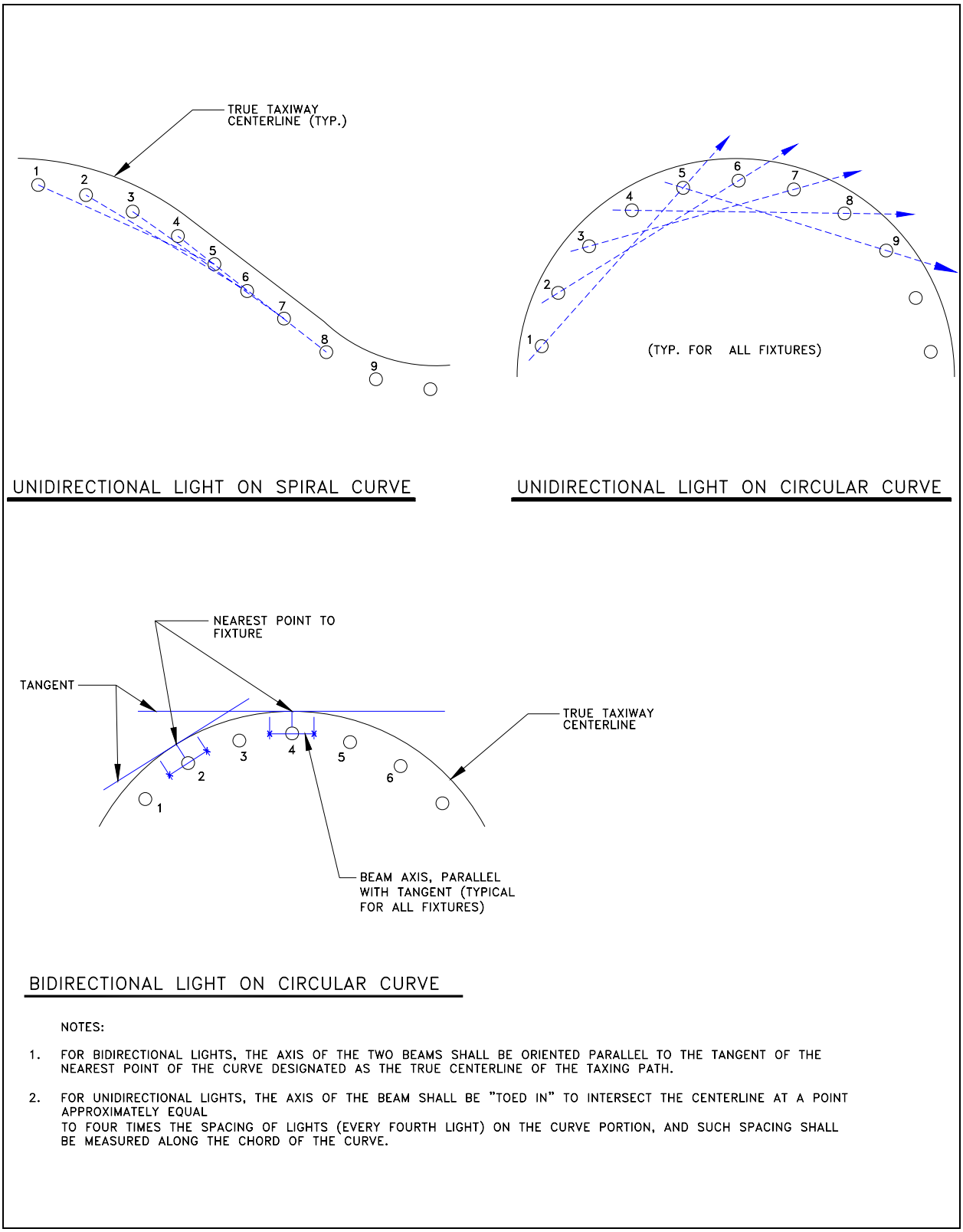


Figure 47. Typical Taxiway Centerline Lighting Configuration for Standard Fillets (Centerline light spacing for operations above 1,200 feet (365 m) RVR).



NOTES:

1. FOR BIDIRECTIONAL LIGHTS, THE AXIS OF THE TWO BEAMS SHALL BE ORIENTED PARALLEL TO THE TANGENT OF THE NEAREST POINT OF THE CURVE DESIGNATED AS THE TRUE CENTERLINE OF THE TAXING PATH.

2. FOR UNIDIRECTIONAL LIGHTS, THE AXIS OF THE BEAM SHALL BE "TOED IN" TO INTERSECT THE CENTERLINE AT A POINT APPROXIMATELY EQUAL TO FOUR TIMES THE SPACING OF LIGHTS (EVERY FOURTH LIGHT) ON THE CURVE PORTION, AND SUCH SPACING SHALL BE MEASURED ALONG THE CHORD OF THE CURVE.

Figure 48. Taxiway Centerline Light Beam Orientation.

