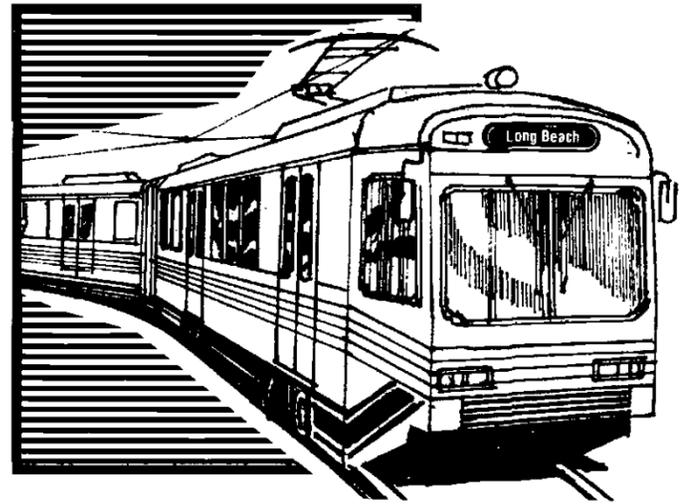


**RAIL
TRANSIT
DESIGN
CRITERIA &
STANDARDS**



JOAN VERTREES/RMC REFERENCE
MTA Construction
NO. 2310

- Volume VI
- Standard Drawings

Los Angeles County Metropolitan Transportation Authority





BASELINE STATUS REPORT: DIRECTIVE/STANDARD DRAWINGS

DRAWING NO.	REV.	DATE MODIFIED	DRAWING TITLE / Change Title	REMARKS
R92-DE306-02 STANDARD DRAWINGS: STRUCTURAL				
SS-000	0 1	02/21/94 10/10/94	STRUCTURAL STANDARD CUT AND COVER SUBWAY INDEX OF DRAWINGS Initial baseline issue Sbcn 12 revised, redrawn	
SS-001	0 1	02/21/94 10/10/94	STRUCTURAL STANDARD CUT AND COVER SUBWAY ABBREVIATIONS AND GENERAL STRUCTURAL NOTES Initial baseline issue Sbcn 12 revised, redrawn	
SS-002	0 1	02/21/94 10/10/94	STRUCTURAL STANDARD CUT AND COVER SUBWAY CONSTRUCTION STRUCTURES LOADS AND DESIGN CRITERIA Initial baseline issue Sbcn 12 revised, redrawn	
SS-003	0 1	02/21/94 10/10/94	STRUCTURAL STANDARD CUT AND COVER SUBWAY CONSTRUCTION STRUCTURES LATERAL PRESSURES CRITERIA Initial baseline issue Sbcn 12 revised, redrawn	
SS-004	0 1	02/21/94 10/10/94	CUT AND COVER SUBWAY CONSTRUCTION STRUCTURES TIE-BACK, SHEETING, BRACING, EXCAVATION AND VERTICAL SUPPORT CRITERIA Initial baseline issue Sbcn 12 revised, redrawn	
SS-005	0 1	02/21/94 10/10/94	STRUCTURAL STANDARD CUT AND COVER SUBWAY CONSTRUCTION STRUCTURES INSTRUMENTATION INSTALLATION Initial baseline issue Sbcn 12 revised, redrawn	
SS-006	0 1	02/21/94 10/10/94	STRUCTURAL STANDARD CUT AND COVER SUBWAY CONSTRUCTION STRUCTURES MISCELLANEOUS DETAILS Initial baseline issue Sbcn 12 revised, redrawn	
SS-007	0 1	02/21/94 10/10/94	STRUCTURAL STANDARD CUT AND COVER SUBWAY BOX STRUCTURES STANDARD DIMENSIONING AND NOTES Initial baseline issue Sbcn 12 revised, redrawn	
SS-008	0 1	02/21/94 10/10/94	STRUCTURAL STANDARD CUT AND COVER SUBWAY U-SECTION STRUCTURES STANDARD DIMENSIONING AND NOTES Initial baseline issue Sbcn 12 revised, redrawn	
SS-009	0 1	02/21/94 10/10/94	STRUCTURAL STANDARD CUT AND COVER SUBWAY ONE-CELL BOX WITH FIXED INVERT DIMENSIONS AND REINFORCEMENT Initial baseline issue Sbcn 12 revised, redrawn	
SS-010	0 1	02/21/94 10/10/94	STRUCTURAL STANDARD CUT AND COVER SUBWAY ONE-CELL BOX WITH FLOATING SLAB DIMENSIONS AND REINFORCEMENT Initial baseline issue Sbcn 12 revised, redrawn	
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SS-013	0 1	02/21/94 10/10/94	STRUCTURAL STANDARD CUT AND COVER SUBWAY TWO-CELL BOX WITH EXTERIOR WALKWAYS DIMENSIONS AND REINFORCEMENT Initial baseline issue Sbcn 12 revised, redrawn	
SS-014	0 1	02/21/94 10/10/94	STRUCTURAL STANDARD CUT AND COVER SUBWAY THREE-CELL BOX WITH INTERIOR WALKWAYS DIMENSIONS AND REINFORCEMENT Initial baseline issue Sbcn 12 revised, redrawn	
SS-015	0	02/21/94	STRUCTURAL STANDARD CUT AND COVER SUBWAY TYPICAL FIXED INVERT AND SERVICE WALKWAY DETAILS Initial baseline issue	

BASELINE STATUS REPORT: DIRECTIVE/STANDARD DRAWINGS

DRAWING NO.	REV.	DATE MODIFIED	DRAWING TITLE / Change Title	REMARKS
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SS-015	1	10/10/94	Sbcn 12 revised, redrawn	
SS-016	0 1	02/21/94 10/10/94	STRUCTURAL STANDAND CUT AND COVER SUBWAY FLOATING SLAB INVERT INVERT PLAN AND LONGITUDINAL SECTION Initial baseline issue Sbcn 12 revised, redrawn	
SS-017	0 1	02/21/94 10/10/94	STRUCTURAL STANDAND CUT AND COVER SUBWAY FLOATING SLAB DETAILS TUNNEL-CUT & COVER SPECIAL TRACK STRUCTURE INTERFACE Initial baseline issue Sbcn 12 revised, redrawn	
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SS-019	0 1	02/21/94 10/10/94	STRUCTURAL STANDAND CUT AND COVER SUBWAY JOINTS AND REINFORCEMENT DETAILS FOR CONCRETE STRUCTURES Initial baseline issue Sbcn 12 revised, redrawn	
SS-020	0 1	02/21/94 10/10/94	STRUCTURAL STANDAND CUT AND COVER SUBWAY WATERPROOFING DETAILS Initial baseline issue Sbcn 12 revised, redrawn	
SS-021	0 1	02/21/94 10/10/94	STRUCTURAL STANDAND CUT AND COVER SUBWAY PLATFORM & UNDERPLATFORM SECTIONS AND DETAILS Initial baseline issue Sbcn 12 revised, redrawn	
SS-023	0 1	02/21/94 10/10/94	STRUCTURAL STANDAND CUT AND COVER SUBWAY RAILING AND HANDRAIL DETAILS SHEET 1 OF 2 Initial baseline issue Sbcn 12 revised, redrawn	
SS-024	0 1	02/21/94 10/10/94	STRUCTURAL STANDAND CUT AND COVER SUBWAY RAILING AND HANDRAIL DETAILS SHEET 2 OF 2 Initial baseline issue Sbcn 12 revised, redrawn	
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SS-030	0 1	02/21/94 10/10/94	STRUCTURAL STANDAND CUT AND COVER SUBWAY NOISE AND VIBRATION CONTROL Initial baseline issue Sbcn 12 revised, redrawn	
SS-031	0 1	02/21/94 10/10/94	STRUCTURAL STANDAND CUT AND COVER SUBWAY TRACK INVERT SECTIONS AND COLLECTOR GRID PLAN AT CROSSOVER AND POCKET TRACK Initial baseline issue Sbcn 12 revised, redrawn	
SS-032	0 1	02/21/94 10/10/94	STRUCTURAL STANDAND CUT AND COVER SUBWAY TRACK INVERT SECTIONS AT CROSSOVER AND POCKET TRACK Initial baseline issue Sbcn 12 revised, redrawn	
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BASELINE STATUS REPORT: DIRECTIVE/STANDARD DRAWINGS

DRAWING ND.	REV.	DATE MODIFIED	DRAWING TITLE / Change Title	REMARKS
R92-DE306-Q2 STANDARD DRAWINGS: STRUCTURAL				
SS-033	0 1	02/21/94 10/10/94	Initial baseline issue Sbcn 12 revised, redrawn	
SS-034	0 1	02/21/94 10/10/94	STRUCTURAL STANDAND CUT AND COVER SUBWAY CONCRETE UNIT MASONRY WALLS Initial baseline issue Sbcn 12 revised, redrawn	
SS-035	0 1	02/21/94 10/10/94	STRUCTURAL STANDAND CUT AND COVER SUBWAY INTERIOR REINFORCED CONCRETE WALLS Initial baseline issue Sbcn 12 revised, redrawn	
SS-036	0 1	02/21/94 10/10/94	STRUCTURAL STANDAND CUT AND CDVER SUBWAY IMPERVIOUS HIGH DENSITY POLYETHYLENE MEMBRANE DETAILS SHEET 1 OF 2 Initial baseline issue Sbcn 12 revised, redrawn	
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SS-038	0 1	02/21/94 10/10/94	STRUCTURAL STANDAND CUT AND COVER SUBWAY MEZZANINE TO PLATFORM REINFORCED CONCRETE STAIR DETAILS AND SUPPORTS Initial baseline issue Sbcn 12 revised, redrawn	

DRAWING NUMBER

DRAWING TITLE

GENERAL

SS-000

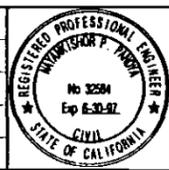
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REV	DATE	BY	CHK	APP	DESCRIPTION
0	22194				SBGN 12 REVISED, REDRAWN BASELINE ISSUE

DESIGNED BY
E. JANISZEWSKI
 DRAWN BY
E. JANISZEWSKI
 CHECKED BY
N. PANDYA
 IN CHARGE
N. PANDYA
 DATE
21 FEB 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

ENGINEERING MANAGEMENT CONSULTANT

REGISTERED PROFESSIONAL ENGINEER
 No. 32594
 Exp. 6-30-97
 CIVIL
 STATE OF CALIFORNIA

SUBMITTED **N.P. PANDYA**
 APPROVED **K.N. MURTHY**

**STRUCTURAL STANDARD
 CUT AND COVER SUBWAY
 INDEX OF DRAWINGS**

CONTRACT NO.	
DRAWING NO.	SS-000
SCALE	NO SCALE
SHEET NO.	

FILED BY: [unreadable]

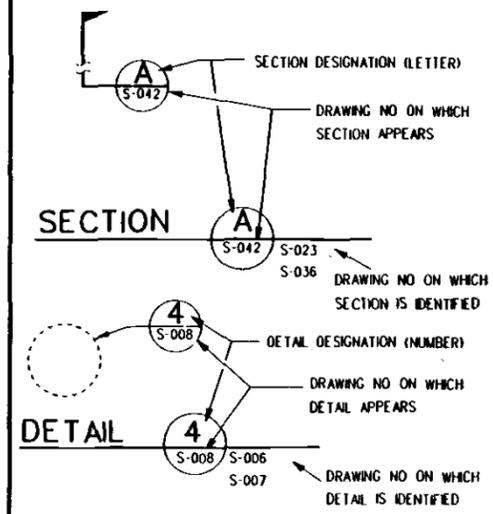
ABBREVIATIONS

ABUT ABUTMENT AL1 ALTERNATE APPROX APPROXIMATE ARCH ARCHITECTURE AUX AUXILIARY AVE AVENUE ABT ABOUT ADD'L ADDITIONAL AWG AMERICAN WIRE GAGE ASTM AMERICAN SOCIETY FOR TESTING AND MATERIALS BAL BALANCE BKF BACKFILL BRG BEARING BP BEARING PILE BM BENCH MARK BH BORE HOLE BF BOTH FACES BOT BOTTOM BLVD BOULEVARD BLOC BUILDING BL BUILDING LINE BM BEAM BTW BETWEEN BC BARE COPPER BRS BLAST RELIEF SHAFT BLS BLUE LIGHT SWITCH / STATION CIP CAST IN PLACE CL CENTER LINE C TO C CENTER TO CENTER CGS CENTER OF GRAVITY OF PRESTRESSING STEEL CLR OR CL CLEARANCE OR CLEAR COL COLUMN CONC CONCRETE CONST CONSTRUCTION CJ CONSTRUCTION JOINT CONT CONTINUOUS CR CARD READER DL DEAD LOAD DEG OR ° DEGREE DEPT DEPARTMENT DET DETAIL DIAG DIAGONAL DIA OR Ø DIAMETER DIAPH DIAPHRAGM DIM DIMENSION DN DOWN OI DRAIN INLET DWG DRAWING EA EACH EF EACH FACE EW EACH WAY E EAST ELECT ELECTRICAL EL OR ELEV ELEVATION EQ EQUAL ESC ESCALATOR EXC EXCAVATE OR EXCAVATION EXIST EXISTING EXP EXPANSION EQUIP EQUIPMENT	ES EACH SIDE ETS EMERGENCY TRIP STATION EMP EMERGENCY MANAGEMENT PANEL ETEL EMERGENCY TELEPHONE F TO F FACE TO FACE FS FAR SIDE OR FEDERAL SPECIFICATIONS FF FAR FACE FT OR (') FEET OR FOOT FIN FINISH FL FLOOR FD FLOOR DRAIN FTG FOOTING FAI FRESH AIR INTAKE FHC FIRE HOSE CABINET GA GAGE OR GAUGE GALV GALVANIZED GEN GENERAL GRO GROUND HH HANDHOLE HT HEIGHT HS BOLT HIGH STRENGTH BOLT HORIZ HORIZONTAL HP HIGH POINT HDPE HIGH DENSITY POLYETHYLENE MEMBRANE IN OR (") INCHES OR INCH INCL INCLUSIVE, INCLUDING ID INSIDE DIAMETER IF INSIDE FACE IR INSIDE RADIUS INV INVERT JT JOINT K KIP OR KIPS KF KIP FOOT KSF KIPS PER SQ. FOOT KSI KIPS PER SQ. INCH KLF KIPS PER LINEAR FOOT KOP KNOCK-OUT PANEL LP LOW POINT LT LEFT LH LEFT HAND L LENGTH OR ANGLE LIN LINEAR, LINEAL LL LIVE LOAD LLV LONG LEG VERTICAL LLH LONG LEG HORIZONTAL LONGIT LONGITUDINAL MH MANHOLE MAX MAXIMUM MECH MECHANICAL MEZZ MEZZANINE MIN MINIMUM (') MINUTE MSC MISCELLANEOUS	NF NEAT FACE NS NEAR SIDE NOM NOMINAL N NORTH NC NOT IN CONTRACT NTS NOT TO SCALE NO NUMBER # NUMBER (REBAR SIZE) OC ON CENTER OPP OPPOSITE OPP HD OPPOSITE HAND O TO O OUT TO OUT OD OUTSIDE DIAMETER OF OUTSIDE FACE OPNG OPENING PC PRECAST PL OR R PLATE PVC POLYVINYL CHLORIDE LB OR LBS POUND OR POUNDS PCF POUNDS PER CUBIC FOOT PSF POUNDS PER SQUARE FOOT PSI POUNDS PER SQUARE INCH P/S PRESTRESSED PL OR P/L PROPERTY LINE PLATF PLATFORM PROJ PROJECTION R OR RAD RADIUS # REBAR SIZE (NUMBER) REF REFERENCE REINF REINFORCING OR REINFORCEMENT REQ'D REQUIRED REV REVISION OR REVISE RT RIGHT RH RIGHT HAND R/W RIGHT-OF-WAY RD ROAD SEC OR (") SECOND SECT SECTION SH1 SHEET SIM SIMILAR SPIC SOLDIER-PILE-TREME-CONCRETE S SOUTH SPEC SPECIFICATION SQ SQUARE SQ FT OR SF SQUARE FOOT SQ IN OR SI SQUARE INCH STD STANDARD STA STATION (ALIGNMENT) STIFF STIFFENER STR STIRRUP ST STREET STRUCT STRUCTURAL OR STRUCTURE SYM SYMMETRICAL SCHED SCHEDULE STL STEEL SPA SPACES	TAN TANGENT TEMP TEMPORARY T&B TOP & BOTTOM T/C TOP OF CONCRETE T/R TOP OF RAIL TOS TOP OF STEEL TOW TOP OF WALL TYP TYPICAL TPSS TRACTION POWER SUBSTATION TC&C TRAIN CONTROL AND COMMUNICATION TW TREAD WIDTH UNO UNLESS OTHERWISE NOTED UPE UNDER PLATFORM EXHAUST UNO UNLESS NOTED OTHERWISE VENT VENTILATION VERT VERTICAL WT WATER TABLE WWF WELDED WIRE FABRIC W WEST WD WIDTH WL WIND LOAD W/ WITH W/O WITHOUT WP WORK POINT
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GENERAL STRUCTURAL NOTES

1. ALL STRUCTURAL DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE SPECIFICATIONS AND ALL OTHER DRAWINGS RELATED TO THE WORK
2. EMBEDDED ITEMS SUCH AS PIPES, INSERTS, SLEEVES AND CONDUITS, AND ANY RECESSES OR OPENINGS REQUIRED FOR UTILITY, ARCHITECTURAL, MECHANICAL AND ELECTRICAL INSTALLATIONS ARE NOT SHOWN ON THE STRUCTURAL DRAWINGS. CONTRACTOR TO REFER TO THE UTILITY, ARCHITECTURAL, MECHANICAL AND ELECTRICAL DRAWINGS FOR THE LOCATIONS AND DETAILS OF THESE ITEMS.
3. THE VERTICAL CONTROL OF ALL TRACK STRUCTURES IS BASED ON ELEVATION OF TOP OF RAIL. TOP OF RAIL SHALL MEAN TOP OF LOW RAIL IN SUPERELEVATED SECTIONS.
4. UNLESS SHOWN DIFFERENTLY ON THE DRAWINGS, WHERE TWO OR MORE TRACKS ARE HOUSED IN ONE STRUCTURE, THE HIGH TOP OF RAIL DETERMINES THE COMMON SOFFIT, WHILE THE LOW TOP OF RAIL DETERMINES THE BOTTOM OF THE GRADE SLAB.
5. THE CONTRACTOR'S ATTENTION IS DRAWN TO AREAS OF SAG VERTICAL CURVES. IN SUCH AREAS CAUTION SHOULD BE EXERCISED THAT THE DIMENSION FROM THE TOP OF RAIL TO INVERT CONCRETE OF TRACKWAY IS NEVER LESS THAN THAT SHOWN FOR INVERT DETAILS.
6. HORIZONTAL CONTROL FOR TRACK STRUCTURES IS BASED ON THE VEHICLE CLEARANCE REQUIREMENTS FOR SUBWAY SECTIONS. CONTRACTOR SHALL EXERCISE ALL NECESSARY CARE TO ASSURE THAT THE SUBWAY STRUCTURES ARE CONSTRUCTED TO INDICATED ALIGNMENT AND WITHIN THE SPECIFIED TOLERANCES.
7. THE CONTRACT DRAWINGS SHOW ONLY THE MINIMUM DESIGN REQUIREMENTS FOR THE LOCATIONS AND EXTENT OF CONSTRUCTION JOINTS. THE CONTRACTOR MAY ELECT TO CHANGE THE LOCATION OF THE JOINTS OR TO USE A GREATER OR LESSER NUMBER OF JOINTS WITHIN PERMISSIBLE LIMITS. SUCH CHANGES SHALL BE SUBJECT TO THE APPROVAL OF THE AUTHORITY OR ITS DESIGNEE.
8. ALL CONSTRUCTION JOINTS MADE IN EXTERIOR WALLS OR SLABS OF CUT-AND-COVER STRUCTURES, INCLUDING U-SECTION, SHALL CONTAIN WATERSTOPS, AS SPECIFIED, AND SHALL HAVE REINFORCEMENT CONTINUOUS ACROSS THE JOINTS.
9. ALL WATERSTOPS SHALL BE INSTALLED SECURELY IN ACCORDANCE WITH THE SPECIFICATIONS. THE WATERSTOPS SHALL BE PLACED CONTINUOUSLY THROUGHOUT THE LENGTH OF THE CONSTRUCTION JOINT. LAPPING OF WATERSTOPS SHALL NOT BE PERMITTED. SPLICING SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.
10. TRANSVERSE REINFORCEMENT IN LINE STRUCTURES ALONG A CURVE SHALL BE RADIAL.
11. UNLESS OTHERWISE NOTED, CONCRETE SURFACES LEADING TO DRAINS SHALL BE SLOPED A MINIMUM OF 1/8 INCH PER FOOT TOWARD DRAIN AND THE ADJACENT SURFACES WARPED AS REQUIRED TO SATISFY AN ADEQUATE DRAINAGE FLOW.
12. ALL EXPOSED CONCRETE EDGES AND CORNERS SHALL BE CHAMFERED WITH A 3/4 INCH TIMES 45 DEGREE CHAMFER, UNLESS NOTED OTHERWISE.
13. UNLESS OTHERWISE NOTED ON THE DRAWINGS, OR SPECIFIED, ALL STRUCTURAL CONCRETE SHALL BE CLASS 4000.
14. UNLESS OTHERWISE NOTED, CONCRETE FOR CROSSWALKS AND SERVICE WALKWAYS SHALL BE CLASS 2500.
15. REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60, UNLESS OTHERWISE SPECIFIED.
16. ALL STRUCTURAL STEEL, UNLESS OTHERWISE NOTED, SHALL CONFORM TO ASTM A36.
17. ALL STRUCTURAL BOLTS SHALL CONFORM TO ASTM A325, UNLESS OTHERWISE SPECIFIED.
18. THE STRUCTURAL DESIGN IS BASED ON THE STRUCTURAL CRITERIA, SECTION 5 OF THE DESIGN CRITERIA ADOPTED FOR THE LOS ANGELES METRO RAIL PROJECT, AND SUPPLEMENTAL CRITERIA FOR SEISMIC DESIGN OF UNDERGROUND STRUCTURES.
19. WHERE STATION FLOOR SLOPES, ALL CONC WALL OPENINGS AT DOORS, LOUVERS ETC TO BE PLUMB. ALL BEAMS AND SLABS TO BE PARALLEL TO SLOPE. ALL COLUMNS AND PILASTERS TO BE PLUMB.

SECTIONS & DETAILS



REV	DATE	BY	SUB	APP	DESCRIPTION

DESIGNED BY
W. J. ARMENTO

DRAWN BY
E. JANSZEWSKI

CHECKED BY
N. PANDYA

IN CHARGE
N. PANDYA

DATE
21 FEB 94



M LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

ENGINEERING MANAGEMENT CONSULTANT

Submitted: **N. P. PANDYA**

Approved: **K. N. MURTHY**

**STRUCTURAL STANDARD
CUT AND COVER SUBWAY
ABBREVIATIONS AND
GENERAL STRUCTURAL NOTES**

CONTRACT NO.	
DRAWING NO.	SS-001
REV	1
SCALE	NO SCALE
SHEET NO.	

DESIGN LOADS					GENERAL NOTES FOR ANALYSIS AND DESIGN		
STRUCTURE	DEAD LOADS (D)	LIVE LOADS (L) AND OTHER LOADS		EARTHQUAKE LOADS (EQ)	LOADING COMBINATIONS		
		VERTICAL	HORIZONTAL				
STREET AND SIDEWALK DECKING	DECK ELEMENTS e.g. DECKING AND HORIZONTAL SUPPORTING FRAMEWORK.	OWN WEIGHT	VEHICLE LOADS: 1. BASIC LOADING (L) HS 20-44* APPLICABLE REFERENCES ARTICLES 3.6, 3.7 * 2. IMPACT (I) ARTICLE 3.8 * 3. APPLICATION OF LIVE LOAD PER ARTICLE 3.11 "REDUCTION IN LOAD INTENSITY" DOES NOT APPLY. OPERATING LOADS FROM CONSTRUCTION EQUIPMENT (L) AS REQUIRED BY CONTRACTOR. SIDEWALK AND PEDESTRIAN ISLAND LOADS (L) 900 PSF (OR VEHICLE LOADS WHICHEVER ARE GREATER).	LONGITUDINAL FORCES (LF) * ARTICLE 3.9 WIND LOADS (W) 20 PSF ON EXPOSED AREA OF VEHICLES AND EQUIPMENT BUT NOT LESS THAN 100 LBS. PER LINEAR FOOT OF DECK STRUCTURE APPLIED NORMAL TO THE DIRECTION IN WHICH LENGTH IS MEASURED LATERAL LOADS (E) AND (A) DUE TO EARTH PRESSURE AND HYDROSTATIC PRESSURE, WHERE APPLICABLE. (SEE SUPPORT OF EXCAVATION BELOW)	1. HORIZONTAL FORCE ON EACH ELEMENT OF 10% OF ITS WEIGHT APPLIED AT ITS CENTER OF GRAVITY IN ANY DIRECTION. 2. ADDITIONAL HORIZONTAL LOAD ON ANY ELEMENT OF EITHER 10 LBS. PER SQ. FT. ON CONTRIBUTORY DECK AREA OR A SINGLE CONCENTRATED LOAD OF 1000 LBS., WHICHEVER IS MORE SEVERE. THIS LOAD IS APPLIED AT THE SURFACE OF THE DECK IN ANY DIRECTION.	GROUP I D+L+1+E+A AT 100% OF BASIC UNIT STRESS GROUP II D+L+1+L.F+W+E+A AT 125% OF BASIC UNIT STRESS GROUP III D+L+E+A+EQ AT 133% OF BASIC UNIT STRESS NOTE: THE VALUE OF (L) IS THE MAXIMUM TOTAL LIVE LOAD OBTAINED BY COMBINING THE VARIOUS LIVE LOADS THAT MIGHT EXIST AT ANY ONE TIME.	<p>1. BASIC UNIT STRESSES FOR THE WORKING STRESS DESIGN OF SUPPORT OF EXCAVATION STRUCTURES SHALL BE TAKEN FROM THE FOLLOWING REFERENCES:</p> <p>STRUCTURAL STEEL - "SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS", OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) MANUAL OF STEEL CONSTRUCTION, ALLOWABLE STRESS DESIGN, NINTH EDITION, A36 STEEL.</p> <p>REINFORCED CONCRETE - "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318-89) CLASS 4,000.</p> <p>TIMBER - "UNIFORM BUILDING CODE" (UBC) 1991 EDITION, CHAPTER 25</p> <p>2. METHODS OF ANALYSIS AND FORMULAS FOR DESIGN OF ROADWAY DECK STRUCTURES SHALL BE TAKEN FROM THE BRIDGE DESIGN SPECIFICATIONS BY CALTRANS, 1992 EXCEPT AS SUPPLEMENTED OR MODIFIED BELOW. USE WORKING STRESS DESIGN.</p> <p>3. DECK BEAMS AND GIRDERS SHALL BE BRACED LATERALLY BY CROSSFRAMES OR DIAPHRAGMS SPACED NOT MORE THAN 25 FEET APART.</p> <p>4. ROADWAY DECK GIRDERS WITH CLEAR SPANS GREATER THAN 40 FEET SHALL BE BRACED IN THE HORIZONTAL PLANE OF THE UPPER CHORD OR FLANGE TO RESIST LONGITUDINAL FORCES.</p> <p>5. METHODS OF ANALYSIS OF SUPPORT OF EXCAVATION STRUCTURES SHALL CONFORM TO GOOD FOUNDATION ENGINEERING PRACTICE AND DESIGN OF THESE STRUCTURES SHALL BE CARRIED OUT ACCORDING TO THE "AISC", "ACI" AND UBC SPECIFICATIONS REFERENCED ABOVE.</p> <p>6. SUPPORT OF EXCAVATION STRUCTURES SHALL BE ANALYZED FOR ALL CONDITIONS THAT MIGHT OCCUR DURING THE VARIOUS STAGES OF CONSTRUCTION. AMONG OTHERS, THESE CONDITIONS INCLUDE: INSTALLATION, RELOCATION AND REMOVAL OF BRACING; SOIL REMOVAL AND DEWATERING OF EXCAVATION; CONCRETING OF EXCAVATION BOTTOM.</p> <p>7. WHERE THE LATERAL LOADING CONDITIONS ON OPPOSITE SIDES OF A CUT ARE NOT EQUAL AND CROSS-LOT BRACING IS USED, THE DESIGN OF SHEETING AND BRACING SHALL BE FOR THE LARGER LOADING.</p> <p>8. ELEMENTS SUPPORTING VERTICAL LOADS AS WELL AS LATERAL PRESSURES SHALL BE ANALYZED AS MEMBERS SUBJECTED TO COMBINED AXIAL LOADS AND BENDING.</p> <p>9. BRACING MEMBERS SHALL BE STRUCTURAL STEEL. THE BACKS SHALL BE HIGH STRENGTH STEEL TENDONS OR RODS.</p> <p>10. IN A BRACING SYSTEM WHERE WALES ARE NOT USED AND A DIRECT STRUT TO SOLDIER PILE CONNECTION IS USED, AN ADDITIONAL PROVISION FOR BENDING STRESS DUE TO THE ECCENTRICITY OF LATERAL LOADING OF 0.10 TIMES THE DEPTH OF MEMBER IN EACH DIRECTION SHALL BE CONSIDERED IN THE DESIGN OF THE STRUT MEMBER.</p> <p>11. THE MAXIMUM SLENDERNESS RATIO OF STRUTS SHALL NOT EXCEED 120 AND THE MAXIMUM AXIAL STRESS TO WHICH STRUTS MAY BE SUBJECTED SHALL BE LIMITED TO 12,000 PSI UNDER GROUP I LOADING OR 15,000 PSI UNDER GROUP II LOADING.</p> <p>12. CONNECTION BETWEEN STRUTS, WALES AND WALL SYSTEM SHALL BE DESIGNED FOR A TENSILE AND SHEARING LOAD EQUAL TO 10% OF THE DESIGN COMPRESSIVE STRUT LOAD. FILLER PLATES SHALL BE USED TO OBTAIN A TIGHT FIT. A HINGE SHALL BE ASSUMED AT SUCH LOCATIONS. STRUTS SHALL BE PRELOADED TO ENSURE FIRM CONTACT OF SUPPORTING SYSTEM AGAINST THE GROUND AT ALL TIMES. WEDGING OR JACKING OF STRUTS SHALL BE USED, AS REQUIRED.</p> <p>13. TEMPORARY BRACING ELEMENTS SHALL BE REMOVED IN SUCH A MANNER SO AS TO AVOID IMPACT LOADING ON THE PERMANENT STRUCTURE OR ON OTHER MEMBERS OF THE CONSTRUCTION STRUCTURES.</p> <p>14. THE SLENDERNESS RATIO OF SECONDARY BRACING ELEMENTS SHALL NOT EXCEED 200</p> <p>15. STRESSES DUE TO TEMPERATURE VARIATIONS SHALL BE TAKEN INTO ACCOUNT IN THE DESIGN OF THE STRUTS. PROVISIONS SHALL BE MADE TO PROTECT STRUTS AGAINST EXCESSIVE DEFORMATION AND STRESS VARIATIONS INDUCED BY TEMPERATURE FLUCTUATIONS.</p> <p>16. SOLDIER PILES, WHERE USED, MAY BE ASSUMED AS FULLY BRACED AGAINST BUCKLING IN THE PLANE OF LAGGING IN THE PLANE PERPENDICULAR TO THE LAGGING. THE COLUMN LENGTH SHALL BE TAKEN AS THE DISTANCE BETWEEN BRACED POINTS. SOLDIER PILES AND BEARING PILES MAY BE ASSUMED TO BE FULLY BRACED IN BOTH PLANES AT THE LEVEL OF BOTTOM OF EXCAVATION</p> <p>17. VERTICAL MEMBERS OF BOTH FLEXIBLE AND RIGID SYSTEMS SHALL BE DESIGNED UNDER ASSUMPTIONS THAT THEY ARE HINGED AT BRACED LEVELS AND AT THE BOTTOM OF EXCAVATION WHERE VERTICAL MEMBERS OF WALL SYSTEM CANTILEVERS ABOVE THE UPPERMOST BRACED LEVEL, A FULLY CONTINUOUS MOMENT SHALL BE TAKEN FOR THE CANTILEVER PORTION ONLY.</p> <p>18. TIMBER LAGGING SHALL BE DESIGNED FOR GROUP I LOADINGS. THE LATERAL PRESSURE DUE TO THE WEIGHT OF THE SOIL AND SURCHARGE MAY BE REDUCED BY 50% WHEN THE LAGGING IS SUPPORTED BY THOSE FLANGES WHICH ARE IMMEDIATELY ADJACENT TO THE EXCAVATION. LOADING ON LAGGING IS UNIFORM. IN NO CASE SHALL EXCAVATION FOR LAGGING EXTEND BEYOND THE FLANGE IN CONTACT WITH SUPPORTED SOIL.</p> <p>19. VOIDS BETWEEN LAGGING AND SOIL TO BE SUPPORTED SHALL BE BACKFILLED WITH SOIL OR GROUT AS SOON AS POSSIBLE AND PRIOR TO THE PRE-LOADING OF BRACINGS.</p> <p>20. IN ORDER TO SATISFY A HINGED CONDITION AT THE BOTTOM OF EXCAVATION THE VERTICAL MEMBERS OF SHEETING SYSTEMS MUST HAVE AT LEAST THE MINIMUM PENETRATION NECESSARY TO DEVELOP THE PASSIVE RESISTANCE OF THE SOIL BELOW SUBGRADE, OTHERWISE CANTILEVER ACTION SHALL BE ASSUMED ABOUT THE LOWEST INSTALLED BRACE.</p> <p>21. AVAILABLE GEOTECHNICAL DATA SHALL BE USED IN CONJUNCTION WITH INDICATED CRITERIA IN THE SELECTION, ANALYSIS AND DESIGN OF EARTH SUPPORT SYSTEMS.</p> <p>22. THE CONTRACTOR SHALL MAKE HIS OWN ASSESSMENT OF EXISTING CONDITIONS, INCLUDING ADJACENT PROPERTY, WHETHER PRIVATE OR PUBLIC, AND OF THE POSSIBLE EFFECTS OF HIS PROPOSED TEMPORARY WORKS AND CONSTRUCTION METHODS, AND SHALL SELECT AND DESIGN SUCH SUPPORT SYSTEMS, METHODS AND DETAILS AS WILL ASSURE SAFETY TO THE PUBLIC, ADJACENT PROPERTY AND OF THE COMPLETED WORK.</p>
	RAILINGS		ARTICLE 2.7 AND 3.14 (L) *				
	CURB AND SAFETY CURBS	OWN WEIGHT	ARTICLE 3.14 (L) *				
* REFER TO APPLICABLE PARAGRAPHS IN THE "BRIDGE DESIGN SPECIFICATIONS" BY CALTRANS.							
SUPPORT OF EXCAVATION	WALL SYSTEM ELEMENTS IN CONTACT WITH RETAINED EARTH SEE NOTE BELOW	OWN WEIGHT AND REACTIONS FROM DEAD LOADS OF DECK STRUCTURE AND BRACING SYSTEM.	REACTIONS FROM LIVE LOADS, EXCLUDING IMPACT ON DECK STRUCTURE (L) WALKWAYS AND INCIDENTAL LOADS (L) CONSTRUCTION EQUIPMENT (L)	LATERAL EARTH PRESSURE (E) DUE TO WEIGHT OF SOIL AND SURCHARGES. HYDROSTATIC PRESSURE (A) AXIAL LOADS FROM END WALLS WHERE APPLICABLE (E) AND (A)	EFFECT OF LATERAL FORCE ON BUILDINGS AND SOIL.	GROUP I D+L+E+A AT 100% OF BASIC UNIT STRESS GROUP II D+L+E+A+EQ AT 120% OF BASIC UNIT STRESS NOTE: SEE ABOVE FOR VALUE OF (L)	
	BRACING SYSTEM MAIN MEMBERS (MEMBERS CARRYING COMPUTED LOADS)			SAMPLE BEAM REACTIONS FROM WALL SYSTEM (E) AND (A) AXIAL LOADS FROM END WALLS WHERE APPLICABLE (E) AND (A)	REACTION FROM WALL SYSTEM		
	SECONDARY BRACING	OWN WEIGHT	AXIAL LOAD EQUAL TO 3% OF THE DESIGN AXIAL LOAD IN THE MORE HEAVILY LOADED ADJACENT BRACED MEMBER (L)		NONE		
<p>† WALL SYSTEMS ARE CLASSIFIED AS FLEXIBLE WALL SYSTEMS OR RIGID WALL SYSTEMS:</p> <p>FLEXIBLE WALL SYSTEMS INCLUDE INTERLOCKING SHEET PILE WALLS, SOLDIER PILES AND TIMBER LAGGING AND SIMILAR SYSTEMS</p> <p>RIGID WALL SYSTEMS INCLUDE REINFORCED CONCRETE WALLS, STRUCTURAL STEEL PLUS CONCRETE WALLS, INTERSECTING CAST-IN-PLACE REINFORCED CONCRETE PILES AND SIMILAR SYSTEMS.</p>							

REV	DATE	BY	CHKD	APP	DESCRIPTION

DESIGNED BY
W. J. ARMENTO

DRAWN BY
R. BAUTISTA

CHECKED BY
N. PANDYA

IN CHARGE
N. PANDYA

DATE
21 FEB 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

ENGINEERING MANAGEMENT CONSULTANT

SUBMITTED
N. P. PANDYA

APPROVED
K. N. MURTHY

STRUCTURAL STANDARD
CUT AND COVER SUBWAY
CONSTRUCTION STRUCTURES
LOADS AND DESIGN CRITERIA

CONTRACT NO.

DRAWING NO.
SS-002

SCALE
NO SCALE

SHEET NO.

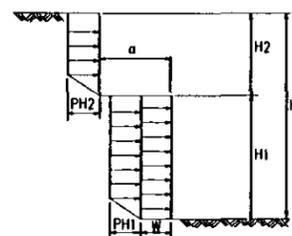
REV 1

DESIGN LATERAL PRESSURE FOR SUPPORT OF EXCAVATION ABOVE BOTTOM OF EXCAVATION

DUE TO SOIL, SOFT-ROCK, AND WATER

MATERIAL	FLEXIBLE WALL SYSTEMS		RIGID WALL SYSTEMS	
	DEWATERED (E)	NOT DEWATERED (E) AND (A)	DEWATERED (E)	NOT DEWATERED (E) & (A)
YOUNG AND OLD ALLUVIUM	<p>P ...</p>	<p>* VALUE BASED ON SOIL INVESTIGATION TYP</p> <p>P ... $\frac{10Z}{H}$</p>	<p>P ...</p>	<p>P ... $\frac{10Z}{H}$</p>
PUEBLO AND FERNANDO FORMATION	<p>P ...</p>	<p>P ... $\frac{10Z}{H}$</p>	<p>P ...</p>	<p>P ... $\frac{10Z}{H}$</p>

DUE TO BENCH EXCAVATION



1. THE FOLLOWING DIAGRAM SHALL APPLY TO BENCHED EXCAVATIONS.
2. P AND CONFIGURATIONS OF PRESSURE DIAGRAMS SHALL BE AS DEFINED IN UNBENCHED CONDITION.
3. W-PRESSURE ON H1 DUE TO SURCHARGE H2
 $W=40 H2 (1-\alpha/H1)$
4. WHEN $D/D < \alpha/H1 < 1.0$, APPLY BENCHED EXCAVATION DIAGRAM. WHEN $\alpha/H1 > 1.0$, APPLY BENCHED EXCAVATION DIAGRAM WITH $W=0$.

GENERAL NOTES:

1. VALUES SHOWN FOR PRESSURE GRADIENTS P_a, P_p & P_w ARE IN POUNDS PER SQUARE FOOT PER FOOT OF DEPTH.
2. VALUES SHOWN FOR PRESSURE INTENSITIES ARE IN POUNDS PER SQUARE FOOT.
3. VALUES FOR DISTANCES H, Y, Z, A ETC ARE IN FEET.
4. BRACE LEVELS ARE NOT SHOWN; THE DIAGRAMS SHOWN ABOVE "FOR SUPPORT OF EXCAVATION ABOVE BOTTOM OF EXCAVATION" ARE APPLICABLE TO MULTIPLE-BRACED SYSTEM.
5. FOR SINGLE-BRACED SYSTEM AND CANTILEVER SHEETING DESIGN ASSUME PRESSURE DIAGRAMS SHOWN UNDER "DESIGN PASSIVE RESISTANCE" HEADING.
6. LATERAL PRESSURE IS BASED ON AN ASSUMED TRAFFIC SURFACE SURCHARGE OF 600 PSF ACTING OVER A LIMITED INFLUENCE AREA FOR MORE SEVERE CONSTRUCTION EQUIPMENT LOADING SPECIAL ANALYSIS MUST BE MADE.
7. ALL VALUES GIVEN FOR LATERAL PRESSURES ARE MINIMUM THEY SHOULD BE INCREASED, IF REQUIRED, TO SUIT ACTUAL CONDITIONS ENCOUNTERED IN THE FIELD.

DUE TO SURCHARGE AND EARTHQUAKE

BUILDING (E)

$W=0.4 n (1 - \frac{D}{H})$ FOR $\frac{D}{H}$ FROM 0 TO 10
 $W=0$ FOR $\frac{D}{H} > 10$
 WHERE:
 n = NET CONTACT PRESSURE (PSF)
 $q_f = 125 D^2$
 q_f = TOTAL DEAD AND LIVE CONTACT PRESSURE (PSF) LIVE CONTACT PRESSURE MAY BE REDUCED IN ACCORDANCE WITH SECTION 2306 OF THE UNIFORM BUILDING CODE.
 q_f = BUILDING LOAD IN WIDTH H1 AREA OF WIDTH H1

THE LATERAL PRESSURE, W, APPLIES ONLY TO THOSE BUILDINGS WHICH ARE ON FOOTINGS OR MAT FOUNDATIONS. IF W IS GREATER THAN THE CORRESPONDING PRESSURE DUE TO TRAFFIC AND CONSTRUCTION EQUIPMENT IT SHALL BE USED BELOW THE DEPTH D. IF W IS LESS THAN VALUE OF THE LATERAL PRESSURE DUE TO TRAFFIC AND CONSTRUCTION EQUIPMENT THE LATTER SHALL BE USED IN LIEU.

IF BUILDING FOUNDATIONS ARE UNDERPINNED OR CONSIST OF EXISTING PILES THEN THE TRANSFER OF BUILDING LOAD TO A LOWER LEVEL SHALL BE CONSIDERED IN EVALUATING RESISTANT LATERAL PRESSURE USING PROCEDURES ACCEPTABLE TO THE AUTHORITY OR ITS DESIGNEE.

BUILDING PRESSURES ARE TO BE DETERMINED BY THE CONTRACTOR BY EXAMINATION OF EXISTING PLANS AND BY ON-SITE FIELD INSPECTION. THEY SHALL BE SUBJECT TO APPROVAL BY THE AUTHORITY OR ITS DESIGNEE.

TRAFFIC AND CONSTRUCTION EQUIPMENT (E)

EARTHQUAKE (EQ)

$P=100$ FOR α FROM 0 TO C
 50 FOR α FROM C TO 2C
 0 FOR $\alpha > 2C$

EMBANKMENT

(A) DUE TO BUILDING

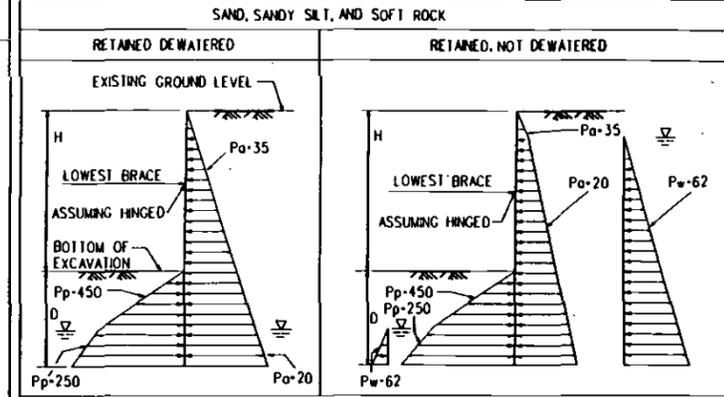
(B) DUE TO SOIL OR SOFT-ROCK

ANGLE "a" FOR FAILURE PLANE SHALL BE DETERMINED BY THE CULMANN GRAPHICAL METHOD; SEE "SOIL MECHANICS IN ENGINEERING PRACTICE" 2ND ED. BY TERZAGHI & PECK. ALL SURCHARGES AFFECTING AND WITHIN THE FAILURE PLANE SHALL BE CONSIDERED ADDITIVE TO THE LATERAL SOIL OR SOFT-ROCK PRESSURES INDICATED ON THIS SHEET. THE INTENSITY OF THIS ADDED PRESSURE SHALL BE DETERMINED USING EQUATIONS OUTLINED IN TEXT BY M.C. SPANGLER "SOIL ENGINEERING" SEE CHAPTER DEALING WITH PRESSURE ON RETAINING WALLS.

NOTES:
 1. (A) AND (B) ARE ADDITIVE
 2. FOR BOTH CASES (A) AND (B) THE LATERAL PRESSURE SHALL BE AS SHOWN REGARDLESS OF WHETHER OR NOT SOIL IS DEWATERED.

DESIGN PASSIVE RESISTANCE

BELOW BOTTOM OF EXCAVATION



- NOTES:
- FOR CANTILEVER SHEETING DESIGN THE PENETRATION FOUND BY USING "SIMPLIFIED LOADING" DIAGRAMS ABOVE SHALL BE INCREASED BY 20%.
 - INCREASED P_a BY 20% FOR RIGID WALL SYSTEM.
 - FOR A SOLDIER PILE AND TIMBER LAGGING SHEETING SYSTEM-ACTIVE PRESSURE ABOVE THE SUBGRADE ELEVATION IS TO BE APPLIED TO THE FULL PANEL WIDTH FROM CENTER TO CENTER OF SOLDIER PILE AND BELOW THE SUBGRADE IT IS TO BE APPLIED TO THE WIDTH OF THE SOLDIER PILE OR ENCASMENT. PASSIVE PRESSURE IS TO BE TAKEN AS ACTING ON 1.5 X DIAMETER FOR SOLDIER PILES CIRCULAR IN PLAN AND 2.0 X WIDTH FOR SOLDIER PILES RECTANGULAR IN PLAN.
 - FOR HORIZONTALLY CONTINUOUS WALLS, BOTH ACTIVE AND PASSIVE PRESSURES AS SHOWN ON THIS DRAWING SHALL BE APPLIED ON A ONE FOOT LENGTH OF WALL BASIS.
 - MINIMUM PENETRATIONS FOR PASSIVE RESISTANCE:
 VERTICAL RESISTING ELEMENT OF SUPPORT OF EXCAVATION WALL SYSTEMS SHALL SATISFY THE PENETRATION FOUND BY ANALYSES OUTLINED AND SHALL HAVE A MINIMUM PENETRATION:
 1. BELOW BOTTOM OF EXCAVATION DEEPER THAN 40 FEET OF AT LEAST:
12 FEET FOR SOLDIER PILES
8 FEET FOR CONTINUOUS WALL SYSTEMS.
 2. BELOW BOTTOM OF EXCAVATION LESS THAN 40 FEET OF AT LEAST:
10 FEET FOR SOLDIER PILES
7 FEET FOR CONTINUOUS WALL SYSTEMS.
 3. BELOW BOTTOM OF EXCAVATION LESS THAN 20 FEET OF AT LEAST:
8 FEET FOR SOLDIER PILES
6 FEET FOR CONTINUOUS WALL SYSTEMS.
 - IN ALL CASES THE PENETRATION BELOW SUBGRADE MUST ALSO SATISFY THE DESIGN VERTICAL SUPPORT CAPACITY INDICATED ON DRAWING SS-004.

END BULKHEAD CONDITIONAL CRITERIA

WHEN TUNNELS ALREADY EXIST AT INTERFACE WITH PROPOSED CUT AND COVER STRUCTURES THE LATERAL SOIL PRESSURE SHALL BE CALCULATED BASED ON AN H VALUE FROM EXISTING GROUND SURFACE DOWN TO SUBGRADE OF THE ADJACENT CUT AND COVER WORK WITH NO REDUCTION MADE ON THE NET AREA OF THE SHEETING SYSTEM DUE TO THE PRESENCE OF THE TUNNELS.

REV	DATE	BY	APP	DESCRIPTION
D	2/21/94	N.P.	GM	SBCN 12 REVISED, REDRAWN BASELINE ISSUE

DESIGNED BY: W.J. ARMENTO
 DRAWN BY: R. BAUTISTA
 CHECKED BY: N. PANDYA
 IN CHARGE: N. PANDYA
 DATE: 21 FEB 94

REGISTERED PROFESSIONAL ENGINEER
 No. 22584
 Exp. 6-30-92
 CIVIL
 STATE OF CALIFORNIA

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

ENGINEERING MANAGEMENT CONSULTANT
 on behalf of
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 1000 Wilshire Blvd., Suite 2000
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 APPROVED: K.N. MURTHY

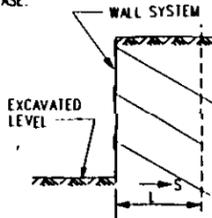
STRUCTURAL STANDARD
 CUT AND COVER SUBWAY
 CONSTRUCTION STRUCTURES
 LATERAL PRESSURES CRITERIA

CONTRACT NO.
 DRAWING NO: SS-003
 SCALE: NO SCALE
 SHEET NO: 1

SPECIAL NOTES FOR TIE-BACK ANALYSIS AND DESIGN

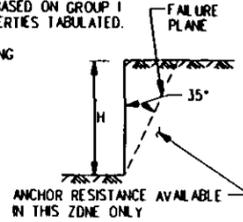
A. GROUP I AND GROUP II LOADING SHALL BE INVESTIGATED AND THE MORE CRITICAL CASE USED FOR DESIGN FOR GROUP II LOADING THE ALLOWABLE VALUES SHOWN BELOW IN NOTES B.D. AND H MAY HAVE THE NORMAL 20% INCREASE.

B. A CHECK IS TO BE MADE ON THE OVERALL STABILITY (SLIDING, ROTATIONAL, ETC.) OF THE SOIL BLOCK FORMING THE ANCHORING MASS OF EARTH IN ANALYZING THE SLIDING STABILITY OF THIS BLOCK UNDER GROUP I LOADING, THE ALLOWABLE RESISTING SHEAR SHALL BE:

$$S = 0.41C + N \times \tan(\phi)$$


ALSO FOR THIS ANALYSIS, THE LENGTH "L" OF RESISTING SURFACE SHALL BE TAKEN NOT GREATER THAN THE DISTANCE FROM THE SUPPORT WALL BACK TO THE VERTICAL PLANE PASSING THROUGH THE END OF THE SHORTEST ANCHOR. FOR A ROTATIONAL ANALYSIS USING THE SLIP CIRCLE METHOD THE DESIGN SHALL YIELD A FACTOR OF SAFETY OF 1.5, BASED ON GROUP I LOADING AND PHYSICAL PROPERTIES TABULATED.

C. FOR PURPOSES OF DETERMINING THE EFFECTIVE LENGTH OF ANCHORS, THE FAILURE PLANE OF THE SOIL MASS BEHIND THE WALL SHALL BE TAKEN AT A MINIMUM ANGLE OF 35° MEASURED FROM THE VERTICAL, AS SHOWN ON THE DIAGRAM. ANCHORS SHALL BE CONSIDERED AS RECEIVING RESISTANCE FROM ONLY THE SOIL MASS ACTING BEYOND THE INDICATED FAILURE PLANE. CONSIDERATION SHALL BE GIVEN TO INCREASED EXTENT OF THE FAILURE ZONE DUE TO HIGH SURCHARGE LOADS. DETERMINATION OF THE APPROXIMATE FAILURE PLANE FOR THE PURPOSES OF EFFECTIVE ANCHOR LENGTH SHALL BE MADE BY CULMANN ANALYSIS WHEN SURCHARGE IS PRESENT.



D. FOR LOADING COMBINATIONS FOUND IN GROUP I, THE ALLOWABLE VALUE OF ADHESION BETWEEN THE SOIL AND THE ANCHOR TO BE USED IN DESIGN OF EFFECTIVE EMBEDDED LENGTH FOR EACH INDIVIDUAL ANCHOR IN VARIOUS STRATA IS:

ADHESION = 750 PSF IN PRE-DRILLED HOLE WITH NON-PRESSURE GROUT

3,000 PLF FOR DRIVEN TIE-BACKS AND PRESSURE GROUTED

THE EFFECTIVE LENGTH THUS FOUND SHALL BE INCREASED BY AT LEAST 10% TO MAKE ALLOWANCE FOR UNFORSEEN FIELD VARIABLES.

E. THE ANGLE BETWEEN THE DIRECTION OF THE ANCHOR AND THE HORIZONTAL LINE PERPENDICULAR TO THE SUPPORT OF EXCAVATION WALL SHALL BE CHOSEN BY THE CONTRACTOR WITH A RANGE OF 20° TO 50° PREFERABLE. DUE ACCOUNT SHALL BE TAKEN OF THE EFFECTS OF RESULTING COMPONENTS AND ASSOCIATED STRUCTURAL IMPLICATIONS ARISING THEREFROM, PARTICULARLY THE PENETRATION REQUIREMENTS OF THE SHEETING TO SUPPORT THE LOAD OF THE VERTICAL COMPONENT.

F. ANCHORS MAY BE INSTALLED IN PRE-DRILLED HOLES AND SHALL BE GROUTED TO INSURE FIRM CONTACT WITH THE SURROUNDING SOIL. PRE-DRILLING BENEATH ADJACENT BUILDINGS IS NOT ACCEPTABLE, BUT WITH PROPERLY OWNERS PERMISSION DRIVEN TIE-BACKS SHALL BE USED.

G. FOR DRILLED IN ANCHORS, THE TOTAL ANCHOR LOAD SHALL BE DEVELOPED IN BOND BETWEEN STEEL AND GROUT, ACTING WITHIN EFFECTIVE LENGTH OF THE ANCHORAGE.

H. WHERE HIGH-STRENGTH TIE ROD STEEL IS USED, THE FINAL WORKING STRESS IS NOT TO EXCEED 60% OF THE ULTIMATE TENSILE STRENGTH OF THE STEEL NOR 70% OF ITS YIELD STRENGTH FOR GROUP I LOADS.

I. FOR TIE-BACK ANCHORS OF HIGH STRENGTH STEEL, A PROOF TEST LOAD OF AT LEAST 150% OF GROUP I WORKING LOAD SHALL BE APPLIED AND SUSTAINED IN ACCORDANCE WITH TESTING PROCEDURES OUTLINED IN THE SPECIFICATIONS. THE LOADS SHALL THEN BE LOCKED OFF AND SET AT NOT LESS THAN 100% OF THE WORKING LOAD. FINAL PROOF TEST STRESS IN THE STEEL IS NOT TO EXCEED 80% OF THE ULTIMATE STRENGTH NOR THE MANUFACTURER'S RECOMMENDATIONS AS SHOWN IN HIS CATALOG OR OTHERWISE STATED BY HIM IN WRITING. A 10 HOUR LOAD TEST WILL BE REQUIRED ON 10% OF 100 TIE-BACKS. SEE SPECS.

J. SPACING OF TIE-BACKS SHOULD ENSURE NO OVERLAP OF RESISTING SOIL STRESS BULBS IN ASSUMING FULL VALUE OF ANCHORAGE FOR EACH TIE-BACK. IN THE EVENT OF OVERLAP, THEN A REDUCTION FACTOR MUST BE USED FOR TIES AFFECTED. IN ANY CASE, IN ANY ONE PLANE THE ANCHORS SHALL HAVE A MINIMUM CLEAR DISTANCE BETWEEN THEM OF 5 FEET. PRETEST SIMULTANEOUSLY TIE-BACKS HAVING OVERLAPPING SOIL STRESS BULBS.

K. NOMENCLATURE AND PHYSICAL PROPERTIES:
L - EFFECTIVE ANCHOR BLOCK LENGTH
N - OVERBURDEN PRESSURE AT MIDDLE OF EFFECTIVE ANCHOR BLOCK LENGTH
S - RESISTING SHEAR PER SQ. FT. OF SLIDING SURFACE.

MATERIAL	C-COHESION KIPS PER SQ. FT.	φ - ANGLE OF INTERNAL FRICTION IN DEGREES
YOUNG ALLUVIUM		
OLD ALLUVIUM		
PUENTE AND FERNANDO FORMATION		

L. WHEN ANY TIE-BACK PASSES THROUGH BOTH ALLUVIUM STRATA AND SOFT-ROCK FORMATION IN THE ANCHOR RESISTANCE ZONE DEFINED BY NOTE C, ANCHORAGE MAY BE CONSIDERED EFFECTIVE IN BOTH MATERIALS.

M. THE VALUE OF "N" USED FOR ADHESION CALCULATIONS SHALL NOT INCLUDE SURCHARGE LOADS.

N. THE TIE-BACK DESIGN SUBMITTAL SHALL INCLUDE SUFFICIENT DRAWINGS TO DEMONSTRATE THE SUITABILITY OF THE TIE-BACK, A SCHEDULE OF CONSTRUCTION AND A DESCRIPTION OF A TECHNIQUE FOR MONITORING THE TIE-BACKS. THE RECOVERY OF ANY PART OF THE TIE-BACK SHALL NOT BE PERMITTED.

O. TIE-BACKS SHALL NOT BE PLACED CLOSER THAN TEN (10) FEET TO FOUNDATION STRUCTURES OF EXISTING STRUCTURES.

P. THE CONTRACTOR MAY USE HIGHER ADHESION VALUES FOR TIE-BACKS HE PROPOSES TO INSTALL IF PROVEN BY PULLOUT TEST OF AT LEAST FOUR (4) SIMILAR ANCHORS AT THE JOB SITE IN COMPARABLE SOIL MATERIALS, AND PROVIDED A FACTOR OF SAFETY OF TWO (2.0) IS APPLIED TO THE MINIMUM ULTIMATE LOAD OBTAINED BY THESE TESTS.