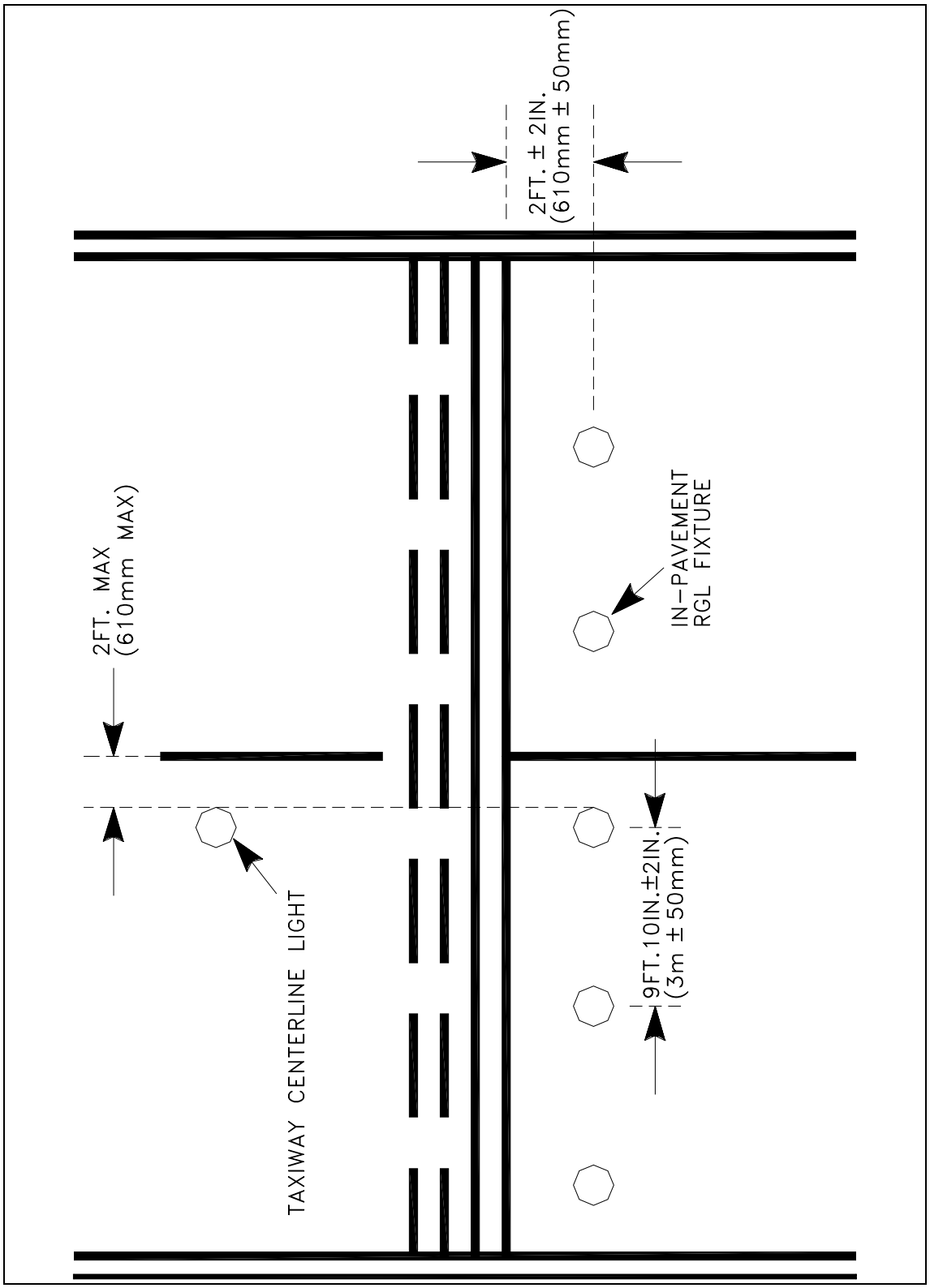


Figure 49. In-Pavement Runway Guard Light Configuration.

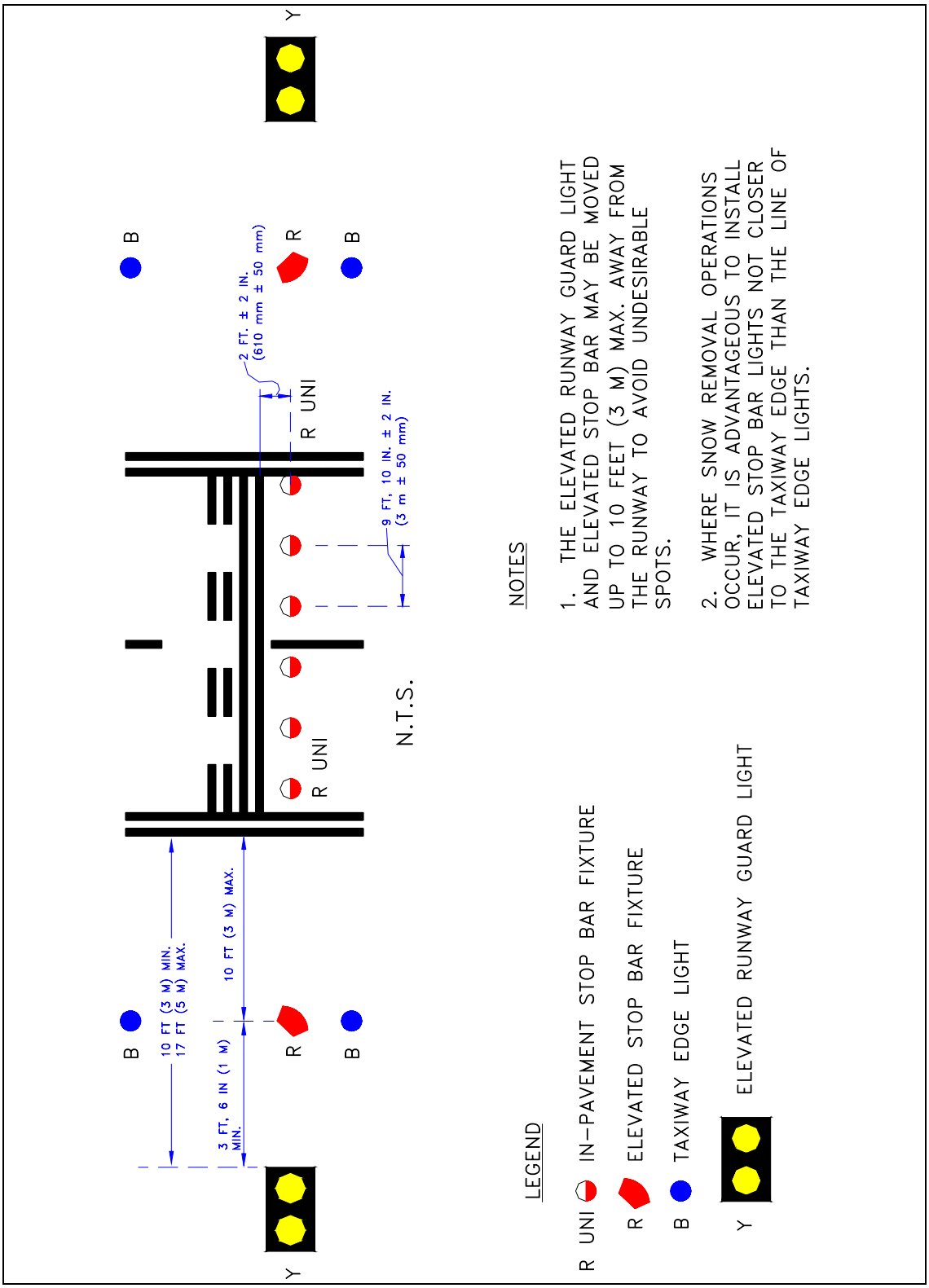


Figure 50. Elevated RGL and Stop Bar Configuration.