CAUTION:
TIE-BACKS USED IN COMBINATION WITH INTERNAL BRACING, IN THE SAME SHEETING PLANE AND AREA, SHALL BE DESIGNED, INSTALLED AND MAINTAINED TO ASSURE THAT THEY CONTINUE TO SUPPORT THEIR DESIGN WORKING LOAD; OR THE INTERNAL BRACING SHALL BE AUGMENTED TO RESIST ANY INCREMENTAL LOAD THAT MIGHT BE TRANSFERRED TO IT BY DECREASE OF SUPPORT IN THE TIE-BACKS.

SPECIAL NOTES FOR SHEETING AND BRACING

1. FOR MINIMUM PENETRATION CALCULATIONS THE MOMENT OF FORCES ABOUT THE LOWEST BRACE SHALL VERIFY STATIC EQUILIBRIUM ASSUMING A HINGE POINT AT THE BRACE LEVEL. ANY BENDING RESISTANCE OFFERED BY THE SHEETING AT THE BRACE ELEVATION SHALL BE IGNORED. PENETRATION SHALL BE SUFFICIENT TO DEVELOP THE DESIGN PASSIVE RESISTANCE DETERMINED BY THIS "FREE EARTH" ANALYSIS.

2. FOR BRACE LOADS, THE SHEETING MAY BE ASSUMED AS SEVERAL INDEPENDENT SIMPLE BEAMS SUPPORTED AT BRACE LEVELS AND THEIR CONTINUITY EFFECTS IGNORED. SUM OF REACTIONS AT EACH SUPPORT IS USED AS THE DESIGN BRACE LOAD. THE FULL LOADING ON CANTILEVERED PORTION SHALL BE CONSIDERED AS ACTING DIRECTLY ON SUPPORTING BRACE LEVEL. A FICTITIOUS STRUT SHALL BE ASSUMED TO EXIST AT THE BOTTOM OF THE EXCAVATION WHEN THE MINIMUM PENETRATION, OR DEEPER, IS SATISFIED.

3. TO ACCOUNT FOR THE CONCENTRATION OF SOIL PRESSURES AT STRUTS AND TIE-BACK LOCATIONS, THE BENDING MOMENTS TAKEN FROM THE PRESSURE DIAGRAMS (HYDROSTATIC PRESSURE EXCLUDED) MAY BE REDUCED BY 20% WHEN CALCULATING FLEXURE REQUIREMENTS FOR SHEETING AND WALES OF FLEXIBLE WALL SYSTEMS.

4. PENETRATION CALCULATIONS FOR BENCHED OR SLOPING EXCAVATIONS SHALL ACCOUNT FOR REDUCTIONS ON PASSIVE RESISTANCE OF MATERIAL ON THE EXCAVATION SIDE AND INCREASES IN HEIGHT OF PRESSURE DIAGRAM ON RETAINED SIDE.

5. NO REDUCTION IN THE INTENSITIES OF THE PRESSURE DIAGRAMS SHALL BE ALLOWED AS CONSTRUCTION OF THE PERMANENT STRUCTURE PROCEEDS UPWARDS.

6. SOIL CHARACTERISTICS AND ELEVATIONS OF HORIZONS WHICH HAVE BEEN ASSUMED IN CALCULATIONS SHALL BE VERIFIED BY FIELD OBSERVATIONS AND WHERE THESE ASSUMPTIONS ARE FOUND TO BE UNSAFE, SUITABLE MODIFICATIONS ARE TO BE MADE.

7. IN THE INITIAL POSITIONING OF SHEETING SYSTEM AT THE GROUND SURFACE, THE CONTRACTOR SHALL MAKE PROPER ALLOWANCES FOR INSTALLATION DEVIATIONS, AND THE PROBABLE INWARD MOVEMENTS OF THE SHEETING DURING EXCAVATION. NO INTRUSION OF SHEETING INTO THE NEAT LINES OF THE STRUCTURES WILL BE PERMITTED. WHERE SHEETING SYSTEMS ARE LOCATED CONTIGUOUS TO THE NEAT LINES OF THE STRUCTURE, REASONABLE PERCENTAGE OF THE DEPTH OF EXCAVATION TO SUBGRADE SHALL BE PROVIDED FOR THE INITIAL INSTALLATION OFFSET.

8. BRACING MAY BE PROVIDED BY STRUTS, RAKERS AND TIE-BACKS, IN ANY COMBINATION THEREOF, AND WITH OR WITHOUT WALES.

9. STRUTS AND RAKERS MAY BE OF H OR W SHAPES OR OF PIPE SECTIONS. HOWEVER, WHERE BRACING IS EMBEDDED IN CONCRETE POURS PIPE SECTIONS SHALL NOT BE USED.

10. WHEN THE GRADE SLAB HAS BEEN POURED AGAINST THE SHEETING SYSTEM, AND THE BRACE TIER ABOVE REMOVED ACCORDING TO NOTE J. OF SPECIAL NOTES FOR EXCAVATION AND BRACING, THE SOLDIER PILE WILL ACQUIRE PARTIAL FIXITY AT THE GRADE SLAB LEVEL. THE BENDING MOMENT IN THE SOLDIER PILE SHALL THEN BE ASSUMED TO BE $PH \cdot Y/12$, WHERE PH IS OBTAINED FROM PRESSURE DIAGRAMS ON SS-003 AND Y IS THE VERTICAL DISTANCE FROM THE TOP OF THE GRADE SLAB TO THE REMAINING BRACE TIER ABOVE. THE FORMULA ALREADY CONTAINS THE 20% REDUCTION OF NOTE 3 ABOVE.

11. SIMILARLY WHEN INTERMEDIATE OR ROOF SLABS HAVE BEEN POURED AGAINST THE SHEETING SYSTEM AND BRACE TIERS REMOVED ACCORDING TO NOTE J. ON THIS SHEET, THE BENDING MOMENT IN THE SOLDIER PILE SHALL THEN BE ASSUMED TO BE $PH \cdot Y^2/12$, WHERE TERMS AND CONDITIONS ARE SIMILAR TO NOTE 10. ABOVE.

SPECIAL NOTES FOR EXCAVATION AND BRACING

A. BRACING REQUIREMENTS SHALL SATISFY THE CRITICAL LOADS DURING COURSE OF EXCAVATION AND THE LOADING CONDITIONS RESULTING DURING STRUCTURE INSTALLATION AND THE REMOVAL OF ANY BRACE.

B. INITIAL EXCAVATION SHALL NOT EXCEED A MAXIMUM OF 8 FEET DEPTH WITHOUT PLACING TOP BRACE. WHERE DECK BEAM IS USED AS TOP BRACE, IT NEED NOT BE PRELOADED BUT SHALL BE WEDGED TIGHT AGAINST SHEETING.

C. AT NO TIME SHALL THE VERTICAL DISTANCE FROM LOWEST INSTALLED BRACE TO THE BOTTOM OF EXCAVATION BE ALLOWED TO EXCEED 15 FEET IN SOIL AND 18 FEET IN SOFT-ROCK.

D. HORIZONTAL CONCRETE SLABS WHICH ARE USED AS BRACING ELEMENTS MUST HAVE ACQUIRED STRENGTH AND AGE AS INDICATED PRIOR TO THE TRANSFERRING OF LATERAL LOADS ONTO THESE SLABS.

E. UNLESS OTHERWISE NOTED, STRUTS (EXCEPT DECK BEAMS) SHALL BE PRESTRESSED TO 25% OF DESIGN COMPRESSION LOAD OCCURRING DURING FULL EXCAVATION PHASE TO SUBGRADE. TIE-BACKS SHALL BE PRE-TESTED AS DESCRIBED IN SPECIAL TIE-BACK NOTE I PRIOR TO CONTINUING EXCAVATION.

F. MAXIMUM ACCEPTABLE SIDE SLOPES FOR CONSTRUCTION EXCAVATION ARE:
SAND AND SANDY SILT - 1 ON 1
SOFT ROCK - 2 ON 1

G. THE CONTRACTOR MAY EXCAVATE WITH STABLE SIDE SLOPES IF LOCAL CONDITIONS SO PERMIT, WITH THE APPROVAL OF THE AUTHORITY OR ITS DESIGNEE. MAXIMUM ALLOWABLE CONTINUOUS HEIGHT OF SIDE SLOPE IS 25 FEET. MINIMUM BERM WIDTH OF 15 FEET TO BE PROVIDED BETWEEN SLOPES.

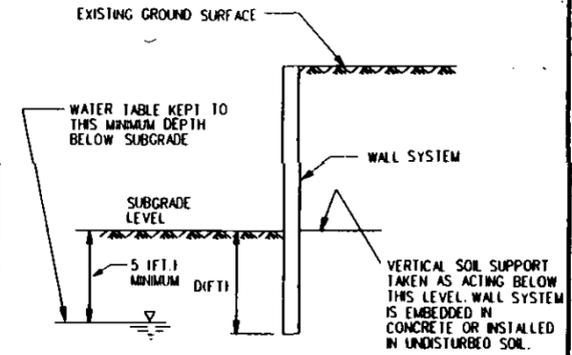
H. VERTICAL FACE CUTS EXCEEDING 5 FEET SHALL HAVE SUPPORT.

J. THE LOWEST BRACING LEVEL SHALL BE REMOVED ONLY AFTER THE GRADE SLAB WHICH ASSUMES THE BRACING FUNCTION HAS ACQUIRED THE MINIMUM COMPRESSIVE STRENGTH OF 2500 PSI AND HAS AGED A MINIMUM OF TEN (10) DAYS.

K. BRACING LEVELS ABOVE AND BELOW THE INTERMEDIATE OR ROOF SLAB WHICH ASSUMES THE BRACING FUNCTION SHALL BE REMOVED ONLY AFTER SUCH SLAB HAS ACQUIRED THE MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AND HAS AGED A MINIMUM OF FOURTEEN (14) DAYS.

L. EXTERIOR WALL OF THE PERMANENT STRUCTURE, IF SUBJECTED TO CANTILEVER ACTION AFTER BRACE REMOVAL, SHALL NOT BE USED FOR TRANSFER OF BRACE LOADS UNLESS THE DESIGN OF THESE WALLS HAS TAKEN INTO ACCOUNT THE EFFECT OF THESE LOADS, AND UNLESS APPROVED BY THE AUTHORITY OR ITS DESIGNEE.

DESIGN VERTICAL ALLOWABLE SUPPORT CAPACITY



WALL SYSTEM	SAND AND SANDY SILT AND SOFT ROCK	UNITS	REMARKS
INTERLOCKING SHEET PILING	2.0 x D	KIPS PER FT OF WALL	
SOLDER PILE	2.0(b + d) x D	KIPS PER PILE	
POURED IN PLACE CONCRETE WALL	2.0x0.2x0	KIPS PER FT OF WALL	B-AVERAGE WIDTH OF WALL IN FT.

THE CONTRACTOR SHALL VERIFY BY APPROPRIATE FIELD MEASUREMENTS, DURING CONSTRUCTION, THE ADEQUACY OF HIS/HER INSTALLED VERTICAL SUPPORT SYSTEM.

IF SOLDIER PILE IS SET IN A CONCRETE ENCASEMENT THEN SUBSTITUTE 3.14R FOR (b + d) ABOVE, WHERE R=RADIUS OF CONCRETE ENCASEMENT, IN FEET.

REV	DATE	BY	CHKD	APP	DESCRIPTION
0	2/21/94				SBCN 12 REVISED, REDRAWN BASELINE ISSUE

DESIGNED BY: W.J. ARMENTO
DRAWN BY: R. BAUTISTA
CHECKED BY: N. PANDYA
IN CHARGE: N. PANDYA
DATE: 21 FEB 94

REGISTERED PROFESSIONAL ENGINEER
No. 32594
Exp. 6-30-92
STATE OF CALIFORNIA

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

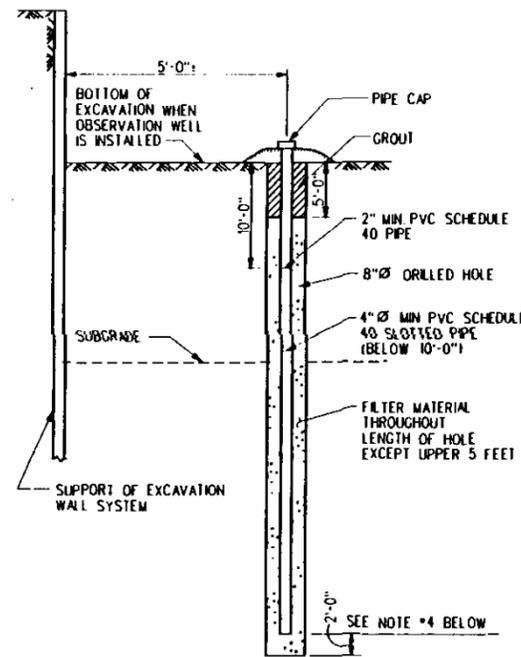
ENGINEERING MANAGEMENT CONSULTANT
Professional Branch Office & Design, Inc.
2700 West Imperial Avenue, Suite 200
Carle Place, Long Beach, California 90801
Telephone: (562) 591-1111
Fax: (562) 591-1112

SUBMITTED: N.P. PANDYA
APPROVED: K.N. MURTHY

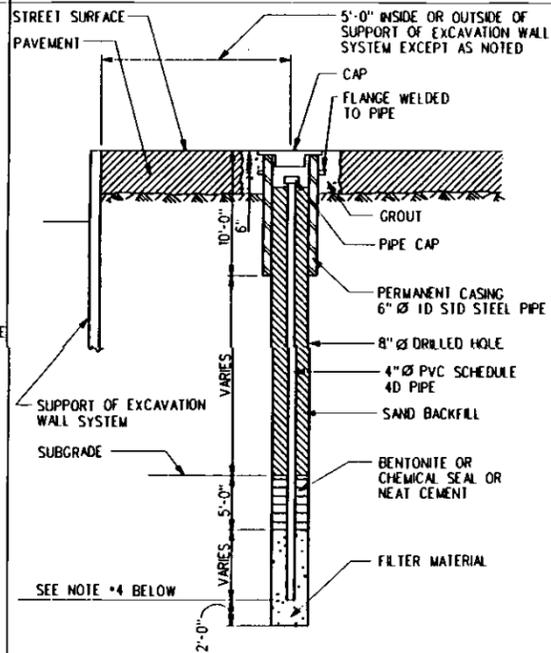
STRUCTURAL STANDARD
CUT AND COVER SUBWAY
CONSTRUCTION STRUCTURES
TIE-BACK, SHEETING, BRACING, EXCAVATION
AND VERTICAL SUPPORT CRITERIA

CONTRACT NO:
DRAWING NO: SS-004
SCALE: NO SCALE
SHEET NO: 1

OBSERVATION WELL TYPE I



OBSERVATION WELL TYPE II



PLAN OF OBSERVATION WELLS, INCLINOMETERS, AND SETTLEMENT MEASUREMENT POINTS

NOTES FOR OBSERVATION WELLS

TYPE I OBSERVATION WELLS

1. SHOWN AS USED INSIDE EXCAVATION WHERE USED OUTSIDE EXCAVATION, UPPER DETAIL SHALL BE SIMILAR TO THAT SHOWN FOR OBSERVATION WELL TYPE II.
2. OUTSIDE THE LIMITS OF EXCAVATION, TYPE I OBSERVATION WELLS SHALL BE INSTALLED PRIOR TO THE START OF ANY EXCAVATION. THE PRIMARY PURPOSE OF THESE OBSERVATION WELLS IS TO MONITOR THE VARIATION OF THE FREE WATER SURFACE IN THE SOIL STRATA.
3. INSIDE THE LIMITS OF EXCAVATION, TYPE I OBSERVATION WELLS MAY BE INSTALLED PRIOR TO THE START OF THE EXCAVATION OR BEFORE THE EXCAVATION REACHES THE NATURAL GROUND WATER LEVEL, BUT NOT LATER. THE PURPOSE OF THESE WELLS IS TO MONITOR THE CONTRACTOR'S COMPLIANCE WITH THE GROUND WATER CONTROL SPECIFICATIONS WITHIN THE EXCAVATION.
4. UNLESS OTHERWISE NOTED, TYPE I OBSERVATION WELLS SHALL BOTTOM AT 15 FEET MIN BELOW THE FINAL DEPTH OF EXCAVATION.
5. MOUND EARTH AROUND TYPE I OBSERVATION WELL.
6. WELLS OUTSIDE LIMITS OF EXCAVATION SHALL BE ABANDONED BY THE CONTRACTOR AS PART OF THE WORK AND THE SURFACE SATISFACTORILY RESTORED.

TYPE II OBSERVATION WELLS

1. SHOWN USED OUTSIDE EXCAVATION WHERE USED INSIDE EXCAVATION, UPPER DETAIL SHALL BE SIMILAR TO THAT FOR OBSERVATION WELL TYPE I.
2. THE PURPOSE OF THESE WELLS IS TO MONITOR HYDROSTATIC CONDITIONS IN THE SOFT-ROCK OR SOIL LAYERS, WITHIN WHICH THE WELLS OCCUR, PRIOR TO AND DURING CONSTRUCTION OF THE SUBWAY STRUCTURES, AND TO PROVIDE INFORMATION ON THE NEED FOR AND DESIGN OF A PRESSURE RELIEF SYSTEM WITHIN THE EXCAVATION TO MAINTAIN THE STABILITY OF THE BOTTOM OF THE EXCAVATION.
3. OUTSIDE THE LIMITS OF THE EXCAVATION, THESE WELLS SHALL BE INSTALLED PRIOR TO THE START OF EXCAVATION. INSIDE THE LIMITS OF EXCAVATION, THESE WELLS SHALL BE INSTALLED PRIOR TO THE START OF EXCAVATION OR BEFORE THE EXCAVATION REACHES THE ORIGINAL GROUND WATER LEVEL, BUT NOT LATER.
4. UNLESS OTHERWISE NOTED TYPE II OBSERVATION WELLS SHALL BOTTOM AT 20 FEET BELOW THE FINAL DEPTH OF EXCAVATION.
5. WELLS OUTSIDE LIMITS OF EXCAVATION SHALL BE ABANDONED BY THE CONTRACTOR AS PART OF THE WORK AND THE SURFACE SATISFACTORILY RESTORED.

GENERAL NOTES

1. THE LOCATIONS OF ALL INSTRUMENTATION INSTALLATIONS ARE SHOWN GRAPHICALLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO RESEARCH UTILITY LOCATIONS AND SELECT FINAL INSTRUMENTATION LOCATION WHICH DO NOT CONFLICT WITH EXISTING UTILITIES.
2. UNLESS OTHERWISE NOTED, PAINTED SETTLEMENT MEASUREMENT CROSS MARKS SHALL BE PLACED AT A MAXIMUM OF 40 FEET ON CENTERS ALONG THE DIRECTION OF THE ALIGNMENT AND AT A MAXIMUM OF 25 FEET ON CENTERS EACH SIDE OF THE EXCAVATION, AND UP TO AT LEAST THE DEPTH OF EXCAVATION DISTANCE BEYOND THE CONSTRUCTION LIMITS.
3. THE AUTHORITY OR ITS DESIGNEE SHALL BE GIVEN ACCESS TO THE INSTRUMENTATION INSTALLATION AT ALL TIMES.
4. SETTLEMENT LEVEL MARKS ON BUILDING FRONTS SHALL BE AT COLUMN LOCATIONS, PREFERABLY.
5. FOR CORNER BUILDINGS AND OTHERS WHERE BUILDING SIDES ARE ACCESSIBLE, SETTLEMENT LEVEL MARKS SHALL BE ESTABLISHED ALONG THE SIDES FOR A DISTANCE AT LEAST EQUAL TO THE DEPTH OF EXCAVATION MEASURED BACK FROM THE FACE OF EXCAVATION AS REFERENCE.
6. INCLINOMETER CASINGS SHALL BE INSTALLED WITHIN THREE (3) FEET OF THE OUTSIDE FACE OF THE SHEETING SYSTEM AND SHALL EXTEND A MINIMUM DISTANCE OF 25 FEET IN SUBSOIL MATERIALS BELOW BOTTOM OF FINAL EXCAVATION.

7. SETTLEMENT MEASUREMENT CROSS MARKS, REFERRED TO IN NOTE 2 ABOVE, MEAN THE SAME AS GROUND SURFACE SETTLEMENT REFERENCE POINTS DESCRIBED IN THE SPECIFICATIONS. SETTLEMENT LEVEL MARKS REFERRED TO IN NOTE 4 ABOVE MEAN THE SAME AS BUILDING SETTLEMENT REFERENCE POINTS DESCRIBED IN THE SPECIFICATIONS.

SYMBOLS

- OBSERVATION WELL, TYPE I
- OBSERVATION WELL, TYPE II
- × PAINTED CROSS MARK ON CURBS, STREET PAVEMENT OR SIDEWALK SLAB.
- ▨ STREET DECKING
- ▤ INSTRUMENTATION ZONE FOR MONITORING BRACE LOADS.
- I INCLINOMETER

REV	DATE	BY	SUB	APP	DESCRIPTION
0	10 10 94	EJ	W	GM	SBCN 12 REVISED, REDRAWN
1	2 21 94	N.P.			BASELINE ISSUE

DESIGNED BY
W. J. ARMENTO
DRAWN BY
R. BAUTISTA
CHECKED BY
N. PANDYA
IN CHARGE
N. PANDYA
DATE
21 FEB 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

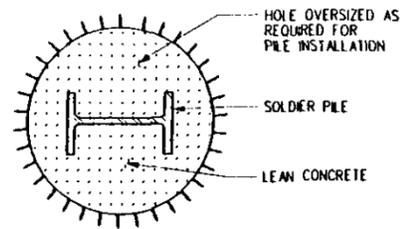
ENGINEERING MANAGEMENT CONSULTANT

FOR MORE INFORMATION CONTACT: Donald Mann Johnson & Burdette, Inc. 2700 Wilshire Blvd., Suite 1000, Los Angeles, CA 90010

SUBMITTED: N.P. PANDYA
APPROVED: K.N. MURTHY

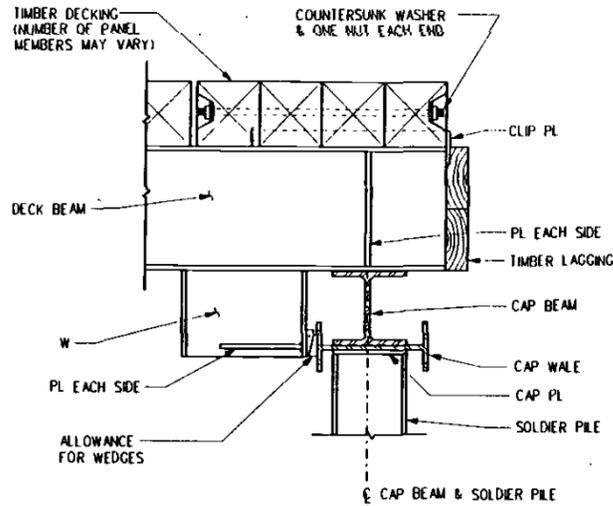
STRUCTURAL STANDARD
CUT AND COVER SUBWAY
CONSTRUCTION STRUCTURES
INSTRUMENTATION INSTALLATION

CONTRACT NO.	
GRAPHIC NO.	SS-005
REV	1
SCALE	NO SCALE
SHEET NO.	

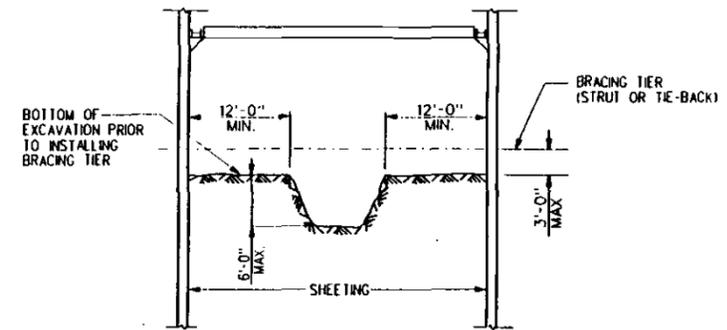


**DETAIL FOR
PREDRILLED HOLE**

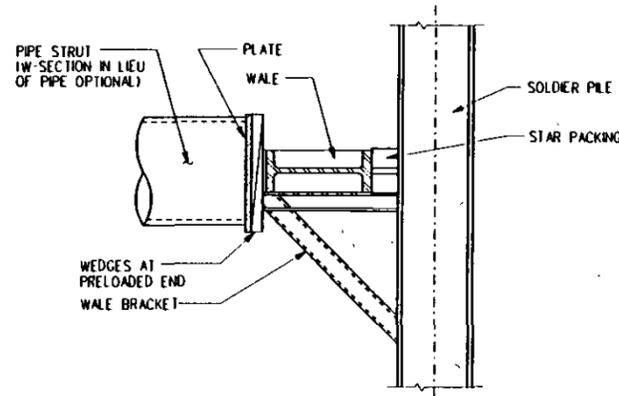
MINIMUM CLEARANCE BETWEEN EDGE OF FLANGE OF PILE TO PERIMETER OF HOLE SHALL BE 2"



DECK BEAM END CONNECTION



**CENTER TRENCHING LIMITATIONS
(TYPICAL FOR ALL SOIL CONDITIONS)
AND ALL SHEETING SYSTEMS**



STRUT END CONNECTION

NOTES:

1. DETAIL FOR PREDRILLED HOLE APPLIES TO SOLDIER-PILE AND TIMBER OR CONCRETE LAGGING SHEETING SYSTEM.
2. CONTRACTOR MAY ELECT TO PREDRILL TO ANY DEPTH FOR INSTALLATION OF SOLDIER PILES, IF PILE DRIVING PERMITTED.
3. SLURRY OR OTHER MEANS SHALL BE EMPLOYED TO PREVENT ANY SLOUGHING OR CAVE-INS IN THE HOLE.
4. FULL HEIGHT OF PREDRILLED HOLE SHALL BE FILLED WITH LEAN CONCRETE AFTER SOLDIER PILE IS INSTALLED.
5. CONTRACTOR MAY ELECT TO FILL THE HOLE BELOW SUBGRADE WITH 2,500 PSI CONCRETE AND WITH LEAN CONCRETE ABOVE SUBGRADE.
6. WHERE CLUMTE (SHOTCRETE) IS USED FOR LAGGING IT SHALL BE REINFORCED AND PLACED IN ACCORDANCE WITH PROVISIONS FOR PNEUMATICALLY PLACED CONCRETE OF THE CITY OF LOS ANGELES BUILDING CODE. THE REINFORCEMENT SHALL BE WELDED SECURELY TO THE SOLDIER PILES.

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1	10/10/94	E.S.	WE		SBCN 12 REVISED, REDRAWN
0	2/21/94				BASELINE ISSUE

DESIGNED BY
W.J. ARMENTO

DRAWN BY
R. BAUTISTA

CHECKED BY
N.PANDYA

IN CHARGE
N.PANDYA

DATE
21 FEB 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

ENGINEERING MANAGEMENT CONSULTANT

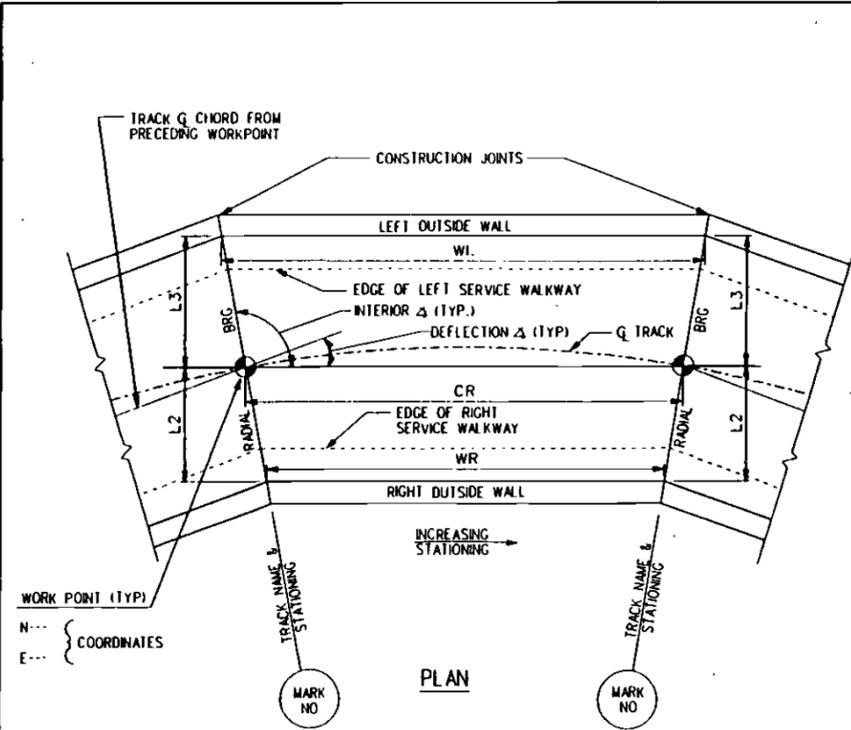
Submitted: **N.P. PANDYA**

Approved: **K.N. MURTHY**

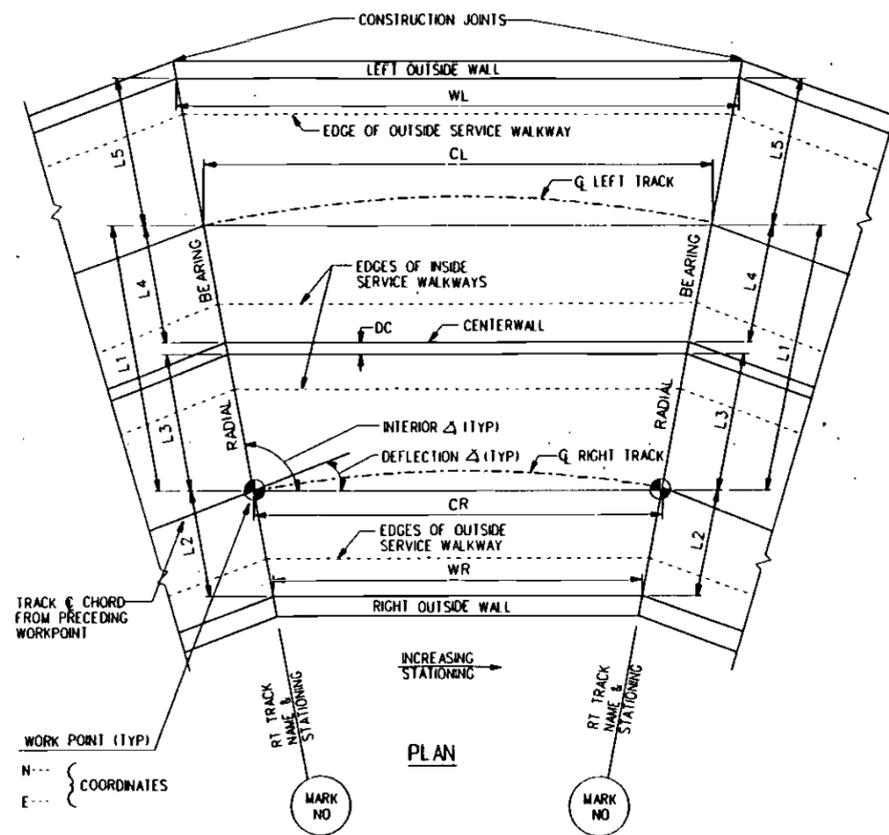
**STRUCTURAL STANDARD
CUT AND COVER SUBWAY
CONSTRUCTION STRUCTURES
MISCELLANEOUS DETAILS**

CONTRACT NO.	
DRAWING NO.	SS-006
REV	1
SCALE	NO SCALE
SHEET NO.	

PLOTTED BY: 8/20/94



PLAN



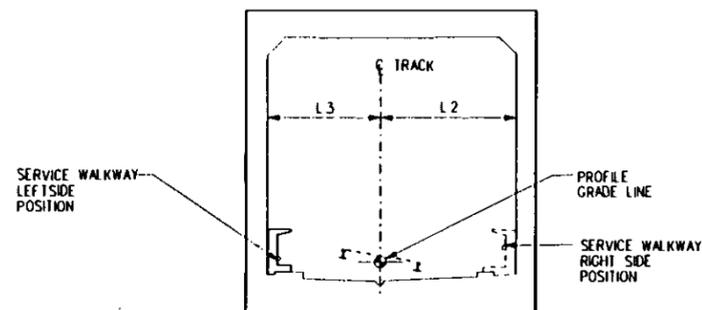
PLAN

LEGEND:

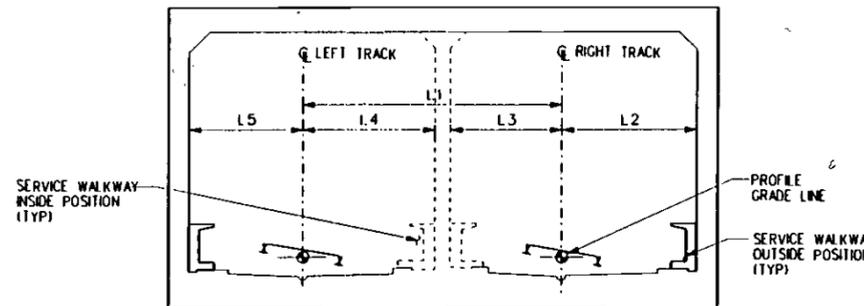
- CR CHORD LENGTH OF RIGHT OR SINGLE TRACK CENTERLINE BETWEEN CONSTRUCTION JOINTS OR WORK POINTS.
- CL CHORD LENGTH OF LEFT TRACK CENTERLINE BETWEEN CONSTRUCTION JOINTS FOR A DOUBLE TRACK CONDITION
- OC WIDTH OF CENTER WALL.
- WR LENGTH OF RIGHT OUTSIDE WALL AT INSIDE FACE.
- WL LENGTH OF LEFT OUTSIDE WALL AT INSIDE FACE.

NOTES:

1. SINGLE AND DOUBLE TRACK SUBWAY PLAN AND SECTIONS HAVE BEEN INDICATED FOR A CURVED CONDITION TO THE RIGHT. ALL DIMENSIONS, BEARINGS AND ANGLES ARE MEASURED IN THE SAME MANNER AND ORDER PROCEEDING IN THE DIRECTION OF INCREASING STATIONING FOR TANGENT SECTIONS AND CURVES TO THE LEFT.
2. DIMENSION LINES AND LIMITS ARE INDICATED ON THIS DRAWING TO DEFINE POINTS AND POSITION OF MEASUREMENTS TABULATED ON OTHER SHEETS.
3. RADIAL BEARINGS ARE PERPENDICULAR OR RADIAL TO THE RIGHT TRACK CENTERLINE FOR A TWO-TRACK CONDITION, OR TO THE TRACK CENTERLINE OF A SINGLE-TRACK CONDITION.
4. SERVICE WALKWAYS ARE INDICATED ON BOTH SIDES OF TRACK CENTERLINES FOR THE PURPOSE OF ILLUSTRATION ONLY. SEE KEY PLAN FOR LIMITS AND LOCATION OF SERVICE WALKWAYS.
5. THE TOP OF RAIL IS THAT PORTION OF THE RUNNING RAIL THAT FOLLOWS THE PROFILE GRADE LINE (P.G.L.).
6. SEE CONSTRUCTION JOINT SCHEDULE FOR CONSTRUCTION JOINT MARK NUMBERS WITH RESPECTIVE CONTROL LINE STATIONING AND COORDINATES, RADIAL BEARINGS, DEFLECTION ANGLES, INTERIOR ANGLES AND "L" DIMENSIONS ALONG CONSTRUCTION JOINTS.
7. SEE WALL AND SERVICE WALKWAY SCHEDULE FOR CHORD LENGTHS OF TRACKS, CHORD LENGTHS OF OUTSIDE WALLS, WIDTH OF CENTER WALL (IF ANY) AND SERVICE WALKWAY POSITION.
8. SEE OTHER STRUCTURAL DRAWINGS FOR STRUCTURAL DIMENSIONS, REINFORCING, INVERT AND OTHER DETAILS.



SECTION AT CONSTRUCTION JOINT
TYPICAL SINGLE TRACK SUBWAY BOX

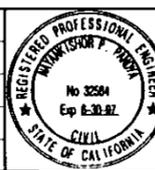


SECTION AT CONSTRUCTION JOINT
TYPICAL DOUBLE TRACK SUBWAY BOX

NOTE: TWO-CELL BOX STRUCTURE IS INDICATED ABOVE. CENTER WALL IS OMITTED FOR ONE-CELL BOX CONSTRUCTION. SEE WALL AND SERVICE WALKWAY SCHEDULE FOR WIDTH OF CENTER WALL, IF ANY.

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
W. J. ARMENTO
DRAWN BY
R. BAUTISTA
CHECKED BY
N. PANDYA
IN CHARGE
N. PANDYA
DATE
21 FEB 94



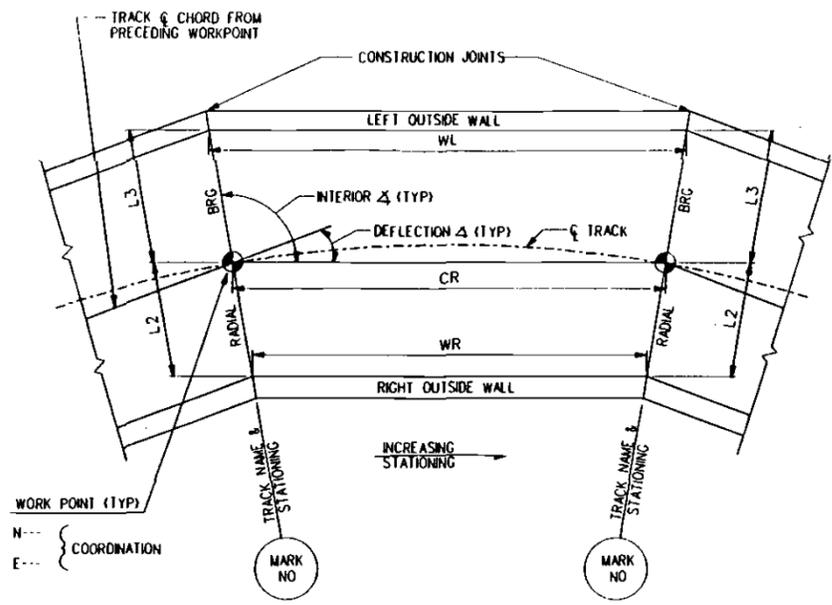
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

ENGINEERING MANAGEMENT CONSULTANT

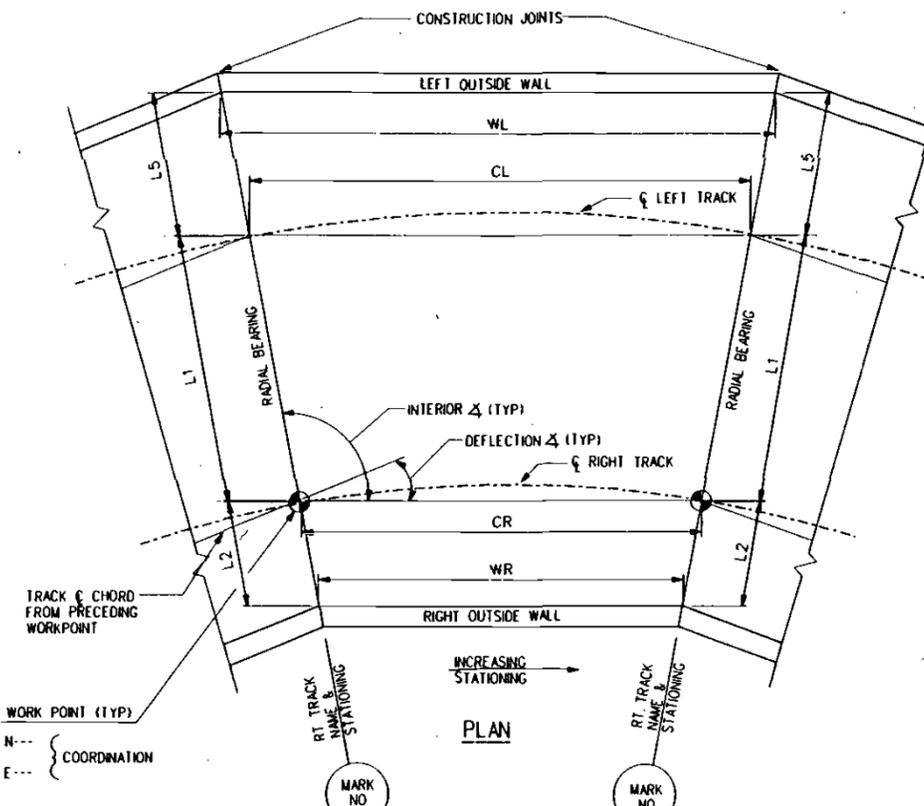
Submitted: N.P. PANDYA
Approved: K.N. MURTHY

STRUCTURAL STANDARD
CUT AND COVER SUBWAY
BOX STRUCTURES
STANDARD DIMENSIONING AND NOTES

CONTRACT NO.	
DRAWING NO.	SS-007
REV.	1
SCALE	NO SCALE
SHEET NO.	



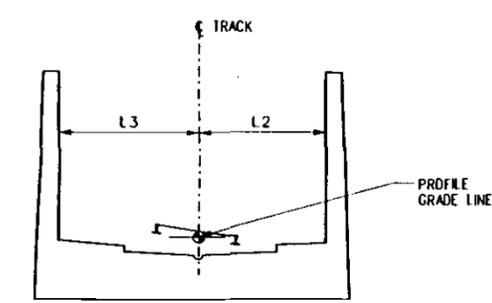
PLAN



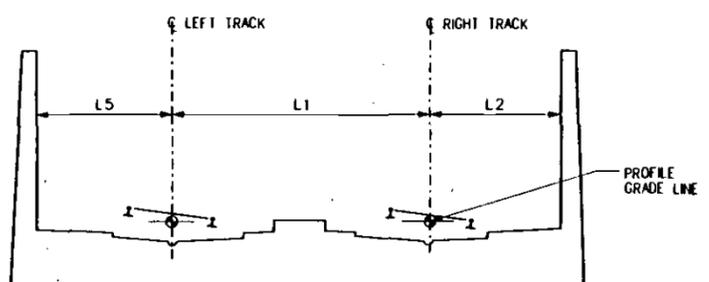
PLAN

- LEGEND:**
- CR CHORD LENGTH OF RIGHT OR SINGLE TRACK CENTERLINE BETWEEN CONSTRUCTION JOINTS OR WORK POINTS.
 - CL CHORD LENGTH OF LEFT TRACK CENTERLINE BETWEEN CONSTRUCTION JOINTS FOR A DOUBLE TRACK CONDITION.
 - WR LENGTH OF RIGHT OUTSIDE WALL AT INSIDE FACE.
 - WL LENGTH OF LEFT OUTSIDE WALL AT INSIDE FACE.

- NOTES:**
1. SINGLE AND DOUBLE TRACK U-SECTION PLANS AND SECTIONS HAVE BEEN INDICATED FOR A CURVED CONDITION TO THE RIGHT. ALL DIMENSIONS, BEARINGS AND ANGLES ARE MEASURED IN THE SAME MANNER AND ORDER PROCEEDING IN THE DIRECTION OF INCREASING STATIONING FOR TANGENT SECTIONS AND CURVES TO THE LEFT.
 2. DIMENSION LINES AND LIMITS ARE INDICATED ON THIS DRAWING TO DEFINE POINTS AND POSITION OF MEASUREMENTS TABULATED ON OTHER SHEETS.
 3. RADIAL BEARINGS ARE PERPENDICULAR OR RADIAL TO THE RIGHT TRACK CENTERLINE FOR A TWO-TRACK CONDITION OR TO THE TRACK CENTERLINE OF A SINGLE-TRACK CONDITION.
 4. THE TOP OF RAIL IS THAT PORTION OF THE RUNNING RAIL THAT FOLLOWS THE PROFILE GRADE LINE (P.G.L.).
 5. SEE CONSTRUCTION JOINT SCHEDULE FOR CONST JOINT MARK NUMBERS WITH RESPECTIVE CONTROL LINE STATIONING AND COORDINATES, RADIAL BEARINGS, DEFLECTION ANGLES, INTERIOR ANGLES AND "L" DIMENSIONS ALONG CONSTRUCTION JOINTS.
 6. SEE WALL AND SERVICE WALKWAY SCHEDULE FOR CHORD LENGTHS OF TRACKS, CHORD LENGTHS OF OUTSIDE WALLS, WIDTH OF CENTER WALL (IF ANY).
 7. SEE OTHER STRUCTURAL DRAWINGS FOR STRUCTURAL DIMENSIONS, REINFORCING, INVERT AND OTHER DETAILS.



SECTION AT CONSTRUCTION JOINT
TYPICAL SINGLE TRACK U-SECTION STRUCTURE



SECTION AT CONSTRUCTION JOINT
TYPICAL DOUBLE TRACK U-SECTION STRUCTURE

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0	2/21/94	N.P.	R.B.		SBCN 12 REVISED, REDRAWN BASELINE ISSUE

DESIGNED BY: W.J. ARMENTO
 DRAWN BY: R. BAUTISTA
 CHECKED BY: N.PANDYA
 IN CHARGE: N.PANDYA
 DATE: 21 FEB 94

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

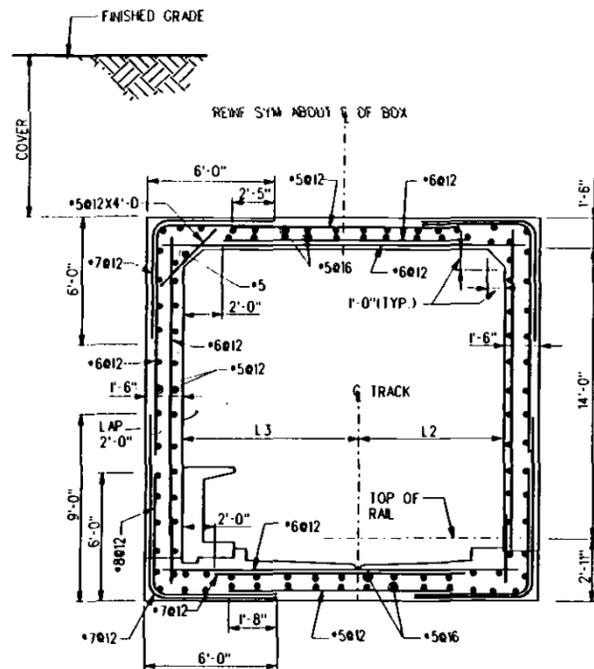
REGISTERED PROFESSIONAL ENGINEER
 No. 32504
 Exp. 6-30-92
 CIVIL
 STATE OF CALIFORNIA

ENGINEERING MANAGEMENT CONSULTANT
 as a member of
 Parsons Brinckerhoff Quade & Douglas, Inc.
 Daniel Mann Johnson & Mendenhall
 P.C. - Senior Engineers, Inc. dba J&M
 Excelsior Franchising, Inc. dba J&M
 Jenkins Corp. dba J&M, Inc.
 The Partnership, General Inc.

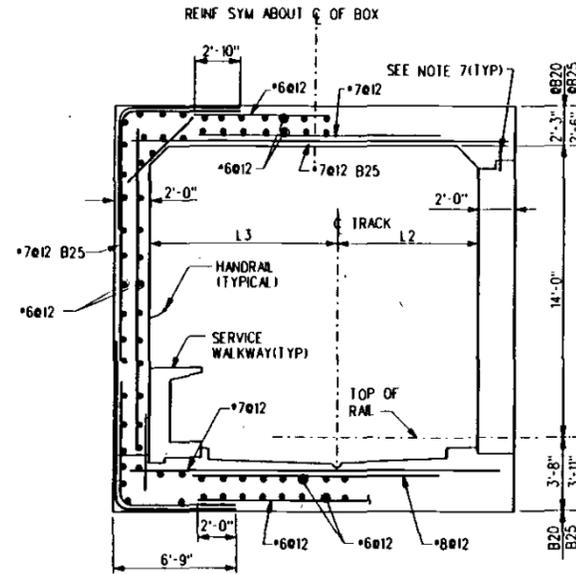
SUBMITTED: N.P. PANDYA
 APPROVED: K.N. MURTHY

**STRUCTURAL STANDARD
 CUT AND COVER SUBWAY
 U-SECTION STRUCTURES
 STANDARD DIMENSIONING AND NOTES**

CONTRACT NO.	
DRAWING NO.	SS-008
REV	1
SCALE	NO SCALE
SHEET NO.	

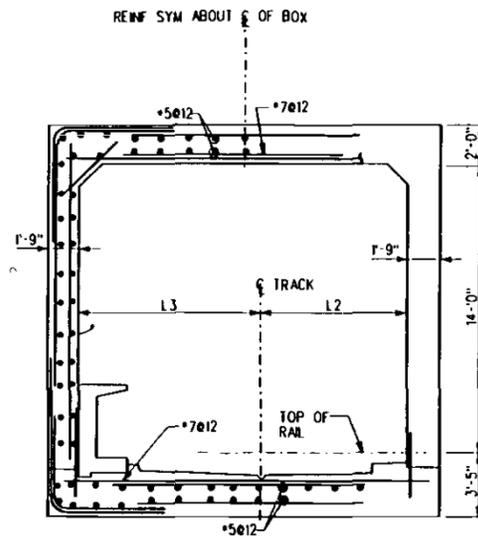


TYPE B-10
COVER: FROM D' TO 10'

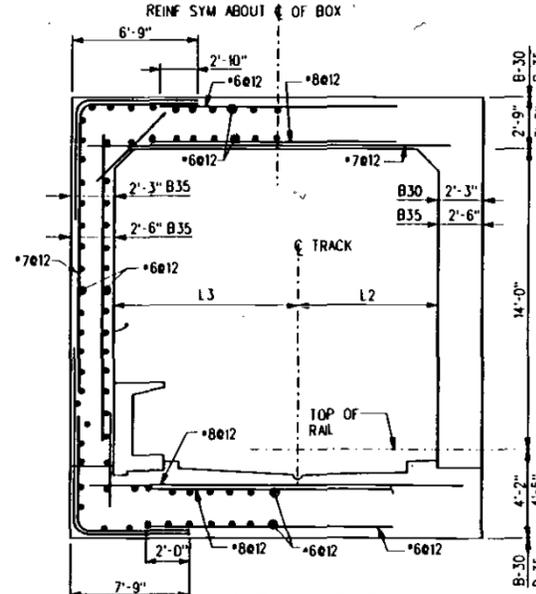


TYPE B-20
COVER: OVER 15' TO 20'

TYPE B-25
COVER: OVER 20' TO 25'



TYPE B-15
COVER: OVER 10' TO 15'



TYPE B-30
COVER: OVER 25' TO 30'

TYPE B-35
COVER: OVER 30' TO 35'

GENERAL NOTES

- UNLESS INDICATED OTHERWISE, REINFORCEMENT DETAILS FOR ALL BOX TYPES ARE SIMILAR TO THOSE SHOWN FOR TYPE B-10.
- FOR BAR LAPS, REINFORCING DETAILS AND JOINT DETAILS NOT SHOWN, SEE DRAWING SS-019.
- FOR INVERT DETAILS, SEE DRAWING SS-015.
- FOR LOCATION OF SERVICE WALKWAY, SEE KEY PLAN AND WALL AND SERVICE WALKWAY SCHEDULE. FOR DETAILS, SEE DRAWING SS-015.
- FOR DIMENSIONS L2 & L3 AT CONSTRUCTION JOINTS OF CURVED SECTIONS, SEE CONSTRUCTION JOINT SCHEDULE DRAWING.
- SEE KEY PLAN FOR LIMITS OF BOX TYPES.
- HORIZONTAL CONSTRUCTION JOINTS BETWEEN WALLS AND TOP SLAB MAY BE ADDED AT THE CONTRACTOR'S OPTION.
- FOR DETAILS OF INTERFACE BETWEEN FIXED INVERT AND FLOATING SLAB INVERT SEE DRAWING SS-016.

DESIGN NOTES

- MINIMUM 28 DAY COMPRESSIVE STRENGTH OF CONCRETE - 4000 PSI.
- REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60.
- CONCRETE THICKNESS AND REINFORCING DETAILS VALID FOR TANGENT AND CURVED ALIGNMENT, PROVIDED AVERAGE CLEAR SPAN OF THE TRACKWAY DOES NOT EXCEED 16'-0" IN ANY POUR SEGMENT.

FOR HEAVY RAIL STRUCTURES ONLY

REV	DATE	BY	SUB	APP	DESCRIPTION
1	10/10/94	E.S.	W.P.		SBCN 12 REVISED, REDRAWN
D	2/21/94				BASELINE ISSUE

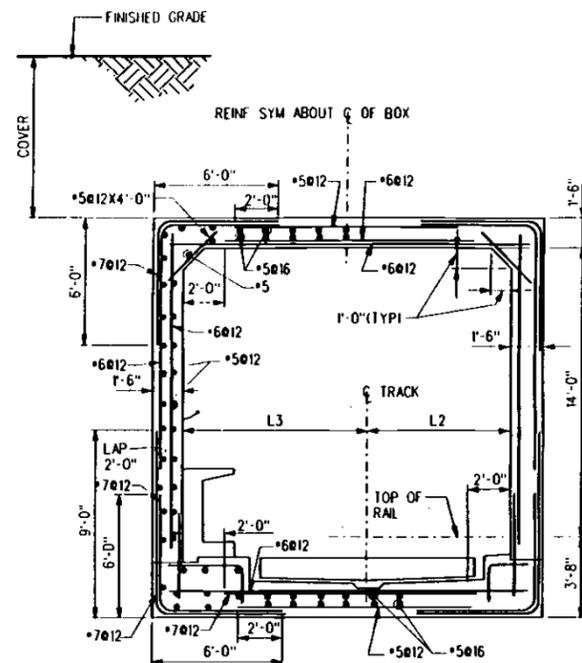
DESIGNED BY
W.J. ARMENTO
DRAWN BY
R. BAUTISTA
CHECKED BY
N. PANDYA
IN CHARGE
N. PANDYA
DATE
21 FEB 94



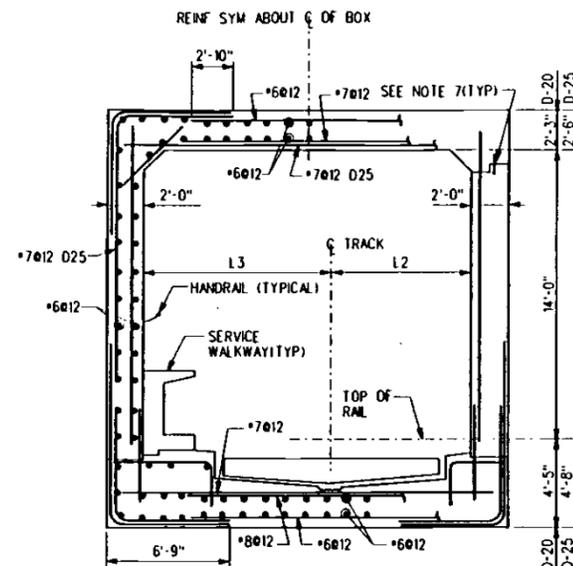
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
ENGINEERING MANAGEMENT CONSULTANT
SUBMITTED **N.P. PANDYA**
APPROVED **K.N. MURTHY**

**STRUCTURAL STANDARD
CUT AND COVER SUBWAY
ONE-CELL BOX WITH FIXED INVERT
DIMENSIONS AND REINFORCEMENT**

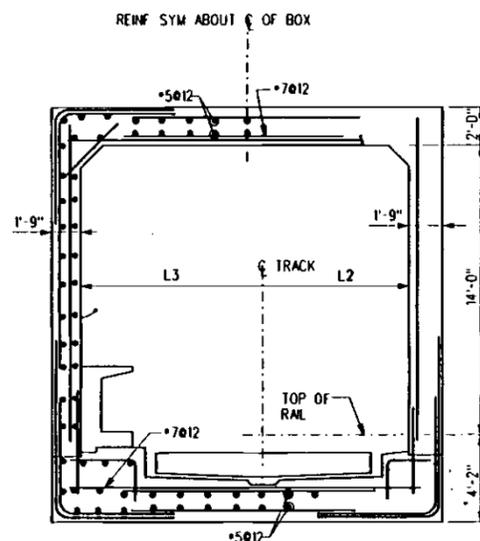
CONTRACT NO.	
DRAWING NO.	SS-009
SCALE	NO SCALE
SHEET NO.	1



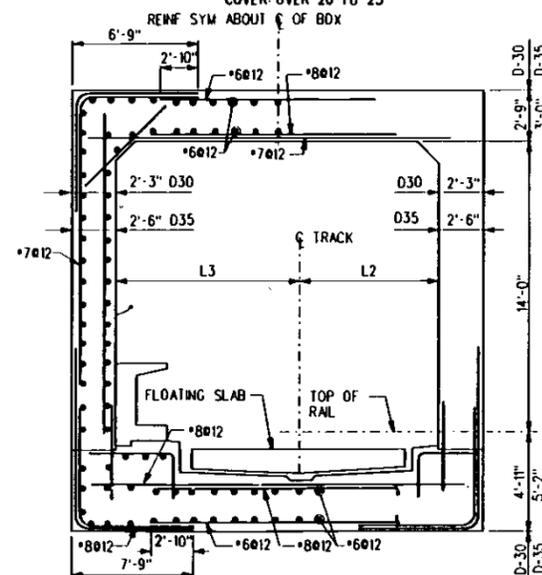
TYPE D-10
COVER: FROM 0' TO 10'



TYPE D-20
COVER: OVER 15' TO 20'
TYPE D-25
COVER: OVER 20' TO 25'



TYPE D-15
COVER: OVER 10' TO 15'



TYPE D-30
COVER: OVER 25' TO 30'
TYPE D-35
COVER: OVER 30' TO 35'

GENERAL NOTES

- UNLESS OTHERWISE INDICATED, REINFORCEMENT DETAILS FOR ALL BOX TYPES ARE SIMILAR TO THOSE SHOWN FOR TYPE D-10.
- FOR BAR LAPS, REINFORCING DETAILS AND JOINT DETAILS NOT SHOWN, SEE DRAWING SS-019.
- FOR INVERT & FLOATING SLAB DETAILS, SEE DRAWINGS SS-016, SS-017 AND SS-018.
- FOR LOCATION OF SERVICE WALKWAY, SEE KEY PLAN & WALL AND SERVICE WALKWAY SCHEDULE. FOR DETAILS, SEE DRAWING SS-015.
- FOR DIMENSIONS L2 & L3 AT CONSTRUCTION JOINTS, SEE CONSTRUCTION JOINT SCHEDULE DRAWING.
- SEE KEY PLAN FOR LIMITS OF BOX TYPES.
- HORIZONTAL CONSTRUCTION JOINTS BETWEEN WALLS AND TOP SLAB MAY BE ADDED AT THE CONTRACTOR'S OPTION.
- FOR DETAILS OF INTERFACE BETWEEN FLOATING SLAB INVERT AND FIXED INVERT, SEE DRAWING SS-016.