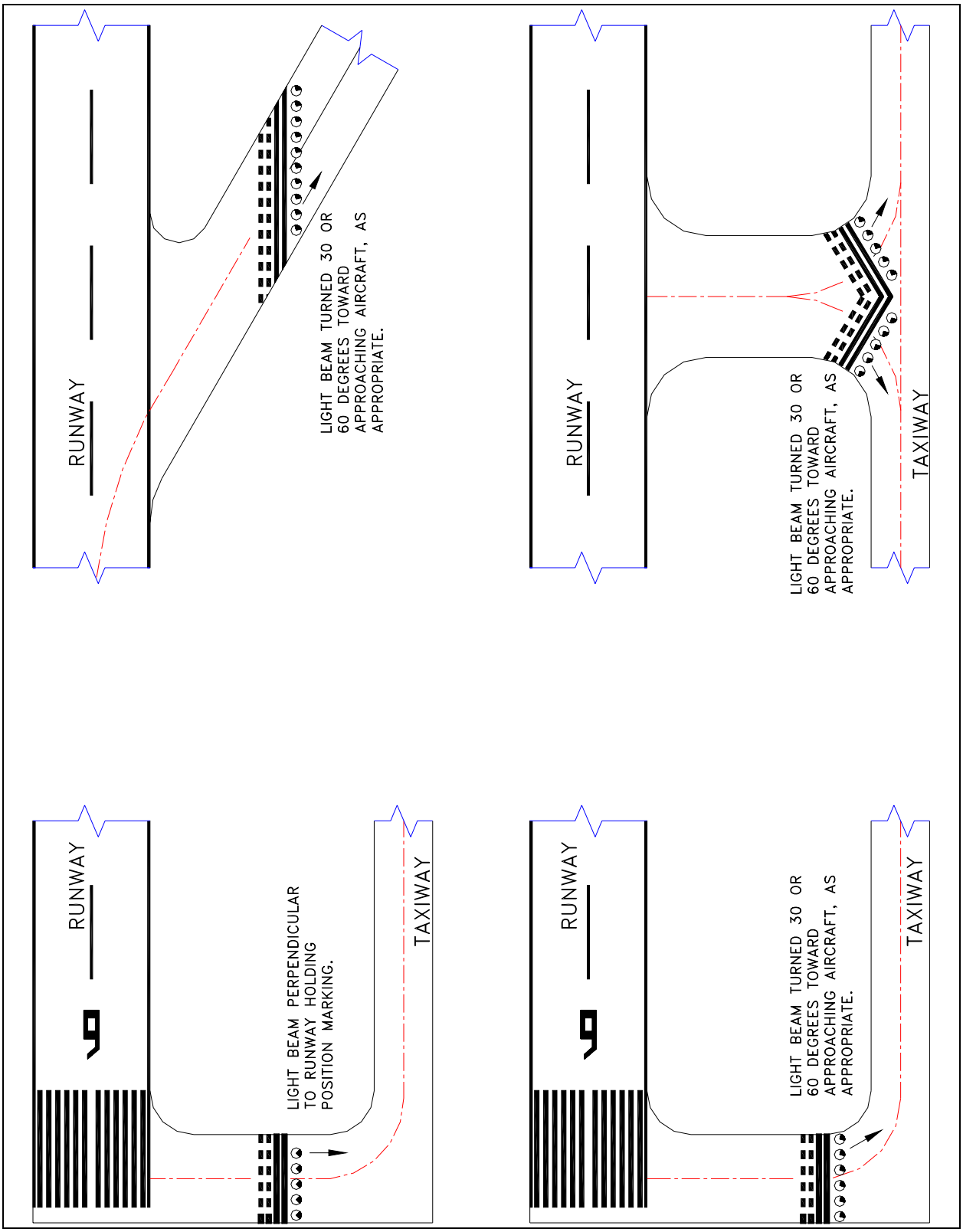


Figure 51. Typical Light Beam Orientation for In-Pavement RGLs and Stop Bars.

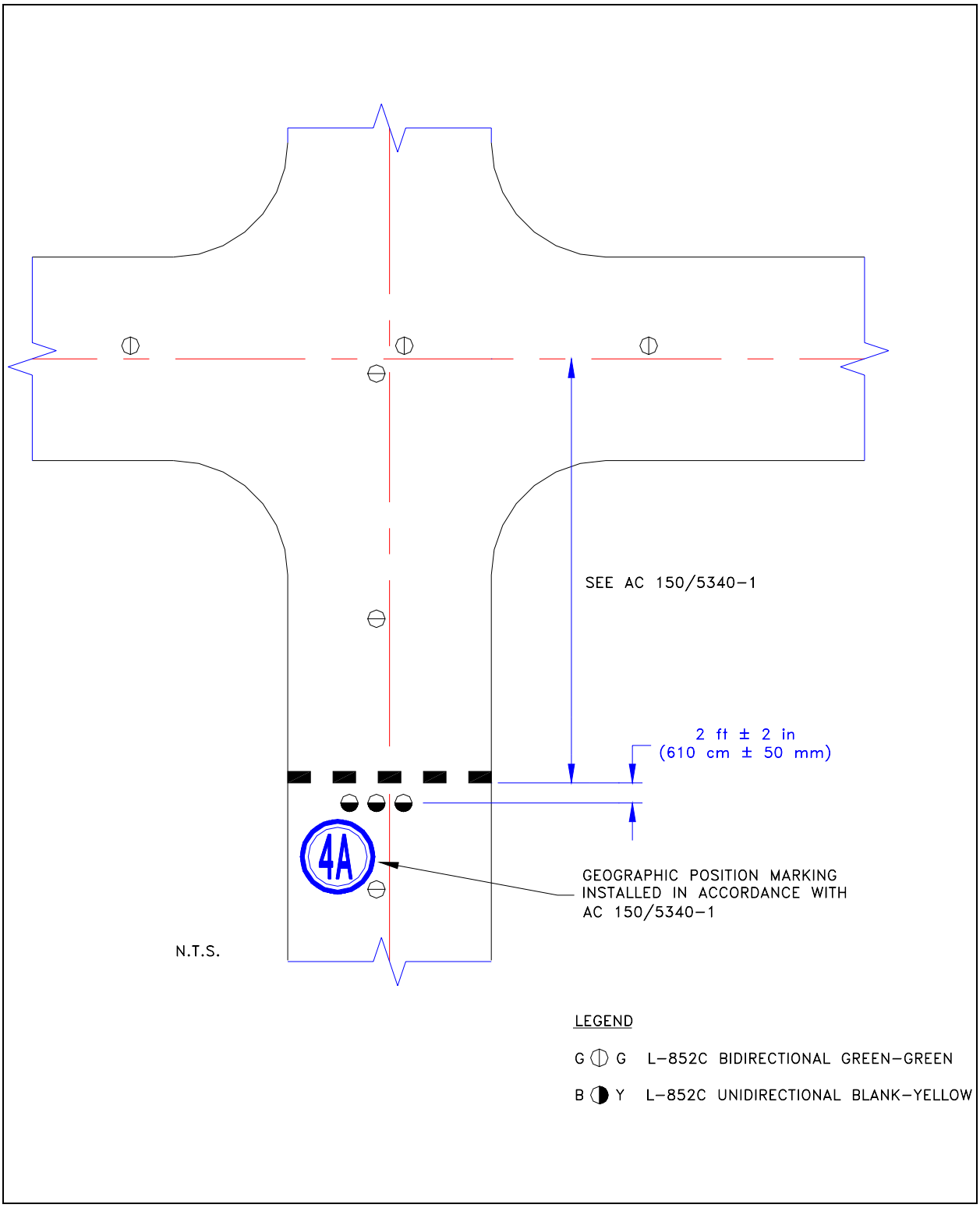


Figure 52. Clearance Bar Configuration at a Low Visibility