DESIGN NOTES

- MINIMUM 28 DAY COMPRESSIVE STRENGTH OF CONCRETE = 4000 PSI.
- REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60.
- CONCRETE THICKNESS AND REINFORCING DETAILS VALID FOR TANGENT AND CURVED ALIGNMENT, PROVIDED CLEAR AVERAGE SPAN OF THE TRACKWAY DOES NOT EXCEED 16'-0" IN ANY POUR SEGMENT.

FOR HEAVY RAIL STRUCTURES ONLY

REV	DATE	BY	SUB	APP	DESCRIPTION
0	2/21/94	N.P.			SBCN 12 REVISED, REDRAWN BASELINE ISSUE

DESIGNED BY
W. J. ARMENTO
DRAWN BY
R. BAUTISTA
CHECKED BY
N. PANDYA
IN CHARGE
N. PANDYA
DATE
21 FEB 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

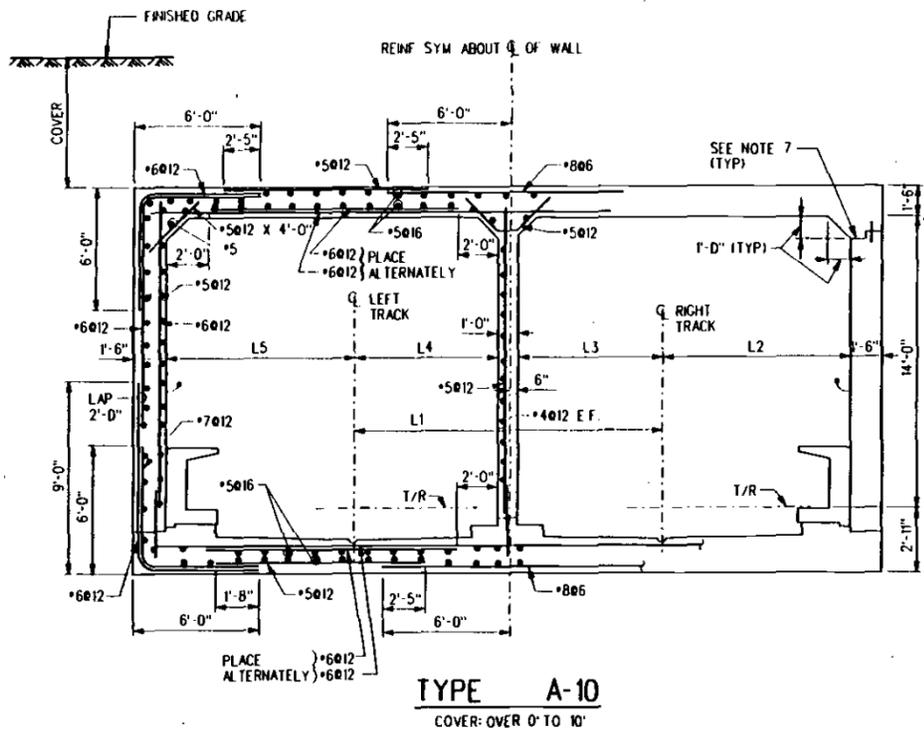
ENGINEERING MANAGEMENT CONSULTANT
an association of:
Parsons Brinckerhoff Dodge & Doughty, Inc.
Bechtel, Hillier, Johnson & Mosekoff
D. Foster Engineers, Kelli & Corp.
Eckhardt-Fitzhugh & Partners
James C. Kelly & Associates, Inc.
The Hillier Group, Inc.

SUBMITTED **N.P. PANDYA**
APPROVED **K.N. MURTHY**

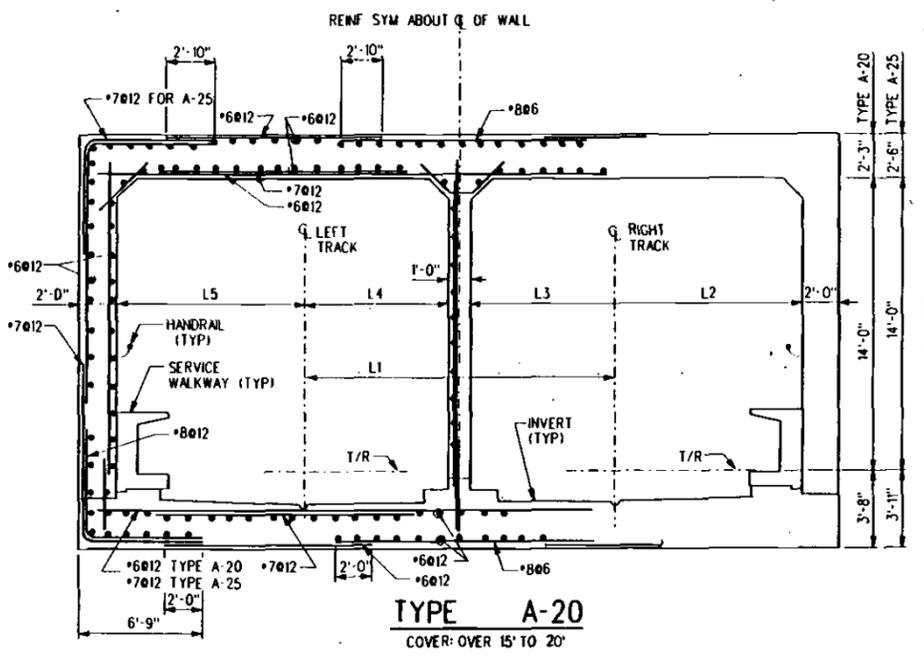
**STRUCTURAL STANDARD
CUT AND COVER SUBWAY
ONE-CELL BOX WITH FLOATING SLAB
DIMENSIONS AND REINFORCEMENT**

CONTRACT NO.	
DRAWING NO.	SS-010
REV	1
SCALE	NO SCALE
SHEET NO.	

PLOTTED BY: approved



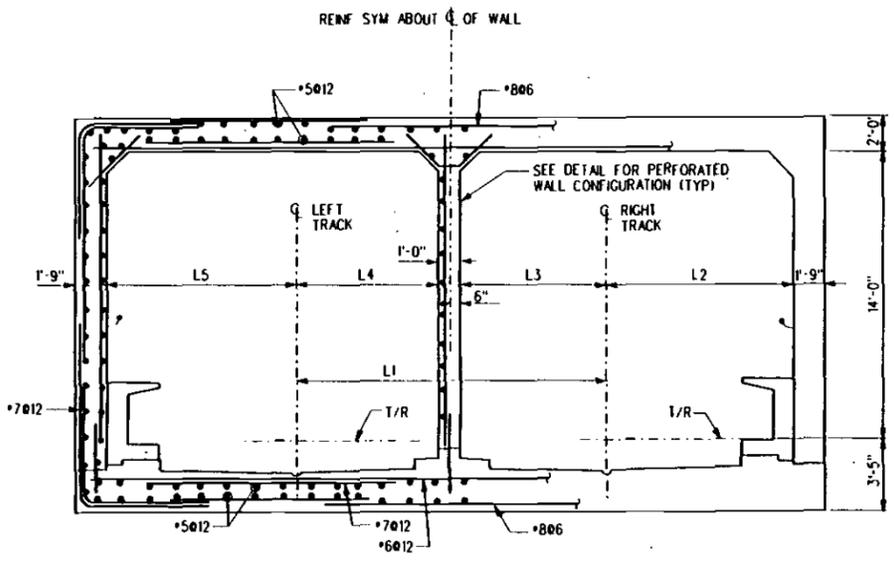
TYPE A-10
COVER: OVER 0' TO 10'



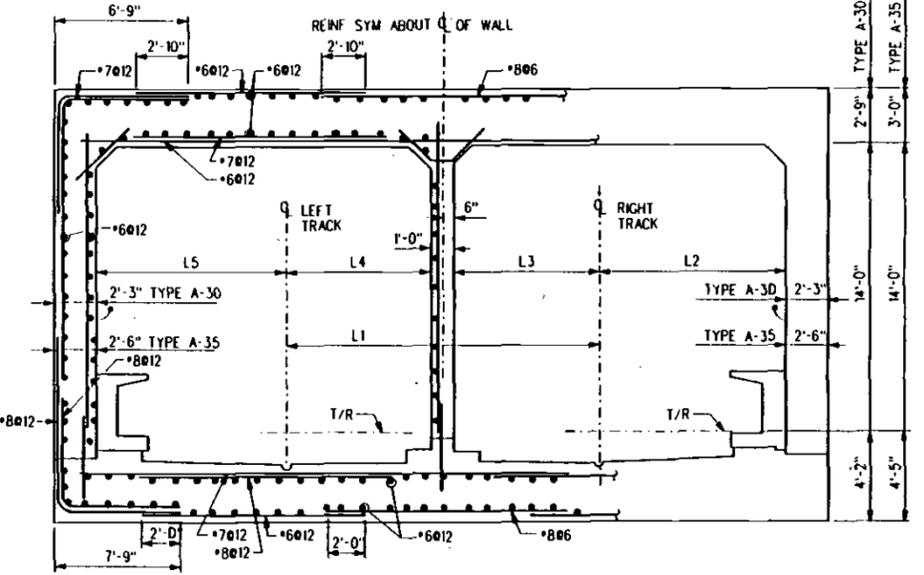
TYPE A-20
COVER: OVER 15' TO 20'



TYPE A-25
COVER: OVER 20' TO 25'



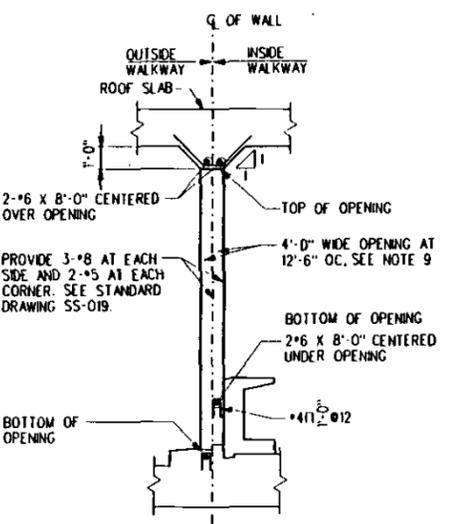
TYPE A-15
COVER: OVER 10' TO 15'



TYPE A-30
COVER: OVER 25' TO 30'



TYPE A-35
COVER: OVER 30' TO 35'



DETAIL
PERFORATED INTERIOR WALL CONFIGURATION

GENERAL NOTES

- UNLESS INDICATED OTHERWISE, REINFORCEMENT DETAILS FOR ALL BOX TYPES ARE SIMILAR TO THOSE SHOWN FOR TYPE A-10.
- FOR BAR LAPS, REINFORCING DETAILS AND JOINT DETAILS NOT SHOWN, SEE DRAWING SS-019.
- FOR INVERT DETAILS, SEE DRAWINGS SS-015.
- SERVICE WALKWAYS MAY BE LOCATED AT EITHER INSIDE OR OUTSIDE WALLS. FOR LOCATION AND DIMENSIONS, SEE KEY PLAN AND WALL AND SERVICE WALKWAY SCHEDULE. FOR DETAILS, SEE DRAWING SS-015.
- FOR DIMENSIONS L1 THRU L5 INCLUSIVE AT END OF CONCRETE POURS, SEE CONSTRUCTION JOINT SCHEDULE DRAWING.
- SEE KEY PLAN FOR LIMITS OF BOX TYPES.
- HORIZONTAL CONSTRUCTION JOINTS BETWEEN WALLS AND TOP SLAB MAY BE ADDED AT THE CONTRACTOR'S OPTION.
- FOR DETAILS OF INTERFACE BETWEEN FIXED INVERT AND FLOATING SLAB INVERT, SEE DRAWING SS-016.
- TRANSVERSE CONSTRUCTION JOINTS IN THE INTERIOR WALL SHALL BE LOCATED NOT CLOSER THAN 3'-0" FROM THE SIDES OF OPENING.

DESIGN NOTES

- MINIMUM 28 DAY COMPRESSIVE STRENGTH OF CONCRETE - 4000 PSI.
- REINFORCING SHALL CONFORM TO ASTM A615, GRADE 60.
- CONCRETE THICKNESSES AND REINFORCING DETAILS VALID FOR TANGENT AND CURVED ALIGNMENT PROVIDED AVERAGE CLEAR SPAN OF EACH TRACKWAY DOES NOT EXCEED 16'-0" IN ANY POUR SEGMENT.

FOR HEAVY RAIL STRUCTURES ONLY

REV	DATE	BY	SAID	APP	DESCRIPTION
0	2/21/94				SBCN 12 REVISED, REDRAWN BASELINE ISSUE

DESIGNED BY
W. J. ARMENTO

DRAWN BY
R. BAUTISTA

CHECKED BY
N. PANDYA

IN CHARGE
N. PANDYA

DATE
21 FEB 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

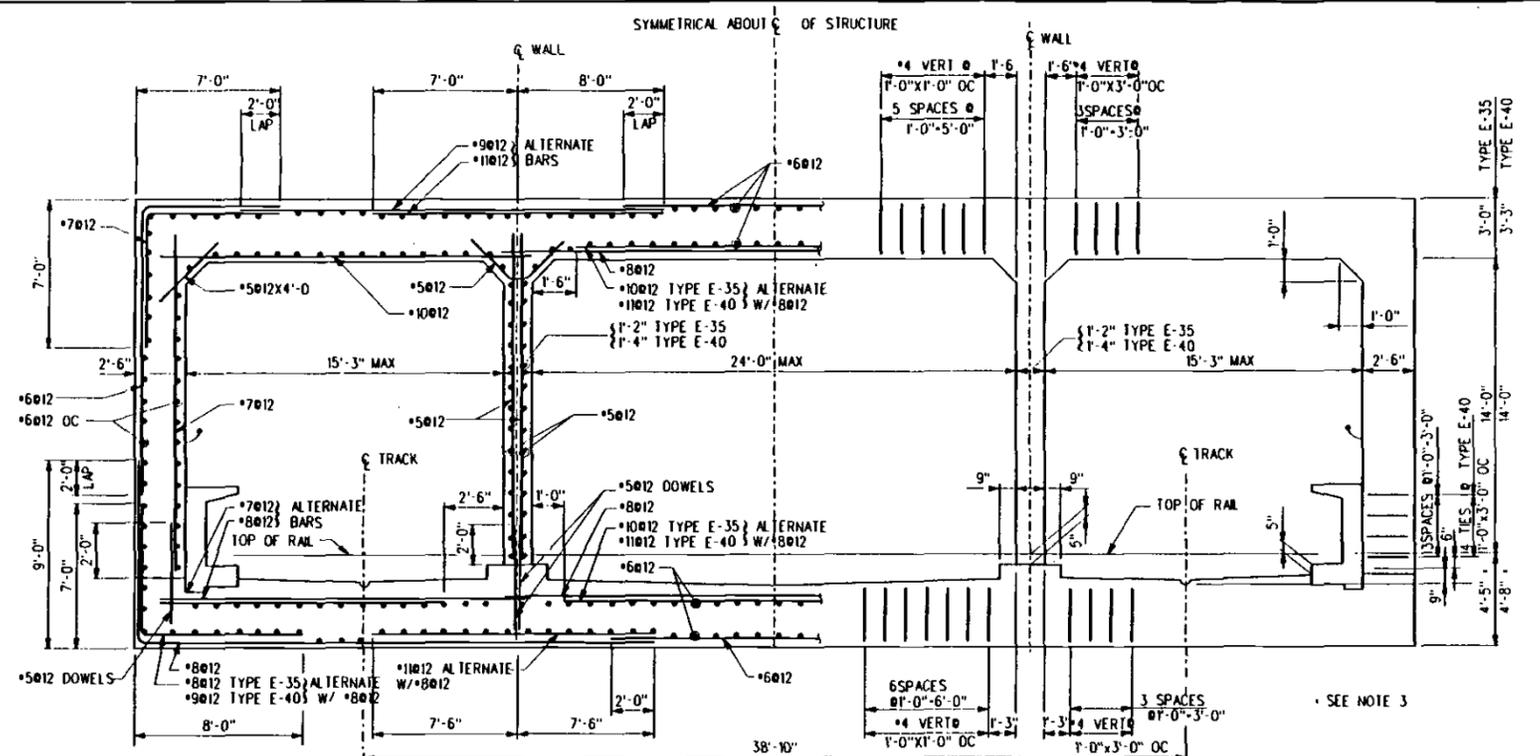
ENGINEERING MANAGEMENT CONSULTANT

Submitted by: **N. P. PANDYA**

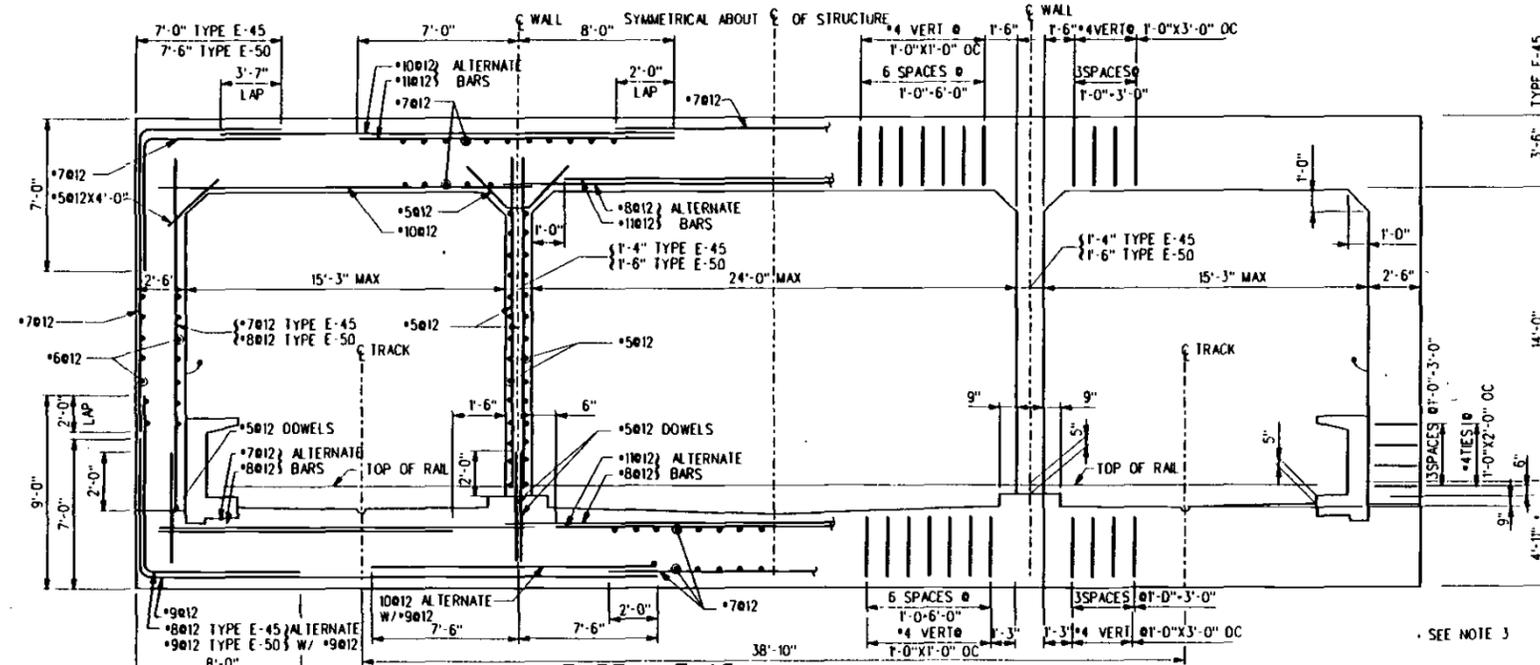
Approved by: **K. N. MURTHY**

STRUCTURAL STANDARD CUT AND COVER SUBWAY TWO-CELL BOX WITH FIXED INVERT DIMENSIONS AND REINFORCEMENT

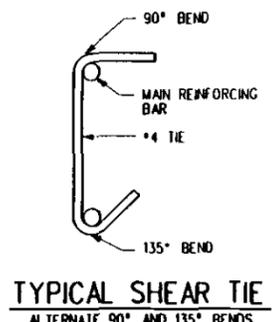
CONTRACT NO.	
DRAWING NO.	SS-011
SCALE	NO SCALE
SHEET NO.	1



TYPE E-35 COVER OVER 30' TO 35'
TYPE E-40 COVER OVER 35' TO 40'



TYPE E-45 COVER OVER 40' TO 45'
TYPE E-50 COVER OVER 45' TO 50'



GENERAL NOTES

- ALL DETAILS AND DIMENSIONS SHOWN ARE SYMMETRICAL ABOUT CENTERLINE OF STRUCTURE.
- THIS DRAWING IS APPLICABLE TO A THREE-CELL BOX STRUCTURE WITH EITHER A FIXED INVERT OR A FLOATING SLAB INVERT.
- WHEN A FLOATING SLAB INVERT IS USED, THE DIMENSION FROM TOP OF RAIL TO BOTTOM OF BASE SLAB SHALL BE INCREASED BY 9 INCHES.
- THIS DRAWING IS APPLICABLE ONLY WHEN THE SERVICE WALKWAYS ARE LOCATED AT THE INSIDE WALLS OF OUTER TRACKWAYS. FOR DIMENSIONS, SEE KEY PLAN AND WALL AND SERVICE WALKWAY SCHEDULE. FOR DETAILS OF SERVICE WALKWAY, SEE DRAWING SS-015.
- FOR BAR LAPS, REINFORCING DETAILS AND JOINT DETAILS NOT SHOWN, SEE DRAWING SS-019.
- FOR INVERT DETAILS, SEE DRAWING SS-018.
- SEE KEY PLAN FOR LIMITS OF BOX TYPES.
- HORIZONTAL CONSTRUCTION JOINTS BETWEEN WALLS AND TOP SLAB MAY BE ADDED AT THE CONTRACTOR'S OPTION.
- FOR DETAILS OF INTERFACE BETWEEN FLOATING SLAB INVERT AND FIXED INVERT, SEE DRAWING SS-016.
- TRANSVERSE CONSTRUCTION JOINTS IN THE INTERIOR WALL SHALL BE LOCATED NOT CLOSER THAN 3'-0" FROM THE SIDE OF OPENING.

DESIGN NOTES

- MINIMUM 28 DAY COMPRESSIVE STRENGTH OF CONCRETE-4000PSI
- REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60
- CONCRETE THICKNESS AND REINFORCING DETAILS ARE VALID FOR TANGENT AND CURVED ALIGNMENT PROVIDED THE AVERAGE CLEAR SPAN OF EACH TRACKWAY IN ANY FOUR SEGMENT DOES NOT EXCEED THE MAXIMUM SPAN INDICATED.

FOR HEAVY RAIL STRUCTURES ONLY

NO	DATE	BY	CHKD	APP	DESCRIPTION
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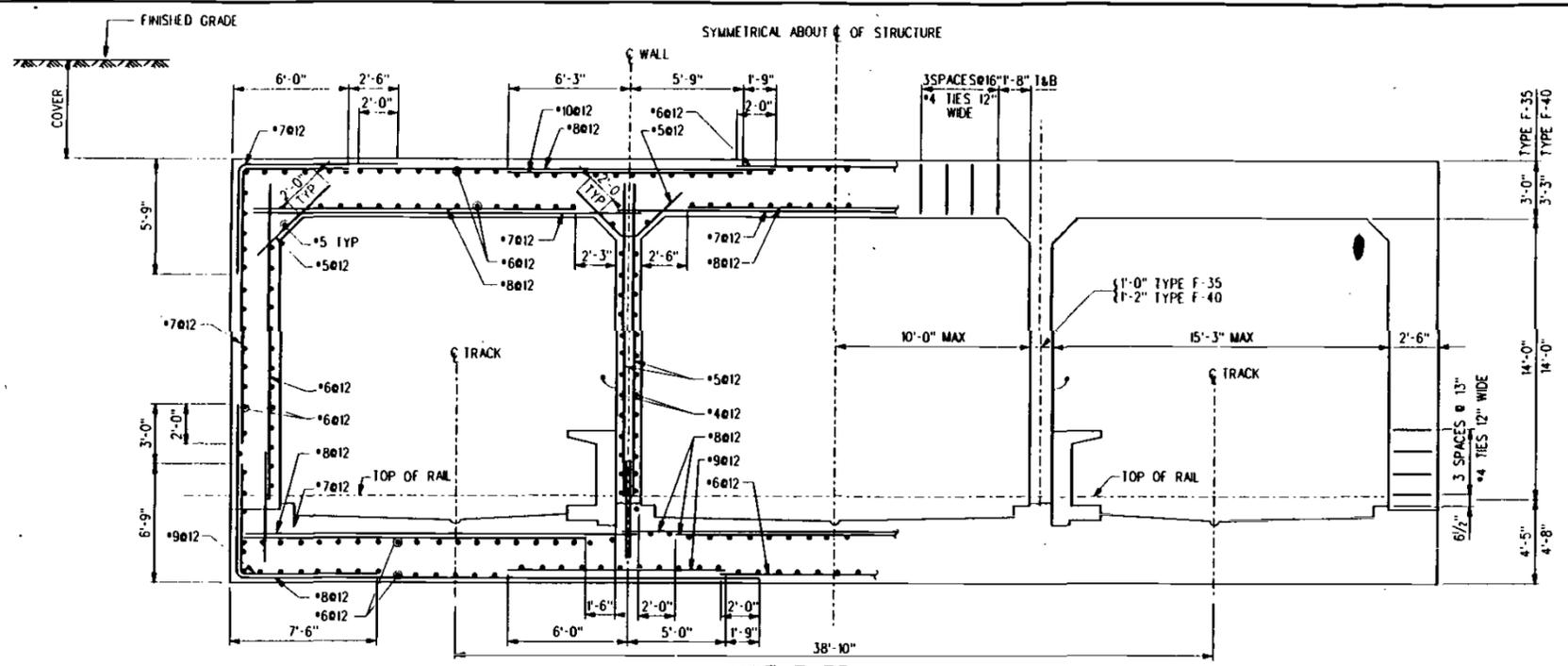
DESIGNED BY
W.J. ARMENTO
DRAWN BY
R. BAUTISTA
CHECKED BY
N. PANDYA
IN CHARGE
N. PANDYA
DATE
21 FEB 94



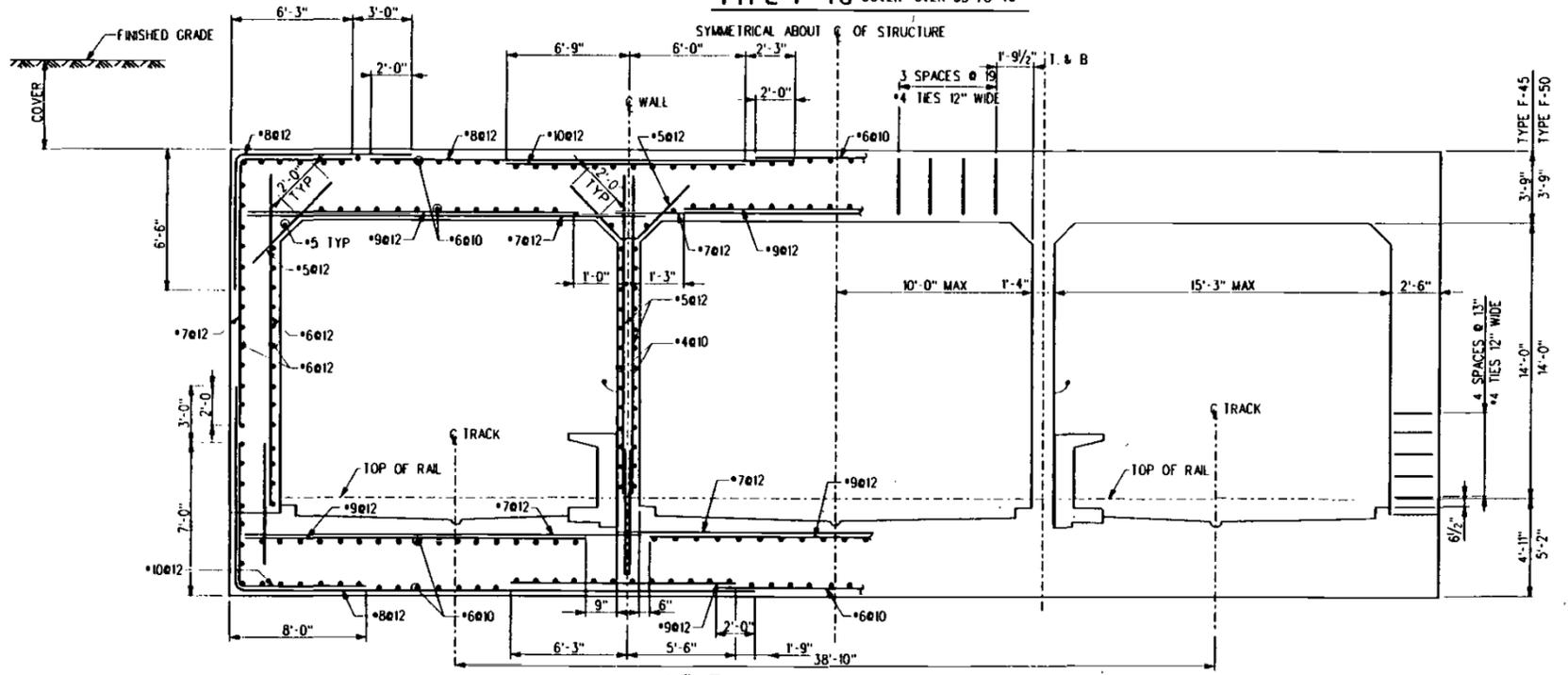
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
ENGINEERING MANAGEMENT CONSULTANT
SUBMITTED BY: N.P. PANDYA
APPROVED BY: K.N. MURTHY

STRUCTURAL STANDARD
CUT AND COVER SUBWAY
TWO-CELL BOX WITH
EXTERIOR WALKWAYS
DIMENSIONS AND REINFORCEMENT

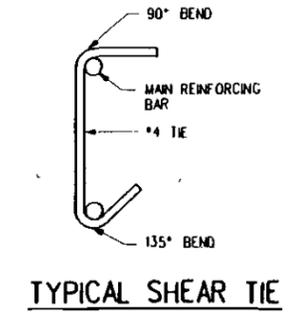
CONTRACT NO.	
DRAWING NO.	SS-013
REV.	1
SCALE	NO SCALE
SHEET NO.	



TYPE F-35 COVER: OVER 30' TO 35'
 TYPE F-40 COVER: OVER 35' TO 40'



TYPE F-45 COVER: OVER 40' TO 45'
 TYPE F-50 COVER: OVER 45' TO 50'



TYPICAL SHEAR TIE

GENERAL NOTES

- ALL DETAILS AND DIMENSIONS SHOWN ARE SYMMETRICAL ABOUT CENTERLINE OF STRUCTURE.
- THIS DRAWING IS APPLICABLE TO A THREE-CELL BOX STRUCTURE WITH EITHER A FIXED INVERT OR A FLOATING SLAB INVERT.
- WHEN A FLOATING SLAB INVERT IS USED, THE DIMENSION FROM TOP OF RAIL TO BOTTOM OF BASE SLAB SHALL BE INCREASED BY 9 INCHES.
- THIS DRAWING IS APPLICABLE ONLY WHEN THE SERVICE WALKWAYS ARE LOCATED AT THE INSIDE WALLS OF OUTER TRACKWAYS. FOR DIMENSIONS, SEE KEY PLAN AND WALL AND SERVICE WALKWAY SCHEDULE. FOR DETAILS OF SERVICE WALKWAY, SEE DRAWING SS-015.
- FOR BAR LAPS, REINFORCING DETAILS AND JOINT DETAILS NOT SHOWN, SEE DRAWING SS-019.
- FOR INVERT DETAILS, SEE DRAWING SS-015.
- SEE KEY PLAN FOR LIMITS OF BOX TYPES.
- HORIZONTAL CONSTRUCTION JOINTS BETWEEN WALLS AND TOP SLAB MAY BE ADDED AT THE CONTRACTOR'S OPTION.
- FOR DETAILS OF INTERFACE BETWEEN FIXED INVERT AND FLOATING SLAB INVERT, SEE DRAWING SS-016.
- TRANSVERSE CONSTRUCTION JOINTS IN THE INTERIOR WALL SHALL BE LOCATED NOT CLOSER THAN 3'-0" FROM THE SIDE OF OPENING.

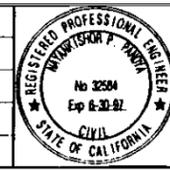
DESIGN NOTES

- MINIMUM 28 DAY COMPRESSIVE STRENGTH OF CONCRETE-4000PSI
- REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60.
- CONCRETE THICKNESS AND REINFORCING DETAILS ARE VALID FOR TANGENT AND CURVED ALIGNMENT PROVIDED THE AVERAGE CLEAR SPAN OF EACH TRACKWAY IN ANY POUR SEGMENT DOES NOT EXCEED THE MAXIMUM SPAN INDICATED.

FOR HEAVY RAIL STRUCTURES ONLY

REV	DATE	BY	CHKD	APPD	DESCRIPTION
10	10 94				SBCN 12 REVISED, REDRAWN
0	2 21 94				BASELINE ISSUE

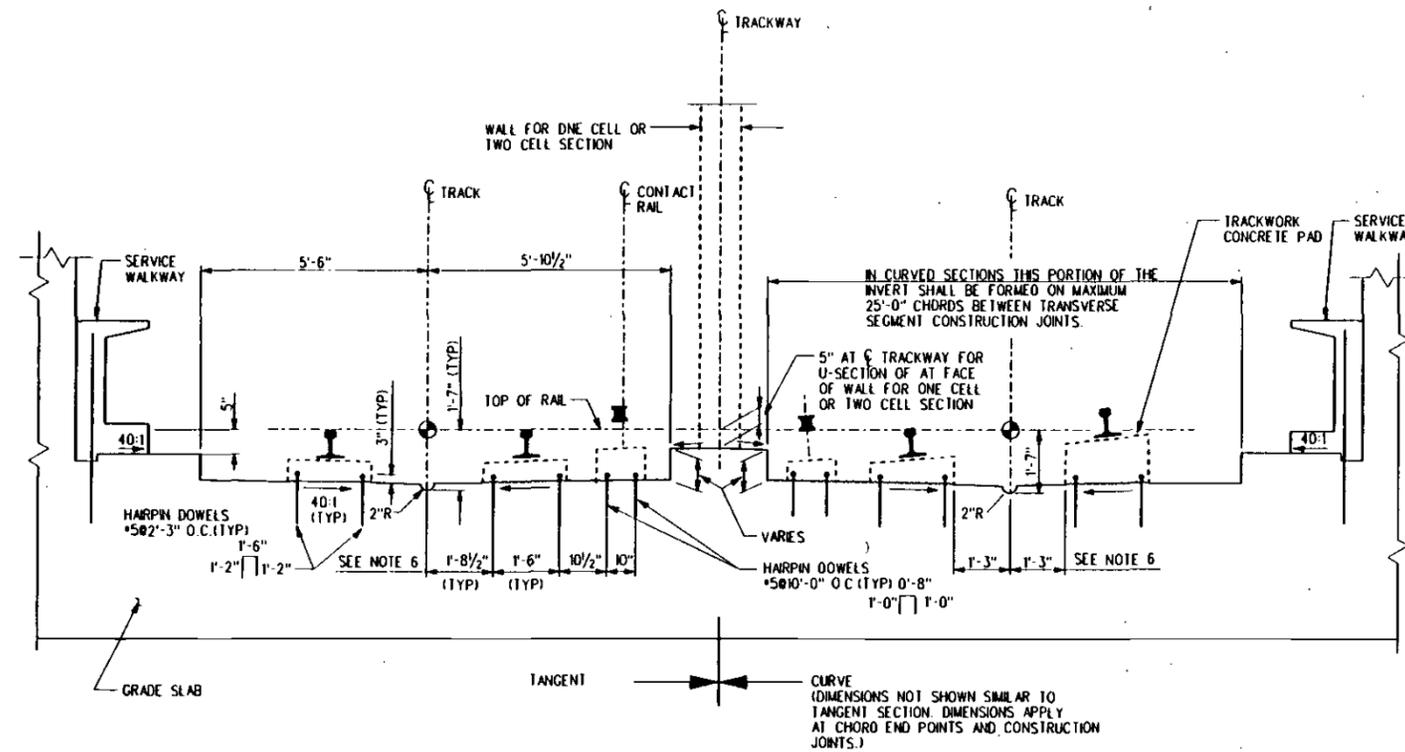
DESIGNED BY
W. J. ARMENTO
 DRAWN BY
R. BAUTISTA
 CHECKED BY
N. PANDYA
 IN CHARGE
N. PANDYA
 DATE
21 FEB 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
 ENGINEERING MANAGEMENT CONSULTANT
 SUBMITTED BY
N.P. PANDYA
 APPROVED
K.N. MURTHY

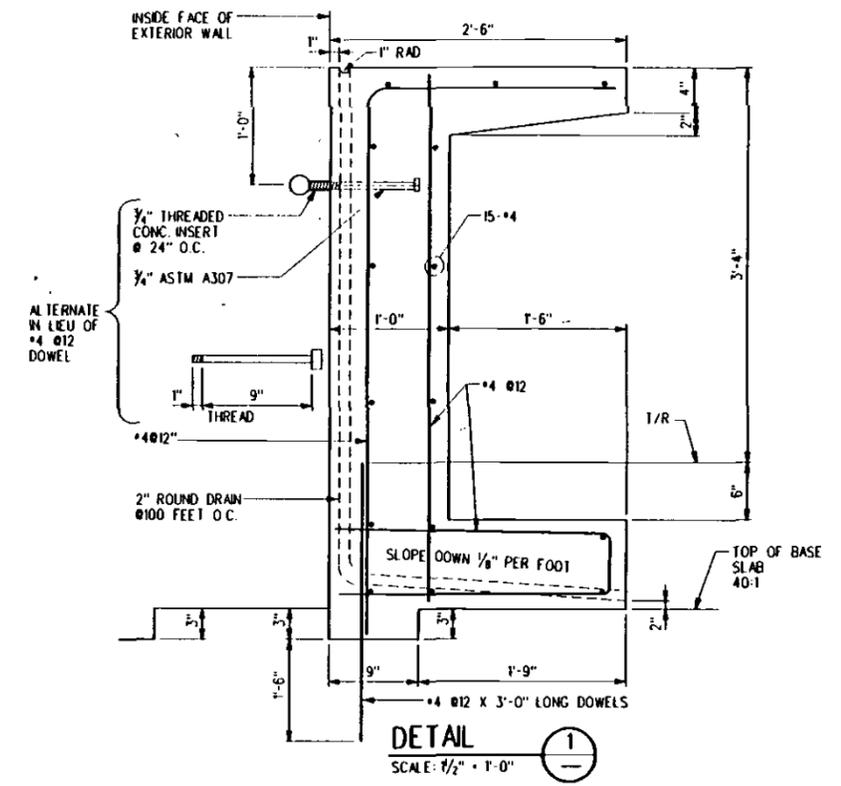
STRUCTURAL STANDARD
 CUT AND COVER SUBWAY
 THREE-CELL BOX WITH
 INTERIOR WALKWAYS
 DIMENSIONS AND REINFORCEMENT

CONTRACT NO.	
DRAWING NO.	SS-014
REV	1
SCALE	NO SCALE
SHEET NO.	



FIXED INVERT TRANSVERSE SECTION

SCALE: 1/2" = 1'-0"



SERVICE WALKWAY

NOTES

1. CONCRETE SURFACE SHOWN THIS INDICATES SCRATCHED FINISH; ALL OTHER TRACK INVERT SURFACES TO BE FLOAT FINISHED.
2. LOCATION OF #5 BARS FOR CONTACT RAIL PEDESTALS TO BE VERIFIED BY THE AUTHORITY OR ITS DESIGNEE.
3. SERVICE WALKWAY MAY BE CONSTRUCTED ON CHORDS NOT EXCEEDING FIFTY FEET.
4. SERVICE WALKWAY DRAINS TO BE SPACED AS FOLLOWS: 2" ROUND DRAIN @ 100 FEET O.C. AND AT ALL LOW POINTS.
5. DETAILS OF #5 HARPIN DOWELS SHOWN APPLY TO INVERTS OF STATION STRUCTURES. SEE CROSSOVER DRAWINGS FOR DETAIL OF SPECIAL TRACKWORK. DOWELS SHALL BE PLACED WITHIN 1/4" OF THE LOCATION SHOWN.
6. FOR STATION STRUCTURES, CONTACT RAIL LOCATED ON OPPOSITE SIDE OF PLATFORM.

REV	DATE	BY	CHKD	APP	DESCRIPTION
0	2/21/94	N.P.	W.P.		SBCN 12 REVISED, REDRAWN BASELINE ISSUE

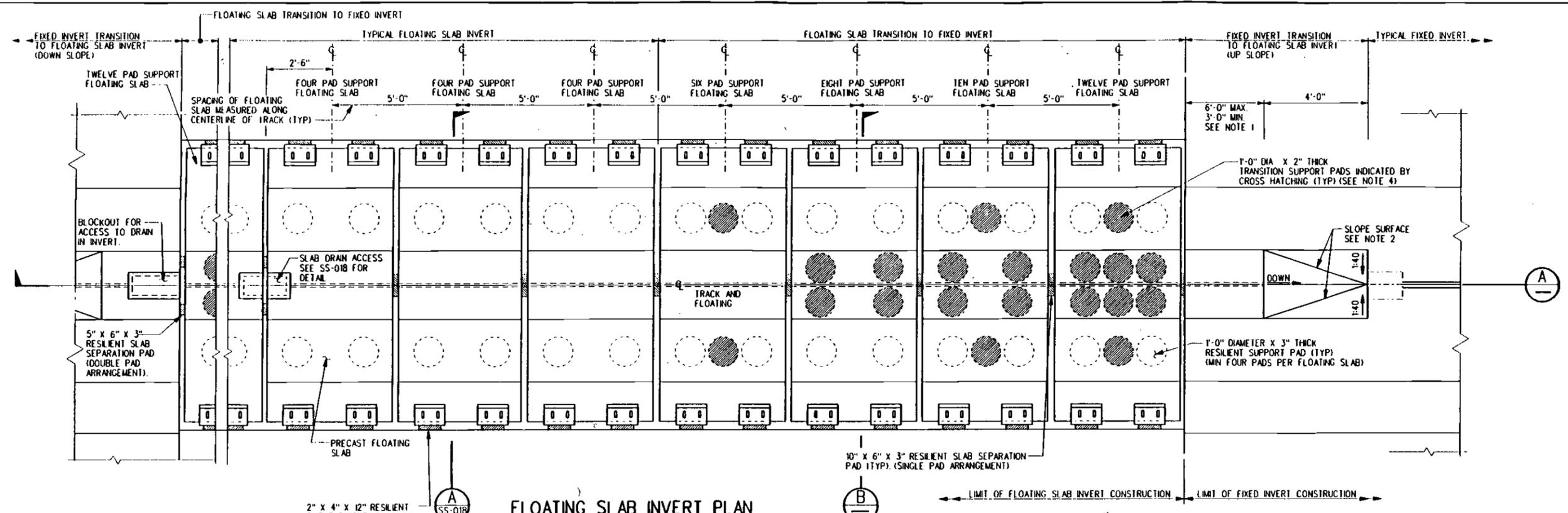
DESIGNED BY
W.J. ARMENTO
DRAWN BY
R. BAUTISTA
CHECKED BY
N. PANDYA
IN CHARGE
N. PANDYA
DATE
21 FEB 94



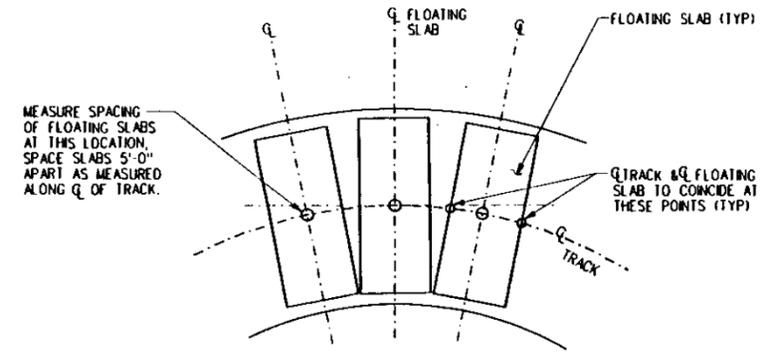
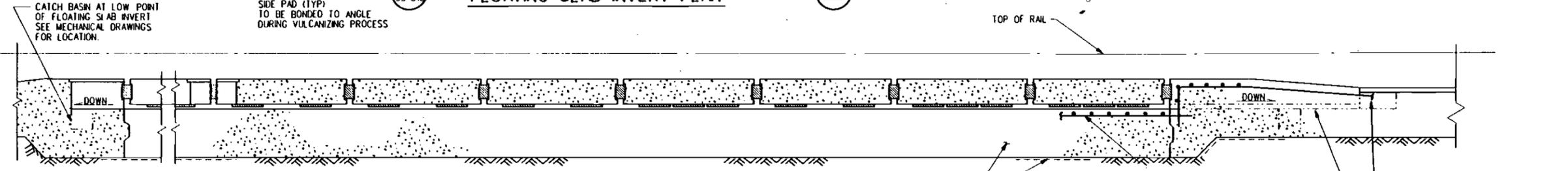
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
ENGINEERING MANAGEMENT CONSULTANT
SUBMITTED: N.P. PANDYA
APPROVED: K.N. MURTHY

STRUCTURAL STANDARD
CUT AND COVER SUBWAY
TYPICAL FIXED INVERT AND
SERVICE WALKWAY DETAILS

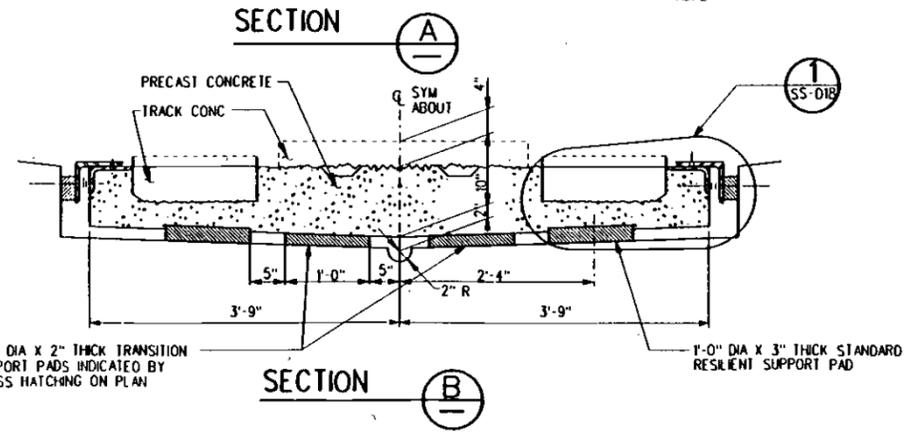
CONTRACT NO.	
DRAWING NO.	SS-015
SCALE	AS NOTED
SHEET NO.	1



FLOATING SLAB INVERT PLAN



FLOATING SLAB ON CURVE LAYOUT



NOTES:

1. THIS DIMENSION TO BE ADJUSTED TO SUT LAYOUT OF FLOATING SLABS AS APPROVED BY THE AUTHORITY OR ITS DESIGNEE
2. SLOPE SURFACE AS INDICATED TO MATCH TYPICAL FIXED INVERT.
3. TWO FLOATING SLABS WITH BLOCKOUTS TO BE PROVIDED OVER INVERT DRAINS OR CLEANOUTS. SEE MECHANICAL DRAWINGS FOR LOCATIONS THE CENTERLINE OF THE SPACE BETWEEN THE FLOATING SLABS TO BE LOCATED WITHIN 2 INCHES OF THE CENTERLINE OF THE DRAIN OR CLEANOUT.
4. CONTRACTOR MAY CHOOSE TO USE 12 - 1'-0" DIA X 3" THICK STANDARD PAD AND 1" BLOCKOUT AT PAD LOCATION TO SUPPORT THE TRANSITION FLOATING SLAB.

REV	DATE	BY	SUB	APP	DESCRIPTION
0	2 21 94	F.F.	SS	cmf	SBCN 12 REVISED, REDRAWN BASELINE ISSUE

DESIGNED BY
F. FORTUNATO
DRAWN BY
E. JANISZEWSKI
CHECKED BY
N. PANDYA
IN CHARGE
F. FORTUNATO
DATE
21 FEB 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

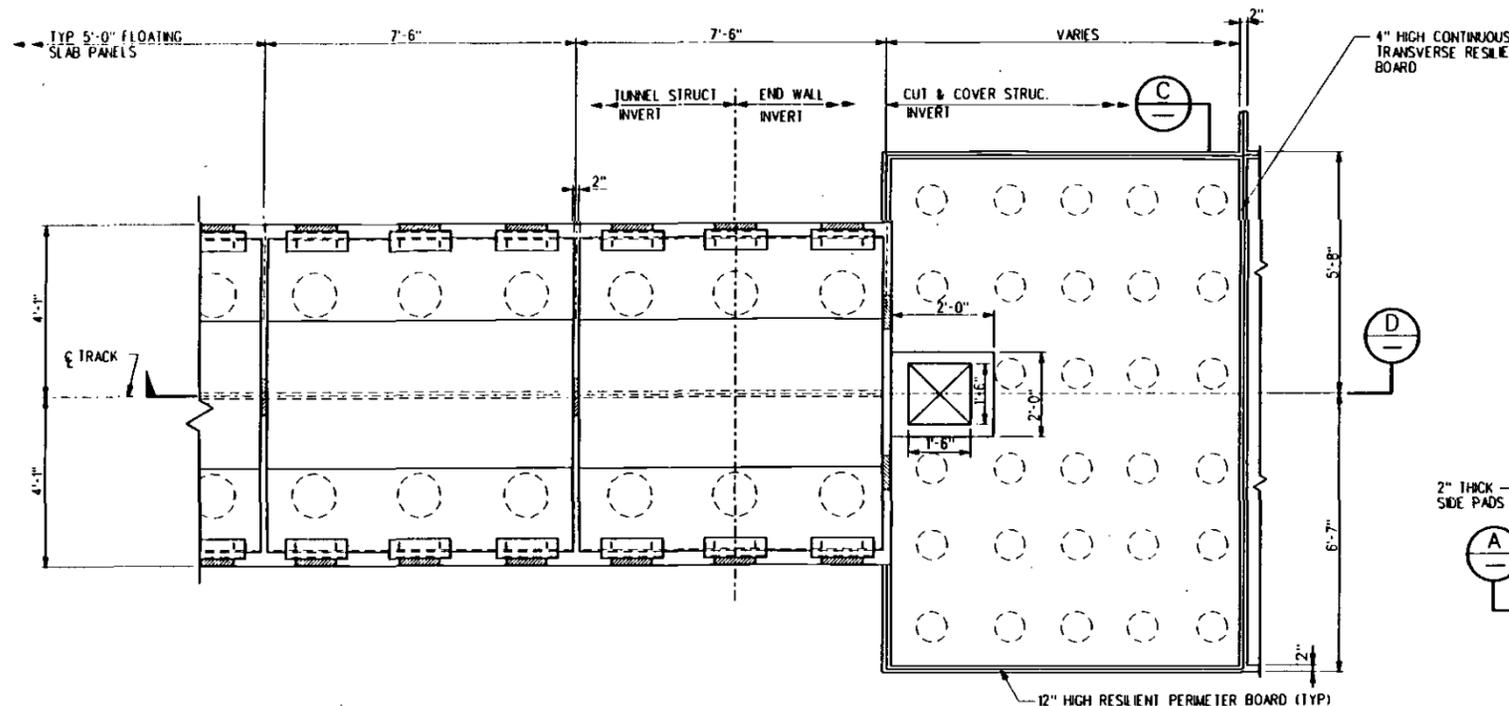
ENGINEERING MANAGEMENT CONSULTANT

SUBMITTED **F.M. FORTUNATO**
APPROVED **K.N. MURTHY**

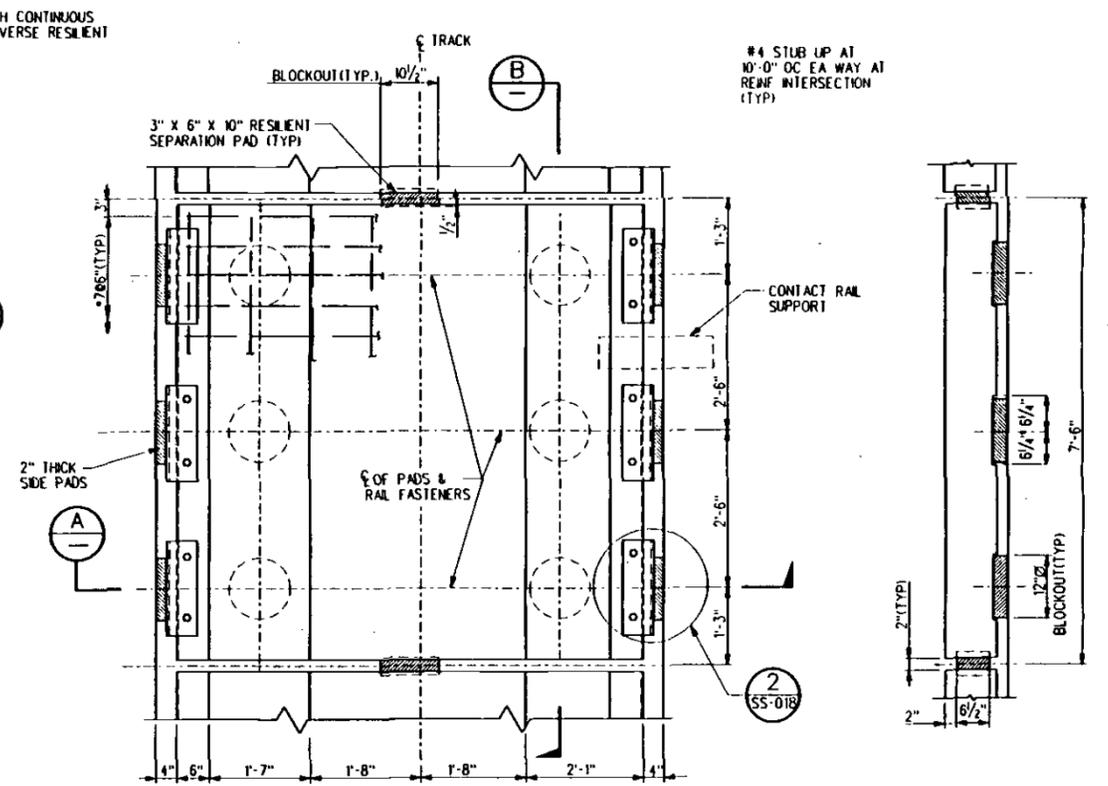
**STRUCTURAL STANDARD
CUT AND COVER SUBWAY
FLOATING SLAB INVERT
INVERT PLAN AND
LONGITUDINAL SECTION**

CONTRACT NO.	
DRAWING NO.	SS-016
REV	1
SCALE	NO SCALE
SHEET NO.	