Hold Point.

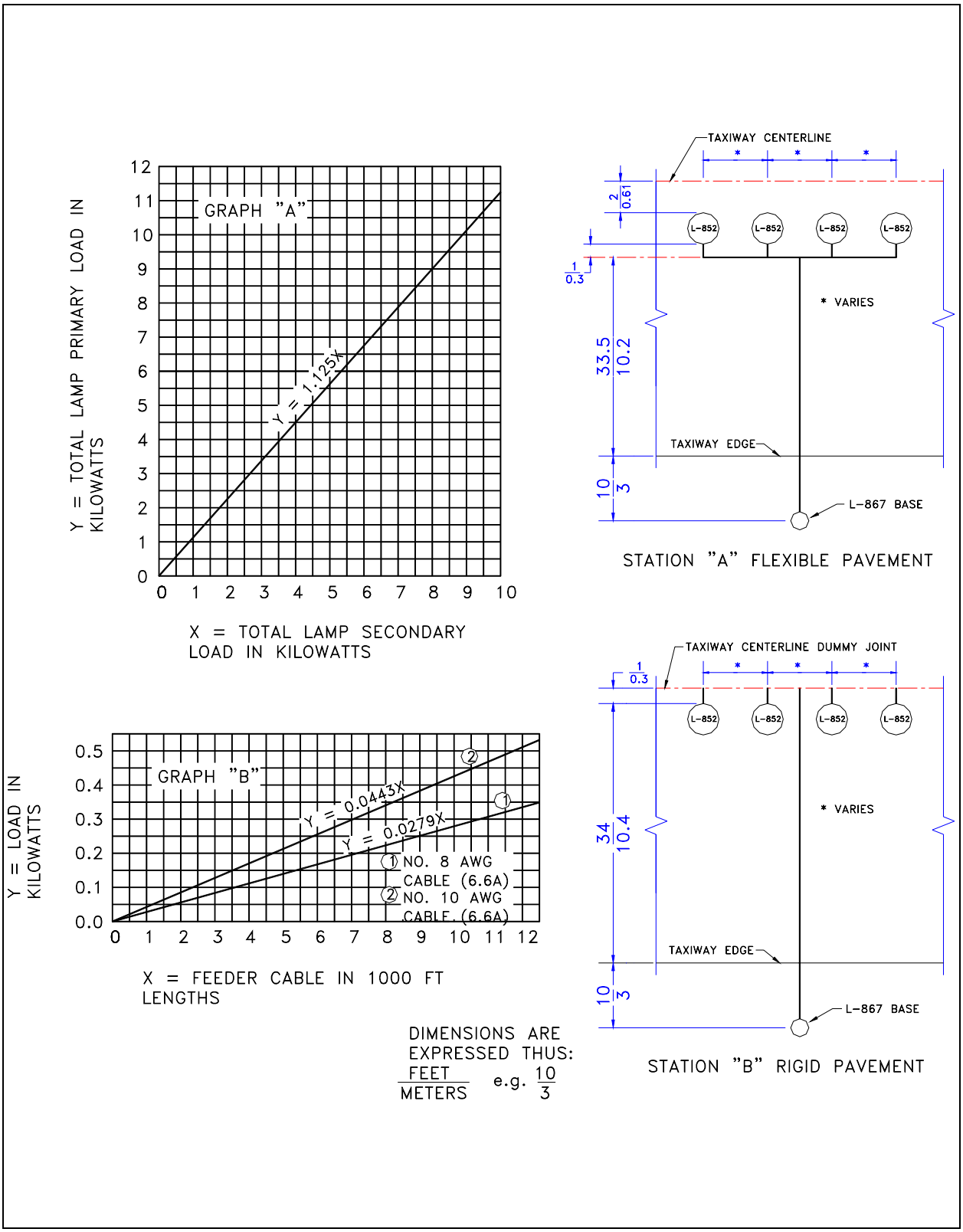
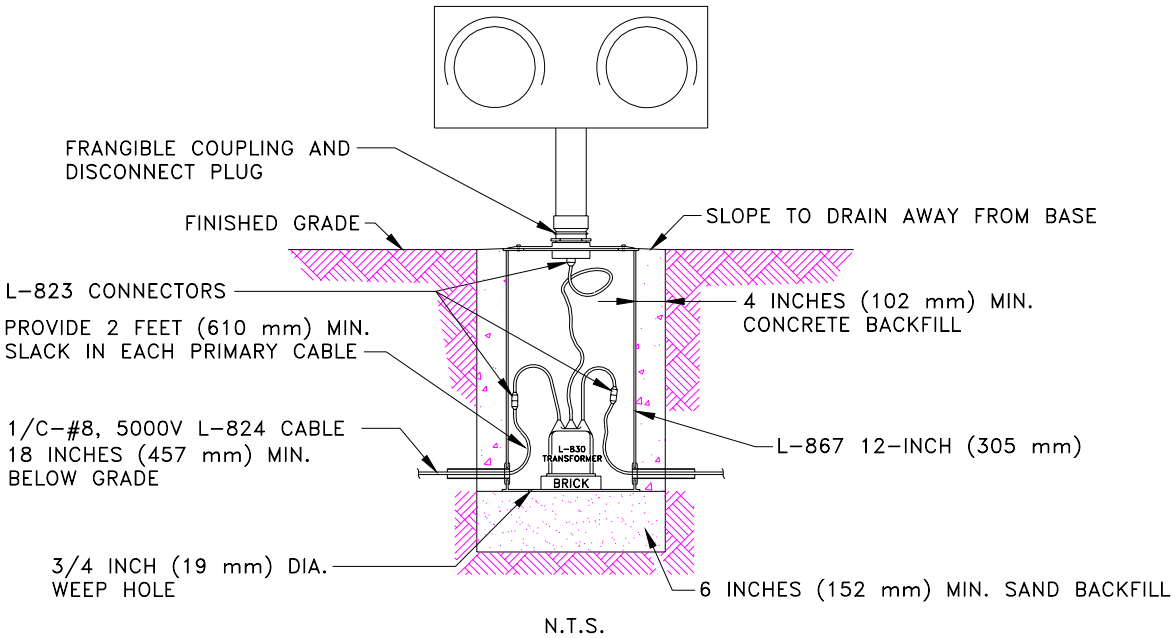