DATE PLOTTED: 10/22/94 10:22 AM; PLOTTER: HP/4000; FILE: SS-016.DWG

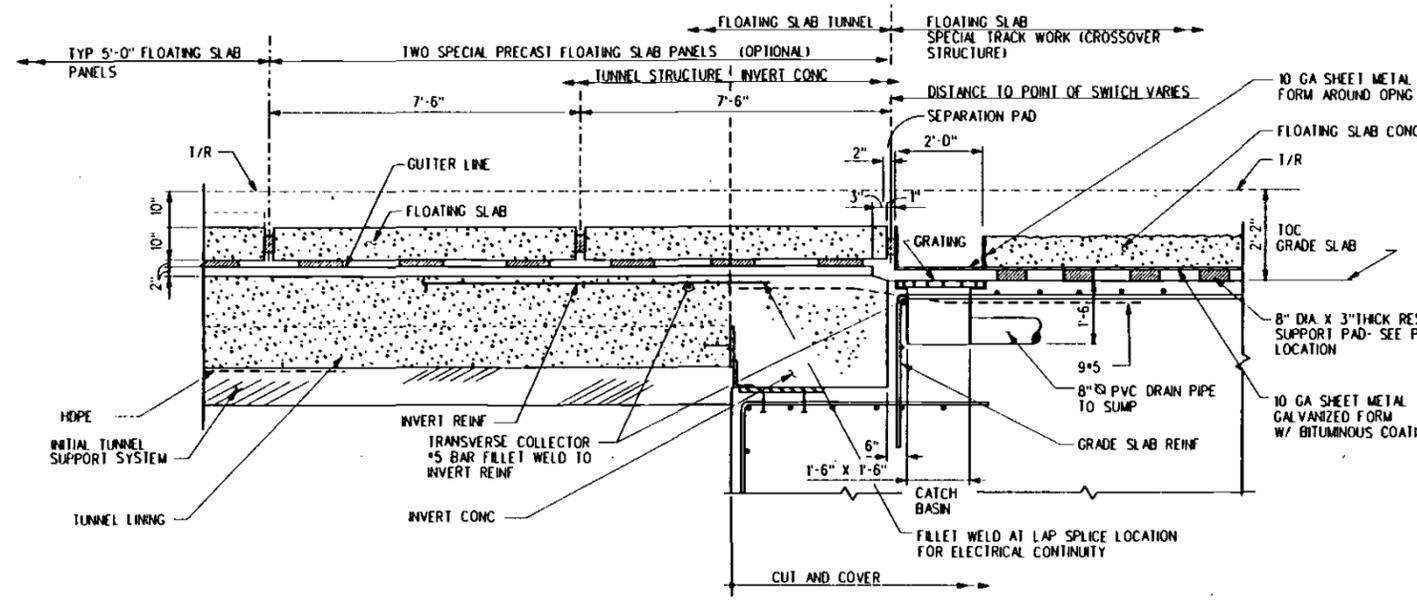


PLAN AT TUNNEL AND CUT & COVER SPECIAL TRACK STRUCTURE INTERFACE
SCALE: 1/2" = 1'-0"

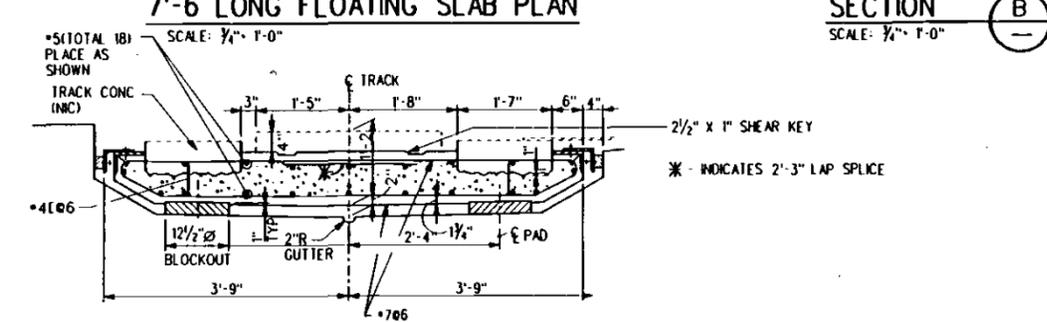


7'-6 LONG FLOATING SLAB PLAN
SCALE: 3/4" = 1'-0"

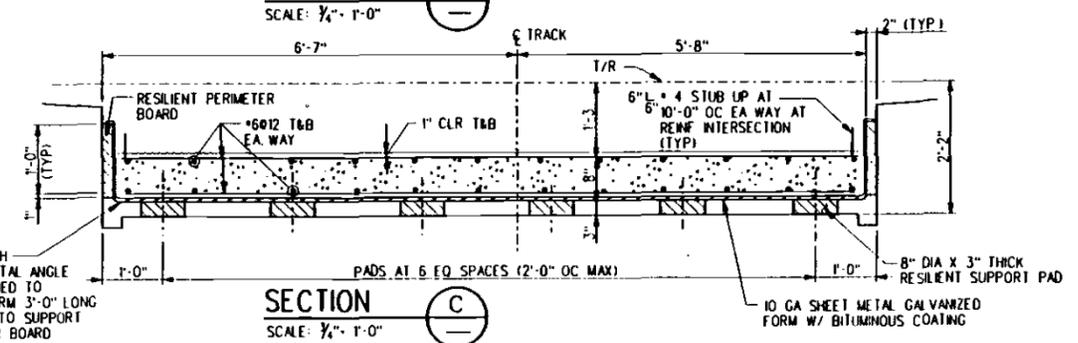
SECTION B
SCALE: 3/4" = 1'-0"



SECTION AT TUNNEL- CUT & COVER SPECIAL TRACK STRUCTURE INTERFACE
SCALE: 1/2" = 1'-0"



SECTION A
SCALE: 3/4" = 1'-0"



SECTION C
SCALE: 3/4" = 1'-0"

REV	DATE	BY	CHKD	APP	DESCRIPTION
1	10 10 94	EJ	FF		SBCN 12 REVISED, REDRAWN
2	2 21 94				BASELINE ISSUE

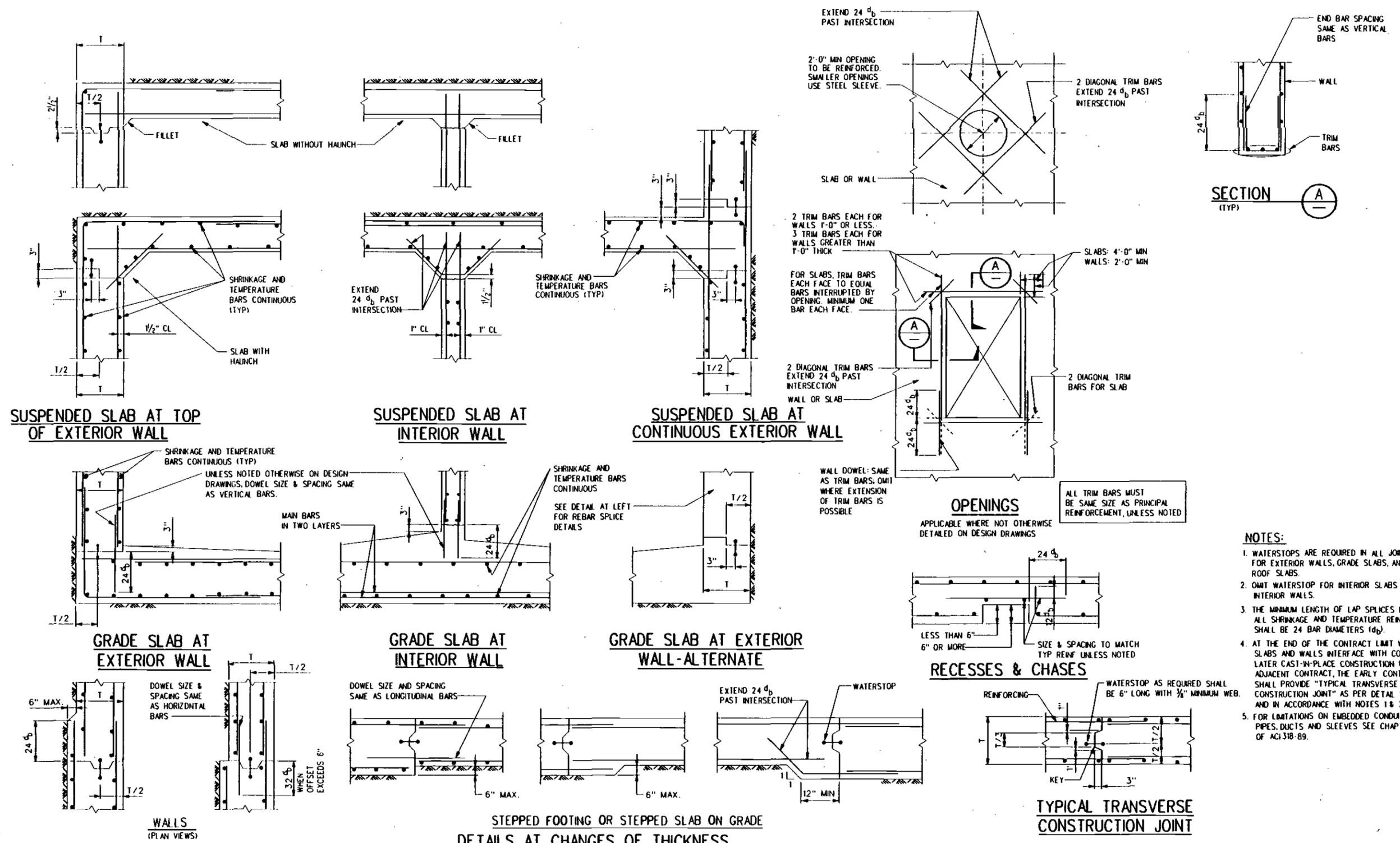
DESIGNED BY
F. FORTUNATO
DRAWN BY
E. JANSZEWSKI
CHECKED BY
N. PANDYA
IN CHARGE
F. FORTUNATO
DATE
21 FEB 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
ENGINEERING MANAGEMENT CONSULTANT
SUBMITTED: F.M. FORTUNATO
APPROVED: K.N. MURPHY

STRUCTURAL STANDARD
CUT AND COVER SUBWAY
FLOATING SLAB DETAILS
TUNNEL-CUT & COVER SPECIAL
TRACK STRUCTURE INTERFACE

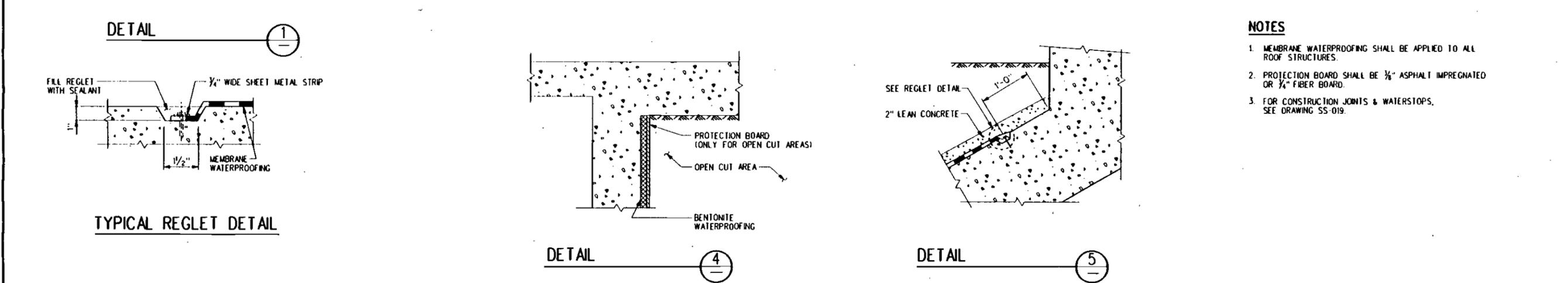
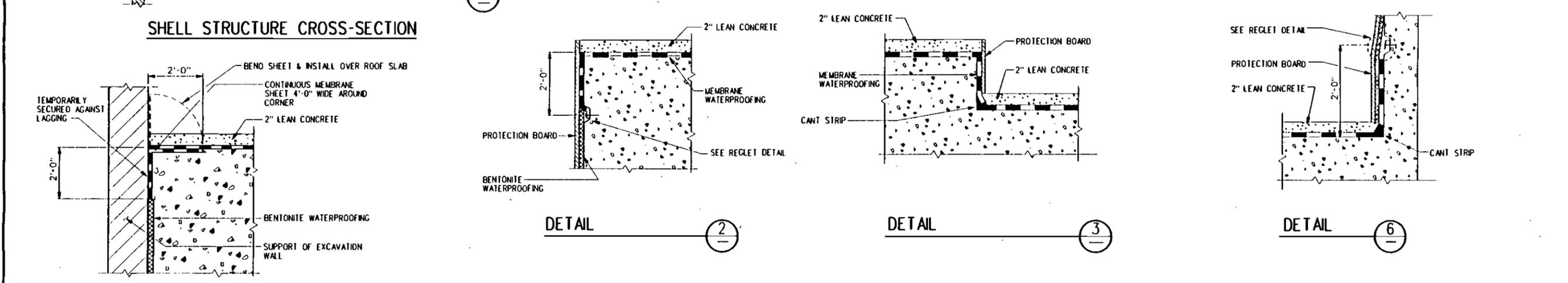
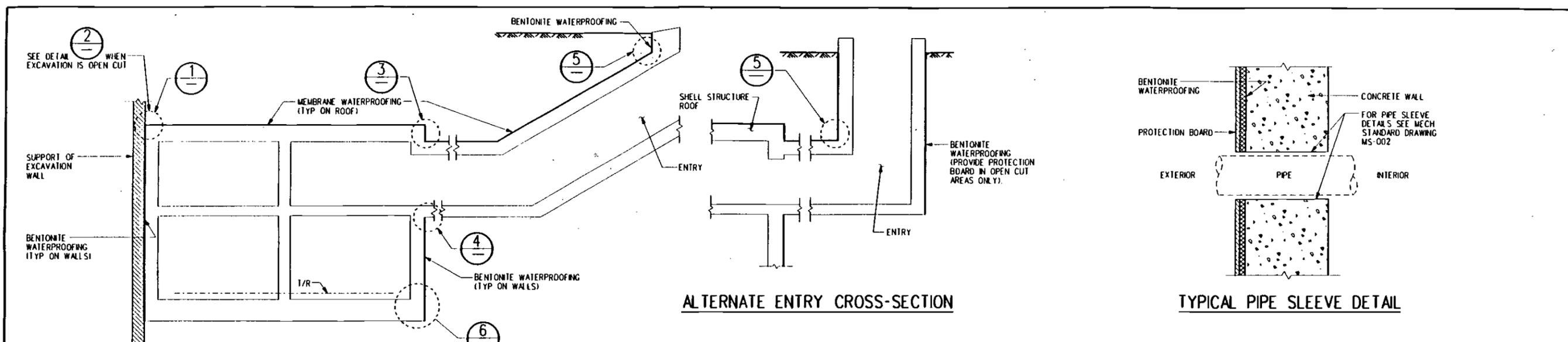
CONTRACT NO.	
DRAWING NO.	SS-017
SCALE	AS NOTED
SHEET NO.	1



- NOTES:**
1. WATERSTOPS ARE REQUIRED IN ALL JOINTS FOR EXTERIOR WALLS, GRADE SLABS, AND ROOF SLABS.
 2. OMIT WATERSTOP FOR INTERIOR SLABS AND INTERIOR WALLS.
 3. THE MINIMUM LENGTH OF LAP SPLICES FOR ALL SHRINKAGE AND TEMPERATURE REINFORCEMENT SHALL BE 24 BAR DIAMETERS (d_b).
 4. AT THE END OF THE CONTRACT LIMIT WHERE SLABS AND WALLS INTERFACE WITH CONTINUING LATER CAST-IN-PLACE CONSTRUCTION OF ADJACENT CONTRACT, THE EARLY CONTRACTOR SHALL PROVIDE "TYPICAL TRANSVERSE CONSTRUCTION JOINT" AS PER DETAIL SHOWN AND IN ACCORDANCE WITH NOTES 1 & 2 ABOVE.
 5. FOR LIMITATIONS ON EMBEDDED CONDUITS, PIPES, DUCTS AND SLEEVES SEE CHAPTER 6 OF ACI 318-89.

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DATE 21 FEB 94	DESCRIPTION SBCN 12 REVISED, REORAWN BASELINE ISSUE		REV. DATE BY SDR APP		REV. DATE BY SDR APP		REV. DATE BY SDR APP																															

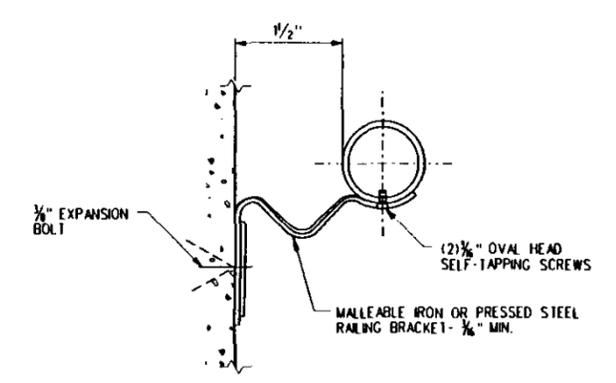
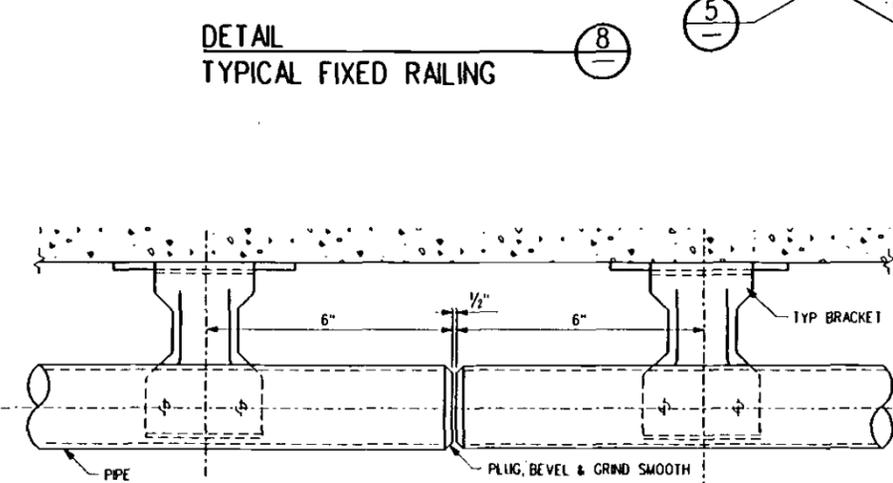
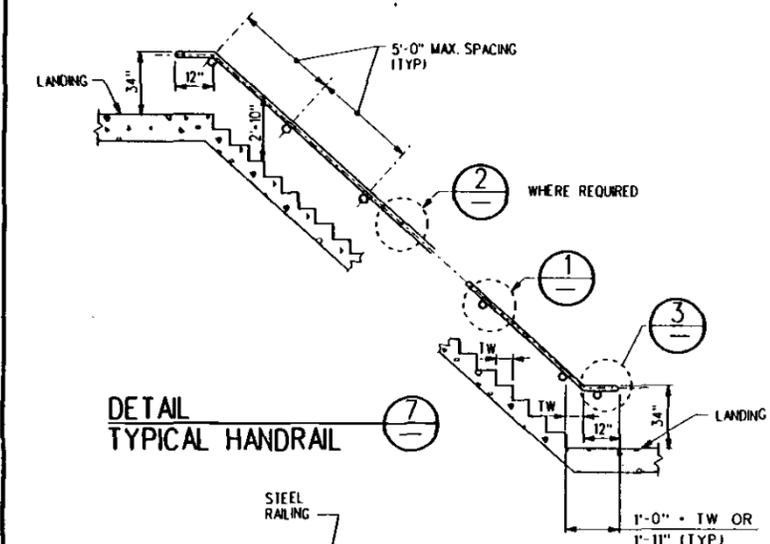
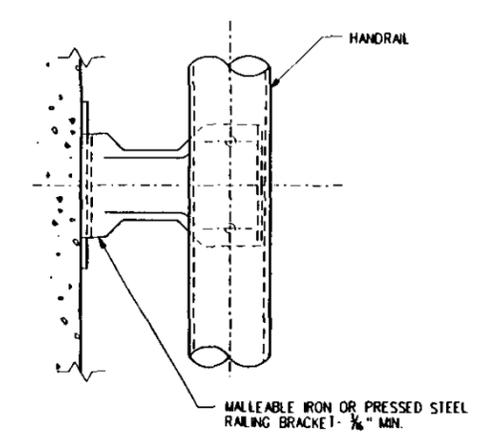
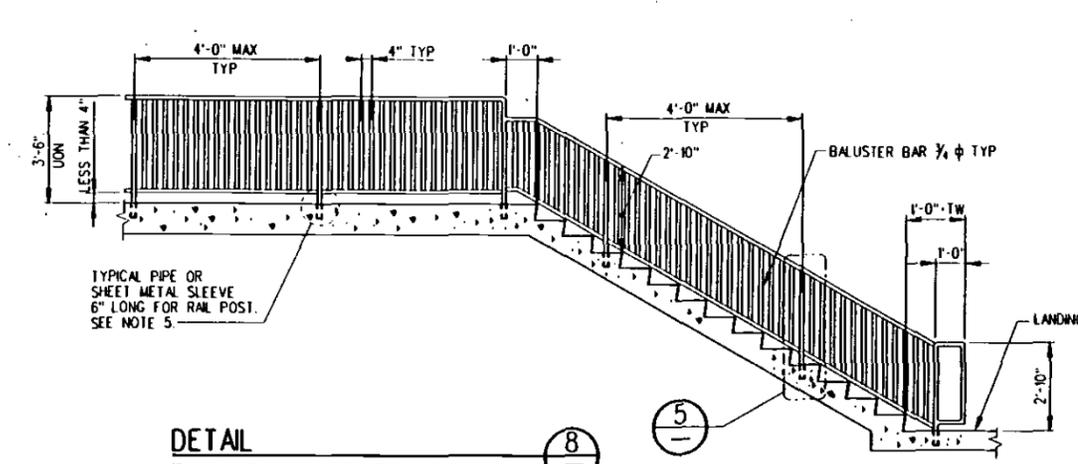
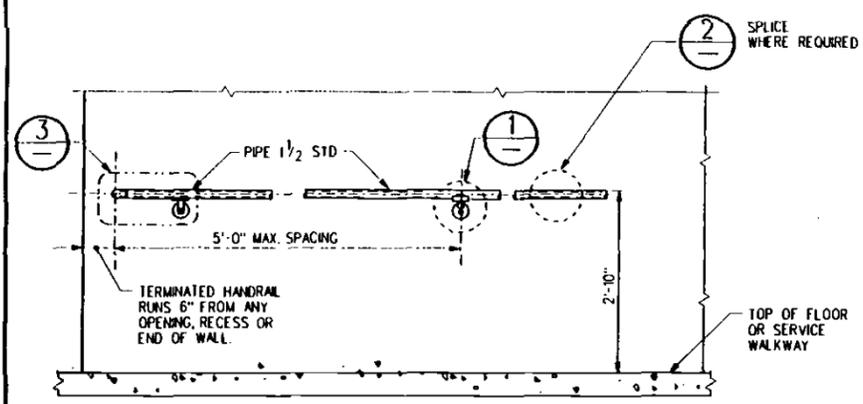
CONTRACT NO. SS-019
 DRAWING NO. SS-019
 SHEET NO. 1



- NOTES**
- MEMBRANE WATERPROOFING SHALL BE APPLIED TO ALL ROOF STRUCTURES.
 - PROTECTION BOARD SHALL BE 3/8" ASPHALT IMPREGNATED OR 3/4" FIBER BOARD.
 - FOR CONSTRUCTION JOINTS & WATERSTOPS, SEE DRAWING SS-019.

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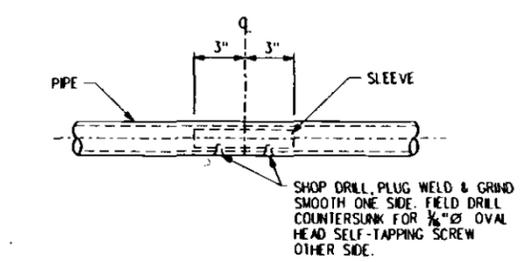
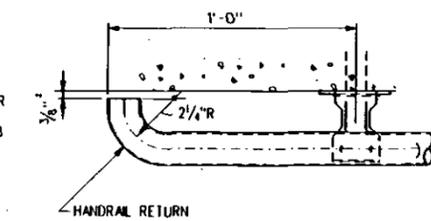
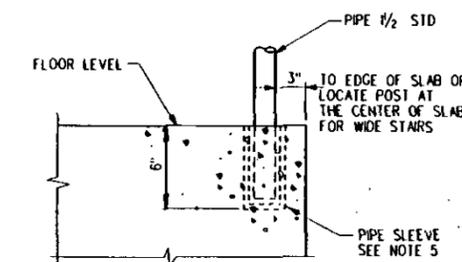
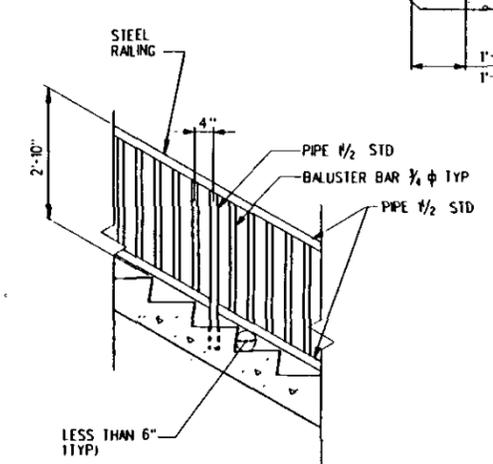
2025 RELEASE UNDER E.O. 14176



DETAIL
TYPICAL HANDRAIL

DETAIL
TYPICAL JOINT BREAK

DETAIL
TYPICAL HANDRAIL BRACKET



NOTES

1. ALL STAIR RAILING JOINTS SHALL BE MADE BY WELDING OR BY THE USE OF FLUSH FITTINGS. ALL WELDS SHALL BE GROUND SMOOTH.
2. MINIMUM SPACING OF SPLICES SHALL BE 10'-0".
3. HANDRAILS ARE CONTINUOUS ALONG FULL LENGTH OF SERVICE WALKWAY, INCLUDING ADJACENT STAIRS.
4. ALL METALS USED FOR RAILING BRACKETS AND HANDRAILS SHALL BE GALVANIZED.
5. GROUT POST IN SLEEVE FOR FIXED POST. PROVIDE 1/4" CLEARANCE AROUND SLEEVE AND RAIL POST FOR REMOVABLE POST.

DETAIL
STAIR RAILING

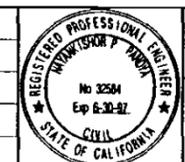
DETAIL
RAIL POST SUPPORT

DETAIL
WALL RETURN

DETAIL
TYPICAL SPLICE

REV	DATE	BY	CHKD	APP	DESCRIPTION
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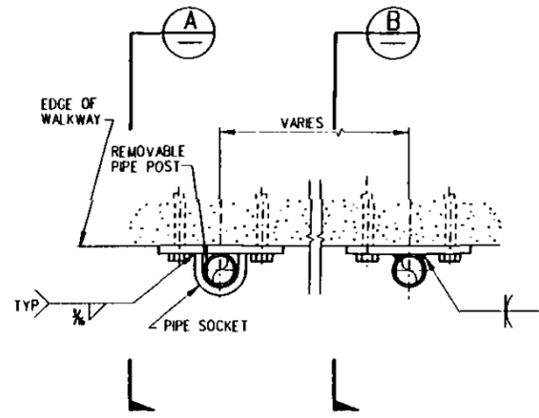
DESIGNED BY
W. J. ARMENTO
DRAWN BY
R. BAUTISTA
CHECKED BY
N. PANDYA
IN CHARGE
N. PANDYA
DATE
21 FEB 94



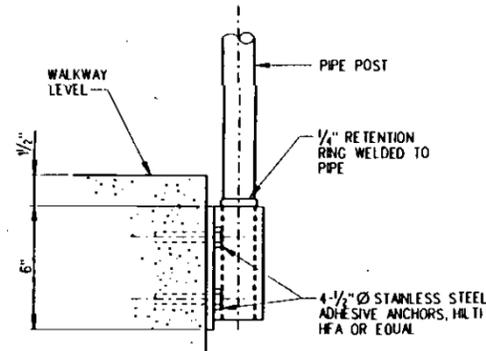
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
ENGINEERING MANAGEMENT CONSULTANT
SUBMITTED: N.P. PANDYA
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STRUCTURAL STANDARD
CUT AND COVER SUBWAY
RAILING AND HANDRAIL DETAILS
SHEET 1 OF 2

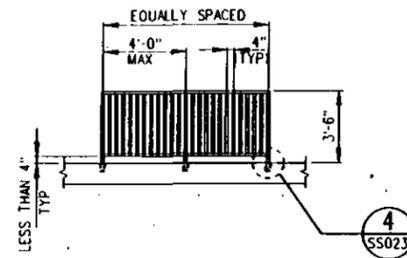
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DRAWING NO.	SS-023
SCALE	NO SCALE
SHEET NO.	



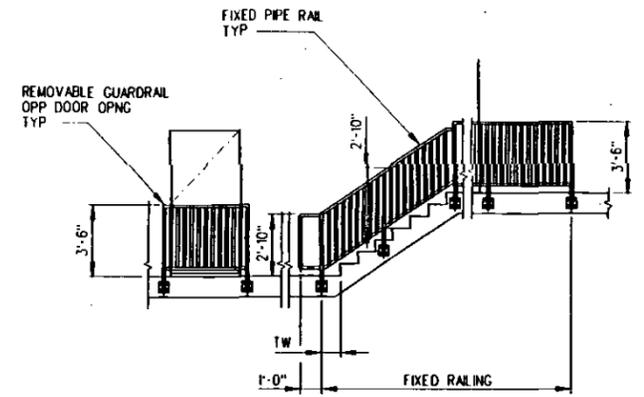
REMOVABLE FIXED
PLAN - PIPE RAIL BRACKET
 3'-1'-0"



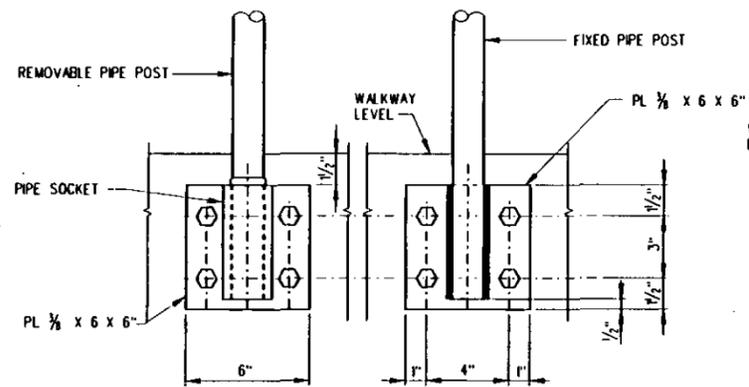
SECTION
 3'-1'-0" A



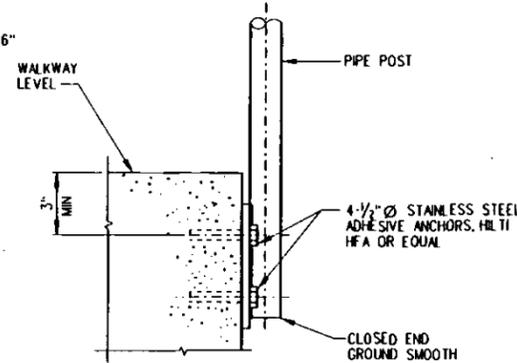
TYPICAL REMOVABLE GUARDRAIL
 NTS (AROUND FLOOR OPENING) 2



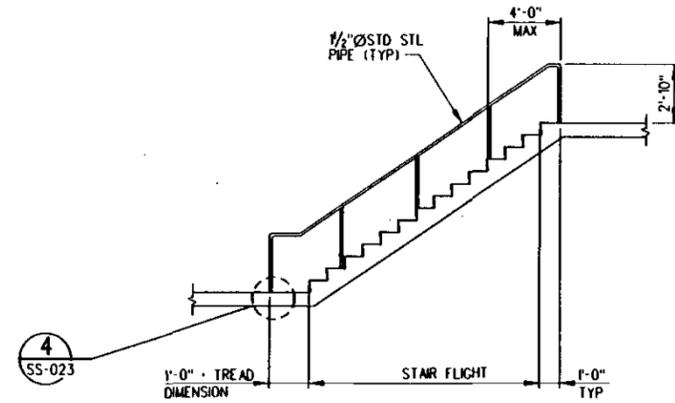
TYPICAL FIXED RAILING AND REMOVABLE GUARDRAIL
 NTS (AT WALKWAY) 1



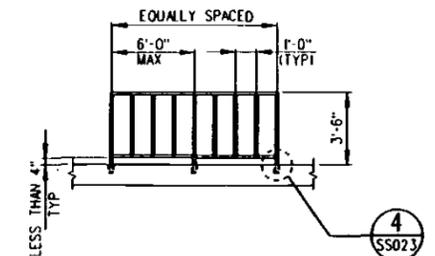
REMOVABLE FIXED
ELEVATION - PIPE RAIL BRACKET
 3'-1'-0"



SECTION
 3'-1'-0" B



TYPICAL CENTER HANDRAIL
 1/4" - 1'-0" 3



TYPICAL FIXED GUARDRAIL
 NTS (AROUND ROOF OPENING) 4

NOTE:
 1. SEE NOTES ON DWG SS-023.

REV	DATE	BY	APP	DESCRIPTION
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0	2/21/94			BASELINE ISSUE

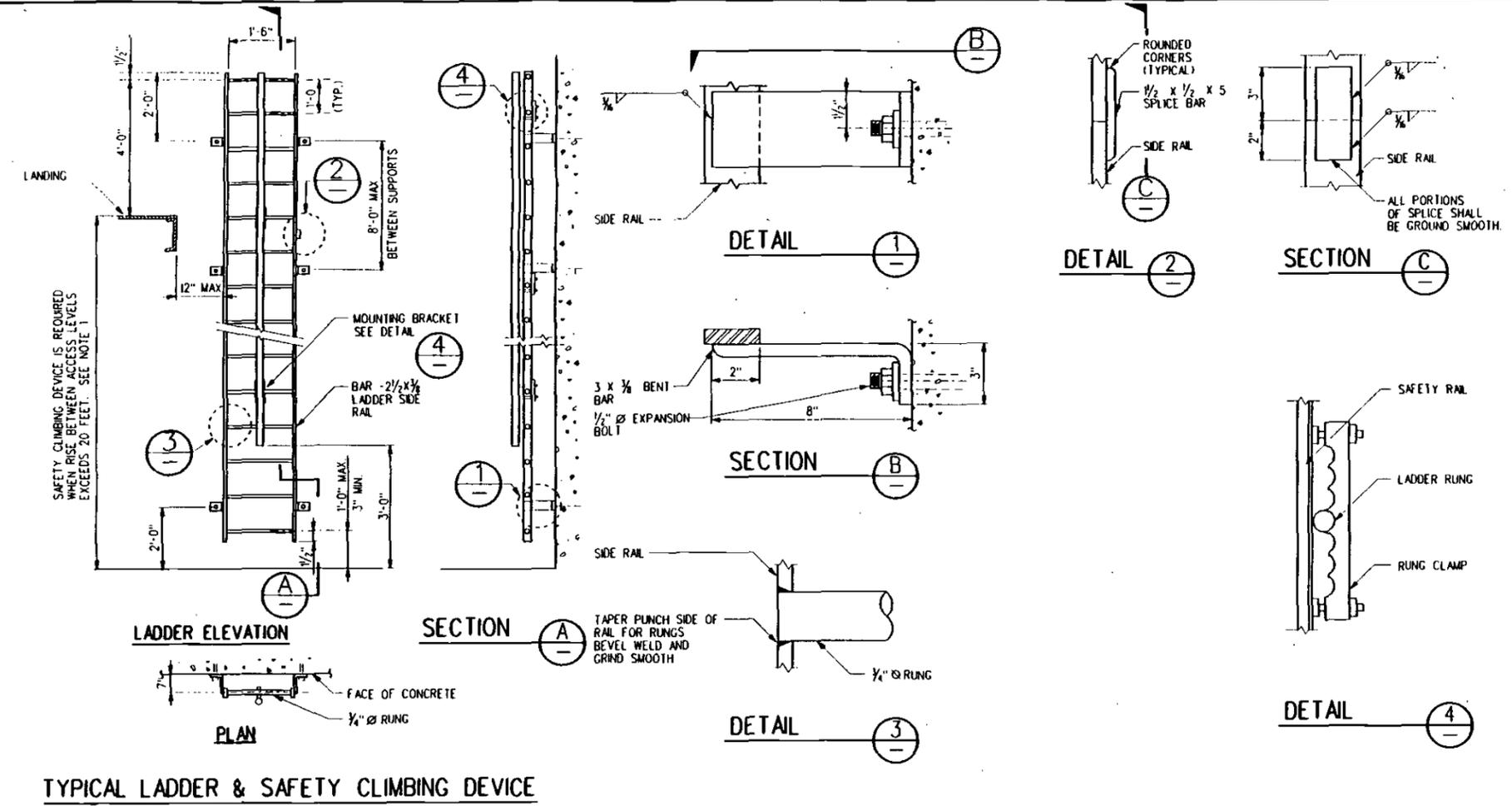
DESIGNED BY
 P. LIN
 DRAWN BY
 E. JANSZEWSKI
 CHECKED BY
 N. PANDYA
 IN CHARGE
 N. PANDYA
 DATE
 21 FEB 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
 ENGINEERING MANAGEMENT CONSULTANT
 SUBMITTED: N.P. PANDYA
 APPROVED: K.N. MURTHY

**STRUCTURAL STANDARD
 CUT AND COVER SUBWAY
 RAILING AND HANDRAIL DETAILS
 SHEET 2 OF 2**

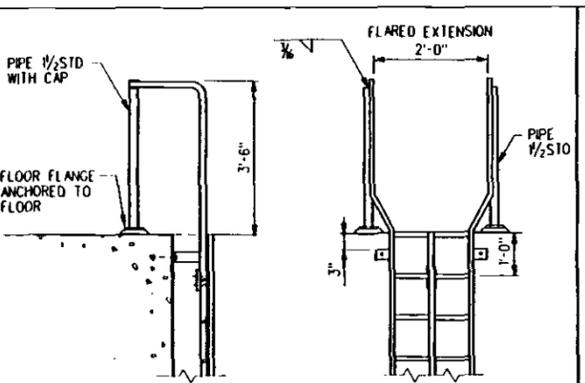
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DRAWING NO.	REV
SS-024	1
SCALE	
AS NOTED	
SHEET NO.	



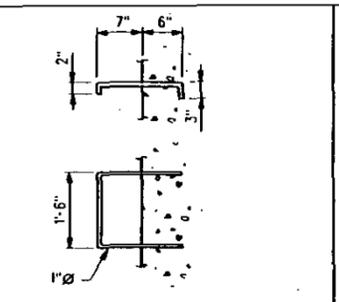
TYPICAL LADDER & SAFETY CLIMBING DEVICE

LADDER SCHEDULE					
LADDER NUMBER	LOCATION	REFERENCE DRAWING NO	APPROX GRID LINE	APPROX TOTAL RISE IN FEET	REMARKS

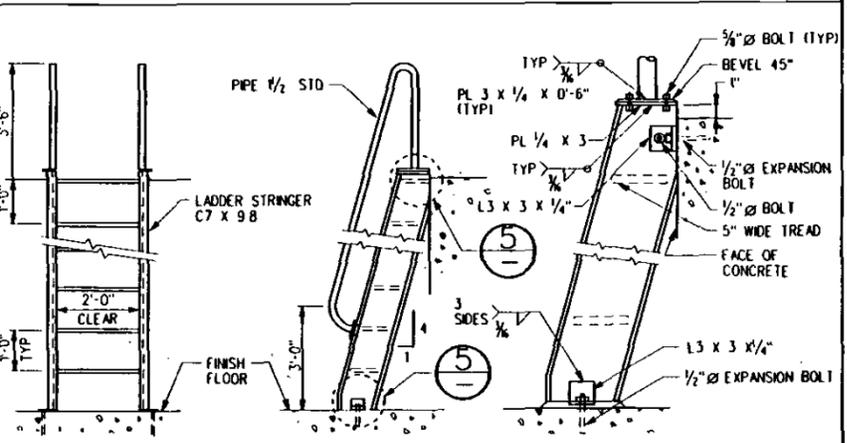
- NOTES:**
- LADDERS CONNECTING LEVELS THAT HAVE A VERTICAL SEPARATION OF 20 FEET, OR LESS DO NOT REQUIRE SAFETY CLIMBING DEVICES. IF THE SEPARATION EXCEEDS 20 FEET, A SAFETY CLIMBING DEVICE IS REQUIRED FROM THE LOWER LEVEL OF THE LADDER AS SHOWN TO THE HIGHER LEVEL. THE MAXIMUM VERTICAL SEPARATION TO BE CONNECTED BY A SINGLE LADDER IS 30 FEET. SEPARATIONS IN EXCESS OF 30 FEET REQUIRE THE INCLUSION OF A LANDING. EACH LADDER SECTION SHALL BE OFFSET FROM ADJACENT SECTIONS.
 - MINIMUM EMBEDMENT OF EXPANSION ANCHOR BOLTS IN CONCRETE SHALL BE 3" WITH A MINIMUM PULL-OUT STRENGTH OF 4000 LBS.
 - ALL METALS SHALL BE GALVANIZED.
 - IN ELECTRICAL VAULTS, LADDERS SHALL NOT CONTACT VAULT FLOOR AND FIRST RUNG SHOULD BE 1'-0" ABOVE FLOOR.



SIDE ELEVATION FRONT ELEVATION
LANDING EXTENSION



EMBEDDED RUNGS



FRONT ELEVATION SIDE ELEVATION DETAIL 5

REV	DATE	BY	SUB	APP	DESCRIPTION

DESIGNED BY: W. J. ARMENTO
 CHECKED BY: R. BAUTISTA
 IN CHARGE: N. PANDYA
 DATE: 21 FEB 94

REGISTERED PROFESSIONAL ENGINEER
 No. 32594
 Exp. 6-30-92
 CIVIL
 STATE OF CALIFORNIA

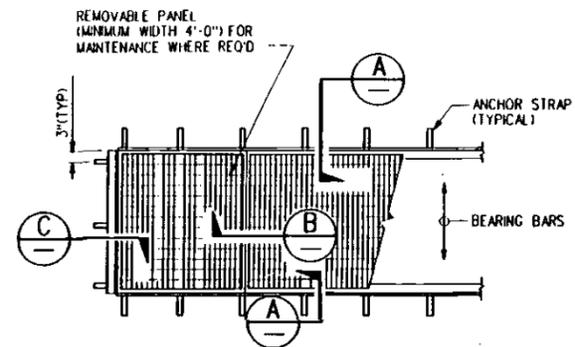
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

ENGINEERING MANAGEMENT CONSULTANT
 on contract for
 Parsons Brinckerhoff Quade & Douglas, Inc.
 Daniel Mann Johnson & Mendenhall
 Civil Engineers (C&M) Corp.
 Excavator-Fracking Architects
 James C. Heston, Inc.
 The Heery Group, Inc.

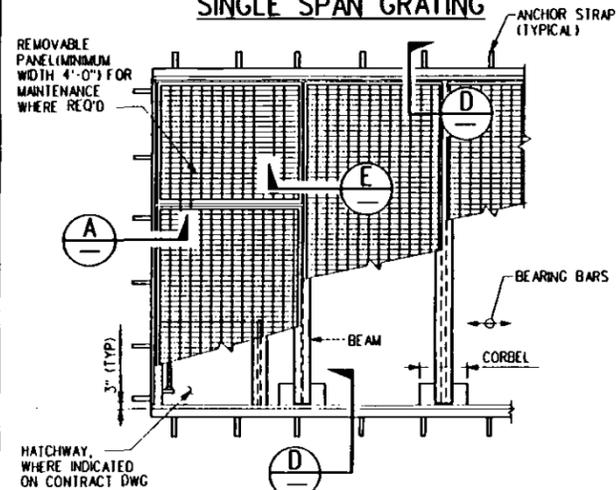
SUBMITTED: N. PANDYA
 APPROVED: K. N. MURTHY

STRUCTURAL STANDARD
 CUT AND COVER SUBWAY
 LADDER DETAILS AND SCHEDULE

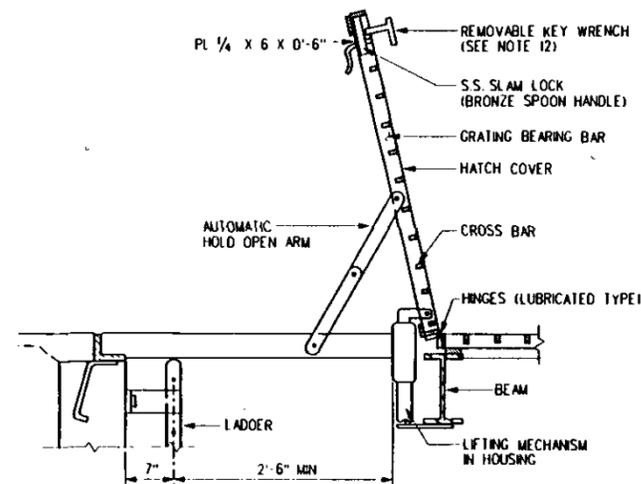
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 DRAWING NO. SS-025
 SCALE: NO SCALE
 SHEET NO. _____



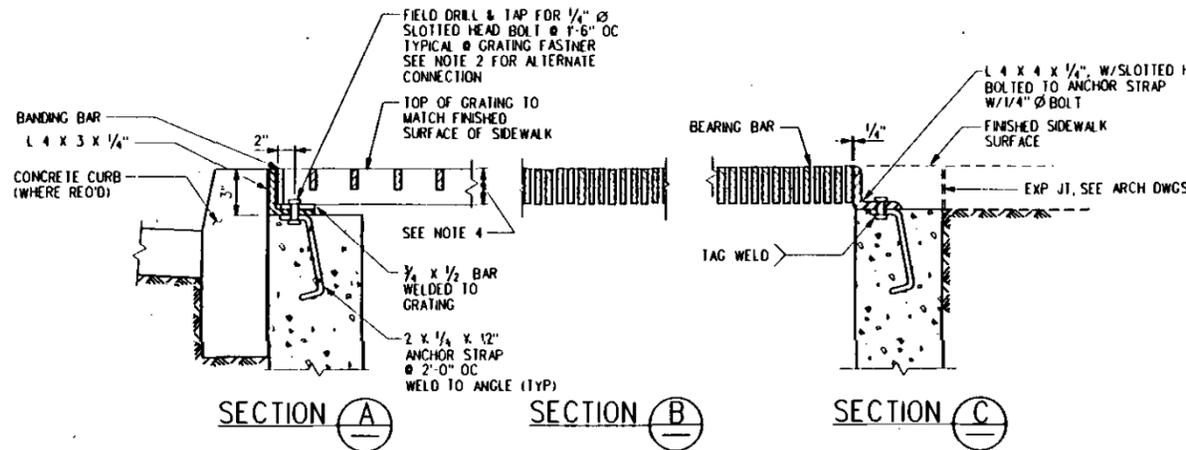
SINGLE SPAN GRATING



MULTIPLE SPAN GRATING



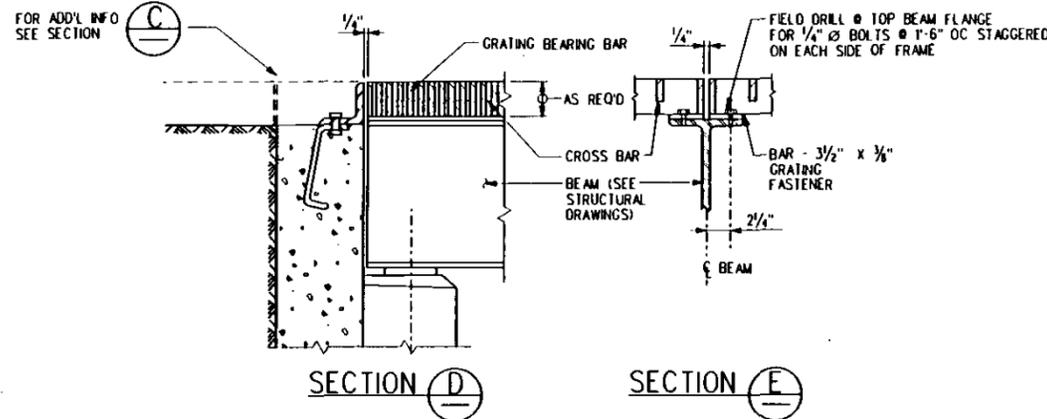
HATCHWAY DETAIL



SECTION A

SECTION B

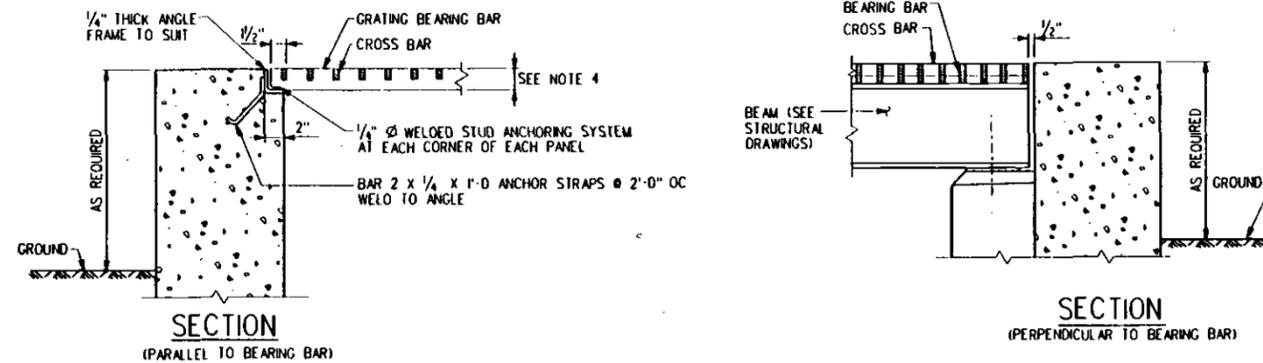
SECTION C



SECTION D

SECTION E

DETAILS FOR GRATINGS AT SIDEWALK LEVEL



SECTION (PARALLEL TO BEARING BAR)

SECTION (PERPENDICULAR TO BEARING BAR)

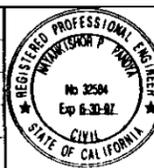
DETAILS FOR LIGHTWEIGHT GRATINGS ABOVE GROUND

NOTES:

- ALL PANELS SHALL BE ANCHORED TO SUPPORTS AND BEAMS.
 - AS AN ALTERNATE TO FIELD DRILL & TAP, A NUT MAY BE WELDED UNDER AN OVERSIZED HOLE FOR BOLT ATTACHMENT.
 - THICKNESS OF ALL PARTS OF STEEL BEAMS, TEE AND ANGLES SHALL BE A MINIMUM OF 1/4" INCH.
 - GRATING MINIMUM BAR DIMENSIONS AND MAXIMUM SPACING ARE INDICATED BELOW:
- | DESCRIPTION | SIDEWALK GRATING | LIGHTWEIGHT GRATING |
|--------------------------------------|--|------------------------|
| BEARING BAR DIMENSION SPACING (C.C.) | 2 1/4" x 3/8" / 15/32" | 1 1/4" x 3/8" / 1 1/8" |
| CROSS BAR DIMENSION | 1/4" x 1/8" (MECHANICAL LOCK)
1" x 1/8" (RIVETED) | 1/2" x 1/8" |
| SPACING (C.C.) | 4" (MECHANICAL LOCK)
7" (RIVETED) | 4" |
- MAXIMUM ALLOWABLE SPAN OF THE BEARING BARS IS 6'-0" FOR SIDEWALK LEVEL AND 7'-0" FOR LIGHTWEIGHT GRATINGS.
 - GRATING OPEN AREA SHALL BE A MINIMUM OF 58 PERCENT OF THE GRATING AREA IN SIDEWALK.
 - MINIMUM CLEAR OPENING OF HATCHWAYS AT MAINTENANCE LADDERS: 2'-6" WIDE AND 3'-1" LONG. SEE DETAIL.
 - HATCH COVERS SHALL BE PROVIDED WITH A LIFTING MECHANISM TO REDUCE THE FORCE NECESSARY TO LIFT THE COVER TO 40 POUNDS OR LESS.
 - HATCH COVERS SHALL OPEN TO A MINIMUM OF 60 DEGREES FROM THE HORIZONTAL.
 - HATCH COVER, LOCKS, AND WRENCH KEYS SHALL BE AS SPECIFIED.
 - GRATING, ANGLES, AND BOLTS SHALL BE GALVANIZED.
 - WELD STEEL PLATE TO GRATING WITH 1/2" Ø HOLE LOCATED UNDER KEY WRENCH OPENING ON HATCHWAY COVER.
 - DETAILS ARE SHOWN FOR RECTANGULAR TYPE GRATINGS. OTHER TYPE GRATINGS, SUCH AS RIVETED TRUSS STYLE, RETICULATED, OR SIMILAR, MAY BE USED PROVIDED LOAD CARRYING CAPACITIES AND GRATING OPEN AREA ARE EQUIVALENT TO THOSE INDICATED FOR THE RECTANGULAR TYPES.
 - GRATING OPEN AREA SHALL BE A MINIMUM OF 80 PERCENT OF THE GRATING AREA FOR ABOVE GROUND GRATINGS.
 - GRATINGS AT SIDEWALK LEVEL SHALL BE DESIGNED TO SUPPORT A LIVE LOAD OF 900 PSF.
 - TOPS OF SIDEWALK GRATING BEARING BARS SHALL HAVE A STATIC COEFFICIENT OF FRICTION OF NOT LESS THAN 0.50 WHEN TESTED AGAINST ANY SHOE SOLE MATERIAL FOR BOTH WET AND DRY CONDITIONS.
 - GRATINGS SHALL CONFORM TO TESTING REQUIREMENTS OF CITY OF LOS ANGELES BUREAU OF ENGINEERING STANDARD PLAN S-601-2.
 - GRATING SURFACES TO BE FLUSH WITHOUT SEPARATIONS.
 - BEARING BARS SHALL BE PERPENDICULAR TO DIRECTION OF PEDESTRIAN TRAVEL.
 - GRATINGS IN STREET SHALL CONFORM TO THE FOLLOWINGS:
 - GRATINGS SHALL BE STRUCTURALLY ADEQUATE TO SUPPORT AN AASHTO H 20-44 LIVE LOAD.
 - NOTES 1, 2, 3, 7, 8, 9, 10, 11, 12, 13 AND 17 APPLY.
 - OPEN AREA SHALL BE A MINIMUM OF 58% OF GRATING AREA.
 - SECTIONS A, B, C, D AND E APPLY EXCEPT FRAME ANGLE SIZES TO SUIT DEPTHS OF BEARING BARS USED.
 - OPENINGS SHALL COMPLY WITH REQUIREMENTS FOR AMERICANS WITH DISABILITIES ACT (ADA) AND BICYCLE SAFETY.