Figure 53. Curves for Estimating Primary Load for Taxiway Centerline Lighting Systems.



Notes:

1. Breaking-point frangible coupling should be located 3 inches max above grade.

Figure 54. Typical Elevated RGL Installation Details.

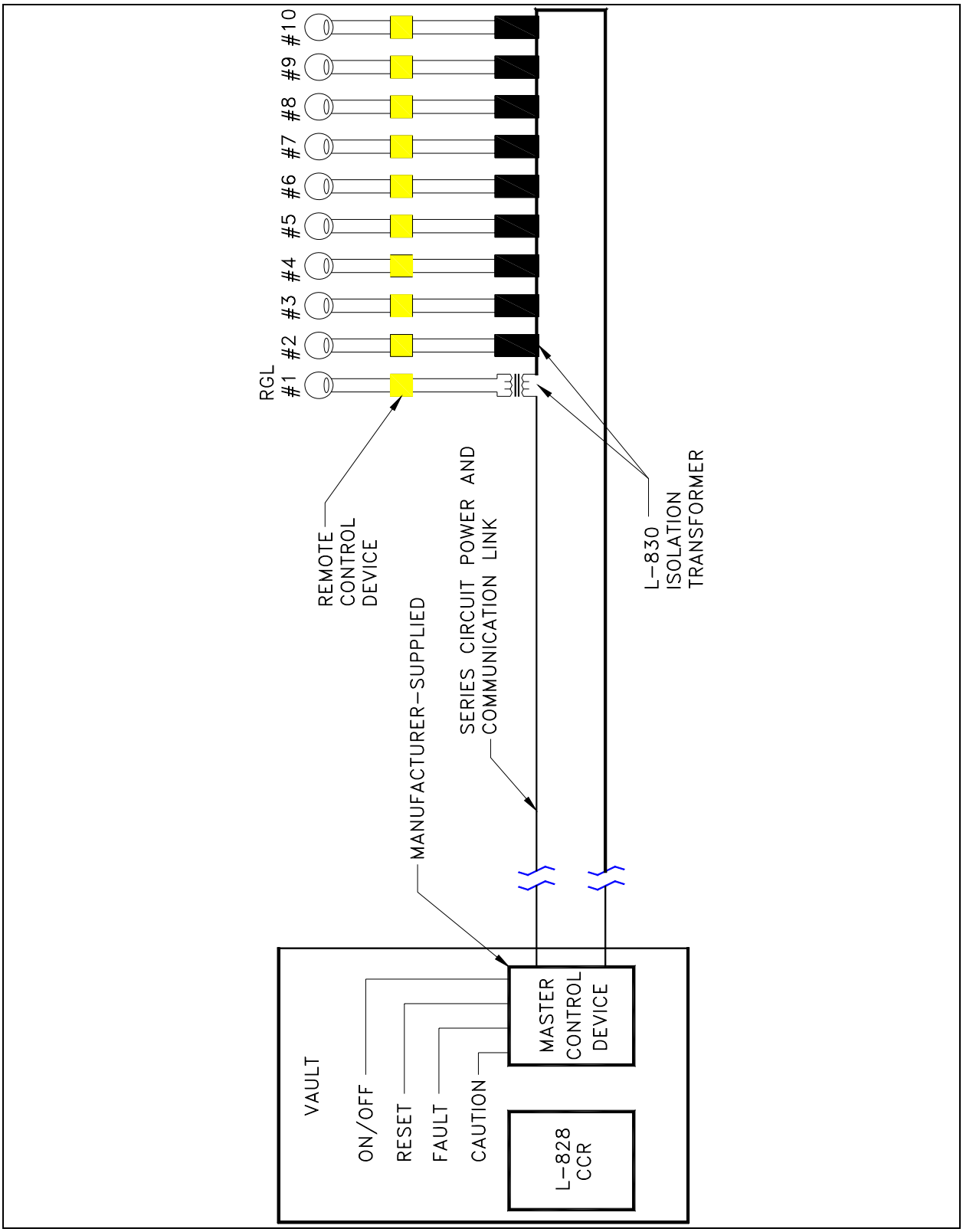


Figure 55. Typical In-Pavement RGL External Wiring Diagram – Power Line Carrier Communication, One Light Per Remote.