REV	DATE	BY	CHKD	APP	DESCRIPTION
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0	2/21/94	N.P.			BASELINE ISSUE

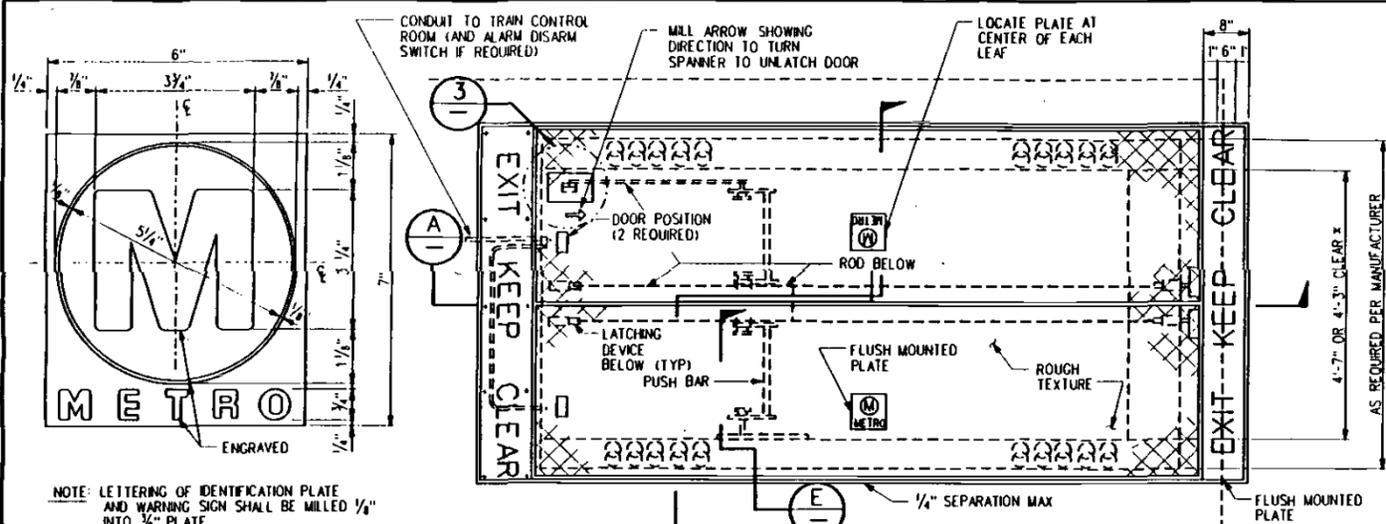
DESIGNED BY
W. J. ARMENTO
DRAWN BY
R. BAUTISTA
CHECKED BY
N. PANDYA
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N. PANDYA
DATE
21 FEB 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
ENGINEERING MANAGEMENT CONSULTANT
SUBMITTED: N.P. PANDYA
APPROVED: K.N. MURTHY

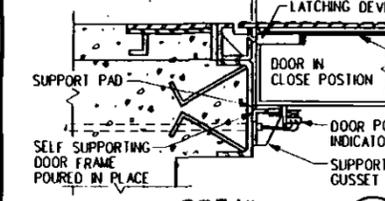
STRUCTURAL STANDARD
CUT AND COVER SUBWAY
STEEL GRATING DETAILS

CONTRACT NO.	
DRAWING NO.	SS-026
SCALE	NO SCALE
SHEET NO.	1



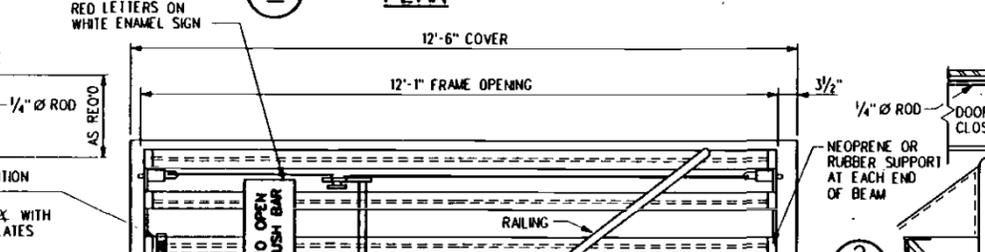
NOTE: LETTERING OF IDENTIFICATION PLATE AND WARNING SIGN SHALL BE MILLED 1/8" INTO 3/4" PLATE

IDENTIFICATION PLATE

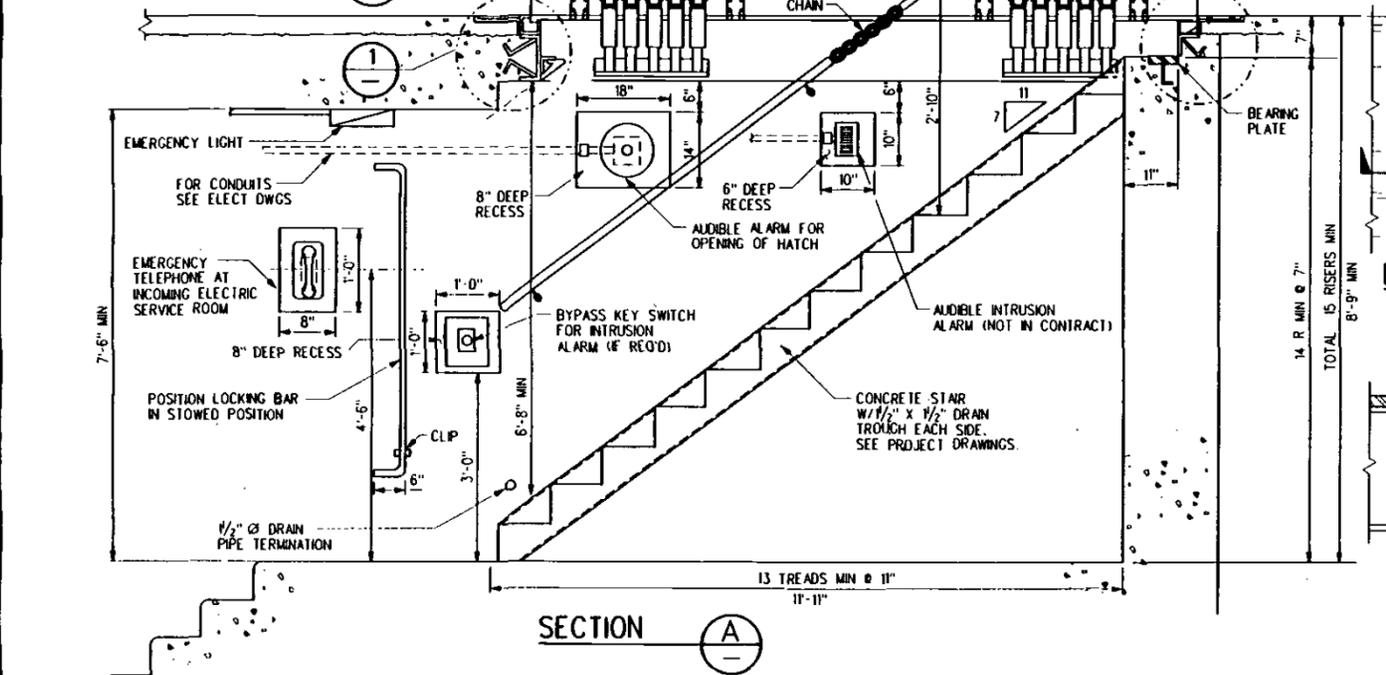


DETAIL 1

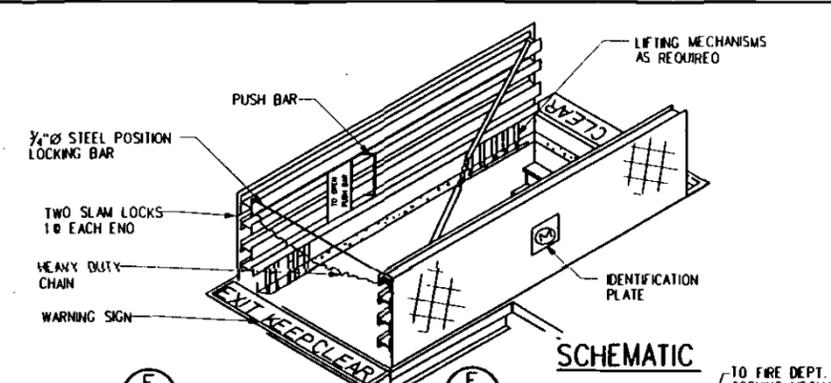
PLAN



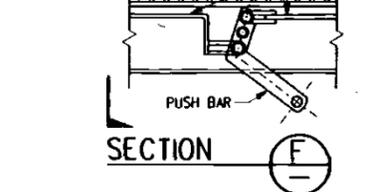
DETAIL 2



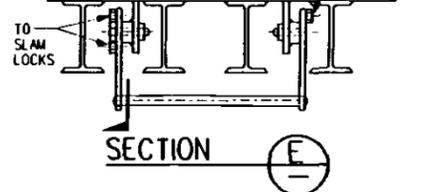
SECTION A



SCHEMATIC



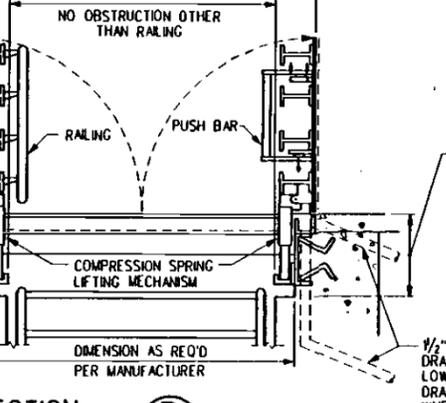
SECTION E



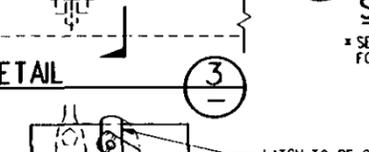
SECTION F



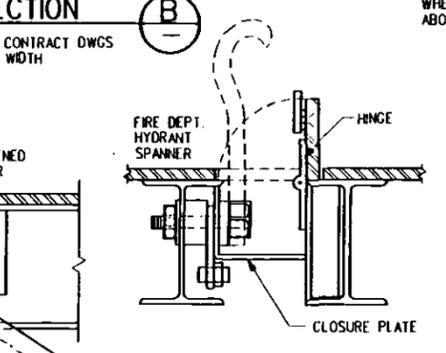
DETAIL 3



SECTION B



DETAIL 4

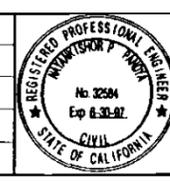


SECTION C

- NOTES:**
- DOORS AND FRAME SHALL BE MOUNTED FLUSH WITH SIDEWALK SURFACE AND SHALL CONFORM TO PITCH OF SIDEWALK SURFACE.
 - DOORS SHALL BE WATERTIGHT AND PROVISIONS MADE TO REMOVE WATER FROM FRAME.
 - DOORS SHALL HAVE HEAVY BRONZE HINGES WITH STAINLESS STEEL HINGE PINS.
 - EACH DOOR SHALL HAVE LATCHING DEVICES TO HOLD DOOR IN CLOSED POSITION. WORKING PARTS OF LATCHING DEVICES SHALL BE FABRICATED FROM BRASS, BRONZE OR STAINLESS STEEL.
 - WHEN LATCHING DEVICE IS RELEASED, DOORS SHALL BE OPENED BY MEANS OF SPRINGS AND SHALL BE HELD OPEN BY SAME. THESE SPRINGS SHALL BE ADJUSTED FOR A SMOOTH OPENING ACTION WITHOUT HAVING DOORS FLY OPEN SUDDENLY.
 - DOORS SHALL BE CLOSED MANUALLY.
 - LATCHING DEVICE SHALL BE RELEASED BY PUSHING BAR FROM THE EXIT PASSAGE OR BY A PENTAGON SHAPED KEY FROM OUTSIDE.
 - DOORS AND FRAME SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION.
 - PROVIDE FOR INTRUSION ALARM ON HATCH.
 - PROVIDE AUDIBLE ALARM IN RECESS NEAR HATCH INTERCONNECTED TO DOOR POSITION SWITCHES.
 - NUMBER AND CONFIGURATION OF LIFTING DEVICES AND HINGES TO BE DETERMINED BY MANUFACTURER.
 - THE LATCHING DEVICE SHALL BE SPRING ASSISTED FOR AUTOMATIC CLOSURE.
 - ENTRANCE FROM THE SURFACE SIDE SHALL BE PROVIDED BY FIRE DEPARTMENT HYDRANT SPANNER.
 - SEE ELECTRICAL DRAWINGS FOR ALARM CONDUITS.
 - LATCHING/OPENING DEVICES SHALL COMPLY WITH UBC REQUIREMENTS FOR GROUP A OCCUPANCIES.
 - DOORS NOT LOCATED IN PUBLIC RIGHTS-OF-WAY NOR SUBJECT TO VEHICULAR TRAFFIC SHALL BE ABLE TO SUSTAIN A LIVE LOAD OF 300 PSF.
 - DOORS AT SIDEWALK LEVEL SHALL BE STRUCTURALLY ADEQUATE TO SUPPORT A UNIFORM LIVE LOAD OF 900 PSF.
 - DOOR LEAF SHALL BE SKID RESISTANT TYPE STEEL PLATE. TOP SURFACE OF THE PLATE SHALL HAVE STATIC COEFFICIENT OF FRICTION OF 0.5 FOR BOTH WET AND DRY CONDITIONS, AND SHALL CONFORM TO REQUIREMENTS OF STANDARD PLAN S-601-2 OF THE CITY OF LOS ANGELES BUREAU OF ENGINEERING.

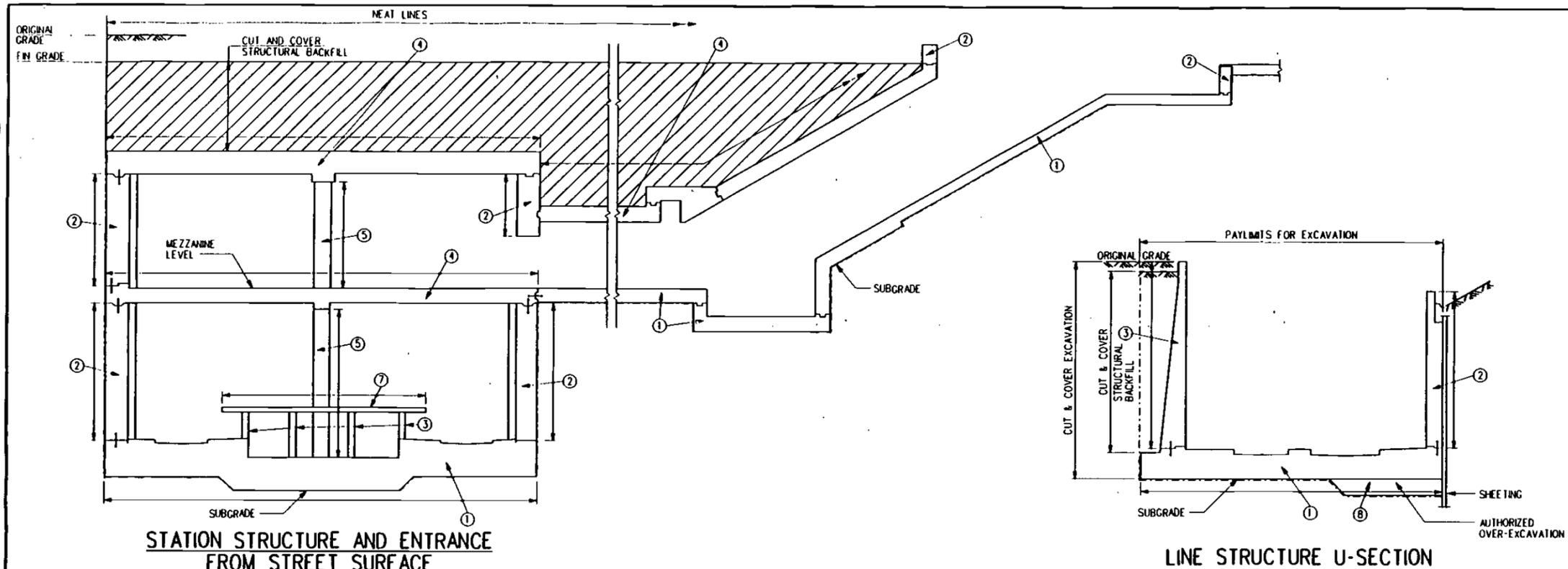
REV	DATE	BY	SUB	APP	DESCRIPTION
1	2/21/94	N.P.			SBCN 12 REVISED, REDRAWN BASELINE ISSUE

DESIGNED BY
W. J. ARMENTO
DRAWN BY
R. BAUTISTA
CHECKED BY
N. PANDYA
IN CHARGE
N. PANDYA
DATE
21 FEB 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
ENGINEERING MANAGEMENT CONSULTANT
SUBMITTED: **N. P. PANDYA**
APPROVED: **K. N. MURTHY**

STRUCTURAL STANDARD CUT AND COVER SUBWAY SIDEWALK EXIT DOOR
CONTRACT NO. **SS-027**
DRAWING NO. **SS-027**
SCALE: **NO SCALE**
SHEET NO. **1**



LEGEND FOR PAYMENT ITEMS:

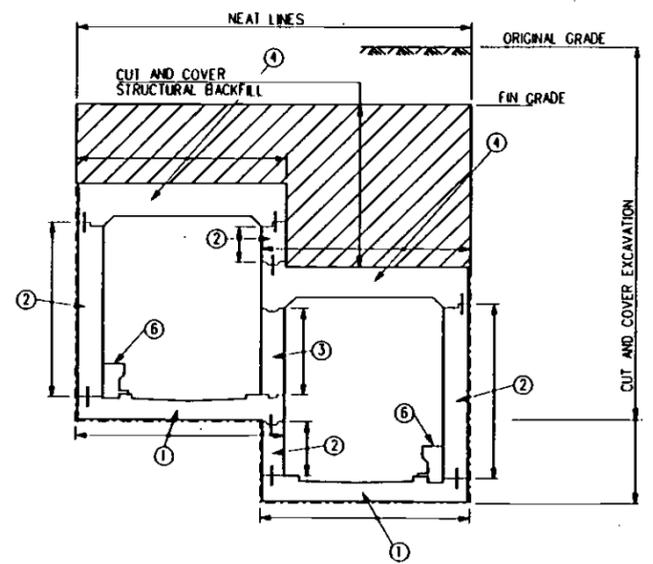
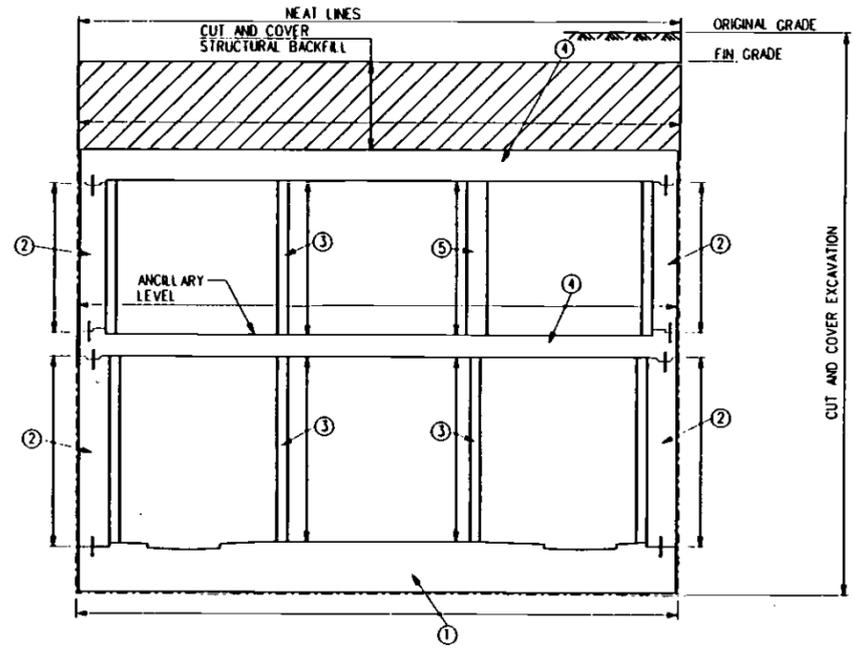
- ① SLAB DN GRADE/TRACK
- ② EXTERIOR WALL AND PLASTERS
- ③ INTERIOR WALL
- ④ SUPPORTED SLAB AND BEAMS
- ⑤ COLUMN
- ⑥ SERVICE WALKWAY
- ⑦ PLATFORM SLAB
- ⑧ F&L CONCRETE

NOTES:

1. THE NEAT LINE OF THE STRUCTURE IS THE OUTSIDE FACE OF EXTERIOR WALL, AND IS THE PAYLIMIT FOR EXCAVATION AND STRUCTURAL BACKFILL.
2. THE BOTTOM SURFACE OF THE STRUCTURE IS THE LOWER SURFACE OF THE SLAB ON GRADE, AND IS THE PAYLIMIT FOR EXCAVATION. SEE NOTE 4.
3. FOR THE LIMITS OF LEAN CONCRETE, INCLUDING MUD SLAB SEE DRAWING SS-036.
4. WHERE HDPE MEMBRANE IS USED BELOW THE SLAB ON GRADE THE PAYLIMIT FOR EXCAVATION IS (SIX) 6 INCHES LOWER THAN THE LOWER SURFACE OF THE SLAB ON GRADE.

STATION STRUCTURE AND ENTRANCE FROM STREET SURFACE

LINE STRUCTURE U-SECTION



STATION STRUCTURE AT ANCILLARY AREA

LINE STRUCTURE BOX SECTION

REV	DATE	BY	APP	DESCRIPTION
0	2/21/94	N.P.		SBCN 12 REVISED, REDRAWN BASELINE ISSUE

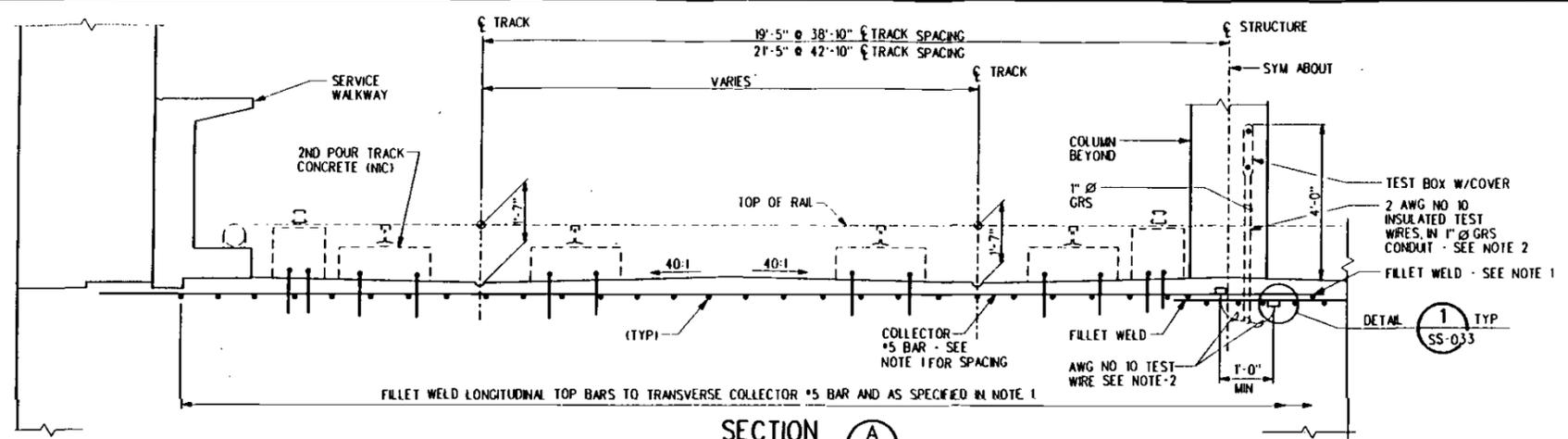
DESIGNED BY
W. J. ARMENTO
DRAWN BY
R. BAUTISTA
CHECKED BY
N. PANDYA
IN CHARGE
N. PANDYA
DATE
21 FEB 94



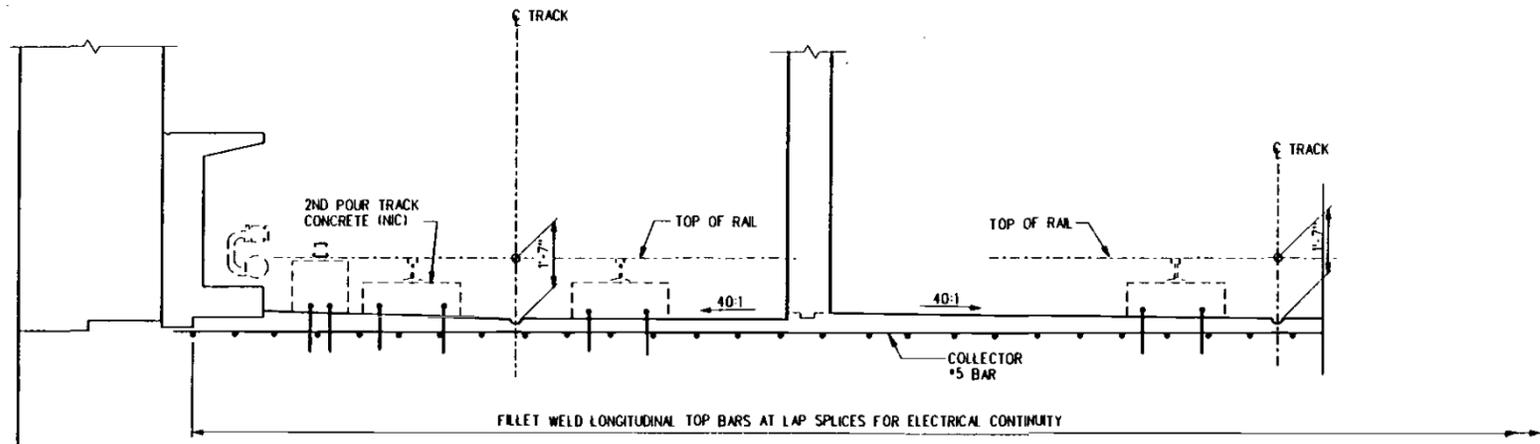
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
ENGINEERING MANAGEMENT CONSULTANT
SUBMITTED N.P. PANDYA
APPROVED K.N. MURTHY

**STRUCTURAL STANDARD
CUT AND COVER SUBWAY
MEASUREMENTS AND PAYMENT LIMITS**

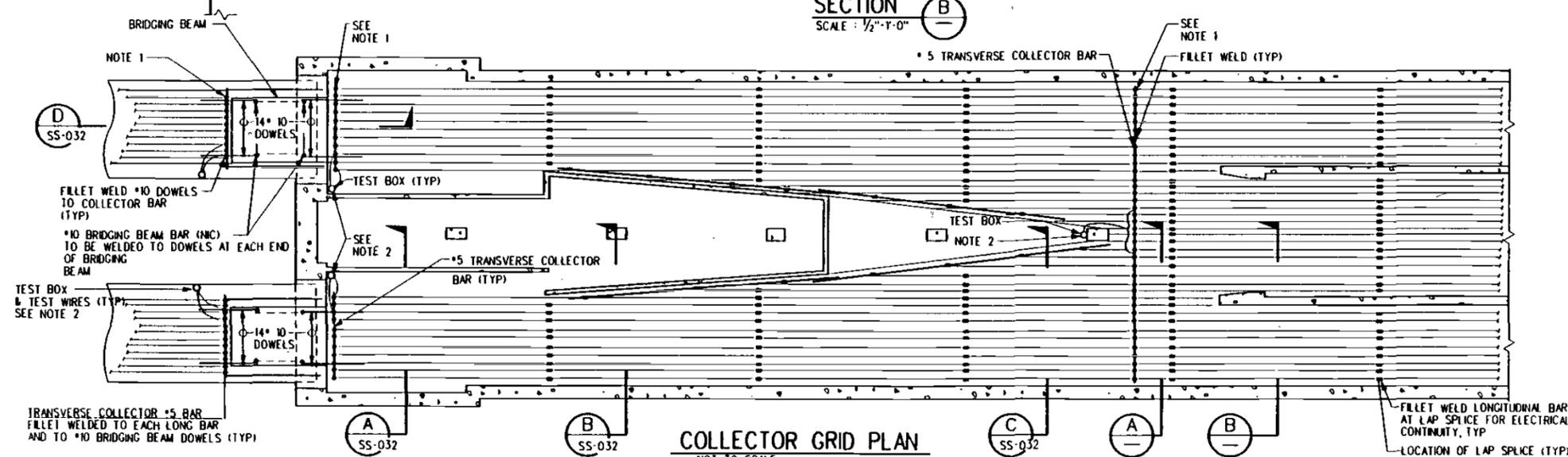
CONTRACT NO.	
DRAWING NO.	SS-029
SCALE	NO SCALE
SHEET NO.	1



SECTION A
SCALE: 1/2"=1'-0"



SECTION B
SCALE: 1/2"=1'-0"



COLLECTOR GRID PLAN
NOT TO SCALE

- NOTES:**
- INSTALL ELECTRICALLY CONTINUOUS TRANSVERSE COLLECTOR #5 BAR AT LOCATIONS INDICATED AND AT INTERVALS OF 500 FEET MAXIMUM. FILLET WELD TRANSVERSE COLLECTOR #5 BAR TO EACH LONGITUDINAL BAR.
 - PROVIDE TWO AWG NO 10 XHHW INSULATED TEST WIRES EXOTHERMIC WELDED TO 2" X 2" X 1/4" STEEL PLATES IN SHOP. STEEL PLATE AS SHOWN IN DETAIL 1 ON DWG SS-033 IS FILLET WELD TO ELECTRICALLY CONTINUOUS TRANSVERSE COLLECTOR #5 BAR. TEST WIRES ROUTED THROUGH 1" Ø GRS CONDUIT WILL BE TERMINATED IN A TEST BOX.

REV	DATE	BY	SUB	APP	DESCRIPTION
1	10 10 94	ES	WP		SBCN 12 REVISED, REDRAWN
0	2 21 94				BASELINE ISSUE

DESIGNED BY: W. J. ARMENTO
 DRAWN BY: R. BAUTISTA
 CHECKED BY: N. PANDYA
 IN CHARGE: N. PANDYA
 DATE: 21 FEB 94

REGISTERED PROFESSIONAL ENGINEER
 STATE OF CALIFORNIA
 No. 3254
 Exp. 6-30-92

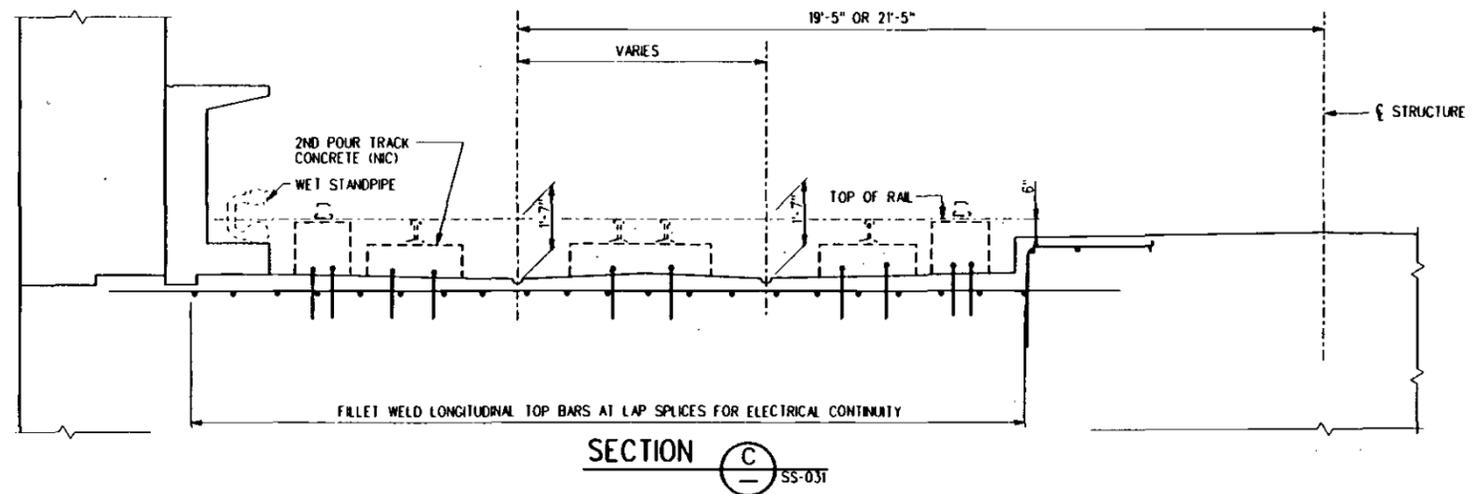
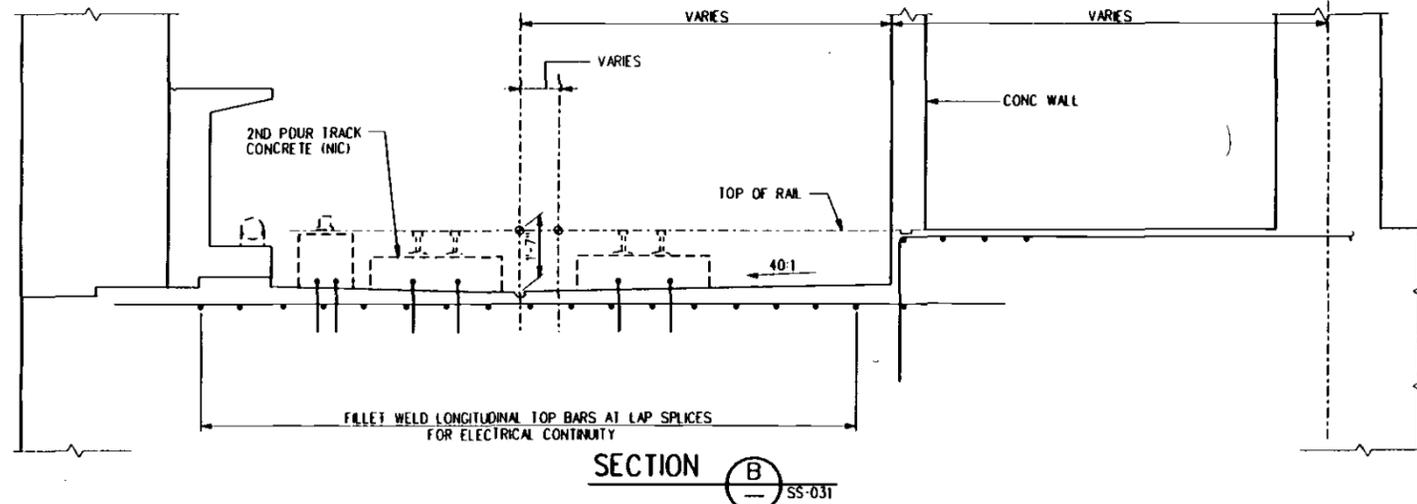
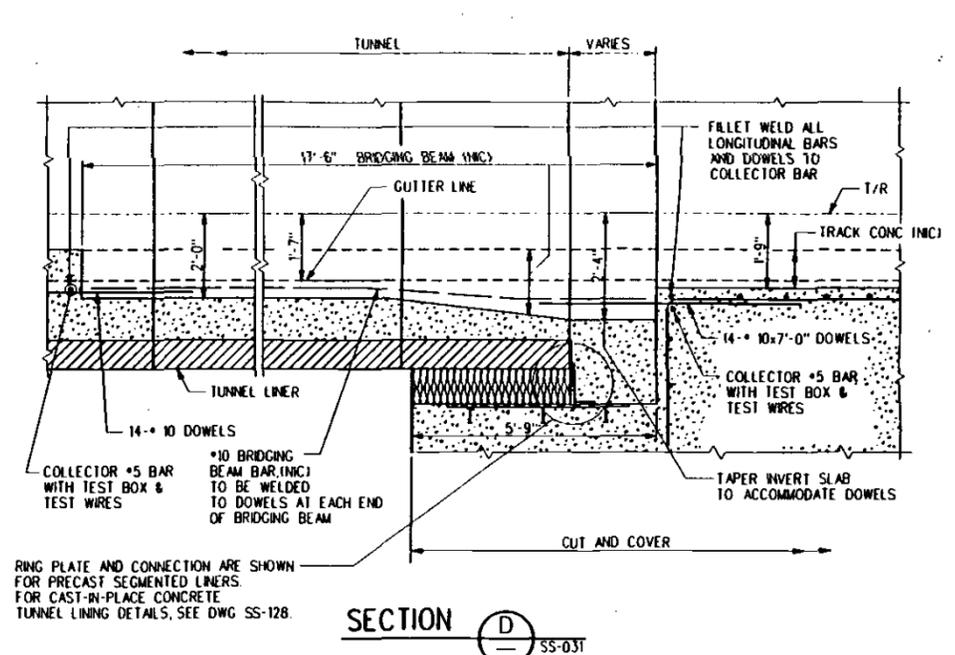
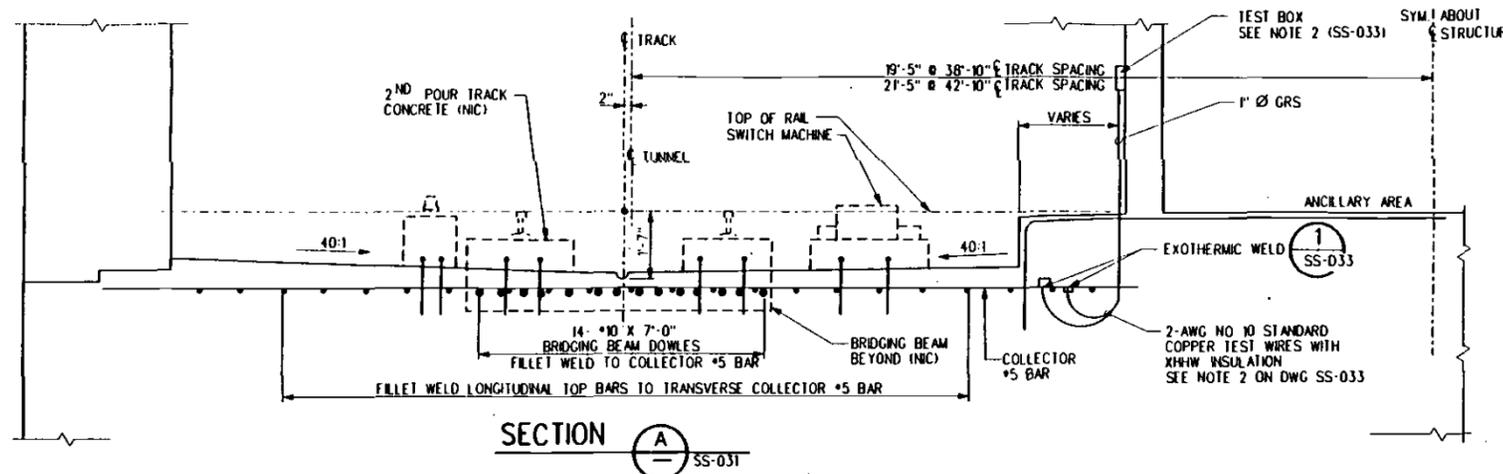
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

ENGINEERING MANAGEMENT CONSULTANT
 Parsons Brinckerhoff O'Brien & Jones, Inc.
 Donald W. Johnson & Associates
 C.F. Rosen Engineers (CA) Inc.
 Escudé & Fitzgibbon Architects
 Jorgensen & Geller Architects, Inc.
 The Heery Group, Inc.

SUBMITTED: N.P. PANDYA
 APPROVED: K.N. MURTHY

STRUCTURAL STANDARD
 CUT AND COVER SUBWAY
 TRACK INVERT SECTIONS AND
 COLLECTOR GRID PLAN AT
 CROSSOVER AND POCKET TRACK

CONTRACT NO.
 DRAWING NO. SS-031
 SCALE: AS NOTED
 SHEET NO. 1



REV	DATE	BY	SUB	APP	DESCRIPTION
0	2/21/94				SBCN 12 REVISED, REDRAWN BASELINE ISSUE

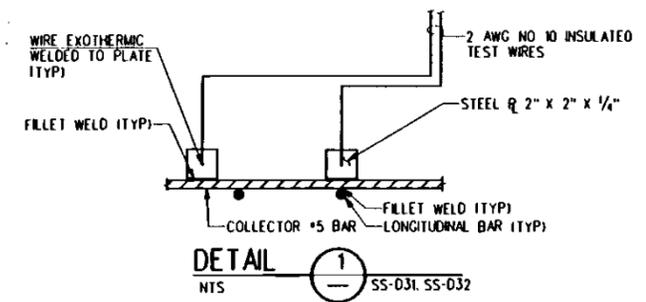
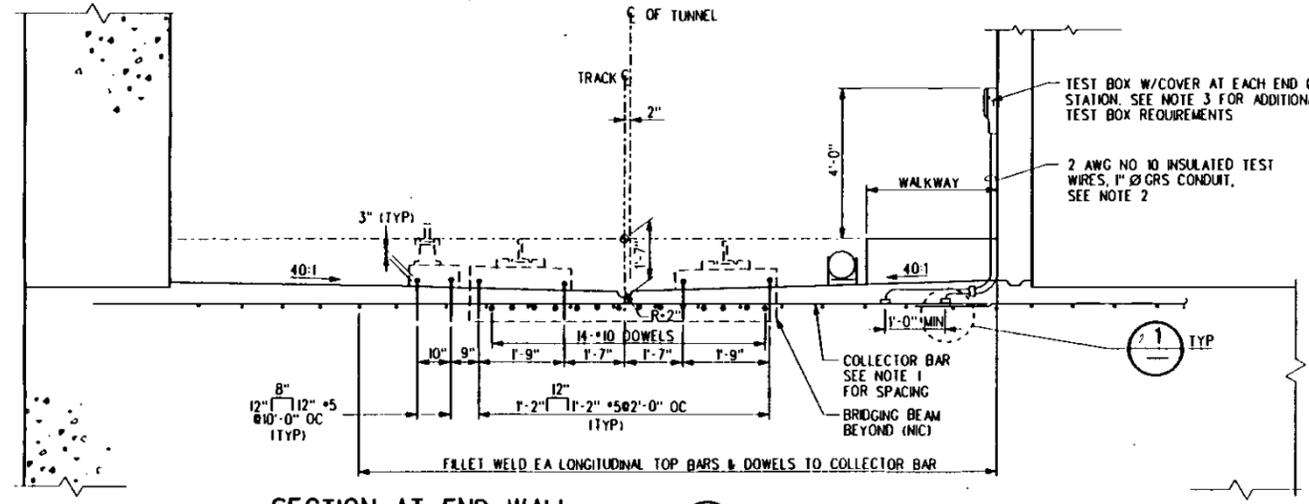
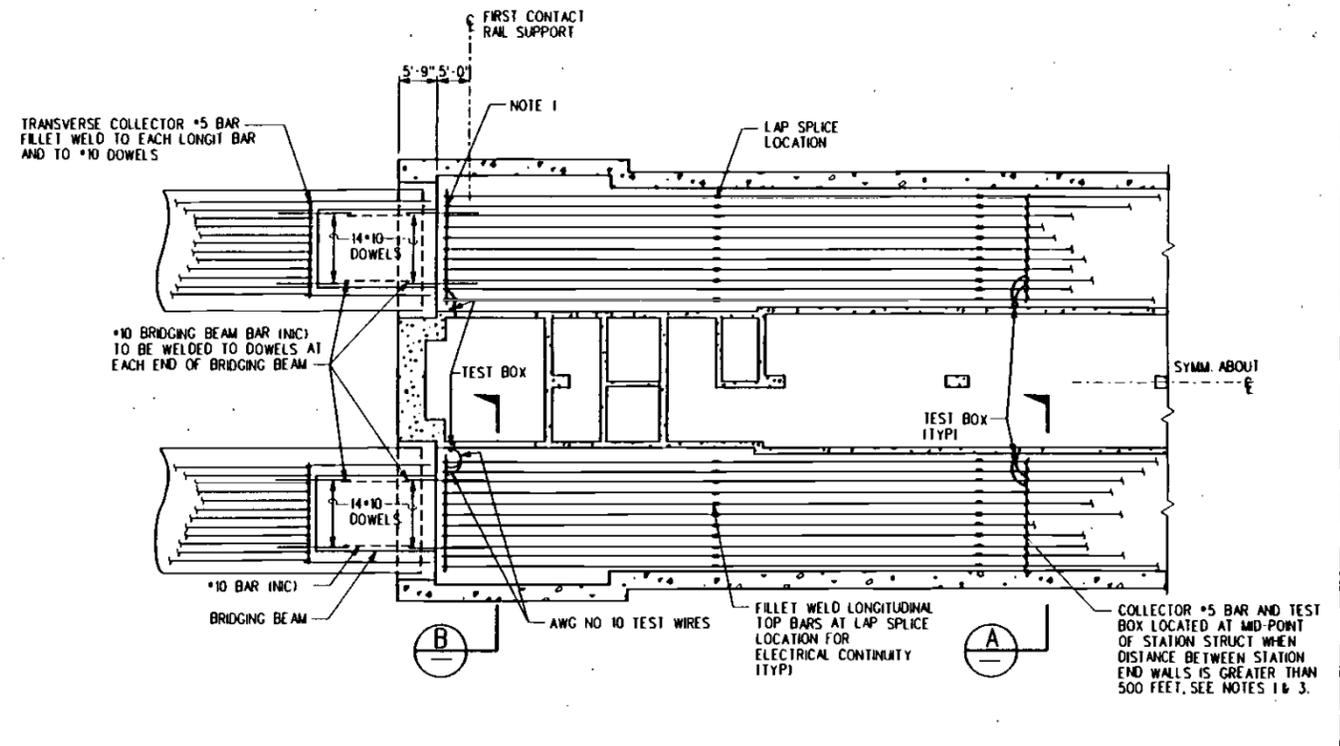
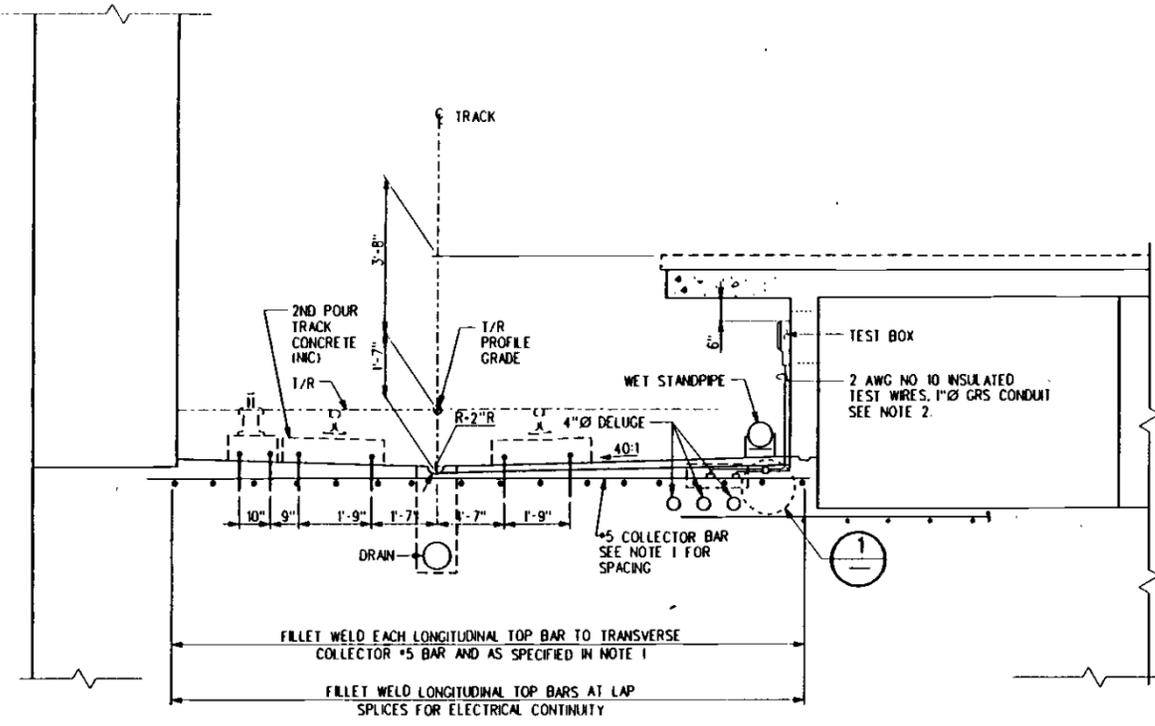
DESIGNED BY
W. J. ARMENTO
DRAWN BY
R. BAUTISTA
CHECKED BY
N. PANDYA
IN CHARGE
N. PANDYA
DATE
21 FEB 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
ENGINEERING MANAGEMENT CONSULTANT
SUBMITTED: N.P. PANDYA
APPROVED: K.N. MURTHY

STRUCTURAL STANDARD
CUT AND COVER SUBWAY
TRACK INVERT SECTIONS AT
CROSSOVER AND POCKET TRACK

CONTRACT NO.	
DRAWING NO.	SS-032
SCALE	1/2" = 1'-0"
SHEET NO.	1



- NOTES:
1. INSTALL TRANSVERSE COLLECTOR #5 BAR AT LOCATIONS INDICATED AND AT INTERVALS OF 500 FEET MAXIMUM. FILLET WELD TRANSVERSE COLLECTOR #5 BAR TO EACH LONGITUDINAL BAR.
 2. PROVIDE TWO AWG NO 10 XHHW INSULATED TEST WIRES EXOTHERMIC WELDED TO 2" x 2" x 1/4" STEEL PLATES IN SHOP. STEEL PLATE AS SHOWN IN DETAIL 1 IS FILLET WELD TO ELECTRICALLY CONTINUOUS TRANSVERSE COLLECTOR #5 BAR. TEST WIRES ROUTED THROUGH 1" Ø GRS CONDUIT AND TERMINATED IN A TEST BOX.
 3. PROVIDE TRANSVERSE COLLECTOR #5 BAR AND TEST BOX AT MID-POINT OF STATION STRUCTURE WHEN DISTANCE BETWEEN STATION END WALLS IS GREATER THAN 500 FEET.

REV	DATE	BY	CHKD	APP	DESCRIPTION
0	10/10/94	N.P.			SBCN 12 REVISED, REDRAWN BASELINE ISSUE
1	2/21/94	N.P.			

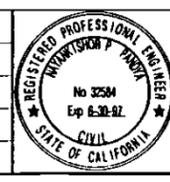
DESIGNED BY
W. J. ARMENTO

DRAWN BY
R. BAUTISTA

CHECKED BY
N. PANDYA

IN CHARGE
N. PANDYA

DATE
21 FEB 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

ENGINEERING MANAGEMENT CONSULTANT

PERSONNEL: Director/Chief Designer, Inc. (Name, Address & Telephone)
Civil Engineer/Staff Engineer
California License No. (Name)
Address, City, State, Zip
The National Group, Inc.

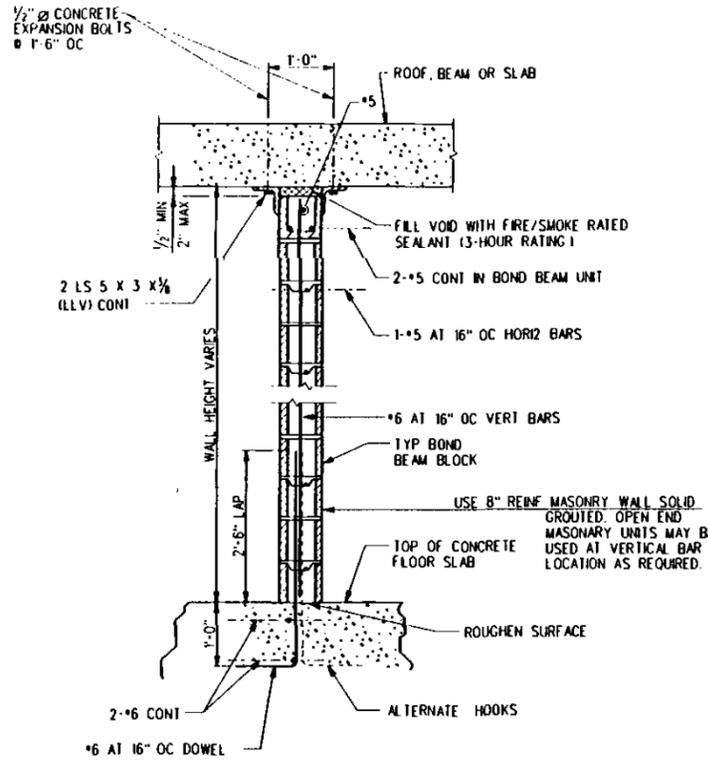
SUBMITTED: N.P. PANDYA

APPROVED: K.N. MURTHY

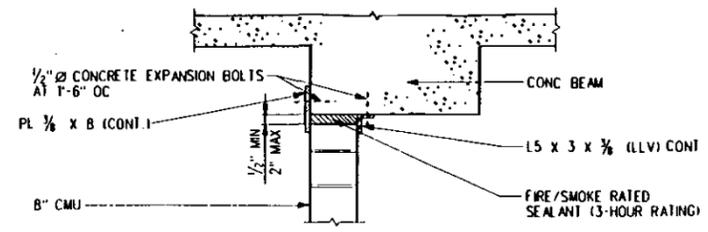
STRUCTURAL STANDARD
CUT AND COVER SUBWAY
TRACK INVERT SECTIONS AND
COLLECTOR GRID AT STATIONS

CONTRACT NO.	
DRAWING NO.	SS-033
SCALE	AS NOTED
SHEET NO.	

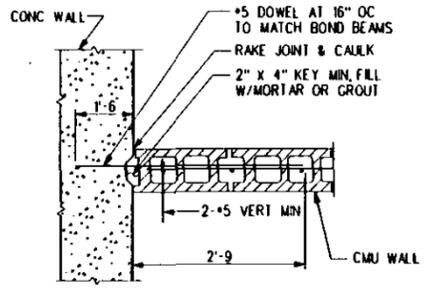
PLOTTED BY: [Name]



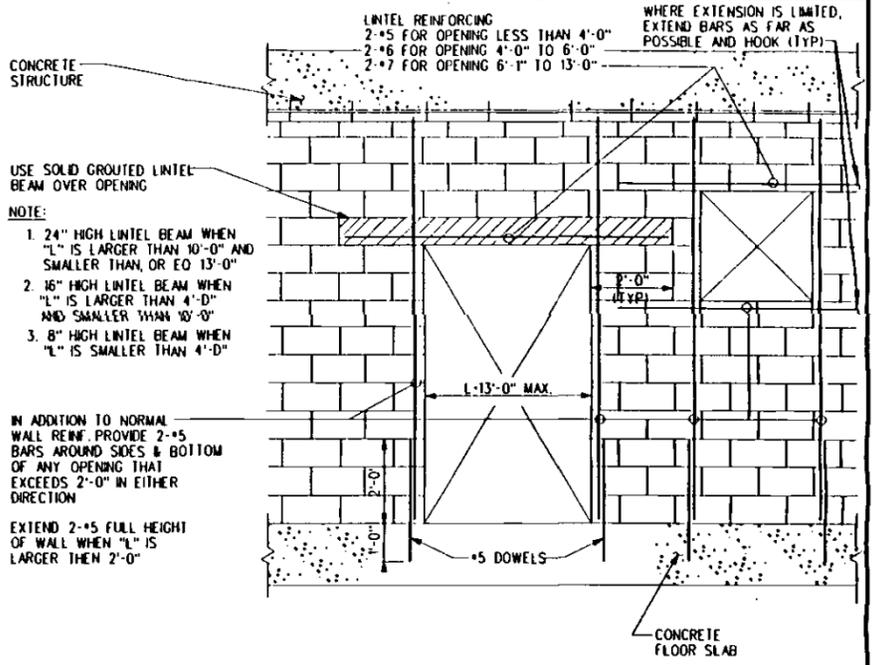
TYPICAL MASONRY WALL SECTION



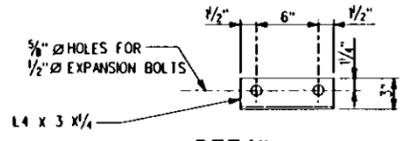
CMU WALL ELEVATION TO CONC BEAM CONNECTION



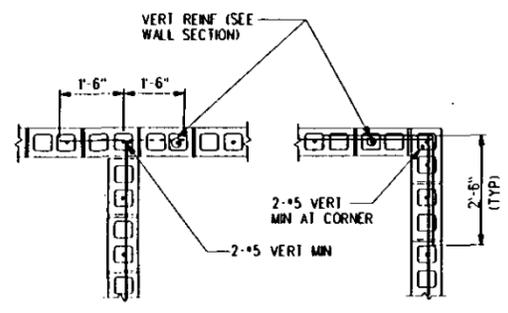
ALTERNATE CMU & CONCRETE WALL CONNECTION



WALL/DOOR OPENING OR KOP

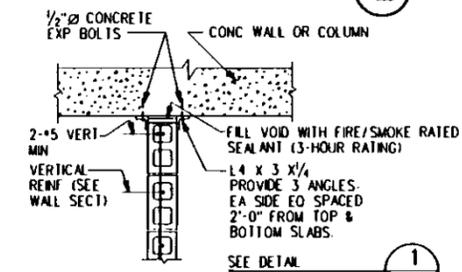


DETAIL 1

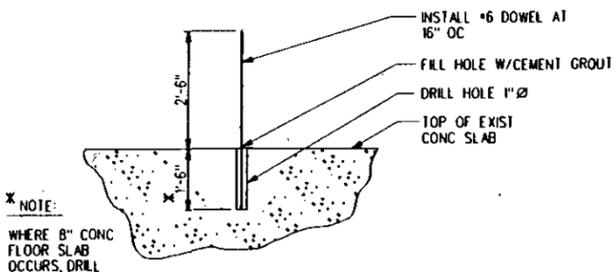


PLAN OF CMU WALL INTERSECTION

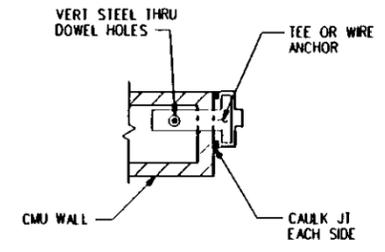
NOTE:
#5 VERTICAL BAR IS REQUIRED AT WALL INTERSECTIONS, CORNERS AND WALL ENDS.



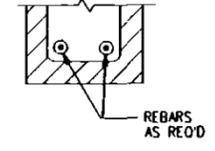
TYPICAL CMU AND CONCRETE WALL CONNECTION



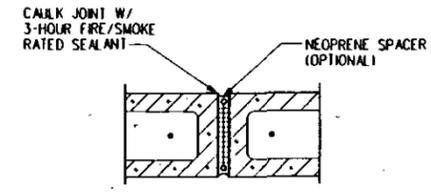
NEW DOWELS FOR CMU WALL (REQUIRED WHERE NON-EXISTING)



METAL FRAME ANCHOR



CMU LINTEL

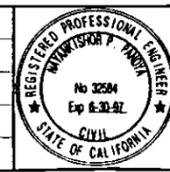


TYPICAL CONTROL JOINT

- CMU WALL NOTES:**
- REFER TO ARCHITECTURAL DRAWINGS FOR EXTENT OF CMU WALL CONSTRUCTION.
 - ALL PLATES, ANGLES AND EXPANSION BOLTS SHALL BE GALVANIZED.
 - CONTROL JOINTS REQUIRED AT 30'-0" OC MAXIMUM SPACING.
 - INSTALL EXPANSION BOLTS AS PER MANUFACTURER'S REQUIREMENTS. (AT LEAST TWO BOLTS ARE REQUIRED FOR EACH ANGLE.)

REV	DATE	BY	CHK	APP	DESCRIPTION
0	2/21/94	N.P.			SBCN 12 REVISED, REORAWN BASELINE ISSUE

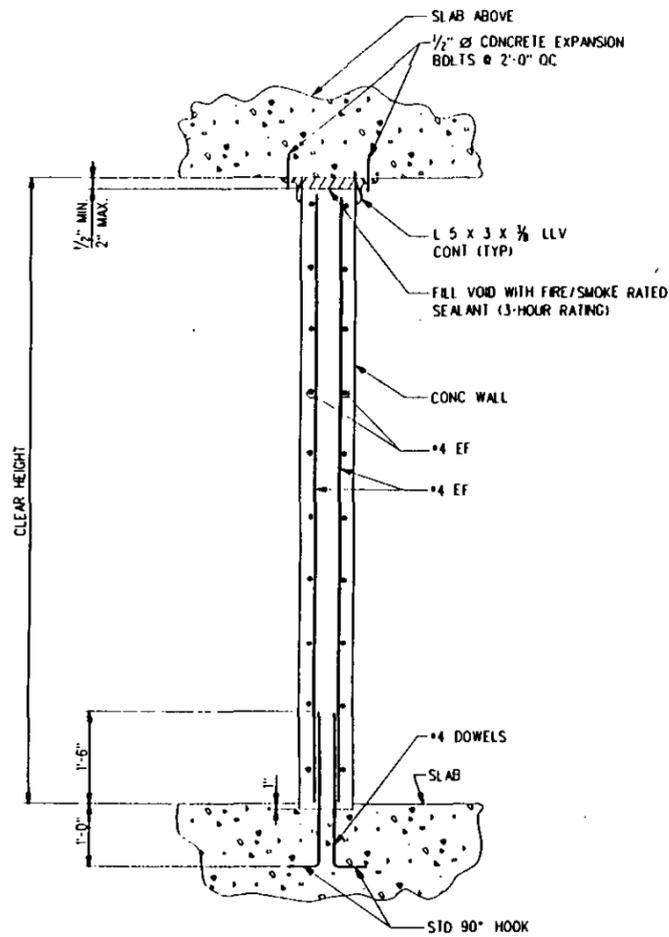
DESIGNED BY
W. J. ARMENTO
DRAWN BY
R. BAUTISTA
CHECKED BY
N. PANDYA
IN CHARGE
N. PANDYA
DATE
21 FEB 94



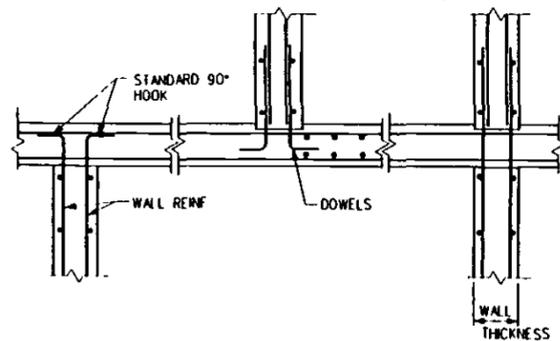
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
ENGINEERING MANAGEMENT CONSULTANT
SUBMITTED: **N.P. PANDYA**
APPROVED: **K.N. MURTHY**

**STRUCTURAL STANDARD
CUT AND COVER SUBWAY
CONCRETE UNIT MASONRY WALLS**

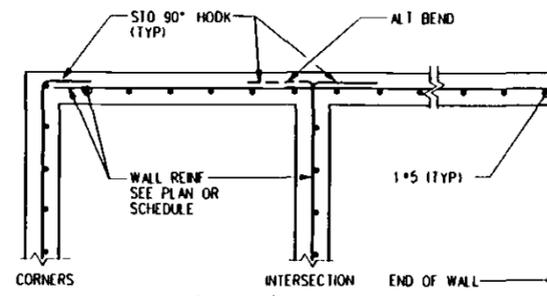
CONTRACT NO.	
DRAWING NO.	SS-034
SCALE	NO SCALE
SHEET NO.	1



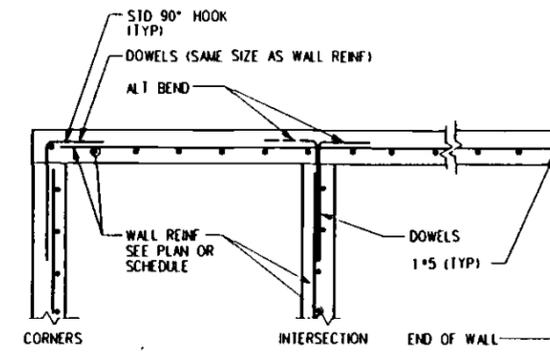
ELEVATION OF NON-BEARING WALL TO SLAB CONNECTIONS



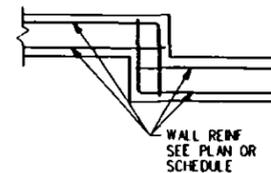
ELEVATION OF BEARING WALL TO SLAB CONNECTIONS



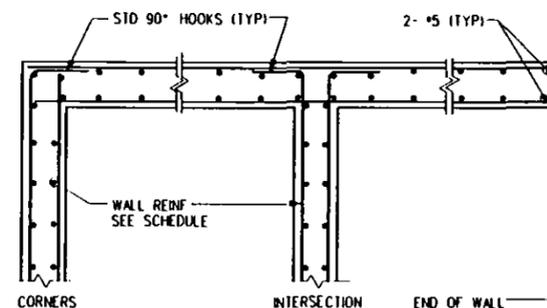
SINGLE LAYER - MONOLITHIC POUR



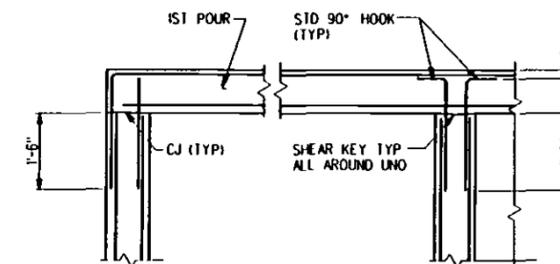
SINGLE LAYER - CONSTRUCTION JOINT



OFFSET WALLS



DOUBLE LAYER - MONOLITHIC POUR



DOUBLE LAYER - CONSTRUCTION JOINTS

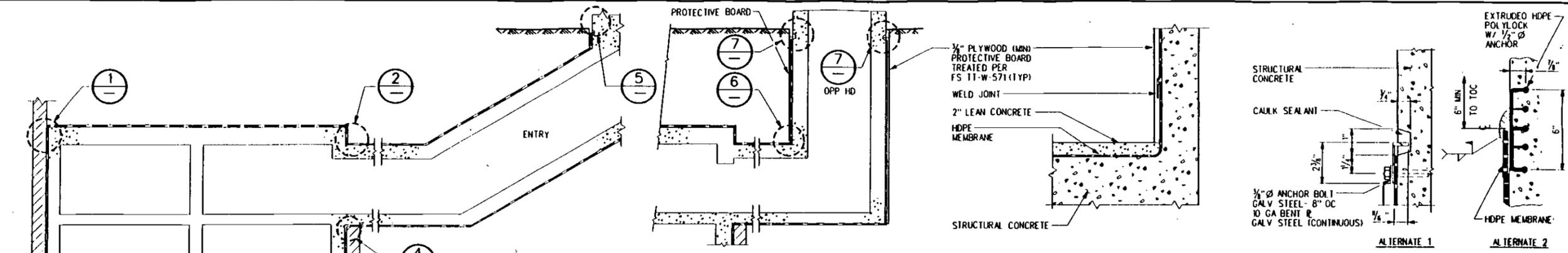
MINIMUM REINFORCING SCHEDULE		
WALL THICK	HORIZONTAL	VERTICAL
6"	*4 @ 12 ON C	*4 @ 12 ON C
8"	*4 @ 18 EF	*4 @ 18 EF
10"	*4 @ 15 EF	*4 @ 15 EF
12"	*4 @ 12 EF	*4 @ 12 EF

NOTES:

- UNLESS NOTED OTHERWISE ON DESIGN DRAWINGS, REINFORCING FOR INTERIOR CONCRETE WALLS SHALL CONFORM TO THAT LISTED IN SCHEDULE.
- INSTALL EXPANSION BOLTS AS PER MANUFACTURER'S REQUIREMENTS.