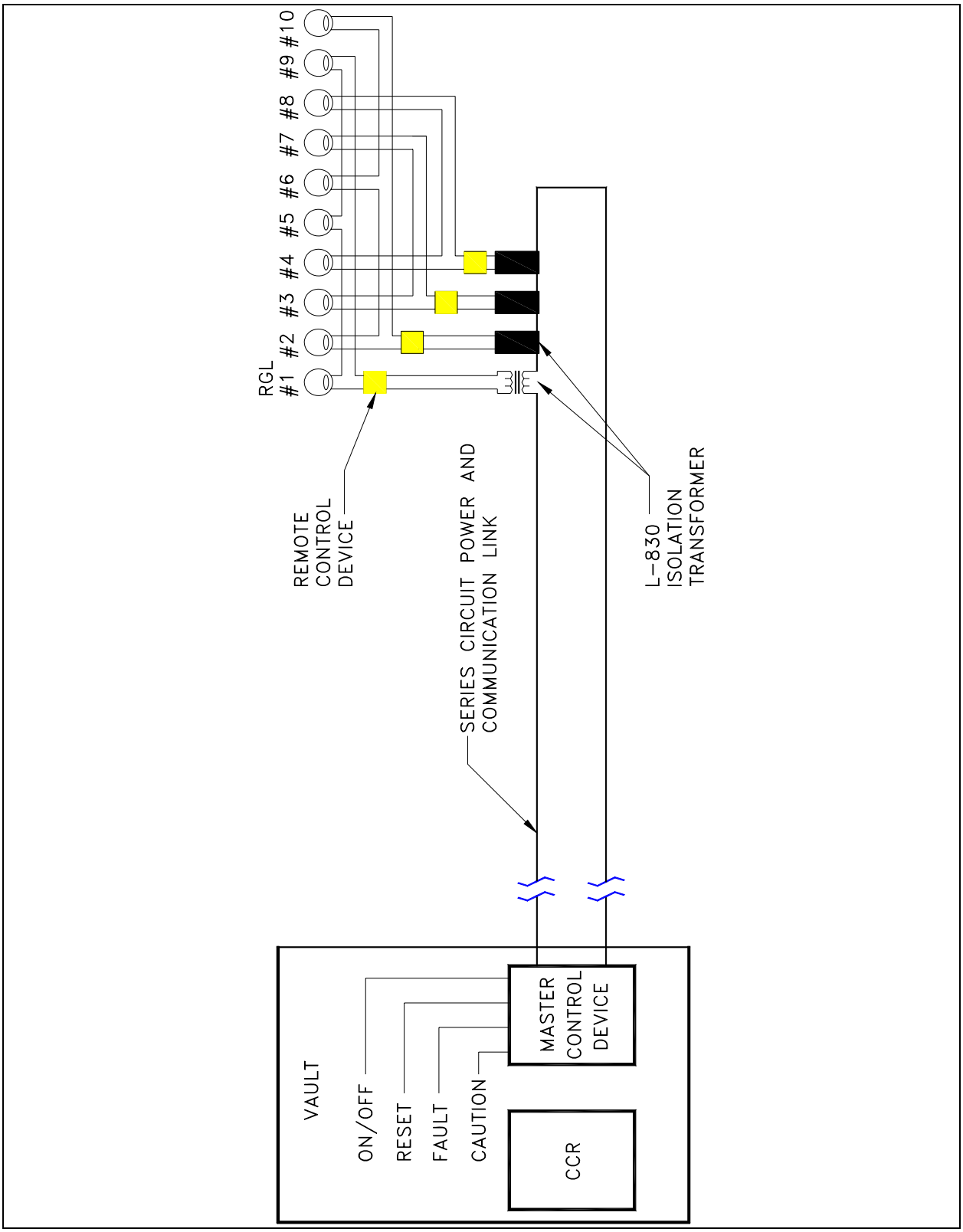


Figure 56. Typical In-Pavement RGL External Wiring Diagram – Power Line Carrier Communication, Multiple Lights per Remote.

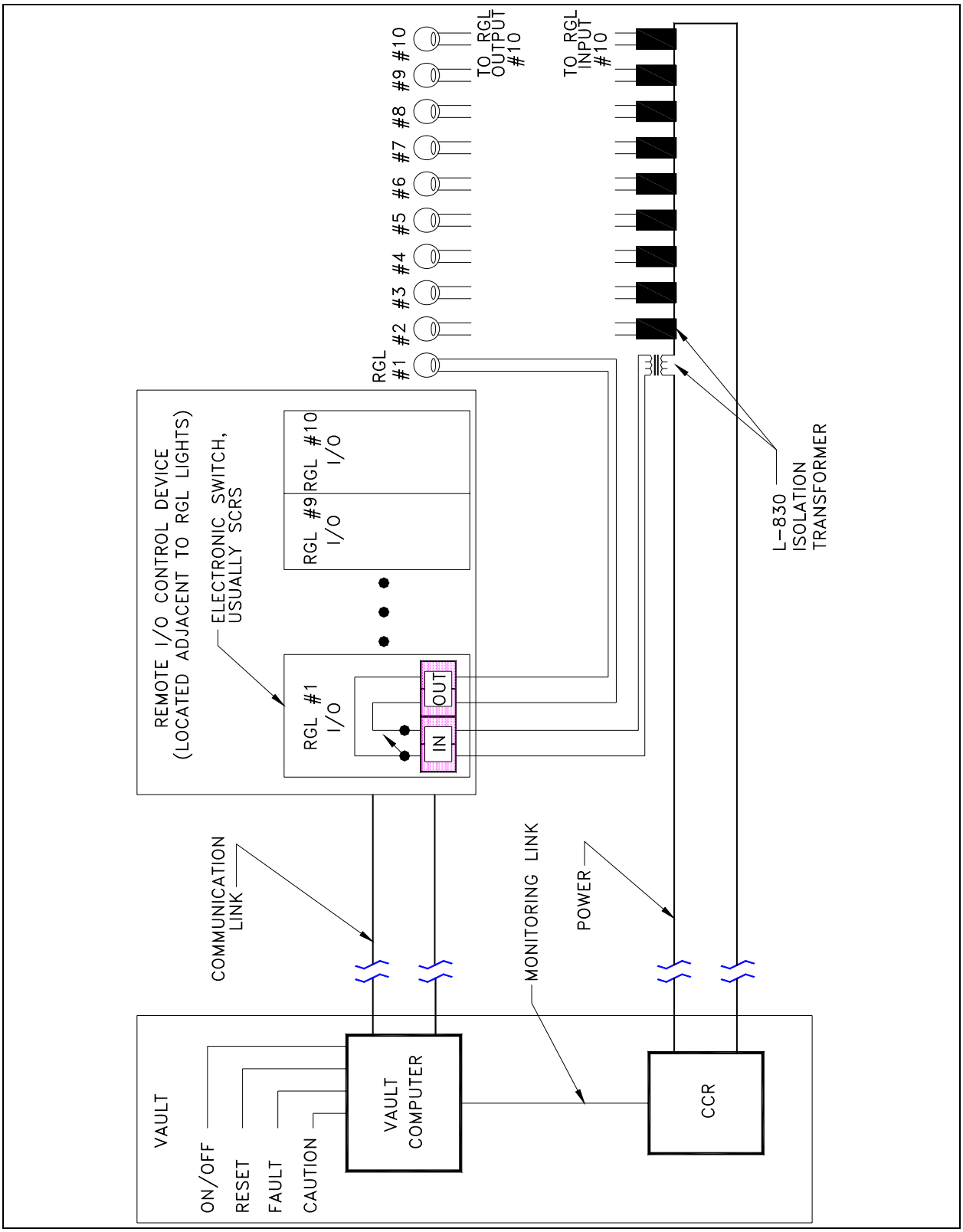


Figure 57. Typical In-Pavement RGL External Wiring Diagram – Dedicated Communication Link.