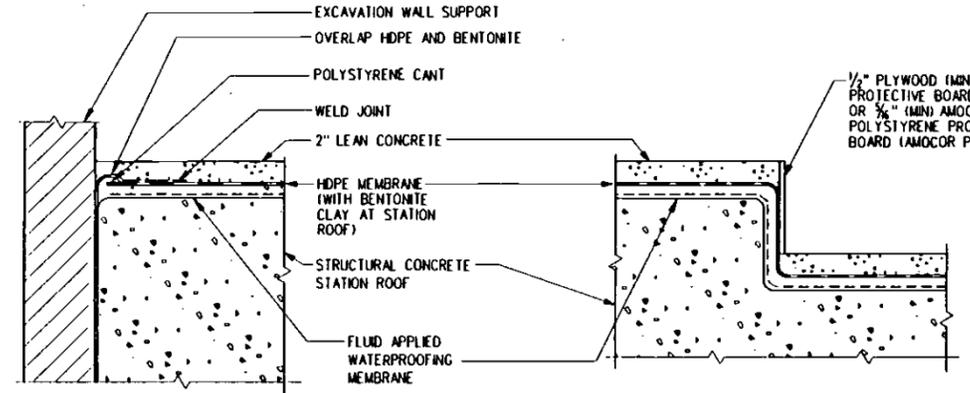
PLANS OF CONCRETE WALL INTERSECTIONS

DESIGNED BY W.J. ARMENTO DRAWN BY R. BAUTISTA CHECKED BY N. PANDYA IN CHARGE N. PANDYA DATE 21 FEB 94																STRUCTURAL STANDARD CUT AND COVER SUBWAY INTERIOR REINFORCED CONCRETE WALLS				CONTRACT NO. DRAWING NO. SS-035 SCALE AS NOTED SHEET NO.	
REV	DATE	BY	CHKD	APPD	DESCRIPTION	SUBMITTED N.P. PANDYA APPROVED K.N. MURTHY		SBCN 12 REVISED, REDRAWN BASELINE ISSUE				ENGINEERING MANAGEMENT CONSULTANT 10000 Wilshire Blvd, Suite 1000 Los Angeles, CA 90024 Telephone: (213) 400-1000 Telex: 251100 The McGraw-Hill Group Inc.									



SHELL STRUCTURE CROSS-SECTION (A)

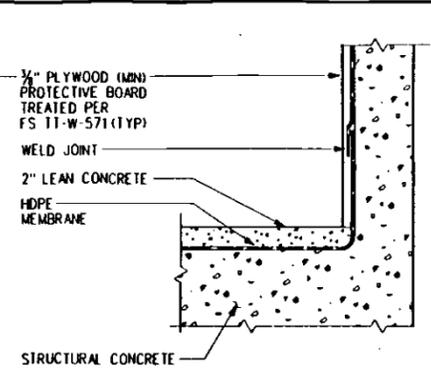
ALTERNATE ENTRY



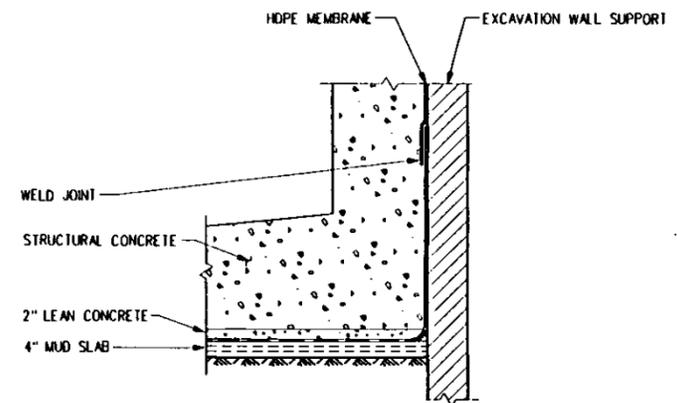
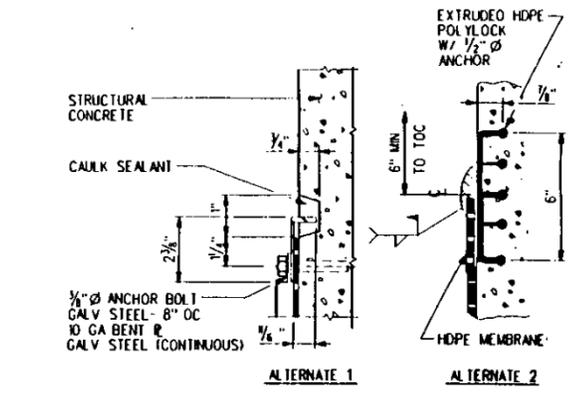
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DETAIL 2

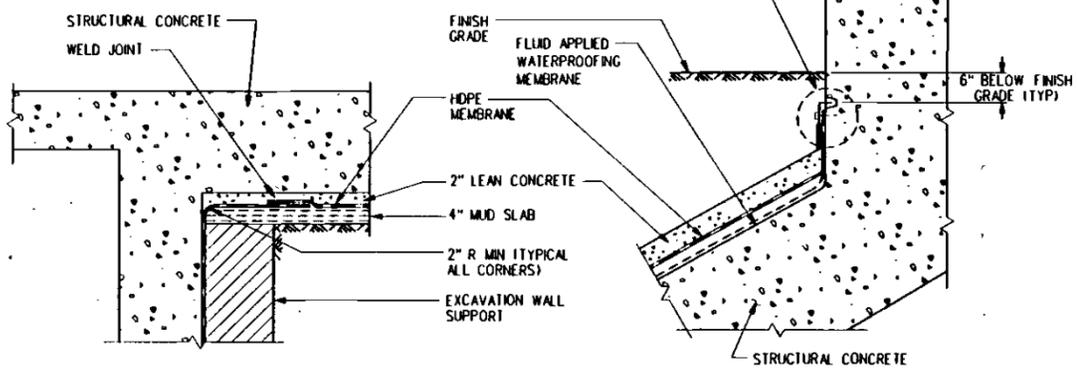
DETAIL 6



TYPICAL REGLET DETAIL 7



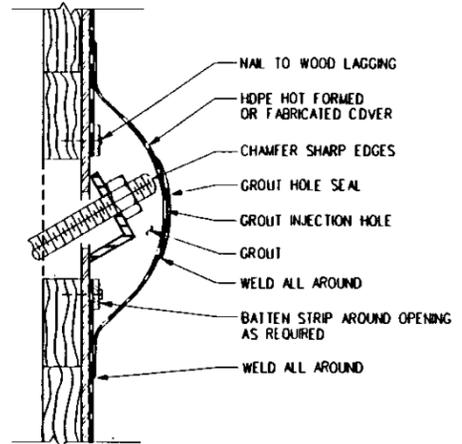
DETAIL 3



DETAIL 4

DETAIL 5

TYPICAL COVER FOR PROJECTIONS THRU MEMBRANE



- NOTES:**
1. IMPERVIOUS HIGH DENSITY POLYETHYLENE MEMBRANE (HDPE) IS SPECIFIED AS "HYDROCARBON-RESISTANT MEMBRANE FOR CAST-IN-PLACE CONCRETE"
 2. CONTRACTOR TO DEVELOP APPROPRIATE DETAILS FOR CONTINUITY OF THE HDPE FOR CONDITION OF BEARING PILE OR SOLDER PILE PENETRATING A SLAB ON GRADE POUR, SUBJECT TO APPROVAL BY THE AUTHORITY OR ITS DESIGNEE.
 3. CANT STRIPS NOT SHOWN, CONTRACTOR TO PROVIDE CANT STRIPS AS PER SPECIFICATIONS
 4. USE HDPE COMPOSITE MEMBRANE WITH BENTONITE CLAY ON THE ROOF OF THE STATION AND ENTRANCE STRUCTURE ONLY. USE WHITE OR BI-COLOR WHITE OVER BLACK HDPE ON THE SIDES AND BOTTOM. FOR ALL OTHER CUT AND COVER STRUCTURES USE WHITE OR BI-COLOR WHITE OVER BLACK HDPE ALL AROUND THE STRUCTURE.

NO.	DATE	BY	SUB	APP	DESCRIPTION
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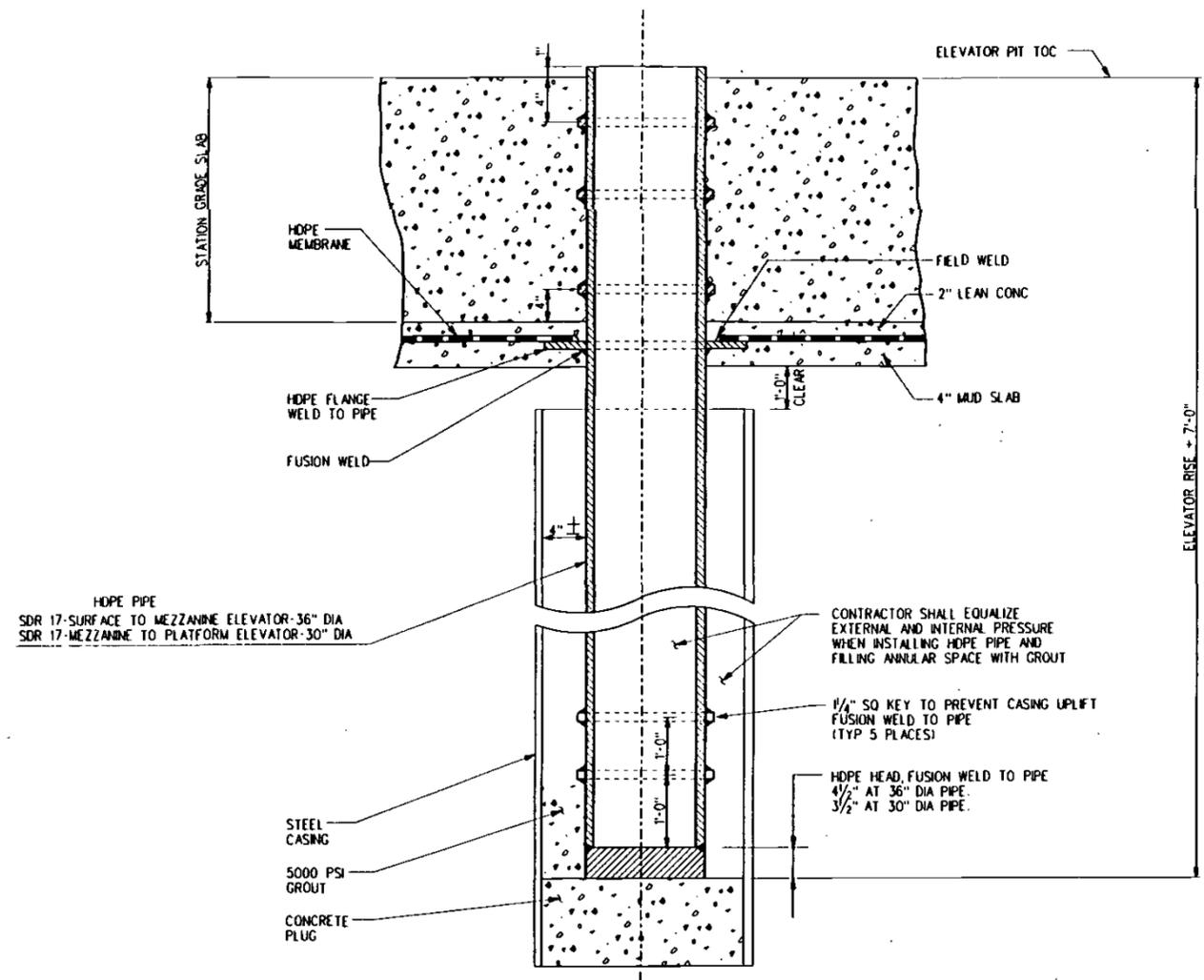
DESIGNED BY
F.E. TEEPLE
DRAWN BY
MUSZYNSKI
CHECKED BY
J.A. OLIGER
IN CHARGE
F. FORTUNATO
DATE
21 FEB 94



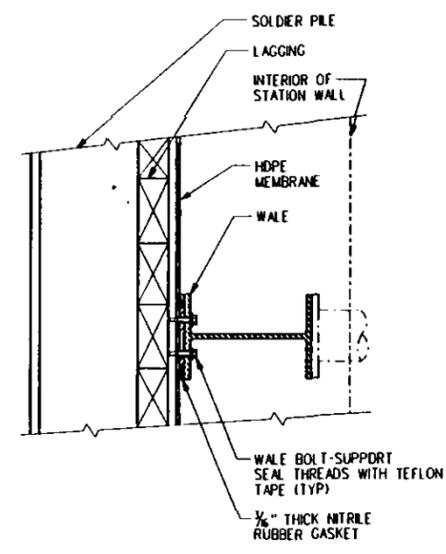
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
ENGINEERING MANAGEMENT CONSULTANT
SUBMITTED: F.M. FORTUNATO
APPROVED: K.N. MURTHY

STRUCTURAL STANDARD
CUT AND COVER SUBWAY
IMPERVIOUS HIGH DENSITY
POLYETHYLENE MEMBRANE DETAILS
SHEET 1 OF 2

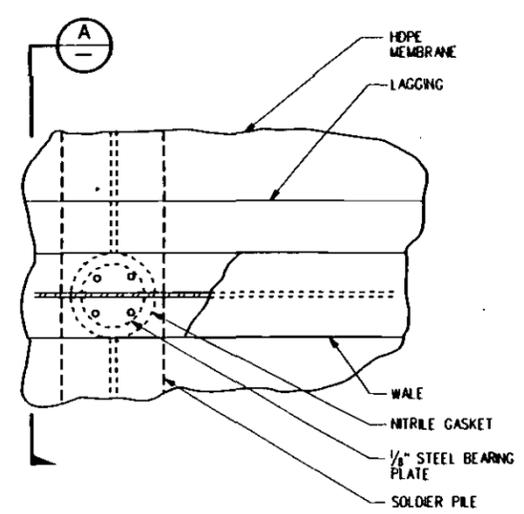
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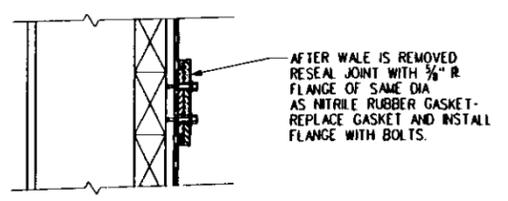
CASING AND HDPE LINER FOR ELEVATOR RAM



**SECTION A
(WALE CAST INTO WALL)**



ELEVATION AT WALE AND SOLDIER PILE



**ALTERNATE DETAIL
WALE REMOVED**

WALE CONNECTION DETAILS

NOTE:
IMPERVIOUS HIGH DENSITY POLYETHYLENE MEMBRANE (HDPE) IS SPECIFIED AS "HYDROCARBON-RESISTANT MEMBRANE FOR CAST-IN-PLACE CONCRETE".

REV	DATE	BY	CHKD	APP	DESCRIPTION
0	2/21/94	ES	SS		SBCN 12 REVISED, REDRAWN BASELINE ISSUE

DESIGNED BY
F. E. TEEPLE

DRAWN BY
E. L. CASTANEDA

CHECKED BY
J. A. OLIGER

IN CHARGE
F. FORTUNATO

DATE
21 FEB 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

ENGINEERING MANAGEMENT CONSULTANT

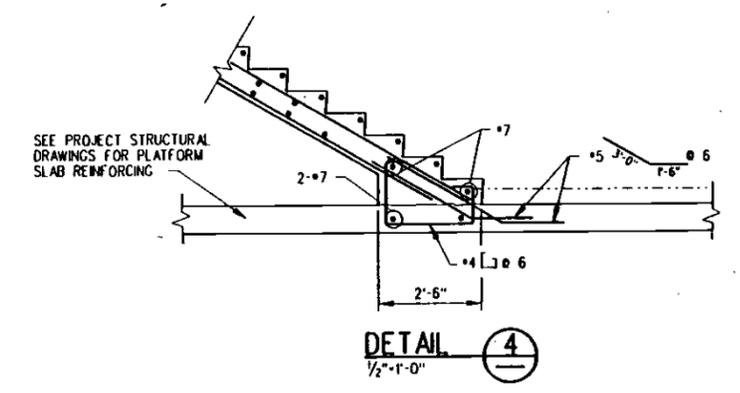
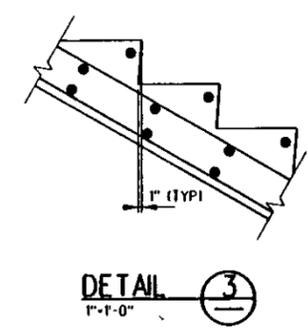
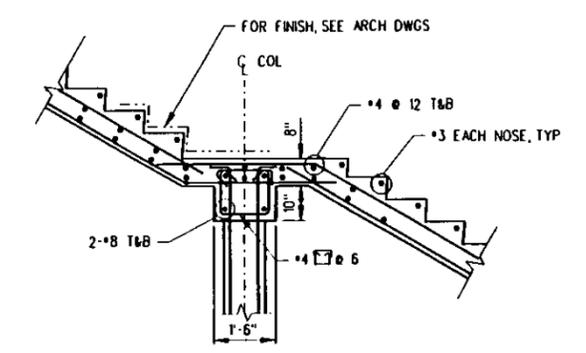
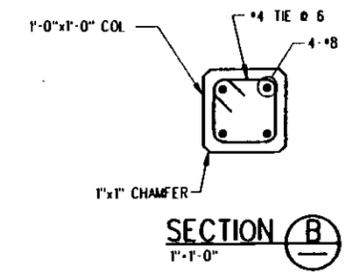
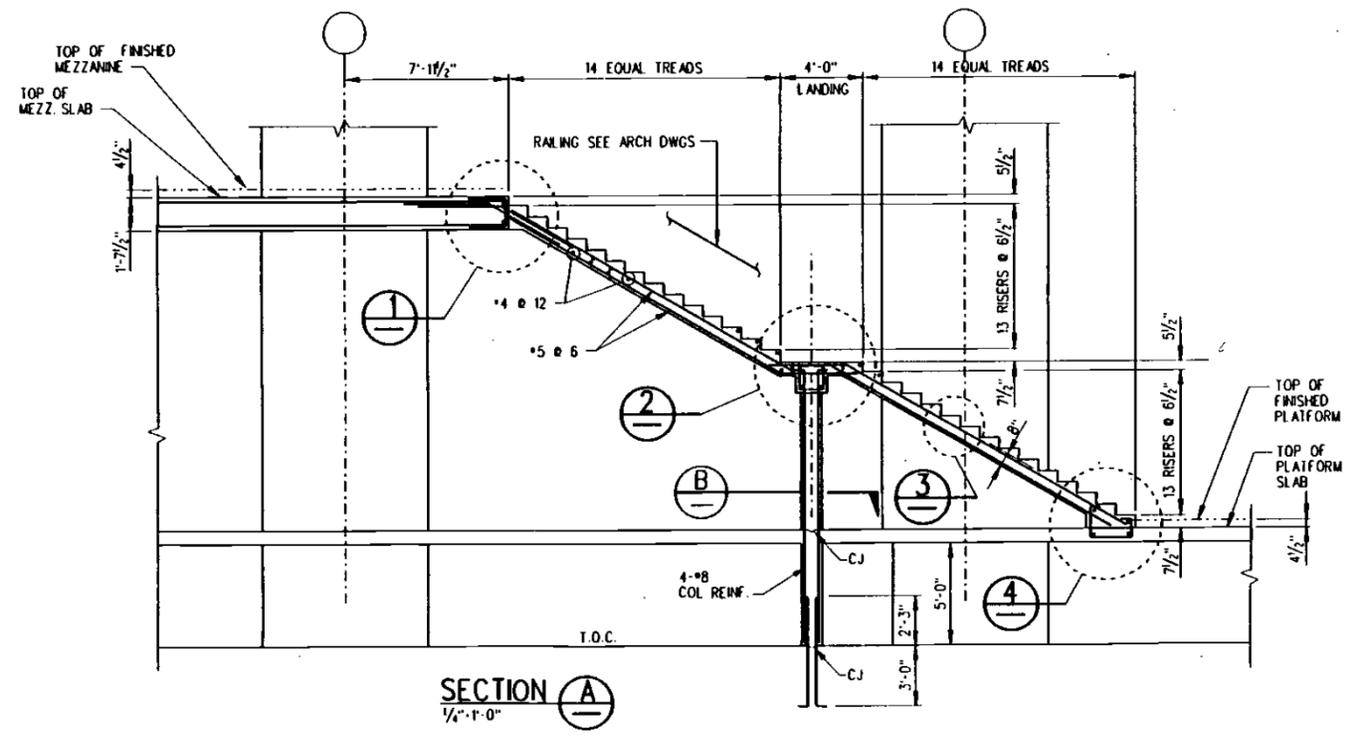
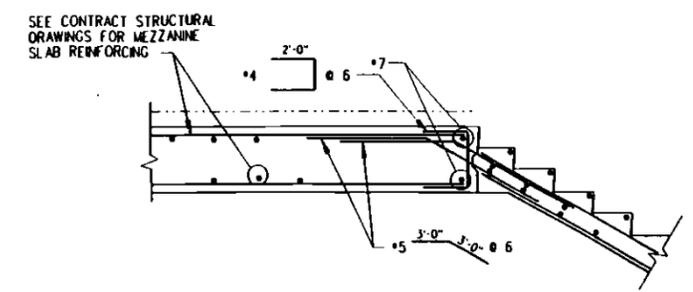
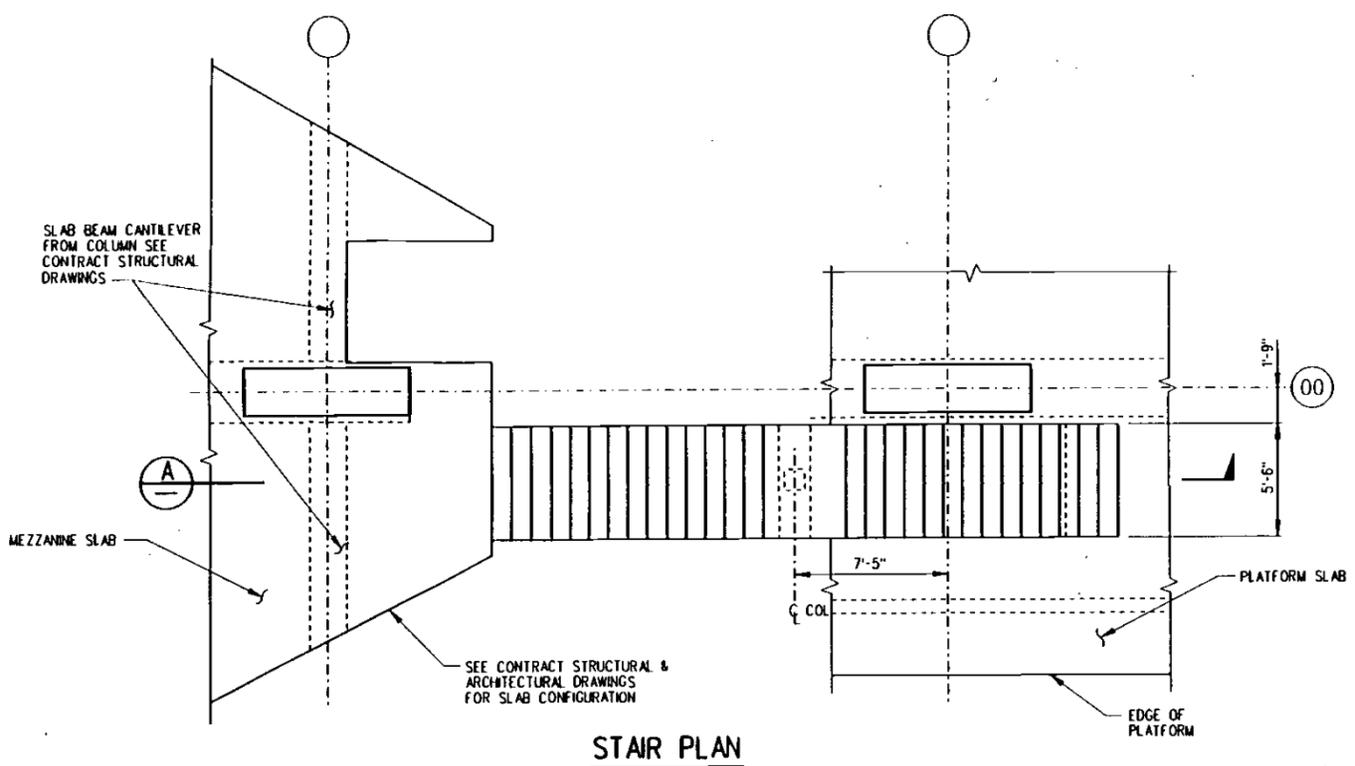
FOR THE PROJECT OF
 PROJECT MANAGER: **FRANK B. FORTUNATO**
 PROJECT ENGINEER: **F. FORTUNATO**
 PROJECT SUPERVISOR: **J. A. OLIGER**

SUBMITTED: **F. M. FORTUNATO**

APPROVED: **K. N. MURTHY**

**STRUCTURAL STANDARD
CUT AND COVER SUBWAY
IMPERVIOUS HIGH DENSITY
POLYETHYLENE MEMBRANE DETAILS
SHEET 2 OF 2**

CONTRACT NO.	
DRAWING NO.	SS-037
REV.	1
SCALE	NO SCALE
SHEET NO.	



REV	DATE	BY	SUB	APP	DESCRIPTION
0	2 21 94	EF			SBCN 12 REVISED, REDRAWN
					BASELINE ISSUE

DESIGNED BY
M. KATKAPHAN

DRAWN BY
E. JANISZEWSKI

CHECKED BY
P. CHIU

IN CHARGE
N. PANDYA

DATE
21 FEB 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

ENGINEERING MANAGEMENT CONSULTANT

Submitted: N.P. PANDYA

Approved: K.N. MURTHY

STRUCTURAL STANDARD
CUT AND COVER SUBWAY
MEZZANINE TO PLATFORM REINFORCED
CONCRETE STAIR DETAILS
AND SUPPORTS

CONTRACT NO.	
DRAWING NO.	SS-038
REV	1
SCALE	AS NOTED
SHEET NO.	

BASELINE STATUS REPORT: DIRECTIVE/STANDARD DRAWINGS

DRAWING NO.	REV.	DATE MODIFIED	DRAWING TITLE / Change Title	REMARKS
R92-DE306-03 STANDARD DRAWINGS: UTILITY PART 2				
US-000	0	03/03/94	UTILITY STANDARD, INDEX OF DRAWINGS Base line issue	
US-001	0	03/03/94	UTILITY STANDARD, ABBREVIATIONS AND SYMBOLS SHEET 1 OF 2 Base line issue	
	1	05/09/95	Revised and redrawn per DE306-SBCN-14	
US-002	0	03/03/94	UTILITY STANDARD, ABBREVIATIONS AND SYMBOLS SHEET 2 OF 2 Base line issue	
	1	05/09/95	Revised and redrawn per DE306-SBCN-14	
US-010	0	03/03/94	UTILITY STANDARD, DESIGN GUIDE - TEMPORARY SUPPORT FOR UTILITIES TELEPHDNE/ELECTRICAL DUCTBANKS Base line issue	
	1	05/09/95	Revised and redrawn per DE306-SBCN-14	
US-011	0	03/03/94	UTILITY STANDARD, DESIGN GUIDE - TEMPORARY SUPPORT FOR WATER FACILITIES Base line issue	
	1	05/09/95	Revised and redrawn per DE306-SBCN-14	
US-012	0	03/03/94	UTILITY STANDARD, DESIGN GUIDE - TEMPORARY SUPPORT FOR GAS FACILITIES Base line issue	
	1	05/09/95	Revised and redrawn per DE306-SBCN-14	
US-013	0	03/03/94	UTILITY STANDARD, DESIGN GUIDE - TEMPORARY SUPPORT FOR TELEPHONE MANHDLES Base line issue	
	1	05/09/95	Revised and redrawn per DE306-SBCN-14	
US-014	0	03/03/94	UTILITY STANDARD, BACKFILL OPERATIDNS Base line issue	
	1	05/09/95	Revised and redrawn per DE306-SBCN-14	
US-015	0	03/03/94	UTILITY STANDARD, TEMPORARY SUPPORT FOR EXISTING ELECTRICAL MANHDLES Base line issue	
	1	05/09/95	Revised and redrawn per DE306-SBCN-14	
US-017	0	03/03/94	UTILITY STANDARD, ACCESS TD SUPPORTED MANHOLES THROUGH DECKING STRUCTURE Base line issue	
	1	05/09/95	Revised and redrawn per DE306-SBCN-14	
	2	11/10/95	Revised and redrawn per DE306-SBCN-19	

VOLUME VI
STANDARD DRAWINGS
UTILITIES

MTA BASELINE DOCUMENT
NO. R92-DE306.03

UTILITY STANDARD DRAWINGS

DRAWING NUMBER

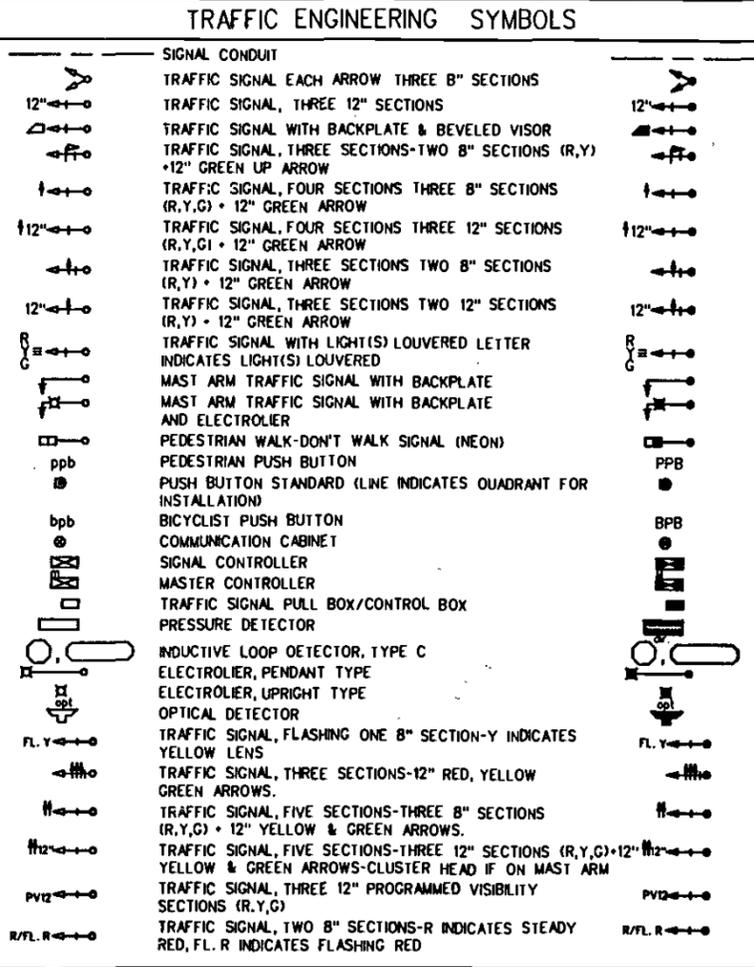
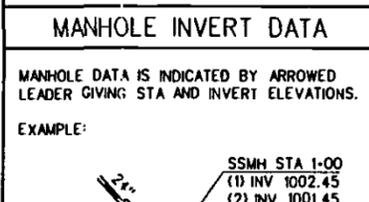
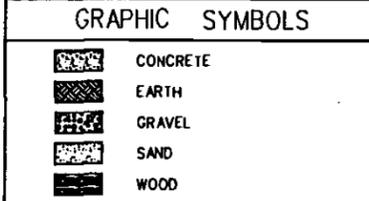
US - 000
 US - 001
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 US - 017

DESCRIPTION

INDEX OF DRAWINGS
 ABBREVIATIONS AND SYMBOLS - SHEET 1 OF 2
 ABBREVIATIONS AND SYMBOLS - SHEET 2 OF 2
 DESIGN GUIDE - TEMPORARY SUPPORT FOR UTILITIES TELEPHONE/ELECTRICAL DUCTBANKS
 DESIGN GUIDE - TEMPORARY SUPPORT FOR UTILITIES WATER FACILITIES
 DESIGN GUIDE - TEMPORARY SUPPORT FOR UTILITIES GAS FACILITIES
 DESIGN GUIDE - TEMPORARY SUPPORT FOR TELEPHONE MANHOLES
 BACKFILL OPERATIONS
 DESIGN GUIDE - TEMPORARY SUPPORT FOR EXISTING ELECTRICAL MANHOLES
 DESIGN GUIDE - ACCESS TO SUPPORTED MANHOLES THROUGH DECKING STRUCTURE

DESIGNED BY: W. JACKSON DRAWN BY: V. NITU CHECKED BY: F. AZZAM IN CHARGE: F. AZZAM DATE: 3 MAR 94												 LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY ENGINEERING MANAGEMENT CONSULTANT <small>Parsons Brinckerhoff O'Connell & Douglas, Inc. David, Mann, Johnson & Mendenhall OF-Neider Engineers (C&G) Corp. Escudé & Fournier, Inc. Jenkins, Calver, Hillman, Inc. The Hittorff Group, Inc.</small>				SUBMITTED:  APPROVED: 		UTILITY STANDARD INDEX OF DRAWINGS		CONTRACT NO. DRAWING NO: US-000 SCALE: NO SCALE SHEET NO.		REV: 0
REV	DATE	BY	SUB	APP	DESCRIPTION	REV	DATE	BY	SUB	APP	DESCRIPTION											
					0 3/3/94						BASE LINE ISSUE											

ABBREVIATIONS				LINE SYMBOLS		STRUCTURE SYMBOLS	
				EXISTING	PROPOSED	EXISTING	PROPOSED
ABAND	ABANDONED	MAX	MAXIMUM	EXISTING	PROPOSED	EXISTING	PROPOSED
ACC	ASBESTOS CEMENT CONCRETE	MCD	MULTIPLE CONCRETE DUCTS	-----	-----	SSMH, EMH, TMH	SSMH, EMH, TMH
ACP	ASBESTOS CEMENT PIPE	MCWD	MULTIPLE CREOSOTED WOOD DUCTS	-----	-----	CO	CO
AL	ALUMINUM	MH	MANHOLE, MAINTENANCE HOLE	-----	-----	WM, WV	WM, WV
APPROX	APPROXIMATELY	MIN	MINIMUM	---XX(DH)---	---XX(DH)---	W	W
AVE	AVENUE	MJ	MECHANICAL JOINT	---STM---	---STM---	SS	SS
AWG	AMERICAN WIRE GAUGE	MP	MEDIUM PRESSURE	---SS---	---SS---	UD	UD
BF	BLIND FLANGE	MTC	MULTI-TILE CONDUIT	---SD---	---SD---	W	W
BO	BLOW-OFF	MTD	MULTI-TILE DUCTS	---UD---	---UD---	G	G
BRK	BRICK	N	NORTH, NORTHING	---W---	---W---	TS	TS
BS	BELL AND SPIGOT	NA	NOT APPLICABLE	---G---	---G---	E	E
BUR CA	DIRECT BURIED CABLE OR CONDUIT	NTS	NOT TO SCALE	---TS---	---TS---	SL	SL
C	CONDUIT, CLEARANCE	OC	ON CENTER	---SL---	---SL---	RSC	RSC
CB	CATCH BASIN	OD	OUTSIDE DIAMETER	---RSC---	---RSC---	POL	POL
CC	CENTER TO CENTER	OH	OVERHEAD	---PDL---	---PDL---	FA	FA
CF	CUBIC FEET			---T---	---T---	TG	TG
CFS	CUBIC FEET PER SECOND			---TV---	---TV---	FUEL	FUEL
CI	CAST IRON			---FUEL---	---FUEL---		
CI(1)	CAST IRON PIPE (CEMENT LINED)						
CIRCUM	CIRCUMFERENCE						
CISPIES)	CAST IRON SOIL PIPE (EXTRA STRENGTH)						
C	CENTERLINE						
CL	CLASS						
CMP	CORRUGATED METAL PIPE						
CO	CLEANOUT, COUNTY						
CONC	CONCRETE						
CP	CONCRETE PIPE						
CPC	SCHEDULE C, PLASTIC CONDUIT						
CULV	CULVERT						
CWD	CREOSOTED WOOD DUCT						
D	DEPTH						
DI	DUCTILE IRON						
DIA, Ø	DIAMETER						
DIAC	DIAGRAM						
DIM	DIMENSION						
DIM(L)	DUCTILE IRON PIPE (LINED)						
DU	DUCT						
DWC	DRAWING						
E	ELECTRIC, EAST, EASTING						
EA	EACH						
EL	ELEVATION						
EMH	ELECTRICAL MANHOLE						
ES	EXTRA STRENGTH						
EX.EXIST	EXISTING						
F	FIBER						
FA	FIBER ALARM						
FC	FIBER CONDUIT						
FD	FIBER DUCT						
FDC	FIRE DEPARTMENT CONNECTION						
FH	FIRE HYDRANT						
FUEL	FUEL						
FT	FOOT OR FEET						
G	GAS						
GALV	GALVANIZED						
GM	GAS METER						
GRS	GALVANIZED RIGID STEEL						
GSC	GALVANIZED STEEL CONDUIT						
GV	GATE VALVE, GAS VALVE						
HC	HOUSE CONNECTION						
HORIZ	HORIZONTAL						
HP	HIGH PRESSURE						
HR	HEADROOM						
HS	HIGH STRENGTH						
ID	INSIDE DIAMETER						
IJ	INSULATED JOINT						
IN	INCH OR INCHES						
INV	INVERT						
KV	KILOVOLT						
L	LINE, LINING						
LBS	POUNDS						
LH	LAMPHOLE						
LIN FT	LINEAR FEET						
LJ	LEADED JOINT						
LP	LOW PRESSURE						
LT	LEFT						
UD	UNDERDRAIN						
UG	UNDERGROUND						
UTIL	UTILITY						
VAR	VARIABLE						
VCC	VITRIFIED CLAY CONDUIT						
VCD	VITRIFIED CLAY DUCT						
VCP	VITRIFIED CLAY PIPE (EXTRA STRENGTH)						
VCP(IES)	VITRIFIED CLAY PIPE (EXTRA STRENGTH)						
VERT	VERTICAL						
W	WATER, WEST						
WI	WROUGHT IRON						
WIP	WROUGHT IRON PIPE						
WM	WATER METER						
WSP	WELDED STEEL PIPE						
WSP(L)	WELDED STEEL PIPE (CEMENT LINED)						
WV	WATER VALVE						



DESIGNED BY W. JACKSON	LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
DRAWN BY V. NITU	
CHECKED BY F. AZZAM	
IN CHARGE F. AZZAM	
DATE 3 MAR 94	



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

ENGINEERING MANAGEMENT CONSULTANT

Submitted: **FOUAD AZZAM**

Approved: **K. N. MURPHY**

UTILITY STANDARD

ABBREVIATIONS AND SYMBOLS

SHEET 1 OF 2

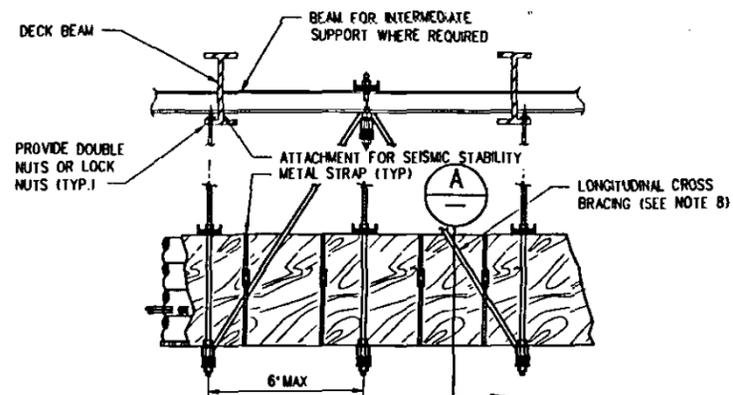
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ABBREVIATIONS

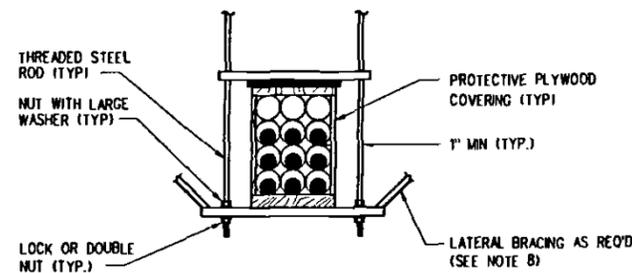
UTILITY COMPANY / AGENCY ABBREVIATIONS

AAR	AMERICAN ASSOCIATION OF RAILROADS	MFS	METROPOLITAN FIBER SYSTEMS
AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS	MSS	MANUFACTURERS STANDARDIZATION SOCIETY
ACI	AMERICAN CONCRETE INSTITUTE	MTA	LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
AF	U.S. AIR FORCE	MTC	MANAGERS OF TRANSIT CONSTRUCTION
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE	MWD	METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA
APWA	AMERICAN PUBLIC WORKS ASSOCIATION		
ARCO	ATLANTIC RICHFIELD COMPANY (NOW FOUR CORNERS PIPELINE COMPANY)	PAS	CITY OF PASADENA
AREA	AMERICAN RAILWAY ENGINEERING ASSOCIATION	P DWPP	CITY OF PASADENA DEPARTMENT OF WATER AND POWER-POWER
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS	P DWPW	CITY OF PASADENA DEPARTMENT OF WATER AND POWER-WATER
ASTM	AMERICAN SOCIETY OF TESTING AND MATERIALS	P PW	CITY OF PASADENA PUBLIC WORKS
AT&SF	ATCHISON, TOPEKA AND SANTA FE RAILWAY COMPANY		
ATS	ACCESS TRANSMISSION SERVICES, INC (FORMERLY WESTERN UNION)	PAC BELL	PACIFIC BELL
AWWA	AMERICAN WATER WORKS ASSOCIATION	PUC	PUBLIC UTILITIES COMMISSION
BOE, LABOE	CITY OF LOS ANGELES BUREAU OF ENGINEERING	RCC	RAIL CONSTRUCTION CORPORATION
BSL, LABSL	CITY OF LOS ANGELES BUREAU OF STREET LIGHTING		
CALTRANS	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION		
		SATVACOW	SATIVA COUNTY WATER (NOW SATIVA WATER DISTRICT)
DWPWS	CITY OF LOS ANGELES, DEPARTMENT OF WATER AND POWER, WATER SYSTEMS	SCE	SOUTHERN CALIFORNIA EDISON COMPANY
DWPPS	CITY OF LOS ANGELES, DEPARTMENT OF WATER AND POWER, POWER SYSTEMS	SCG	SOUTHERN CALIFORNIA GAS COMPANY (NOW THE GAS COMPANY)
		SCRRA	SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY
EMC	ENGINEERING MANAGEMENT CONSULTANT	SCWCO	SOUTHERN CALIFORNIA WATER COMPANY
		SO PAC P	SOUTHERN PACIFIC PIPELINE COMPANY
FHWA	FEDERAL HIGHWAY ADMINISTRATION	SO PAS	CITY OF SOUTH PASADENA
FTA	FEDERAL TRANSIT ADMINISTRATION	SP OR SPTC	SOUTHERN PACIFIC TRANSPORTATION COMPANY
		SPPWC	STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION
		STD OIL CO	STANDARD OIL COMPANY OF CALIFORNIA
		TGC	THE GAS COMPANY
GP	GENERAL PETROLEUM (NOW MOBIL OIL)	TM-CATV	TIMES MIRROR CABLE TELEVISION (NOW SIMMONS CABLE TELEVISION)
GSD	CITY OF LOS ANGELES, GENERAL SERVICE DIVISION	UBC	UNIFORM BUILDING CODE
GTE	GENERAL TELEPHONE COMPANY	UP	UNION PACIFIC RAILROAD
		US	UNITED STATES
		USC & GS	UNITED STATES COAST AND GEODETIC SURVEY
LA	CITY OF LOS ANGELES	WU, WUT	WESTERN UNION TELEGRAPH COMPANY
LAC DPW	LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS		
LACFCD	LOS ANGELES COUNTY FLOOD CONTROL DISTRICT		
LACO	COUNTY OF LOS ANGELES		
LACOW	LOS ANGELES COUNTY WATER WORKS		
LACSD	LOS ANGELES COUNTY STATION DISTRICTS		
LADOT	CITY OF LOS ANGELES, DEPARTMENT OF TRANSPORTATION		
LAX	LOS ANGELES INTERNATIONAL AIRPORT		
LB	CITY OF LONG BEACH		

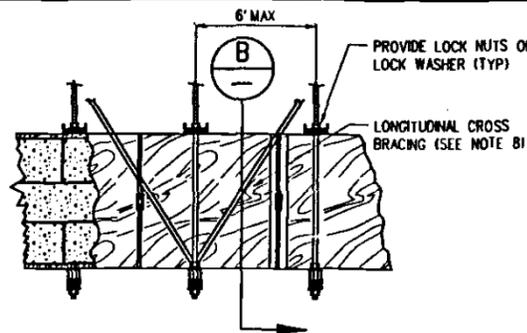
DESIGNED BY W. JACKSON				 LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY		UTILITY STANDARD ABBREVIATIONS AND SYMBOLS SHEET 2 OF 2		CONTRACT NO. 																	
DRAWN BY V. NITU		 ENGINEERING MANAGEMENT CONSULTANT		SUBMITTED FOUAD AZZAM		DRAWING NO US-002		REV 1																	
CHECKED BY F. AZZAM		IN CHARGE F. AZZAM		APPROVED K. N. MURTHY		SCALE NO SCALE		SHEET NO 																	
DATE 3 MAR 94		REVISIONS <table border="1"> <tr> <th>REV</th> <th>DATE</th> <th>BY</th> <th>SUB</th> <th>APP</th> <th>DESCRIPTION</th> </tr> <tr> <td>0</td> <td>3/3/94</td> <td></td> <td></td> <td></td> <td>BASE LINE ISSUE</td> </tr> <tr> <td>1</td> <td>5/9/95</td> <td>SAUS</td> <td>FA</td> <td></td> <td>REVISED AND REDRAWN PER DEJ06 - SBCH-14.00</td> </tr> </table>		REV	DATE	BY	SUB	APP	DESCRIPTION	0	3/3/94				BASE LINE ISSUE	1	5/9/95	SAUS	FA		REVISED AND REDRAWN PER DEJ06 - SBCH-14.00				
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EXISTING TELEPHONE CABLES TO BE ENCLOSED IN PLASTIC SPLIT DUCT DETAIL (1)

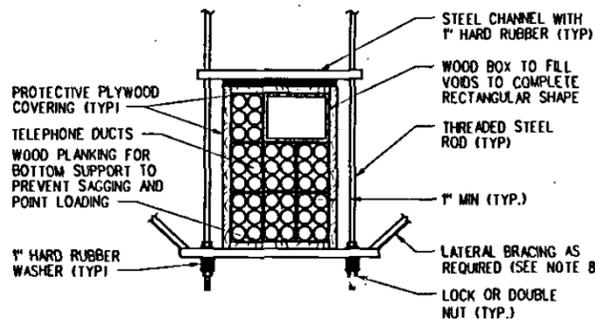


SECTION (1)



NOTE: EXISTING DUCTBANK CONFIGURATIONS VARY AND MUST BE MAINTAINED. INDIVIDUAL M.C.D. UNITS ARE NOT TO BE SHIFTED. IF CONCRETE COVER OR ENCASEMENT IS BONDED TO M.C.D. UNITS, IT MUST BE SUPPORTED.

EXISTING TELEPHONE MULTIPLE CONCRETE DUCTS (MCD) OR MULTIPLE TILE DUCTS (MTD) - DETAIL (2)



SECTION (2)

CHARACTERISTICS OF MULTIPLE CONCRETE TELEPHONE DUCTS - TYPE C

SIZE	LENGTH INCH	HEIGHT & WIDTH (INCH)	APPROX. WEIGHT (LBS)
4 DUCTS	42 OR 54	10 3/8	175 TO 195
6 DUCTS	42 OR 54	10 3/8 x 10 3/8	175 TO 195
9 DUCTS	36 OR 54	10 3/8	175 TO 195

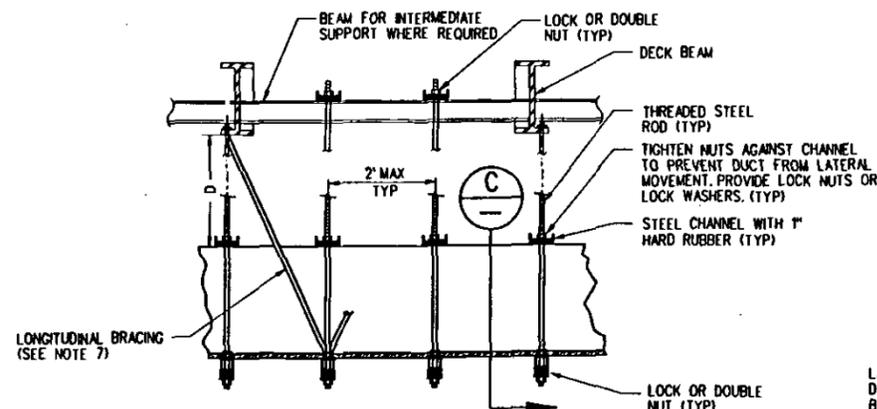
* DOES NOT INCLUDE CABLE WEIGHT

NOTICE TO CONTRACTOR

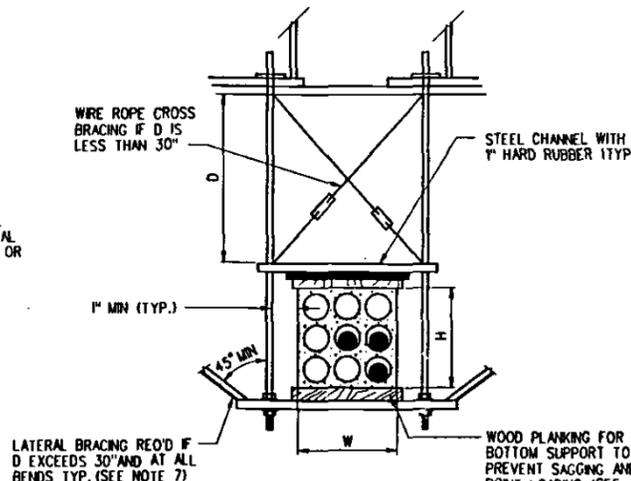
THE CONTRACTOR SHALL DESIGN ENTIRE STRUCTURAL SUPPORT SYSTEM TO RESIST ALL ANTICIPATED LOADINGS. THE STRUCTURAL SHAPES, CONFIGURATIONS AND DETAILS SHOWN IN THESE SUPPORT STANDARDS ARE MERELY REPRESENTATIVE. THE TEMPORARY SUPPORT SYSTEM SHALL BE DESIGNED BY A CIVIL OR STRUCTURAL ENGINEER REGISTERED IN THE STATE OF CALIFORNIA. THE FINAL DESIGN SHALL BE SUBMITTED FOR APPROVAL BY THE AUTHORITY AND OWNER OF THE FACILITY.

TELEPHONE FACILITIES NOTES

- WHEN REQUIRED TO BREAK AWAY A DUCTBANK FROM THE CABLES, THE PAC BELL APPROVED CONTRACTOR SHALL EXPOSE THE CABLES, AND ENCLOSE THEM IN SPLIT DUCTS. CONDUIT SPACERS ARE NOT REQUIRED DURING TEMPORARY SUPPORT OF SPLIT DUCTS.
- SUPPORTS SHALL BE SIZED, SPACED AND CONSTRUCTED OF MATERIALS TO PREVENT SAGGING, SWINGING AND LATERAL AND LONGITUDINAL MOVEMENT. STEEL BANDS SHALL NOT BE USED IN DIRECT CONTACT WITH DUCTS.
- TO AVOID POINT LOADING AND SAGGING OF THE CONDUITS, WOOD PLANKING SHALL BE PLACED BENEATH THE DUCTBANK. MINIMUM WIDTH OF PLANKING SHALL EQUAL THE WIDTH OF DUCTBANK.
- FOR PROTECTION, PLYWOOD PANELS, WITH A MINIMUM THICKNESS OF 1/2 INCH SHALL BE USED OVER THE TOP AND SIDES OF THE DUCTBANK. METAL STRAPS SHALL BE USED TO FASTEN THE SHEETS TOGETHER WITH THE WOOD PLANKING.
- FOR RADIUS LESS THAN 80 FEET, SPLIT DUCTS SHALL BE ENCASED IN CONCRETE. THE ENCASEMENT SHALL COMPLY WITH THE PAC BELL STANDARD SPECIFICATIONS. STEEL CONDUITS MAY BE USED WITH APPROVAL OF THE AUTHORITY.
- DURING BACKFILLING OPERATIONS, ALL SUPPORT SYSTEMS AND PROTECTIVE COMPONENTS SHALL BE REMOVED.
- ALL WOOD USED FOR TEMPORARY SUPPORT SHALL BE FIRE RETARDANT IMPREGNATED TREATED LUMBER OR COATED ON ALL EXPOSED SURFACES WITH FIRE RETARDANT PAINT.
- SEISMIC RESTRAINT SYSTEM SHALL BE PROVIDED TO RESIST SEISMIC LOADING IN ANY DIRECTION PER UBC.



EXISTING ELECTRICAL DUCTS ENCASED IN CONCRETE DETAIL (3)



SECTION (3)

CHARACTERISTICS OF DEPT. OF WATER AND POWER ELEC. DUCTBANKS

NUMBER OF DUCTS	W (INCH) MINIMUM	H (INCH) MINIMUM	WEIGHT LBS/FT
2	20	12	215
4	20	19	330
6	20	27	460
8	20	34	570
9	30	27	680

ALL DIMENSIONS AND WEIGHTS ARE APPROXIMATE. THE CONCRETE ENCASEMENT WAS POURED IN PLACE AND MAY VARY IN SIZE AND WEIGHT. THE WEIGHT INCLUDES WEIGHT OF CABLES.

ELECTRICAL FACILITIES NOTES

- ALL EXISTING ELECTRICAL DUCTS ARE CONCRETE ENCASED. THE CONTRACTOR SHALL NOT REMOVE THE ENCASEMENT NOR ANY PART OF THE EXISTING STRUCTURES. ELECTRICAL FACILITIES MUST BE SUPPORTED INTACT.
- THE MAXIMUM LENGTH OF DUCTBANK TO BE UNDERMINED AT ONE TIME IS FIVE FEET.
- TO AVOID POINT LOADING AND SAGGING OF THE CONDUITS, WOOD PLANKING SHALL BE PLACED BENEATH THE DUCTBANK.
- ALL WOOD USED FOR TEMPORARY SUPPORT SHALL BE FIRE RETARDANT IMPREGNATED TREATED LUMBER OR COATED ON ALL EXPOSED SURFACES WITH FIRE RETARDANT PAINT.
- DURING BACKFILLING OPERATIONS, ALL SUPPORT SYSTEMS AND PLYWOOD PROTECTIVE COMPONENTS SHALL BE REMOVED.
- SUPPORTS SHALL BE SIZED, SPACED AND CONSTRUCTED OF MATERIALS TO PREVENT SAGGING, SWINGING AND LATERAL AND LONGITUDINAL MOVEMENT. NO STEEL BANDS SHALL BE USED.
- SEISMIC RESTRAINT SYSTEM SHALL BE PROVIDED TO RESIST SEISMIC LOADING IN ANY DIRECTION PER UBC.
- PROVIDE SBMS AND/OR GROUT BED TO ADJUST FOR IRREGULARITIES IN CONCRETE ENCASEMENT.

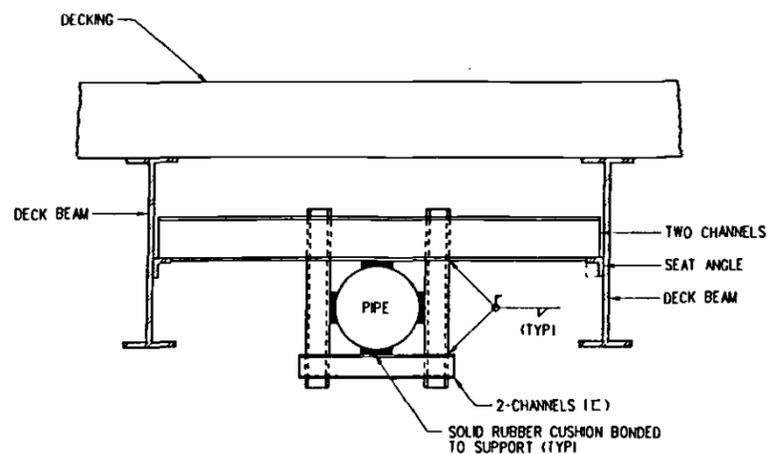
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1	5/9/94	FA			REVISED AND REDRAWN PER DES 306 - SBCH-M-00

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DRAWN BY
V. NITU
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F. AZZAM
IN CHARGE
F. AZZAM
DATE
3 MAR 94

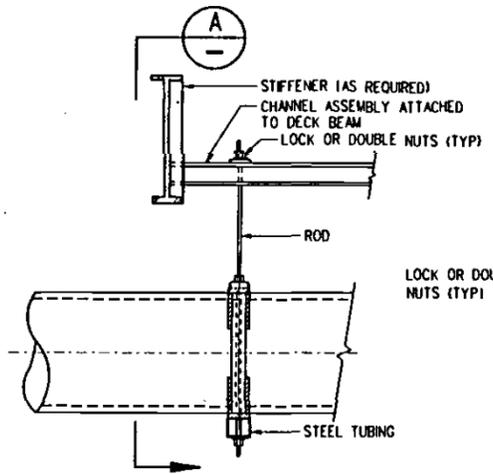


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ENGINEERING MANAGEMENT CONSULTANT
SUBMITTED **FOUAD AZZAM**
APPROVED **K. N. MURTHY**

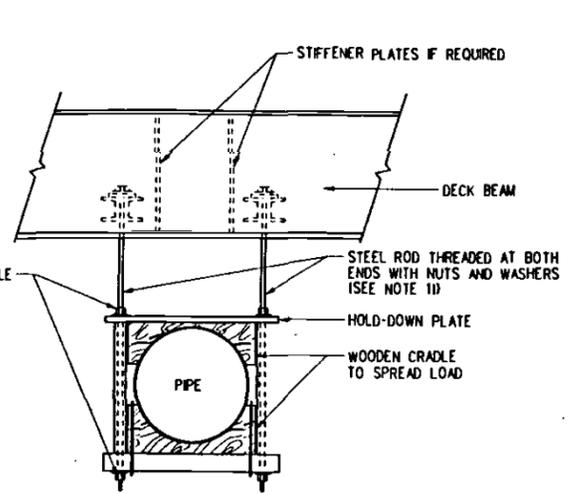
UTILITY STANDARD DESIGN GUIDE
TEMPORARY SUPPORT FOR UTILITIES TELEPHONE/ELECTRICAL DUCTBANKS
CONTRACT NO.
DRAWING NO **US-010** REV **1**
SCALE **NO SCALE**
SHEET NO



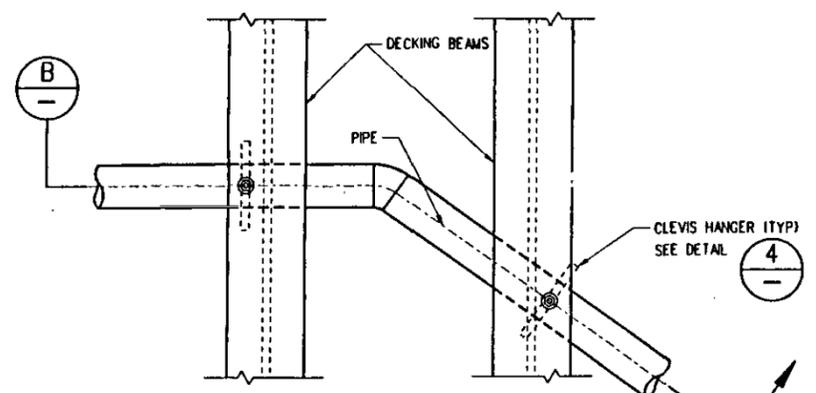
**LATERAL CROSSING HANGER
DETAIL**



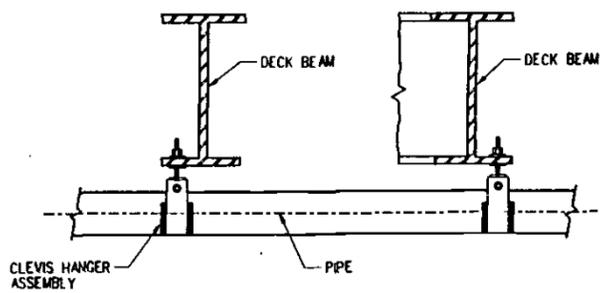
**TRAPEZE ASSEMBLY
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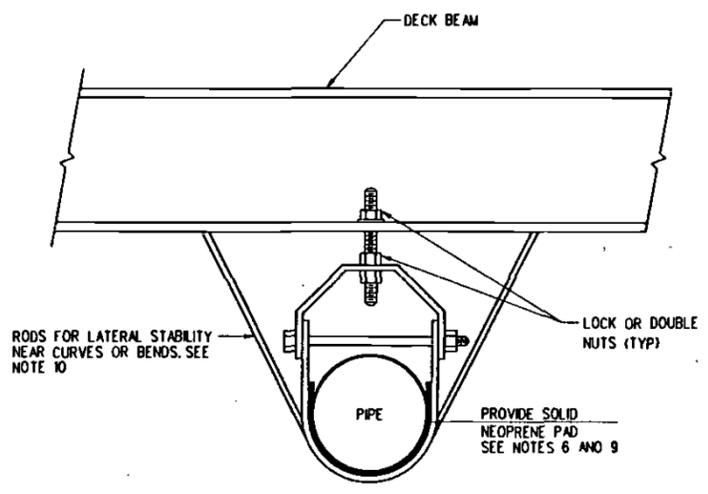
SECTION



DETAIL



SECTION



**CLEVIS HANGER ASSEMBLY
DETAIL**

MAXIMUM PIPE SPANS

PIPE SIZE (INCHES)	MAXIMUM SPAN (FT)
UNDER 2"	5'
2" TO 3"	10'
4" TO 12"	15'
16" AND GREATER	20'

**WEIGHTS #IN LBS PER LINEAL FOOT OF
STEEL PIPE LINING AND COATINGS**

PIPE SIZE O.D.	CEMENT MORTAR LINED			
	CEMENT MORTAR COATED		ASPHALT MASTIC COATED	
	PIPE THICKNESS - 1/8"		PIPE THICKNESS - 1/8"	
	EMPTY	FULL	EMPTY	FULL
4-1/2"	30	35	22	27
6-3/8"	43	58	35	48
8-3/8"	56	78	47	69
12-3/4"	83	133	70	120
16"	110	191	98	179
20"	138	266	126	254
24"	165	351	152	338
30"	207	501	196	490
32"	221	556	209	544
36"	248	674	235	660
60"	447	1647	—	—

* WEIGHTS ARE FOR 1/8" THICK PIPE. CONTRACTOR TO ADJUST ACCORDINGLY FOR OTHER PIPE THICKNESSES.

NOTICE TO CONTRACTOR

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WATER FACILITIES NOTES

- ALL EXISTING WATER MAINS TO BE SUPPORTED IN PLACE ARE STEEL WITH WELDED JOINTS UNLESS OTHERWISE NOTED.
- TEMPORARY SUPPORTS MUST BE WIDE ENOUGH TO TRANSFER LOADS AND TO PREVENT DAMAGE TO THE PIPE AND COATING. WOODEN CRADLES ARE ALSO REQUIRED TO SPREAD THE LOAD AROUND THE PIPE WHEN NON-ROUND PIPE IS USED.
- SUPPORTS MUST RESTRAIN THE WATER MAIN IN ALL DIRECTIONS.
- DURING BACKFILLING OPERATIONS ALL SUPPORT SYSTEMS MUST BE REMOVED.
- SURFACE CONNECTIONS SHALL BE SUPPORTED TO PREVENT SHEARING STRESSES AT THE CONNECTION.
- THE CONTRACTOR SHALL TAKE PRECAUTIONARY MEASURES TO PREVENT DAMAGE TO THE PROTECTIVE COATING OF THE PIPE. ANY COATING DAMAGE WILL BE REPAIRED WITH COATING COMPATIBLE WITH THE EXISTING PIPE COATING SYSTEM BY THE FACILITY OWNER AT THE CONTRACTOR'S EXPENSE.
- SPACE SUPPORTS SO THAT MAXIMUM DEFLECTION OF THE PIPE SHALL NOT BE GREATER THAN L/360 WHERE "L" IS SPAN IN FEET. PROVIDE ADDITIONAL SUPPORT FOR SERVICES, LATERALS, VALVES AND METERS.
- AT ALL TIMES THERE SHALL BE NO METAL-TO-METAL CONTACT BETWEEN PIPELINE AND SUPPORT SYSTEM.
- STEEL BANDS SHALL NOT BE USED.
- SEISMIC RESTRAINT SYSTEM SHALL BE PROVIDED TO RESIST SEISMIC LOADING IN ANY DIRECTION PER UBC.
- SUPPORT RODS AND HANGER SYSTEM TO BE SIZED TO SUPPORT PIPELINE AND SEISMIC LOADS.
- VALVES LARGER THAN 10 INCHES SHALL BE SUPPORTED WITH TWO HANGERS LOCATED ON EITHER SIDE OF THE VALVE. SMALLER VALVES SHALL BE SUPPORTED WITH A SINGLE HANGER. HANGERS SHALL BE WITHIN 12-INCHES OF VALVE.
- PROVIDE A SUFFICIENT NUMBER OF PIPE SUPPORTS TO MINIMIZE STRESSES TO PIPE AND FITTINGS, TO DISTRIBUTE LOADS TO SUPPORT STRUCTURES AND TO CONFORM WITH UTILITY OWNER'S STANDARDS AND REQUIREMENTS.

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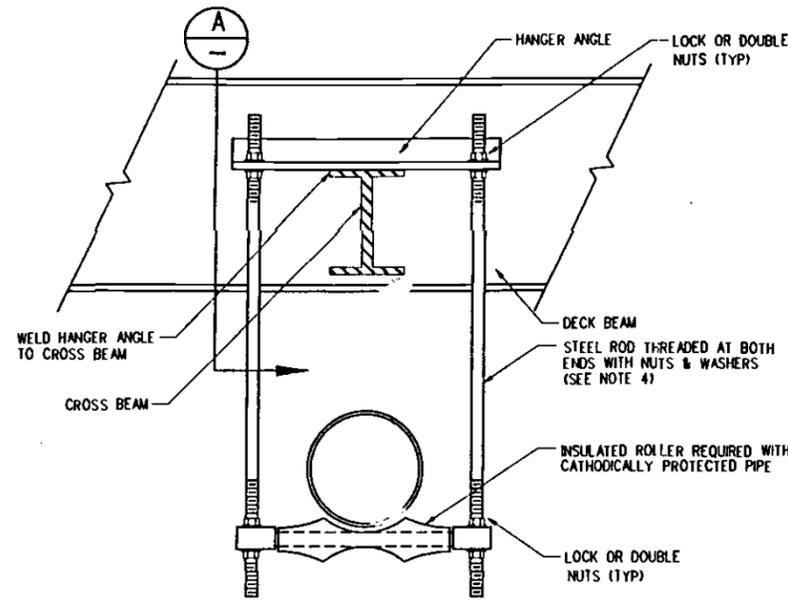
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DRAWN BY
V. NITU
CHECKED BY
F. AZZAM
IN CHARGE
F. AZZAM
DATE
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LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
ENGINEERING MANAGEMENT CONSULTANT
SUBMITTED **FOUAD AZZAM**
APPROVED **K. N. MURTHY**

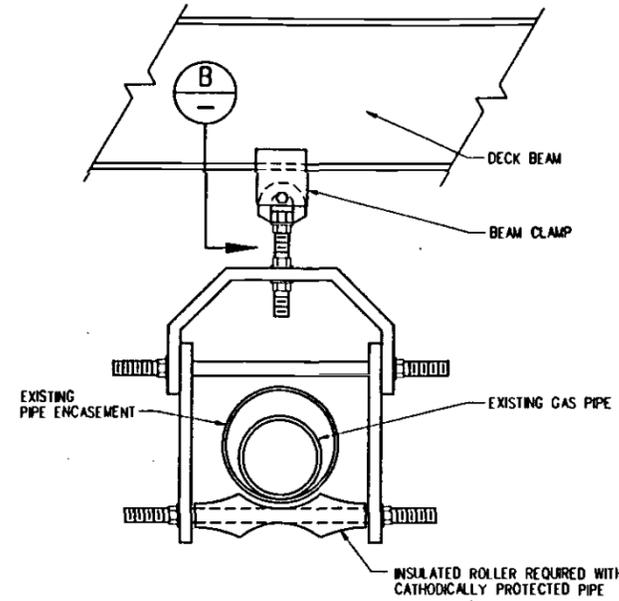
**UTILITY STANDARD
DESIGN GUIDE
TEMPORARY SUPPORT FOR UTILITIES
WATER FACILITIES**

CONTRACT NO.	
DRAWING NO.	US-011
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SCALE	NO SCALE
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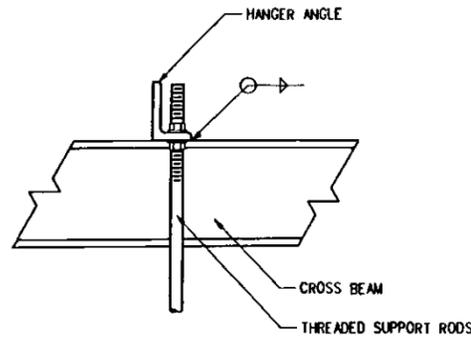
ADJUSTABLE ROLLER SUPPORT
DETAIL

1



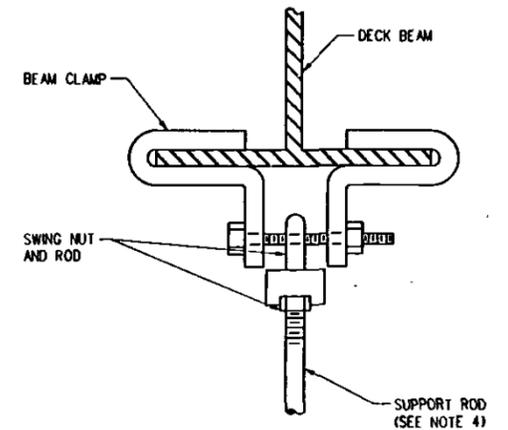
ROLLER-HANGER SUPPORT DETAIL

2



SECTION

A



SECTION

B

NOTICE TO CONTRACTOR

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GAS FACILITIES NOTES

1. THE CONTRACTOR SHALL TAKE PRECAUTIONARY MEASURES TO PREVENT DAMAGE TO THE EXISTING CORROSION CONTROL FACILITIES AND PROTECTIVE COATING OF THE PIPE. DAMAGE WILL BE REPAIRED BY FACILITY OWNER AT CONTRACTOR'S EXPENSE.
2. DURING BACKFILLING OPERATIONS ALL SUPPORT SYSTEMS AND PROTECTIVE COMPONENTS MUST BE REMOVED.
3. SEISMIC RESTRAINT SYSTEM SHALL BE PROVIDED TO RESIST SEISMIC LOADING IN ANY DIRECTION PER UBC.
4. SUPPORT RODS AND HANGER SYSTEM TO BE SIZED TO SUPPORT PIPELINE AND SEISMIC LOADS.
5. SPACE SUPPORTS SO THAT MAXIMUM DEFLECTION OF THE PIPE SHALL NOT BE GREATER THAN L/360 WHERE "L" IS SPAN IN INCHES. PROVIDE ADDITIONAL SUPPORT FOR SERVICES LATERALS VALVES AND METERS.
6. PROVIDE SUFFICIENT NUMBER OF PIPE SUPPORTS TO MINIMIZE STRESSES TO PIPE AND FITTINGS, TO DISTRIBUTE LOADS TO SUPPORT STRUCTURES AND TO CONFORM WITH UTILITY OWNER'S STANDARDS AND REQUIREMENTS.

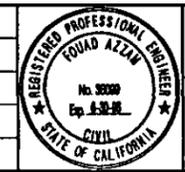
PIPE WEIGHT AND MAXIMUM SPAN

SIZE (INCHES)	WEIGHT STD # (LBS/FT)	MAX PIPE SPAN (FT)
2	3.8	5
3	7.7	10
4	11.0	
6	19.5	
8	29.4	15
10	40.5	
12	49.6	
16	62.6	
18	70.6	
20	78.6	20
22	86.6	
24	94.6	
26	102.6	
30	118.7	
34	134.7	
36	142.7	

UNCOATED PIPE

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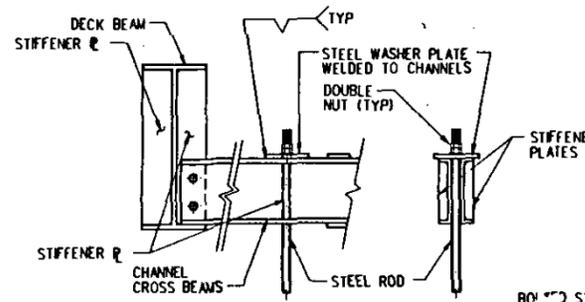
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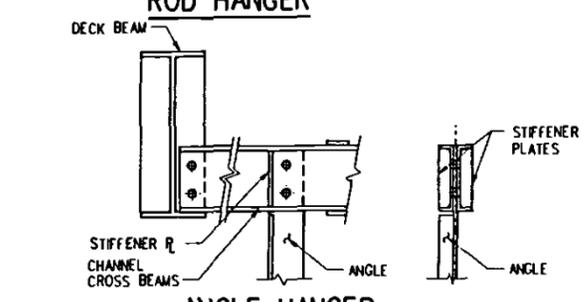
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
ENGINEERING MANAGEMENT CONSULTANT
Submitted: FOUAD AZZAM
Approved: K. N. MURTHY

UTILITY STANDARD
DESIGN GUIDE
TEMPORARY SUPPORT FOR UTILITIES
GAS FACILITIES

CONTRACT NO	
DRAWING NO	US-012
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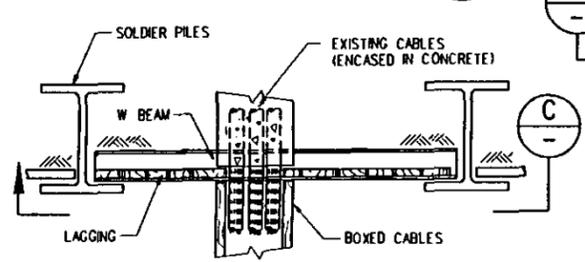


ROD HANGER

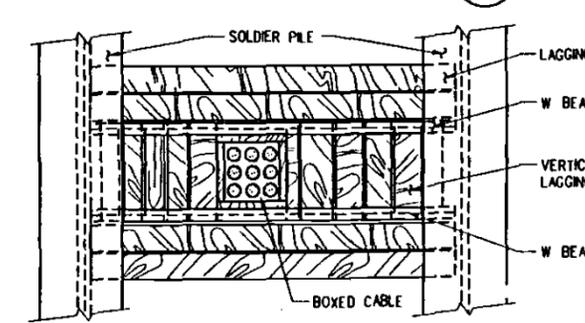


ANGLE HANGER

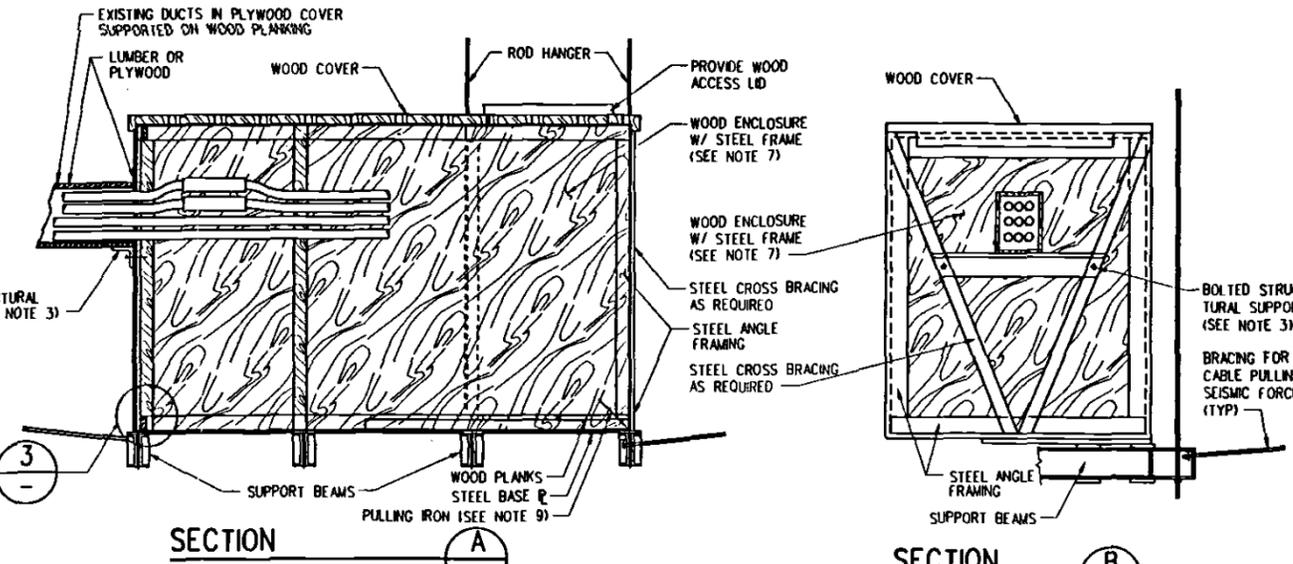
HANGER CONNECTION TO TOP SUPPORT BEAM DETAIL



SUPPORT OF FACILITIES THROUGH THE LAGGING SYSTEM

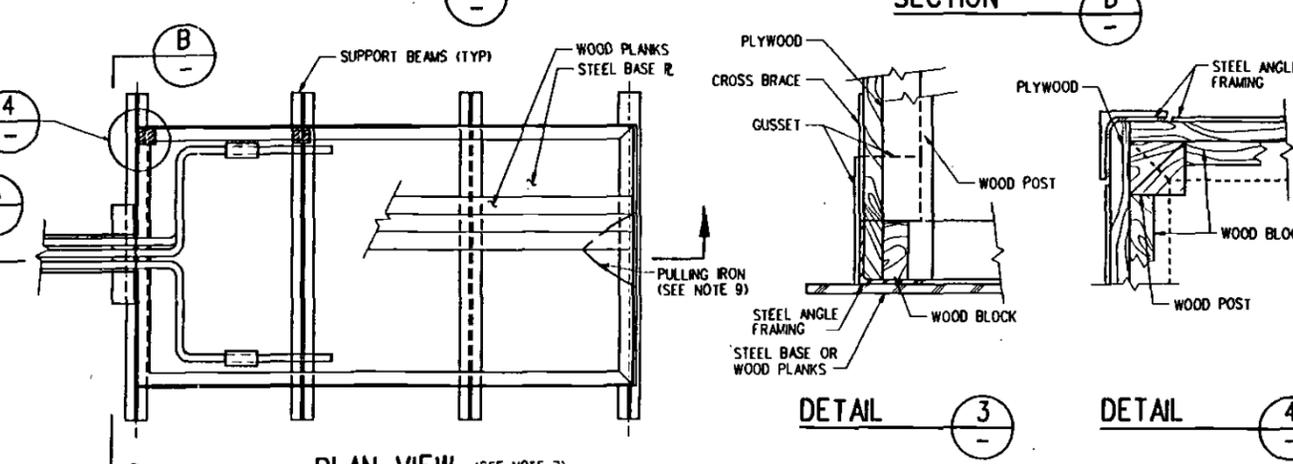


SECTION



SECTION

SECTION

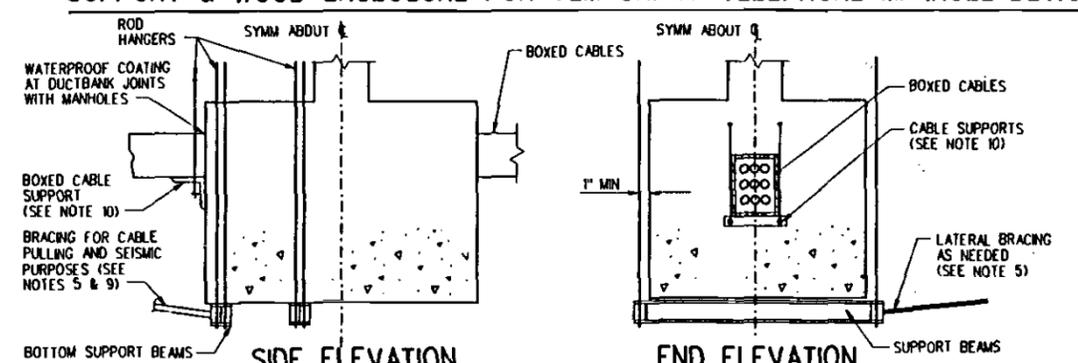


PLAN VIEW

DETAIL

DETAIL

SUPPORT & WOOD ENCLOSURE FOR TEMPORARY TELEPHONE MANHOLE-DETAIL



SIDE ELEVATION

END ELEVATION

SUPPORT FOR EXISTING CONCRETE MANHOLE

NOTICE TO CONTRACTOR

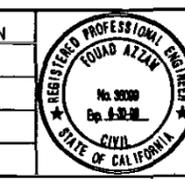
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NOTES:

- SEISMIC RESTRAINT SYSTEM SHALL BE PROVIDED TO RESIST SEISMIC LOADING IN ANY DIRECTION PER UBC.
- ALL FACILITIES INSIDE OF A WOOD ENCLOSED MANHOLE SHALL BE ADEQUATELY SUPPORTED TO ASSURE INTEGRITY.
- THE LAST SUPPORT FOR A DUCTBANK SHALL BE A STRUCTURAL MEMBER BOLTED TO THE MANHOLE (FOR CONCRETE MANHOLES SEE NOTE 10).
- WHERE INDICATED, SUPPORTS HAVE BEEN PLACED BENEATH NEW MANHOLES. THESE SUPPORTS SHALL BE USED BY THE CONTRACTOR FOR THE HANGING OF THE MANHOLE. HANGERS & HANGER CONNECTIONS TO SUPPORT BEAMS SHALL BE DESIGNED BY THE CONTRACTOR AND SUBMITTED FOR APPROVAL.
- SUPPORTS SHALL BE BRACED TO PREVENT MOVEMENT DUE TO SEISMIC AND CABLE PULLING FORCES. NO OTHER LOADS MAY BE SUPPORTED FROM UTILITY FACILITIES.
- DURING BACKFILLING OPERATIONS, ALL SUPPORT SYSTEMS AND PROTECTIVE COMPONENTS SHALL BE REMOVED.
- WHEN AN EXISTING MANHOLE IS TO BE REPLACED TEMPORARILY, THE CONTRACTOR SHALL DESIGN & CONSTRUCT A WOODEN ENCLOSURE WITH EXTERNAL STEEL FRAME AND INTERNAL BRACKETS TO SUPPORT THE EXISTING CABLES, CONNECTIONS OR SPLICES. ENCLOSURE FRAME SHALL BE BRACED TO PROVIDE ADDED STRENGTH AND RIGIDITY AS REQUIRED. ENCLOSURE INTERNAL DIMENSIONS SHALL NOT BE SMALLER THAN EXISTING MANHOLE.
- ALL WOOD USED FOR TEMPORARY SUPPORT SHALL BE FIRE RETARDANT IMPREGNATED TREATED LUMBER OR COATED INSIDE AND OUT WITH FIRE RETARDANT PAINT.
- INSTALL A PULLING IRON AT THE BASE OF THE WALL OPPOSITE EACH DUCTBANK ENTRY TO WITHSTAND A PULLING FORCE OF 3500 POUNDS.
- DO NOT CONNECT BOXED CABLE SUPPORTS TO EXISTING CONCRETE MANHOLES.

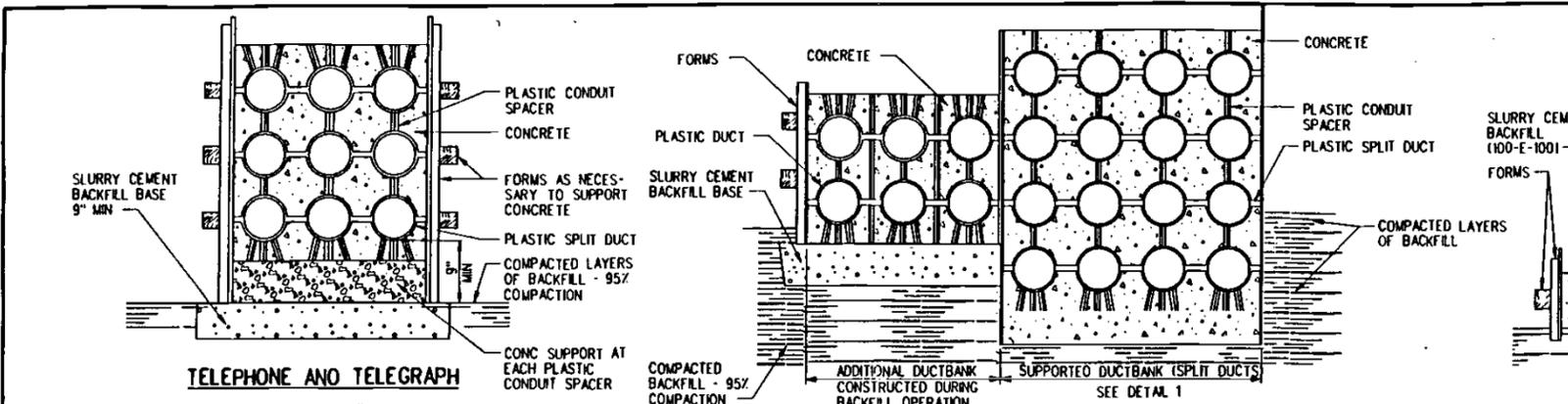
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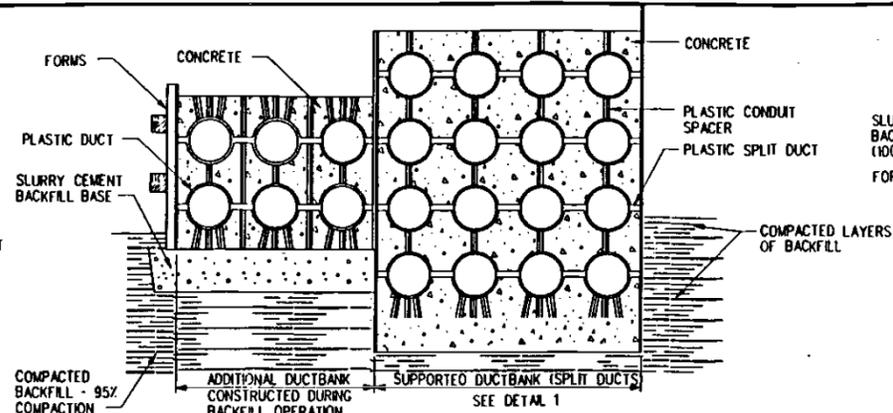


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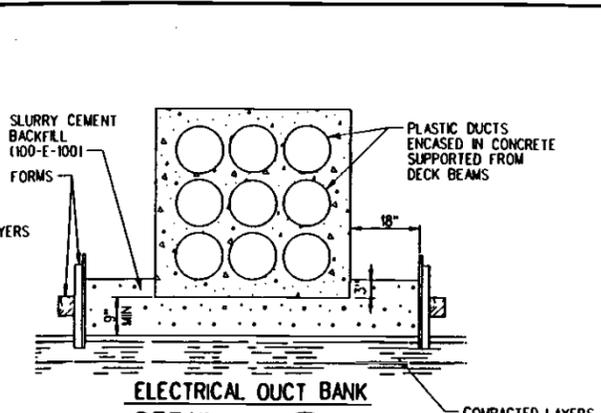
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DESIGN GUIDE
TEMPORARY SUPPORT FOR TELEPHONE
MANHOLES
CONTRACT NO
DRAWING NO
US-013
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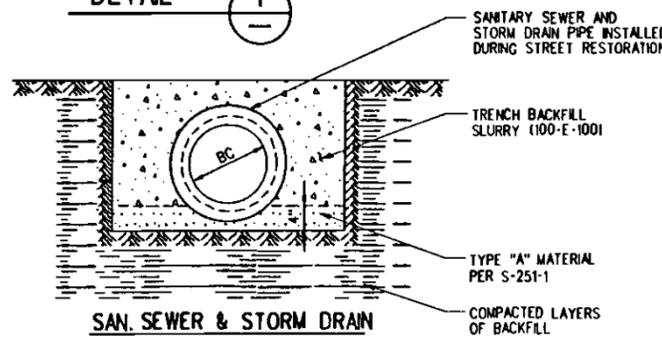
**TELEPHONE AND TELEGRAPH
DETAIL 1**



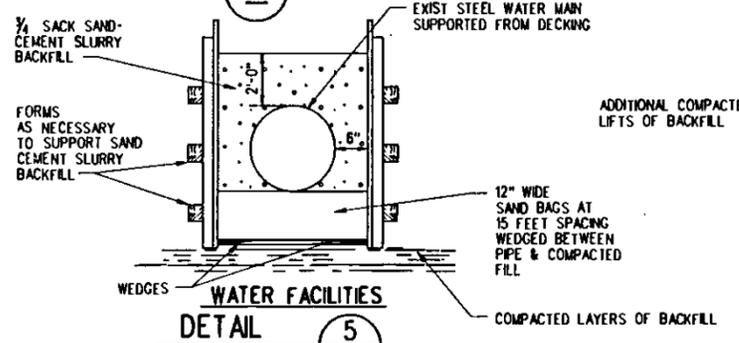
**TELEPHONE AND TELEGRAPH
DETAIL 2**



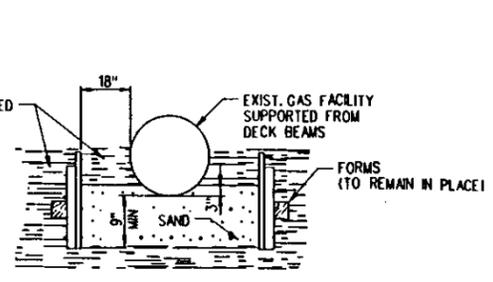
**ELECTRICAL
DETAIL 3**



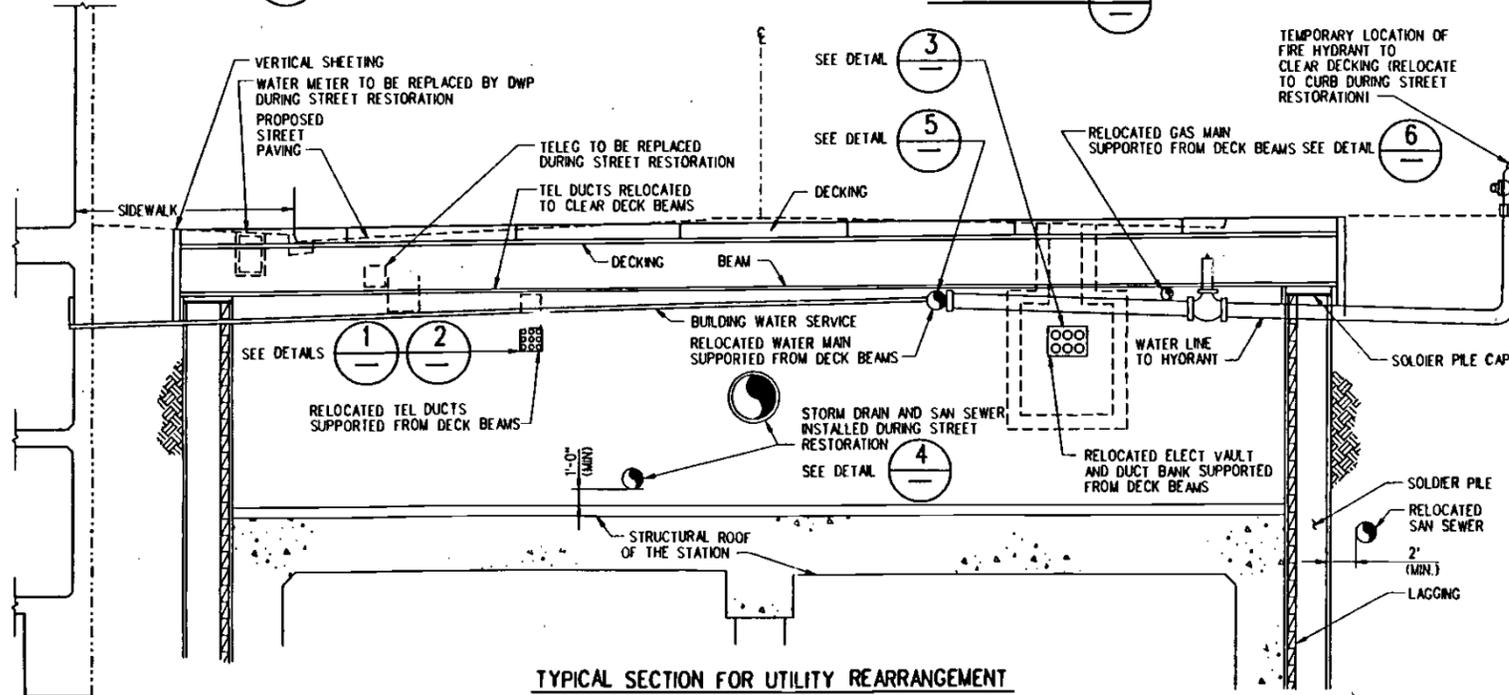
**SAN SEWER & STORM DRAIN
DETAIL 4**



**WATER FACILITIES
DETAIL 5**



**GAS FACILITIES
DETAIL 6**



TYPICAL SECTION FOR UTILITY REARRANGEMENT

SUPPORTED COMMUNICATION DUCTBANK (SPLIT DUCTS)

1. PROCEED WITH THE BACKFILLING OPERATION IN COMPACTED LIFTS AND SLURRY CEMENT BACKFILL TO A MINIMUM OF 9 INCHES BENEATH THE SUPPORTED PLASTIC SPLIT DUCTS.
2. REMOVE WOOD PROTECTION PANELS FROM SUPPORTED DUCTS.
3. INSTALL THE PLASTIC CONDUIT SPACERS TO AVOID THE SAGGING OF THE DUCTS. THE PLASTIC SPACERS SHALL BE SUPPORTED UNDERNEATH TO REST ON THE COMPACTED BACKFILL. SPACING TO BE APPROVED BY FACILITY OWNER.
4. REMOVE THE TEMPORARY SUPPORT SYSTEM ONLY AFTER THE DUCTBANK IS SUPPORTED FROM BELOW.
5. INSPECT ALL SPLIT DUCT AND ASSURE THAT IT IS PROPERLY SEALED.
6. INSTALL FORMS AND POUR THE CONCRETE MIXTURE TO FILL THE SPACE BETWEEN THE COMPACTED BACKFILL AND THE TOP OF THE PLASTIC SPACER.
7. AFTER THE CONCRETE MIXTURE HAS SET REMOVE THE FORM AND CONTINUE WITH THE BACKFILLING OPERATION AROUND THE ENCASUREMENT.

ADDED COMMUNICATION DUCTBANK

1. PROCEED WITH THE BACKFILLING COMPACTED AS INDICATED IN THE SUPPORTED DUCTBANK (SPLIT DUCTS) OPERATION. SEE DETAIL 1.
2. ADDITIONAL DUCTS SHALL BE INSTALLED ONLY AFTER THE DUCTBANK HAS BEEN ENCASED IN CONCRETE AND ADDITIONAL SLURRY CEMENT BACKFILL HAS BEEN PLACED. SUPPORT THE ADDITIONAL DUCTS DIRECTLY ON SLURRY CEMENT BACKFILL BASE.

EXISTING CONCRETE ENCASED ELECTRICAL DUCTS

1. PROCEED WITH THE BACKFILLING OPERATION IN COMPACTED LIFTS TO A MINIMUM OF 9 INCHES BENEATH THE EXISTING CONC. ENCASUREMENT.
2. THE EXISTING CONCRETE ENCASED DUCTS SHALL BE SUPPORTED UNDERNEATH TO REST ON THE COMPACTED BACKFILL. SPACING TO BE APPROVED BY FACILITY OWNER.
3. REMOVE THE TEMPORARY SUPPORT SYSTEM AND THE WOOD PROTECTING PANELS ONLY AFTER SUPPORTED FROM BELOW.
4. INSTALL FORMS AND POUR THE SLURRY CEMENT BACKFILL TO FILL THE SPACE TO 3 INCHES ABOVE THE BOTTOM OF THE EXISTING CONCRETE ENCASUREMENT.
5. AFTER THE SLURRY BACKFILL HAS SET REMOVE THE FORM AND CONTINUE WITH THE BACKFILLING OPERATION AROUND THE ENCASUREMENT.
6. SLURRY BACKFILL SHALL CONFORM TO THE SSPWC, SECTION 201-1.1.2 CONCRETE CLASS 100-E-100.

SANITARY SEWER AND STORM DRAIN INSTALLED DURING STREET RESTORATION

1. TEMPORARY PIPES SHALL NOT BE USED AS PERMANENT FACILITIES.
2. PROCEED WITH THE BACKFILLING OPERATION IN COMPACTED LIFTS TO A MINIMUM OF 1'-0" ABOVE THE TOP OF THE PROPOSED PIPE.
3. TRENCH THE COMPACTED BACKFILL AND INSTALL THE PIPE IN COMPLIANCE WITH S-251-1 (CITY OF L.A. FACILITIES).

WATER FACILITIES

1. PROCEED WITH THE BACKFILLING OPERATION IN COMPACTED LIFTS TO A MINIMUM OF 8 INCHES BENEATH THE EXISTING WATER FACILITY.
2. INSTALL SAND BAGS AND WEDGES UNDER PIPE.
3. THE EXISTING WATER FACILITY SHALL BE SUPPORTED UNDERNEATH TO REST ON THE SAND BAGS TO ALLOW PIPELINE TO BE ENCASED IN 3/4 SACK SAND-CEMENT SLURRY BACKFILL.
4. REMOVE THE SUPPORT SYSTEM WHICH HANGS THE WATER FACILITY FROM THE DECK BEAMS ONLY AFTER SUPPORT HAS BEEN SUPPLIED WITH SAND BAGS BELOW.
5. DWPWS WILL INSPECT PROTECTIVE COATING ON PIPE AND REPAIR ANY DAMAGE.
6. INSTALL FORMS.
7. POUR THE 3/4 SACK SAND-CEMENT SLURRY TO FILL THE SPACE BETWEEN THE COMPACTED BACKFILL TO 24 INCHES ABOVE THE TOP OF THE PIPE OR TO THE BOTTOM OF PROPOSED STREET PAVEMENT.
8. AFTER THE SLURRY BACKFILL HAS SET, REMOVE THE FORM AND CONTINUE WITH THE BACKFILLING OPERATION AROUND THE SLURRY BACKFILL.

NOTE:

ALL TRENCH BACKFILL SHALL COMPLY WITH THE LOS ANGELES CITY ENGINEER'S SPECIAL ORDER NO. SO-06-0182 DATED JANUARY 28, 1982 (SLURRY CEMENT)

REV	DATE	BY	SUB	APP	DESCRIPTION
0	3/3/94				BASE LINE ISSUE

DESIGNED BY
W. JACKSON
DRAWN BY
V. NITU
CHECKED BY
F. AZZAM
IN CHARGE
F. AZZAM
DATE
3 MAR 94



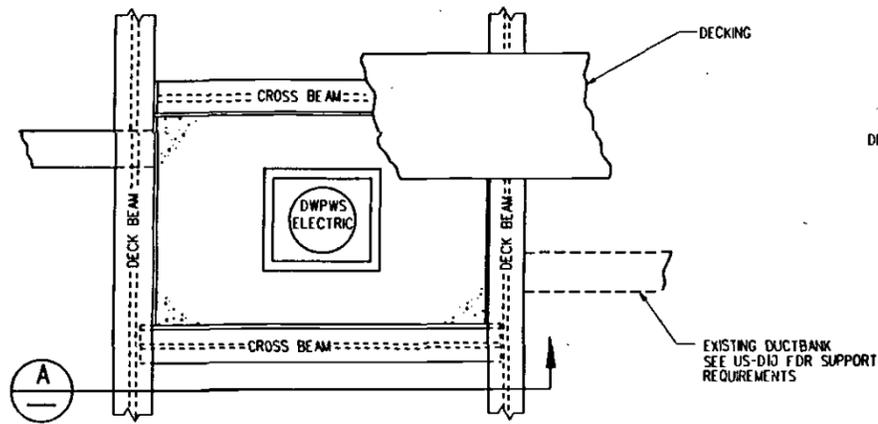
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

ENGINEERING MANAGEMENT CONSULTANT

Submitted: **FOUAD AZZAM**
Approved: **K. N. MURTHY**

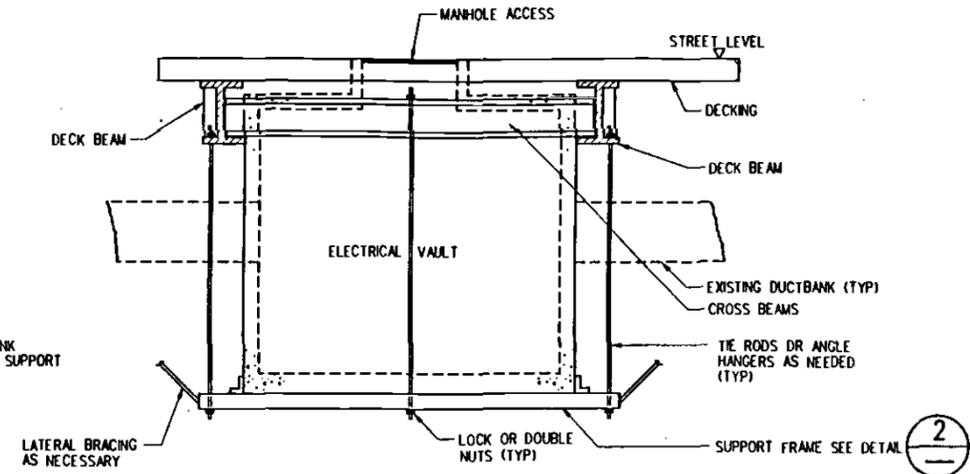
UTILITY STANDARD BACKFILL OPERATIONS

CONTRACT NO. _____
DRAWING NO. **US-014** REV **1**
SCALE: **NO SCALE**
SHEET NO. _____



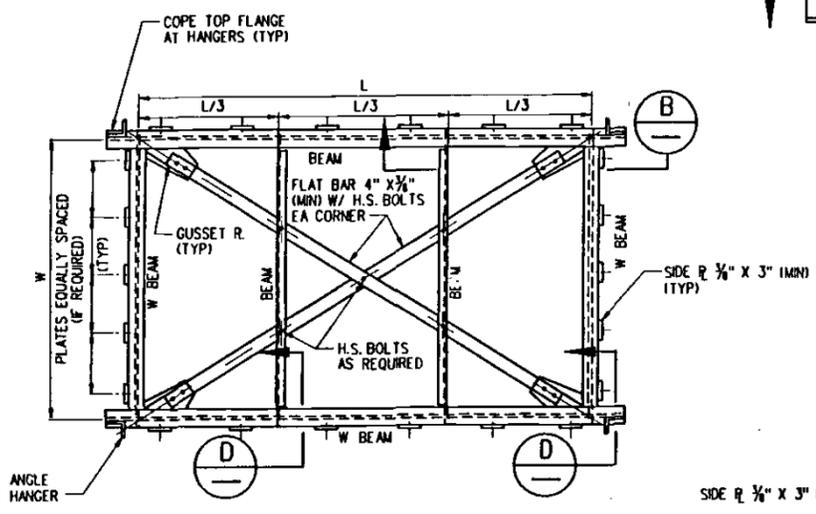
EXISTING ELECTRICAL VAULT AND SUPPORT

1



SECTION A

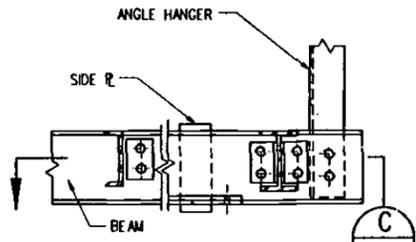
2



PLAN

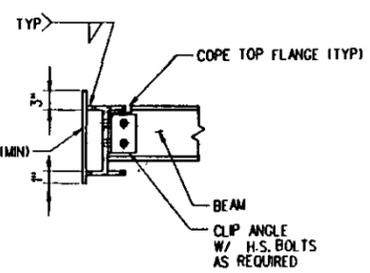
SUPPORT FOR NEW ELECTRICAL MANHOLE

2

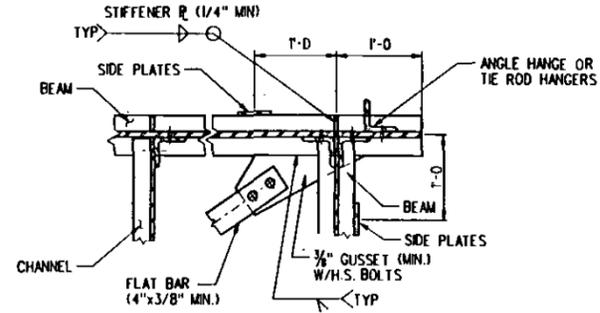


SECTION B

SECTION D



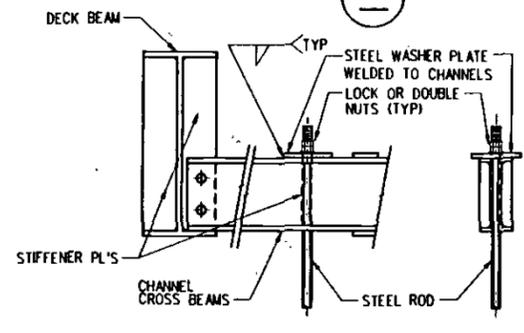
2



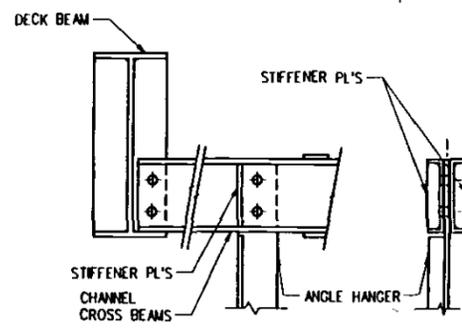
SECTION C

HANGER CONNECTION TO TOP OF BEAM

3



ROD HANGER (ALTERNATE)



ANGLE HANGER

NOTICE TO CONTRACTOR

THE CONTRACTOR SHALL DESIGN ENTIRE STRUCTURAL SUPPORT SYSTEM TO RESIST ALL ANTICIPATED LOADINGS. THE STRUCTURAL SHAPES, CONFIGURATIONS AND DETAILS SHOWN IN THESE SUPPORT STANDARDS ARE MERELY REPRESENTATIVE. THE TEMPORARY SUPPORT SYSTEM SHALL BE DESIGNED BY A CIVIL OR STRUCTURAL ENGINEER REGISTERED IN THE STATE OF CALIFORNIA. THE FINAL DESIGN SHALL BE SUBMITTED FOR APPROVAL BY THE AUTHORITY AND OWNER OF THE FACILITY.

EXISTING ELECTRICAL VAULT SUPPORT NOTES

1. THE CONTRACTOR SHALL NOT REMOVE OR BREAK ANY PORTION OF AN ENERGIZED ELECTRICAL VAULT.
2. THE CONTRACTOR SHALL DESIGN ALL ELEMENTS OF THE EXCAVATION SUPPORT SYSTEM INCLUDING SOLDIER PILES, DECK BEAMS AND DECKING TO ACCOMMODATE EXISTING ELECTRICAL VAULTS.
3. CONTINUOUS ACCESS SHALL BE PROVIDED TO ENERGIZED ELECTRICAL VAULTS FOR THE FACILITY OWNER'S PERSONNEL AND EQUIPMENT.
4. A VAULT SUPPORT PLAN SHALL BE SUBMITTED FOR EACH EXISTING ENERGIZED VAULT, INCLUDING DECK FRAMING AND DECKING DETAILS. THE FACILITY OWNER AND THE AUTHORITY SHALL REVIEW AND APPROVE THIS PLAN WHICH SHALL ALSO DESCRIBE THE PROPOSED METHOD OF INSTALLATION.
5. AFTER THE VAULT SUPPORT SYSTEM IS IN PLACE IT SHALL BE INSPECTED AND APPROVED BY THE FACILITY OWNER PRIOR TO LOADING.

REV	DATE	BY	SUB	APP	DESCRIPTION
0	5/9/95	WJS	FA		REVISED AND REDRAWN PER DE-306 - SBCH-14.DD
0	3/3/95				BASE LINE ISSUE

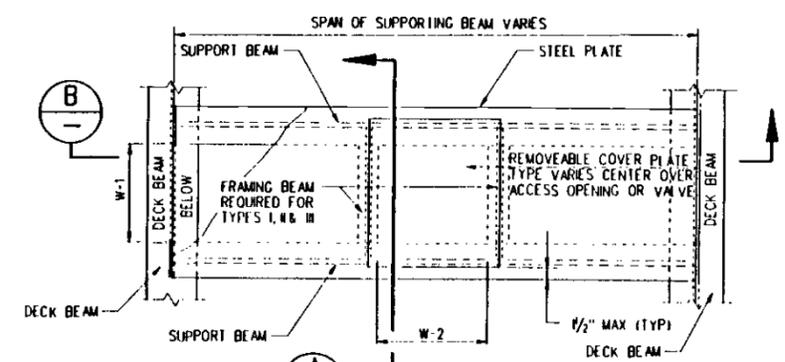
DESIGNED BY
W. JACKSON
DRAWN BY
V. NITU
CHECKED BY
F. AZZAM
IN CHARGE
F. AZZAM
DATE
3 MAR 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
ENGINEERING MANAGEMENT CONSULTANT
SUBMITTED: FOUAD AZZAM
APPROVED: K. N. MURTHY

UTILITY STANDARD DESIGN GUIDE
TEMPORARY SUPPORT FOR EXISTING ELECTRICAL MANHOLES

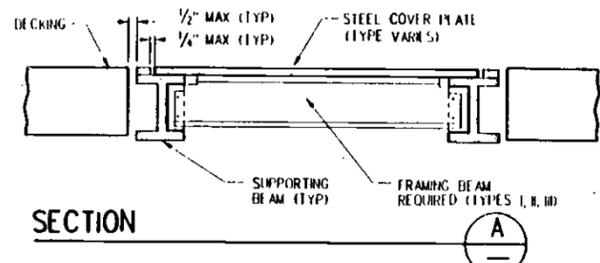
CONTRACT NO.	
DRAWING NO.	US-015
REV	1
SCALE	NO SCALE
SHEET NO.	



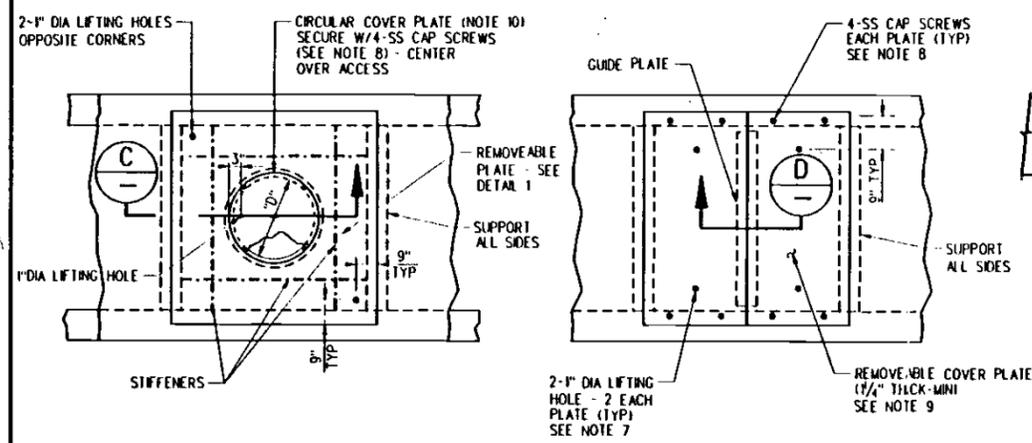
NOTE: DECKING REMOVED FOR CLARITY
PLAN VIEW
 DETAIL

UTILITY	MIN CLEAR ACCESS OPENING			COVER TYPE	UTILITY ID (NOTE 5)
	W-1	W-2	D		
ELECT VAULT	56"	56"	36"	I	LA DWP ELECTRICAL
TELEPHONE VAULT	27 1/2"	29 1/2"	—	II & III	TELEPHONE
SAN SEWER MH	36"	36"	—	II	SEWER
STORM DRAIN MH	36"	36"	—	II	STORM DRAIN
GAS VALVE	12"	12"	—	IV	GAS
WATER VALVE	12"	12"	—	IV	LA DWP WATER

- NOTES:**
- ALL SUPPORTING MEMBERS AND FRAMING CONNECTIONS SHALL BE DESIGNED BY THE CONTRACTOR'S CIVIL OR STRUCTURAL ENGINEER REGISTERED IN THE STATE OF CALIFORNIA AND SHALL BE SUBMITTED FOR APPROVAL TO THE FACILITY OWNER AND THEIR ENGINEER THROUGH THE AUTHORITY.
 - TOP SURFACE OF PLATE SHALL BE FLUSH WITH ADJACENT DECK SURFACE.
 - COAT ALL STEEL PLATES WITH ANTI-SKID MATERIAL IN ACCORDANCE WITH SECTION 01522 OF THE SPECIFICATION.
 - PROVIDE ACCESS COVER PLATE FOR ALL MANHOLES, VAULTS AND VALVES LOCATED UNDER THE DECKING.
 - PROVIDE UTILITY IDENTIFICATION CALLOUTS ON ALL ACCESS COVER PLATES, SUCH AS DWPWS, ETC. FOR EASY OWNERSHIP IDENTIFICATION OF UTILITIES (SEE TABLE).
 - DESIGN COVER PLATES AND STRUCTURAL SUPPORTS USING A MINIMUM WHEEL LOAD OF 20 KB. THIS INCLUDES A 30% IMPACT FACTOR. MINIMUM COVER PLATE AND STIFFENER SIZES ARE FOR THE MINIMUM ACCESS SPANS SHOWN ON THIS DRAWING. SUBMIT DESIGN CALCULATIONS FOR ANY CHANGES TO THE MINIMUM SPANS INDICATED. COVER PLATE SHALL BE MINIMUM 1" THICK.
 - PROVIDE LIFTING HOLES AS INDICATED WITHOUT IMPAIRING THE STRUCTURAL STRENGTH OF THE COVER PLATE. LOCATE AT OPPOSITE SIDES OF PLATE. EQUIP LIFTING HOLES WITH REMOVABLE PLASTIC PLUGS IN ALL PLATES WITH PEDESTRIAN ACCESS.
 - USE 3/8" DIA 11 NC OR 1/2" DIA 13 NC STAINLESS STEEL CAP SCREWS TO SECURE COVER PLATES AS INDICATED.
 - KEEP WEIGHT OF EACH RECTANGULAR COVER PLATE OR PLATE SEGMENT UNDER 300 LBS. PROVIDE ADDITIONAL SEGMENTS AS NEEDED. PROVIDE GUIDE PLATE ATTACHED TO ONE SIDE OF COVER PLATE.
 - KEEP WEIGHT OF CIRCULAR COVER PLATES UNDER 350 LBS.
 - CONSTRUCT 1" PLYWOOD ENCLOSURE AROUND VAULT COVER ASSEMBLY AND NECK. REST ENCLOSURE ON VAULT SUBSTRUCTURE AND EXTEND TO WITHIN 2" OF COVER PLATE OR STRUCTURAL MEMBERS. FASTEN ENCLOSURE TOGETHER WITH METAL STRAPS. DO NOT ATTACH ENCLOSURE DIRECTLY TO VAULT.

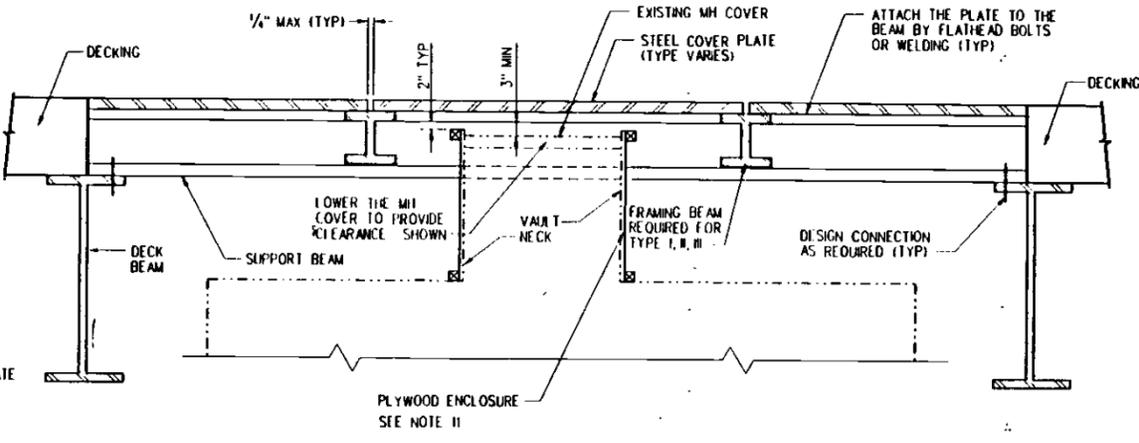


SECTION

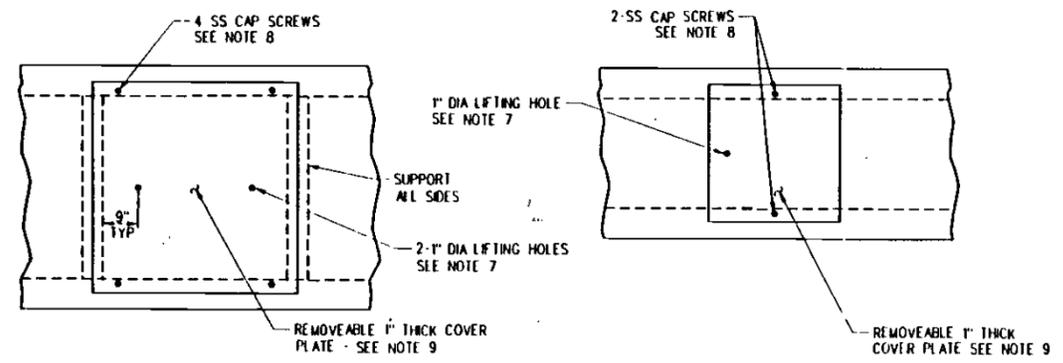


COVER PLATE - TYPE I

COVER PLATE - TYPE II

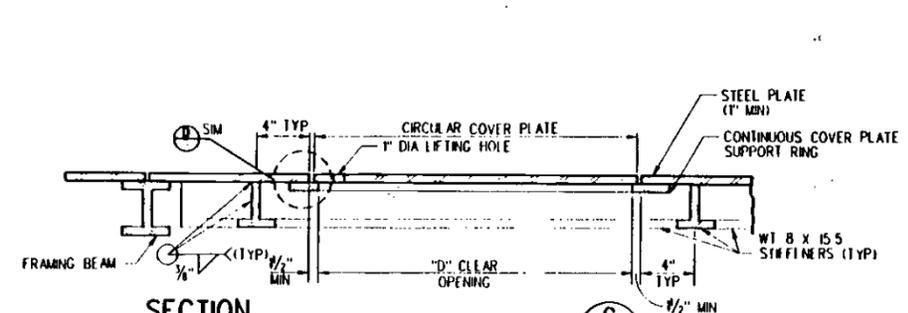


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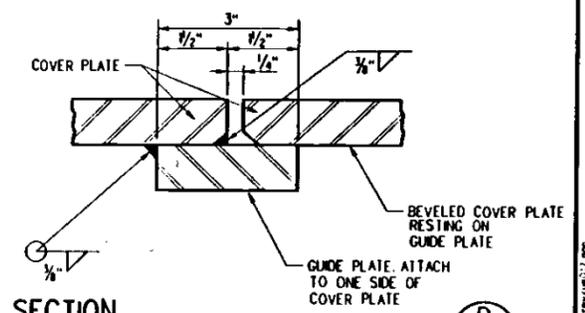


COVER PLATE - TYPE III

COVER PLATE - TYPE IV

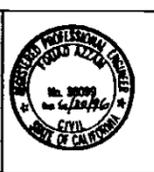


SECTION



SECTION

REV	DATE	BY	SUB	APP	DESCRIPTION
0	3/3/94	SWJ	FA	GMC	BASE LINE ISSUE



DESIGNED BY: W. JACKSON
 DRAWN BY: V. NIJU
 CHECKED BY: F. AZZAM
 IN CHARGE: F. AZZAM
 DATE: 3 MAR 94

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

ENGINEERING MANAGEMENT CONSULTANT
 FOUAD AZZAM
 10000 Wilshire Blvd, Suite 1000, Los Angeles, CA 90024
 (213) 746-1111

SUBMITTED: FOUAD AZZAM
 APPROVED: K. N. MURTHY

UTILITY STANDARD DESIGN GUIDE
ACCESS TO SUPPORTED MANHOLES THROUGH DECKING STRUCTURE

CONTRACT NO.	
DRAWING NO.	US-017
REV	2
SCALE	NO SCALE
SHEET NO.	



BASELINE STATUS REPORT: DIRECTIVE/STANDARD DRAWINGS

DRAWING NO.	REV.	DATE MODIFIED	DRAWING TITLE / Change Title	REMARKS
R92-DE306-04 STANDARD DRAWINGS: MECHANICAL				
MS-000	0 1	04/12/94 12/29/95	INDEX OF DRAWINGS - MECHANICAL STANDARDS Baseline issue Rev. per de306-sbcn-22.00	
MS-001	0 1	04/12/94 12/29/95	HEATING, VENTILATING AND AIR CONDITIONING SYMBOLS AND ABBREVIATIONS Baseline issue Rev. per de306-sbcn-22.00	
MS-002	0 1	04/12/94 12/29/95	PIPE SLEEVES FOR EXTERIOR AND INTERIOR STRUCTURAL ELEMENTS Rev. & redrawn per dcn 91-9 and 92-3 Rev. per de306-sbcn-22.00	
MS-003			NOT USED	
MS-004	0 1	04/12/94 12/29/95	VENTILATION SYSTEM/DAMPER MOUNTING DETAILS Rev. & redrawn per dcn 92-4 and 91-17 Rev. per de306-sbcn-22.00	
MS-005	0	04/12/94	TUNNEL WET STAND PIPE SUPPORT AND ANCHOR AND MISCELLANEOUS HVAC DETAILS Rev. & redrawn per dcn 90-1 and 93-12	
MS-006			NOT USED	
MS-007			NOT USED	
MS-008			NOT USED	
MS-009			NOT USED	
MS-010	0 1	04/12/94 12/29/95	PLUMBING, DRAINAGE AND FIRE PROTECTION SYMBOLS AND ABBREVIATIONS Rev. & redrawn per dcn 91-9 and 92-3 Rev. per de306-sbcn-22.00	
MS-011	0 1	04/12/94 12/29/95	SEISMIC RESTRAINTS FOR PIPES Rev. & redrawn per dcn 91-9 and 93-12 Rev. per de306-sbcn-22.00	
MS-012			NOT USED	
MS-013	0	04/12/94	FIRE DEPARTMENT CONNECTION IDENTIFICATION Rev. & redrawn per dcn 91-9 and 90-2	
MS-014	0	04/12/94	PIPE HANGER AND SUPPORT DETAILS Rev. & redrawn per dcn 91-9	
MS-015	0	12/29/95	HVAC FLOW SWITCH DETAILS Baseline issue per de306-sbcn-22.00	

VOLUME VI

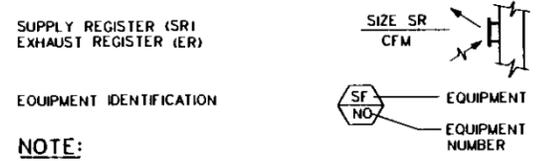
STANDARD DRAWINGS

MECHANICAL

**MTA BASELINE DOCUMENT
NO. R92-DE306.04**

HVAC SYMBOLS

AIR FLOW EXHAUST/RETURN	
AIR FLOW SUPPLY	
AIR FLOW THROUGH DOOR LOUVER	
AIR FLOW THROUGH UNDERCUT DOOR	
DAMPER - FIRE 1/2 HR RATED	
DAMPER - FIRE 3 HR RATED	
DAMPER - GRAVITY OPERATED	
DAMPER - MANUAL VOLUME	
DAMPER - MOTOR OPERATED	
DAMPER - MOTORIZED VORTEX	
DAMPER OPERATOR-MANUAL OVERRIDE	
SPLITTER DAMPER W/ ADJUSTING ROD	
BRANCH CONNECTION-SUPPLY & RETURN	
DIRECTION OF FLOW	
DUCT - ACOUSTIC LINER	
DUCT SIZE - FIRST DIMENSION IS FOR SIDE SHOWN	
DUCT - SUPPLY AIR	
DUCT - EXHAUST OR RETURN AIR	
DUCT - OUTSIDE AIR	
DUCT - EXTERNAL INSULATION	
DUCT - FLEXIBLE	
DUCT - FLEXIBLE CONNECTION	
DUCT - TRANSITION	
ELBOW WITH TURNING VANES	
ELECTRICAL CONTROL	
ELECTRICAL POWER	
FAN - CENTRIFUGAL	
RISE OR DROP (IN RESPECT TO AIR FLOW)	
TRANSITION - RECTANGULAR TO ROUND	
ROUND DUCT DOWN	
ROUND DUCT UP	
REDUCER (CONCENTRIC)	
CAPPED DUCT	
SUPPLY REGISTER (SR)	
EXHAUST/RETURN REGISTER (ER/RR)	
DIFFERENTIAL PRESSURE TRANSMITTER/SWITCH	
DIRTY FILTER GAUGE	
THERMOSTAT	
THERMOSTAT, REMOTE BULB	
HUMIDISTAT	
LIMIT SWITCH	
AIR FLOW SWITCH	
SUPPLY REGISTER (SRI)	
EXHAUST REGISTER (ER)	



NOTE:
THIS IS A GENERAL ABBREVIATION AND SYMBOL LIST
SOME ABBREVIATIONS AND SYMBOLS MAY NOT BE USED
IN THIS CONTRACT.

PIPING SYMBOLS

CHILLED WATER SUPPLY	
CHILLED WATER RETURN	
CONDENSER WATER SUPPLY (OR COOLING)	
CONDENSER WATER RETURN (OR COOLING)	
CONDENSATE DRAIN	
HEATING HOT WATER RETURN	
REFRIGERANT LIQUID LINE	
REFRIGERANT SUCTION LINE	
ANGLE VALVE	
AUTOMATIC CONTROL VALVE	
BALANCING VALVE	
BUTTERFLY VALVE	
CHECK VALVE	
CONTROL VALVE, 2-WAY	
CONTROL VALVE, 3-WAY	
GATE VALVE	
GLOBE VALVE	
PRESSURE REDUCING VALVE	
PRESSURE RELIEF VALVE	
RELIEF VALVE	
SOLENOID OPERATED VALVE	
THERMAL EXPANSION VALVE	
VACUUM BREAKER	
VALVE IN VERTICAL PIPE	
ALL PURPOSE COUPLING	
AUTOMATIC AIR VENT	
BACK FLOW PREVENTER	
CAPPED CONNECTION	
DIRECTION OF FLOW	
GRADE IN DIRECTION OF FLOW	
ELBOW 90° - SHORT RAD	
ELBOW 90° - LONG RAD	
ELBOW 45°	
ELBOW - SIDE OUTLET	
TEE (SCREWED END)	
FLANGE - ORIFICE/VENTURI	
HOSE CONNECTION	
JOINT - EXPANSION	
JOINT - FLEXIBLE	
JOINT - SCREWED	
PIPE ANCHOR - HANGER	
PIPE HANGER (CEILING/WALL)	
PIPE SLEEVE	
PLUG	
REDUCER - CONCENTRIC	
REDUCER - CONCENTRIC	
REDUCER - ECCENTRIC, DOWN	
REDUCER - ECCENTRIC, UP	
STRAINER	
TEMPERATURE, PRESSURE TEST PORT	
UNION	
THERMOMETER	
AREA SMOKE DETECTOR	
DUCT SMOKE DETECTOR	
HEAT DETECTOR	
POINT OF CONNECTION - NEW WORK TO EXISTING WORK	
DEMOLITION END - CAP PIPING & DUCTS	

ABBREVIATIONS

ABOVE FINISHED FLOOR	AFF
ACCESS DOOR	AD
ACCESS PANEL	AP
AIR CONDITIONING UNIT	ACU
AIR HANDLING UNIT	AHU
AIR INTAKE HOOD	IH
AIR COMPRESSOR	AC
AIR COOLED CONDENSER	C
AIR COOLED CONDENSING UNIT	CU
ANGLE	L
ASSEMBLY	ASSY
AUXILIARY	AUX
BACKDRAFT DAMPER	BDD
BYPASS DAMPER	BD
BACK FLOW PREVENTER	BFP
BLAST RELIEF SHAFT	BR5
BOTTOM OF DUCT	BOD
BOTTOM OF PIPE	BOP
BRAKE HORSEPOWER	BHP
BTU PER HOUR	BTUH
BRITISH THERMAL UNIT	BTU
CEILING	CLG
CEILING DIFFUSER	CD
CEILING GRILLE	CG
CEILING REGISTER	CR
CENTER LINE	C
CHILLER	CH
COMBINATION FIRE/SMOKE DAMPER	FSD
COMMUNICATION INTERFACE CABINET	CIC
CONCRETE MASONRY UNIT	CMU
CONNECTION	CONN
CONTINUED	CONT'D
CONTROL PANEL	CP
COOLING COIL	CC
COOLING TOWER	CT
CUBIC FEET	CU FT
CUBIC FEET PER MINUTE	CFM
DETAIL	DET
DIAMETER	DIA
DIMENSION	DIM
DOWN	DN
DOOR LOUVER	DL
DIFFERENTIAL PRESSURE TRANSMITTER/SWITCH	DPT
DRAWING	DWG
DOUBLE DEFLECTION GRILLE	DDG
EFFICIENCY	EFF
ELECTRIC-PNEUMATIC SWITCH	EP
EMERGENCY FAN DAMPER	ED
EXHAUST	EXH
EXHAUST AIR	EA
EXHAUST GRILLE	EG
EXHAUST AIR FAN	EF
EXHAUST REGISTER	ER
ELECTRICAL HEATER	EH
EXPANSION TANK	ET
DEGREES FARENHEIT	°F
FRESH AIR INTAKE	FAI
FAN COIL UNIT	FC
FIRE DAMPER	FD
FUTURE	FUT
GALLONS PER MINUTE	GPM
GALVANIZED	GALV
GAUGE	GA
GRAVITY RELIEF VENT	GV
HAND-OFF-AUTOMATIC SWITCH	HOA
HEATING COIL	HC
HEATING & VENTILATING UNIT	HV
HIGH DENSITY POLYETHYLENE MEMBRANE	HDPE
HERTZ	HZ
HIGH LIMIT	HL
HORSE POWER, HEAT PUMP	HP
INCHES	IN

LINEAR DIFFUSER	LD
LONG	LG
LONG RADIUS	LR
LOW LIMIT	LL
1000 BTU PER HOUR	MBH
MANHOLE	MH
MANUFACTURER	MFR
MAXIMUM	MAX
MINIMUM	MIN
MOTOR CONTROL CENTER	MCC
MOTORIZED DAMPER	MD
NATIONAL STANDARD	NS
NUMBER	NO.
NORMALLY CLOSED (FAIL SAFE CLOSED)	NC
NORMALLY OPEN (FAIL SAFE OPEN)	NO
NOT IN CONTRACT	NIC
NOT TO SCALE	NTS
ON CENTER	OC
OPENING	OPNG
OPPOSED BLADE DAMPER	OBD
OPERATING	OPER
OUTSIDE AIR	OA
PLATE	P
PLENUM	PLN
PHASE	PH
PNEUMATIC-ELECTRIC SWITCH	PE
POUNDS	LBS
PUMP	P
QUANTITY	QTY
RADIANT HEATER	RH
RADIUS	R
REFERENCE	REF
REDUCED PRESSURE BACKFLOW PREVENTER	RPBP
RETURN AIR	RA
RETURN AIR FAN	RAF
RETURN AIR GRILLE	RG
RETURN AIR REGISTER	RR
REVOLUTIONS PER MINUTE	RPM
ROOM	RM
SCHEDULE	SCH
SHEET	SHT
SMOKE EXHAUST	SE
SOLENOID VALVE	SOL
SPECIFICATIONS	SPECS
SPLITTER DAMPER	SPD
SUPPLY AIR	SA
SUPPLY REGISTER	SR
SUPPLY FAN	SF
SOUND TRAP, SOUND ATTENUATOR	SA
SQUARE HEAD	SQ HD
STAINLESS STEEL	SS
STANDARD	STD
STATIC PRESSURE	SP
STATION	STA
STREET	ST
TOP OF CONCRETE	TOC
TOP OF DUCT	TOD
TOP OF PIPE	TOP
TOTAL PRESSURE	TP
TRACK DAMPER	TD
TRANSFER GRILLE	TG
TYPICAL	TYP
UNDERPLATFORM EXHAUST	UPE
UNIT HEATER	UH
VARIABLE AIR VOLUME BOX	VV
VOLUME DAMPER	VD
VOLTS	V
WEIGHT	WT
WITH	W/
WITHOUT	W/O
WATER COLUMN	WC
WATER GAUGE	WG
WALL SUPPORT	WS

DESIGNED BY	EMC
DRAWN BY	J IONESCU
CHECKED BY	D SHAH
IN CHARGE	E BENCZE
DATE	12 APR 94

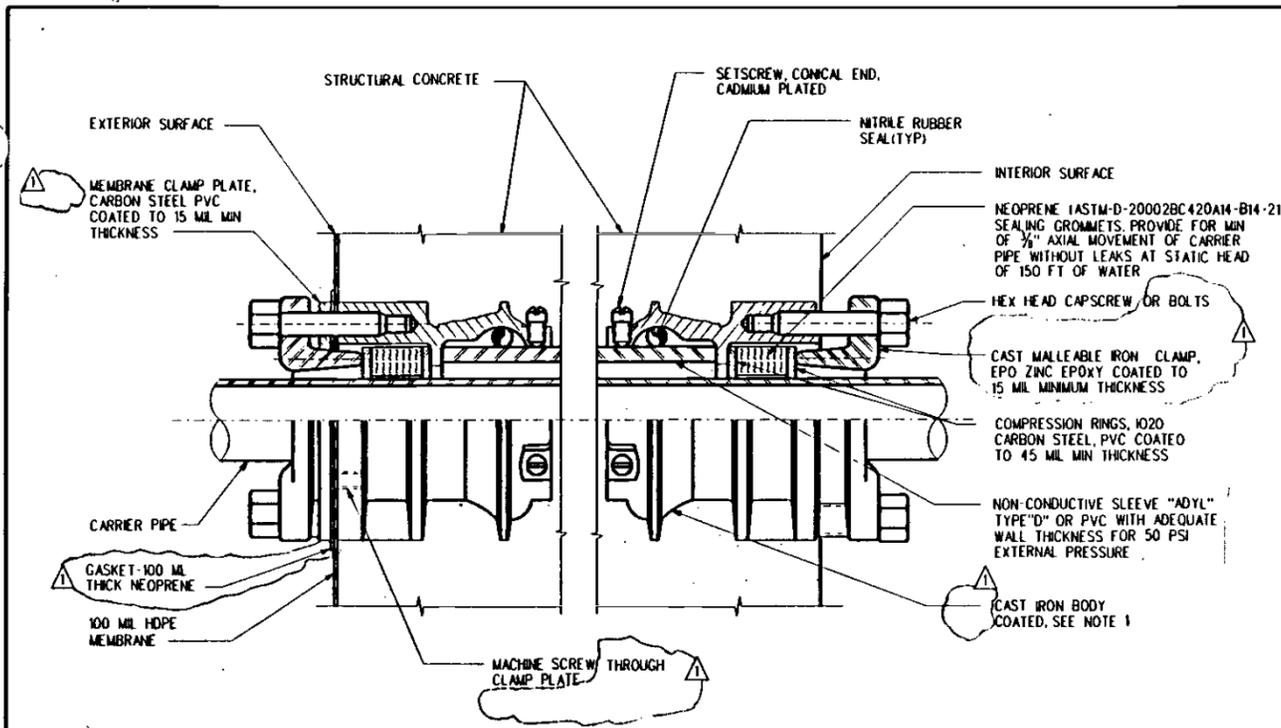
A SIGNED & SEALED ORIGINAL OF THIS DRAWING IS MAINTAINED BY THE MTA

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
ENGINEERING MANAGEMENT CONSULTANT
SUBMITTED: EVA BENCZE
APPROVED: K. N. MURTHY

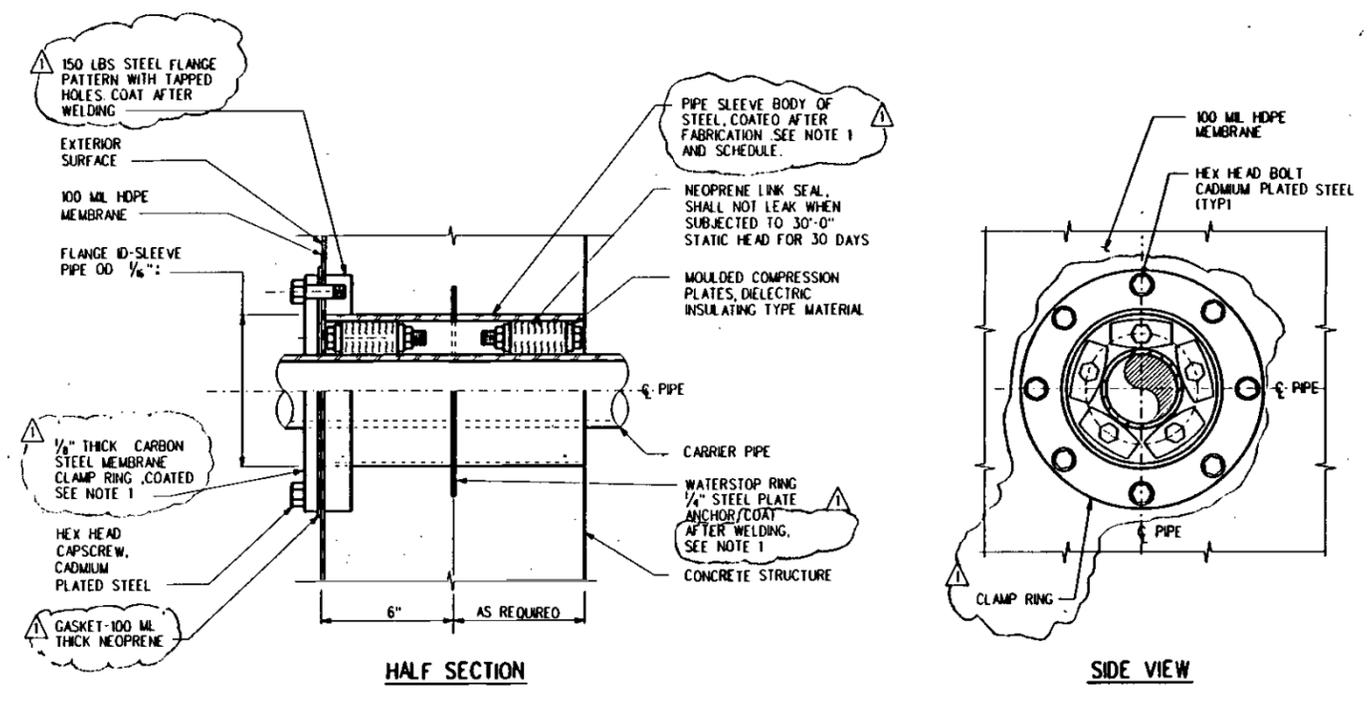
MECHANICAL STANDARD HEATING, VENTILATION AND AIR CONDITIONING SYMBOLS AND ABBREVIATIONS
DRAWING NO: MS-001
REV: 1
SCALE: NO SCALE
SHEET NO:

REV	DATE	BY	SLD	APP	DESCRIPTION
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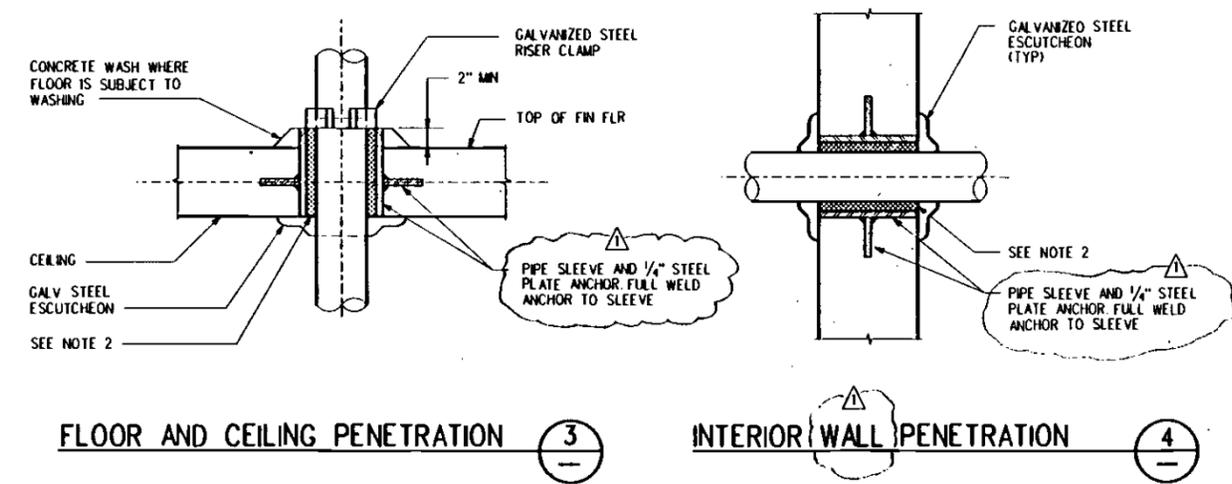
PLOTTED BY: [unreadable]



PIPE SLEEVE FOR EXTERIOR STRUCTURAL ELEMENTS TYPE "H" ①
FOR INSTALLATION MORE THAN 15'-0" BELOW GROUND SURFACE ELEVATION (INSTALL IN PAIRS AS SHOWN).



PIPE SLEEVE FOR EXTERIOR STRUCTURAL ELEMENTS TYPE "L" ②
FOR INSTALLATION 15'-0" OR LESS BELOW SURFACE ELEVATION



FLOOR AND CEILING PENETRATION ③ **INTERIOR WALL PENETRATION** ④

PIPE SLEEVE DATA-SCHEDULE EXTERIOR WALLS & FLOORS

CARRIER PIPE NOMINAL SIZE IN	SLEEVE-SCH 40 PIPE NOM SIZE IN	SLEEVE-SCH 30 PIPE NOM SIZE IN	MIN FLANGE THICKNESS IN	CAP-SCREW SIZE IN
3/4	2	—	3/8	1/2
1	2 1/2	—	3/8	1/2
1 1/2	3	—	3/8	1/2
2	4	—	3/8	1/2
2 1/2	4	—	3/8	1/2
3	6	—	3/4	5/8
4	6	—	3/4	5/8
6	10	—	3/4	5/8
8	—	12	3/4	5/8
10	—	14	1	3/8
12	—	16	1	3/8

* 8" SCH 40 FOR DUCTILE IRON CARRIER PIPE

PIPE SLEEVE DATA-SCHEDULE INTERIOR WALLS & FLOORS

CARRIER PIPE NOMINAL SIZE IN	SLEEVE-SCH 40 PIPE NOM SIZE IN
3/4	1 1/2
1	2
1 1/2	2 1/2
2	3
2 1/2	4
3	4
4	5
6	8
8	10
10	12

- NOTES:**
- COATING SHALL BE AS SPECIFIED IN SECTION D9802, COAL TAR EPOXY COATING SYSTEM
 - FIRE RATED PACKING REQUIRED AT RATED WALLS AND FLOORS.
 - INSTALL TYPE "H" AND TYPE "L" SLEEVES SO THAT THERE IS COMPLETE ELECTRICAL ISOLATION WITH NO METAL TO METAL CONTACTS BETWEEN THE CARRIER PIPE AND METALLIC COMPONENTS OF THE SLEEVE INCLUDING MEMBRANE CLAMPS, COMPRESSION PLATES AND COMPRESSION RINGS.
 - SLEEVES FOR FIRE PROTECTION PIPING SHALL BE SIZED IN ACCORDANCE WITH NFPA 13.

DESIGNED BY EMC	12 APR 94
DRAWN BY J. IONESCU	
CHECKED BY D. SHAH	
IN CHARGE E. BENCZE	
DATE	

A SIGNED & SEALED ORIGINAL OF THIS DRAWING IS MAINTAINED BY THE MTA

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

ENGINEERING MANAGEMENT CONSULTANT

Submitted: EVA BENCZE

Approved: K. N. MURTHY

MECHANICAL STANDARD PIPE SLEEVES FOR EXTERIOR AND INTERIOR STRUCTURAL ELEMENTS

CONTRACT NO

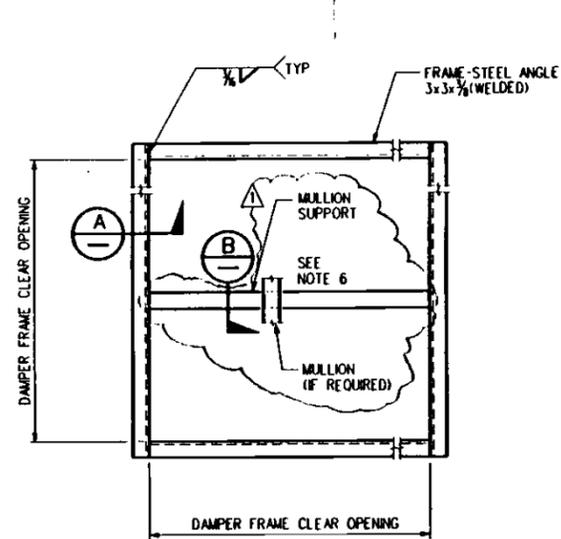
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SCALE NO SCALE

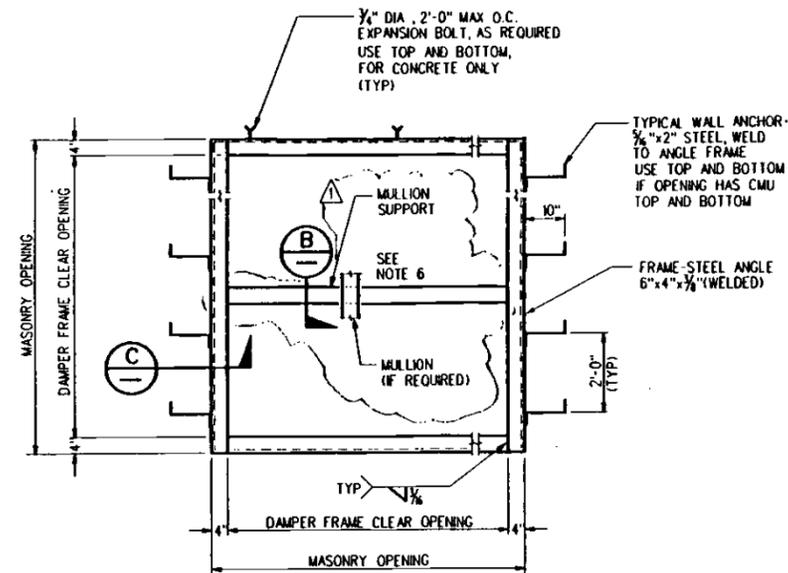
SHEET NO

REV	DATE	BY	SHD	APP	DESCRIPTION
0	12 APR 94	J. IONESCU			REV PER DE 306-SBCN-22 00 J. BOOTH M12296 EXP. 9-30-99
1		J. IONESCU			REV & REDRAWN PER DCN 91-9 AND 92-3

PLOTTED BY: approve



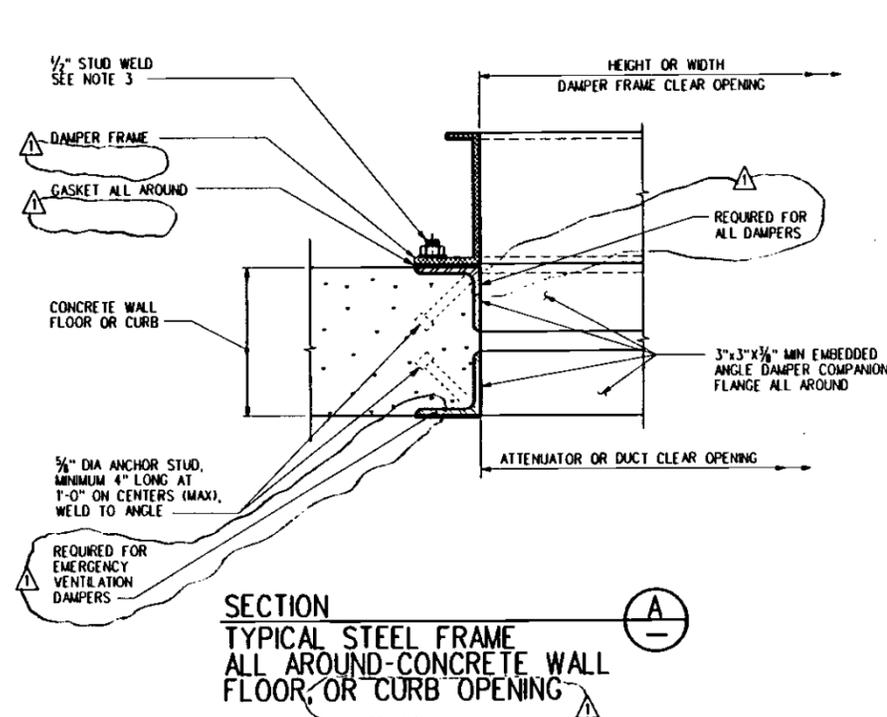
PLAN OR ELEVATION
EMBEDDED STEEL DAMPER COMPANION FLANGE
IN CONCRETE WALL FLOOR OR CURB OPENING



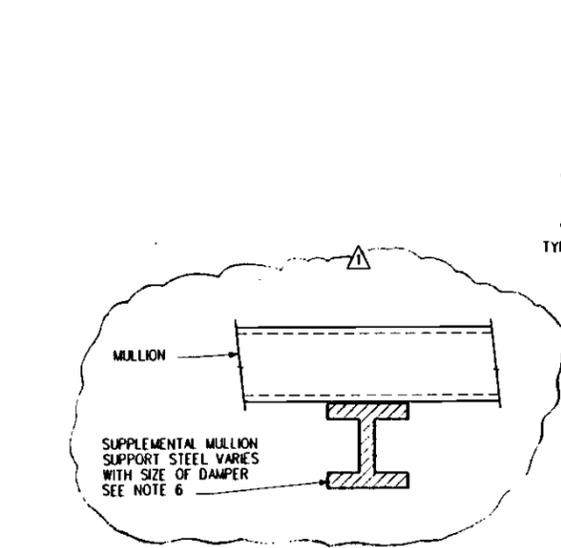
ELEVATION
EXTERIOR STEEL DAMPER COMPANION FLANGE
IN MASONRY WALL OPENING

NOTES:

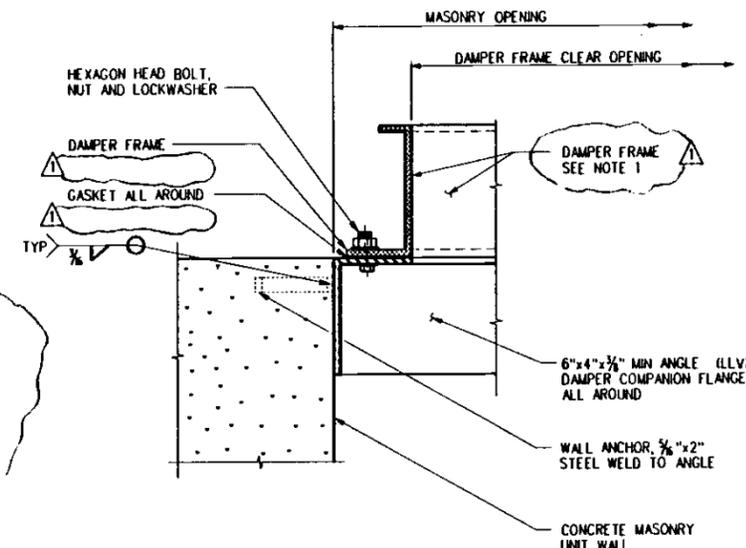
1. PROVIDE ALL DAMPERS AND SUPPLEMENTAL STRUCTURAL STEEL, ANGLES, AND APPURTENANCES.
2. GASKETS USED IN CONNECTING DUCTWORK FOR EMERGENCY VENTILATION SYSTEMS SHALL BE ABLE TO WITHSTAND TEMPERATURES UP TO 482°F FOR A 1HR PERIOD.
3. PROVIDE DAMPER COMPANION FLANGES FOR ALL DAMPERS, INCLUDING THOSE FOR DAMPERS FURNISHED BY OTHERS. ALIGN DAMPER FRAME WITH COMPANION FLANGE. CENTER PUNCH AT HOLE LOCATIONS. DISC GRIND TO REMOVE GALVANIZED FILM AND STUD WELD ANCHOR BOLT.
4. GALVANIZED FINISH DESTROYED BY INSTALLATION PROCESS SHALL BE REFINISHED BY COATING WITH ZINC-RICH PAINT.
5. DAMPER COMPANION FLANGES SHALL BE FABRICATED IN ACCORDANCE WITH SPECIFICATION SECTION 5500, METAL FABRICATION. STEEL SHALL BE GALVANIZED.
6. MULLION SUPPORT REQUIREMENT IS DETERMINED BY DAMPER MANUFACTURER AND FURNISHED AND INSTALLED BY DAMPER MANUFACTURER IF REQUIRED.



SECTION A
TYPICAL STEEL FRAME
ALL AROUND-CONCRETE WALL
FLOOR, OR CURB OPENING



SECTION B
TYPICAL MULLION SUPPORT



SECTION C
TYPICAL STEEL FRAME
ALL AROUND-MASONRY WALL OPENING

REV	DATE	BY	CHKD	APP	DESCRIPTION
0	12/29/95	EMC	EB	CMC	REV PER DE 306-SBCN-22.00 J BOOTH M12296 EXP 9-30-99 REV & REDRAWN PER DCN 92-4 AND 91-17

DESIGNED BY
EMC
 DRAWN BY
S. TABAK
 CHECKED BY
D. SHAH
 IN CHARGE
E. BENCZE
 DATE
12 APR 94

A SIGNED &
 SEALED ORIGINAL
 OF THIS DRAWING
 IS MAINTAINED
 BY THE MTA

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

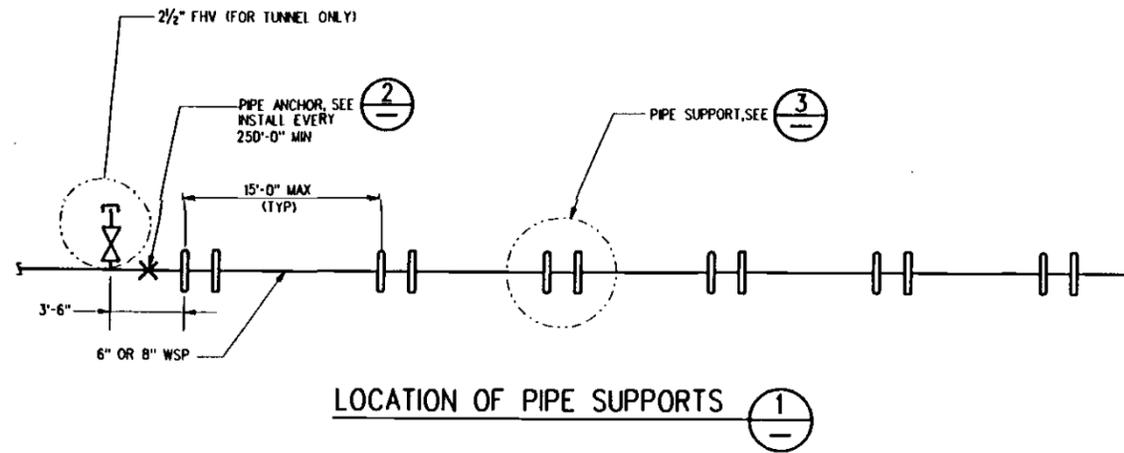
ENGINEERING MANAGEMENT CONSULTANT
 a subsidiary of
 Parsons Brinckerhoff Quade & Douglas, Inc.
 Daniel Mann, Johnson & Mendenhall
 2700 Wilshire Boulevard, Suite 1000
 Los Angeles, California 90048
 Telephone: (213) 487-1000
 Telex: 980000
 Fax: (213) 487-1000

SUBMITTED
EVA BENCZE
 APPROVED
K. N. MURTHY

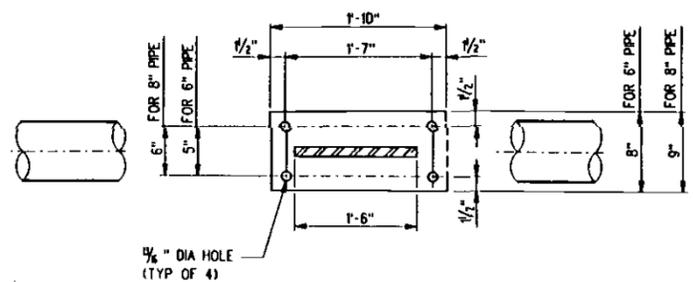
MECHANICAL STANDARD
VENTILATION SYSTEM
DAMPER MOUNTING DETAILS

CONTRACT NO.	
DRAWING NO.	MS-004
REV	1
SCALE	NO SCALE
SHEET NO.	

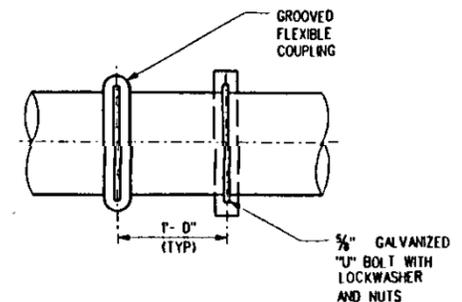
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 PLOTTED BY: gpraves



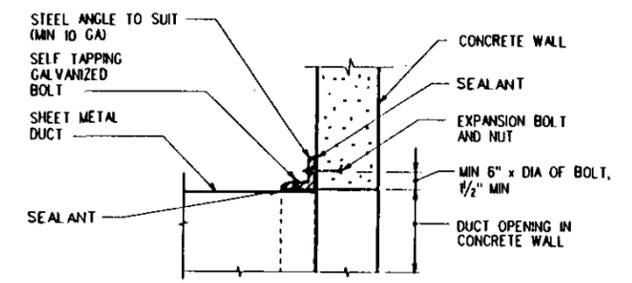
LOCATION OF PIPE SUPPORTS (1)



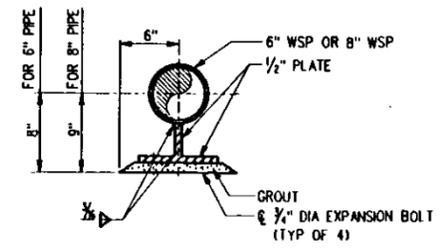
PLAN



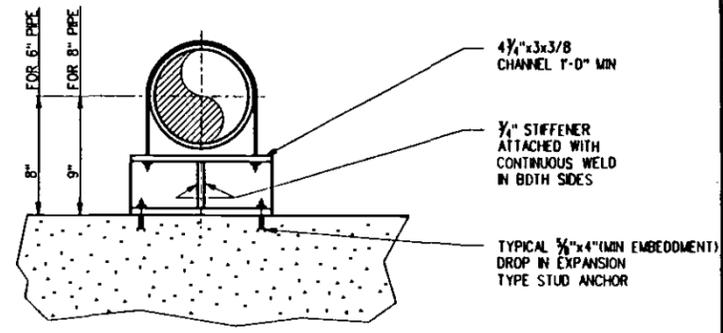
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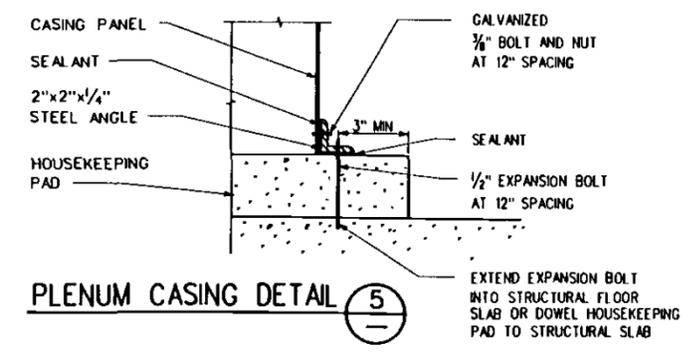
METAL DUCT TO CONCRETE WALL CONNECTION DETAIL (4)



SECTION



SECTION



PLENUM CASING DETAIL (5)
HVAC DETAILS

PIPE ANCHOR DETAIL (2)

PIPE SUPPORT DETAIL (3)

REV	DATE	BY	SUB	APP	DESCRIPTION

DESIGNED BY
EMC
DRAWN BY
J. IONESCU
CHECKED BY
B. REAL
IN CHARGE
E. BENCZE
DATE
12 APR 94

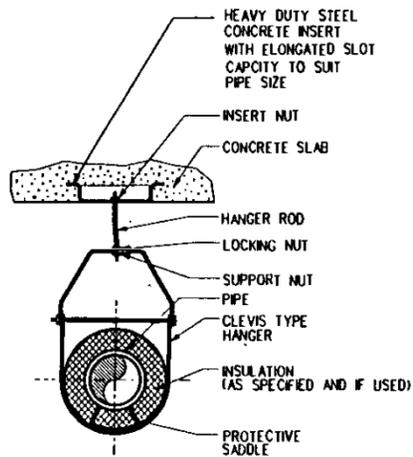


M LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
ENGINEERING MANAGEMENT CONSULTANT
Submitted by: *E. Bencze*
Approved by: *[Signature]*

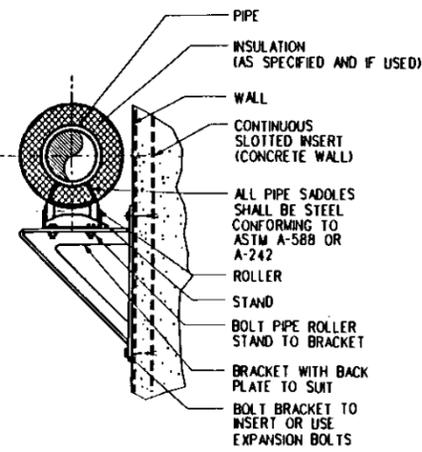
MECHANICAL STANDARD
TUNNEL WET STAND PIPE
SUPPORT AND ANCHOR DETAILS
AND MISCELLANEOUS HVAC DETAILS

CONTRACT NO.	
DRAWING NO.	MS-005
REV.	0
SCALE	NO SCALE
SHEET NO.	

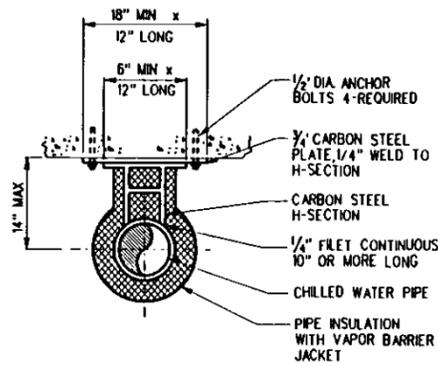
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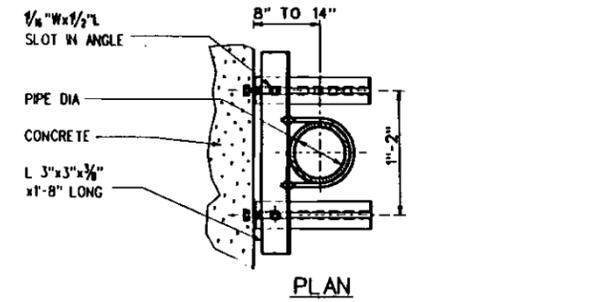
PIPE HANGER DETAIL 1
(SEE NOTE 1)



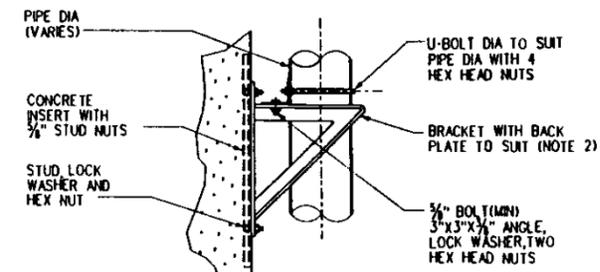
PIPE SUPPORT BRACKET DETAIL 2
(HEAVY DUTY BRACKET SIZED TO SUIT ROLLER STAND)
(SEE NOTES 1 AND 2)



PIPE ANCHOR DETAIL 3

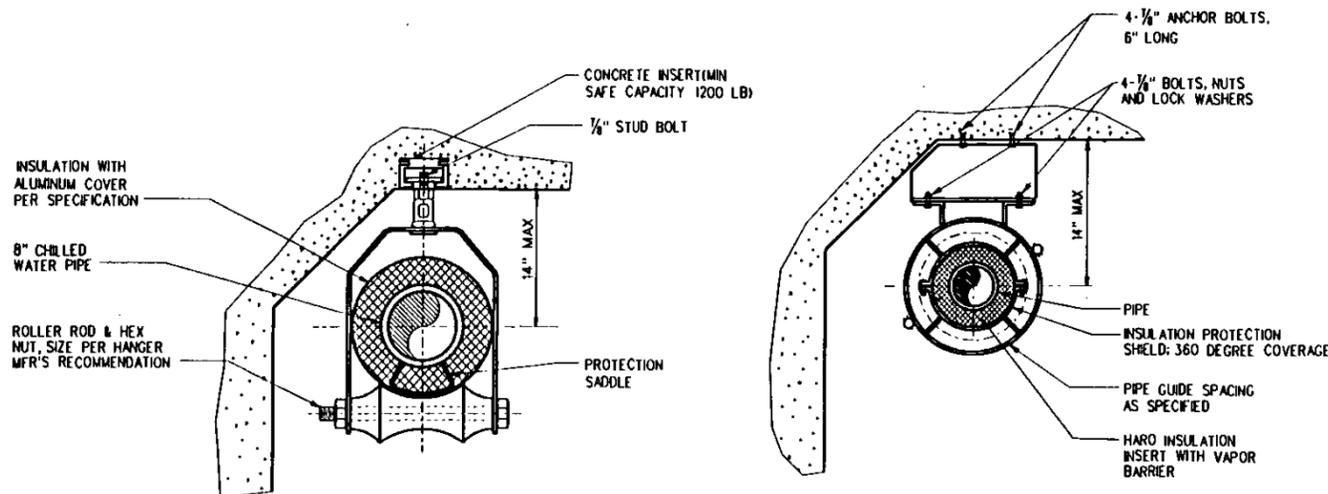


PLAN



ELEVATION

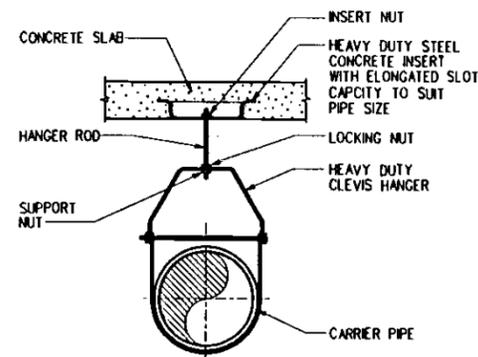
TYPICAL SUPPORTING ARRANGEMENT FOR VERTICAL PIPING 4



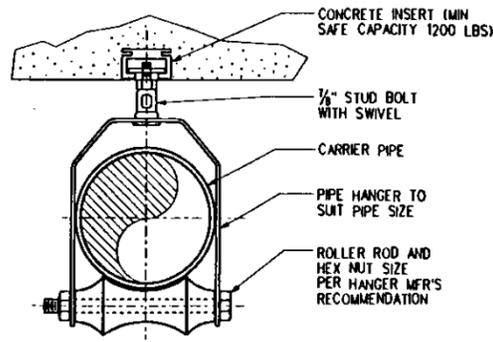
HANGER
NOTE: DETAIL INDICATES LOCATION OF PIPE NEAR STATION WALL. MAKE APPROPRIATE MODIFICATIONS AT OTHER LOCATIONS.

GUIDE

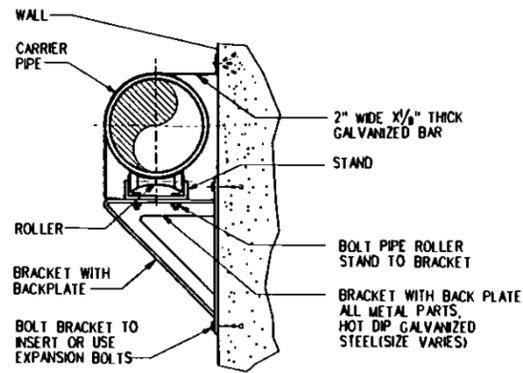
PIPE SUPPORT DETAIL FOR CHILLED WATER PIPE IN SMOKE EXHAUST DUCT (IN UNDERGROUND STATIONS ONLY) 5



PIPE HANGER DETAIL 6



PIPE HANGER DETAIL 7

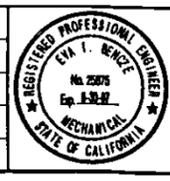


PIPE HANGER DETAIL 8

- NOTES:**
1. ALL PIPE SADDLES SHALL BE WELDED TO PIPE AT FOUR (4) CORNERS ONLY. ALL PIPE HANGERS AND SADDLES SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION. BOLTS AND NUTS SHALL BE CADMIUM PLATED.
 2. BRACKETS, U-BOLTS, ANGLES AND BACK PLATES SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION. BOLTS, NUTS AND WASHERS SHALL BE CADMIUM PLATED.
 3. FOR SEISMIC RESTRAINTS, SEE DRAWING MS-011 AND SPECIFICATIONS.

REV	DATE	BY	SUB	APP	DESCRIPTION
0	12 APR 94	J	EB	GMC	REV & REDRAWN PER DCN 91-9

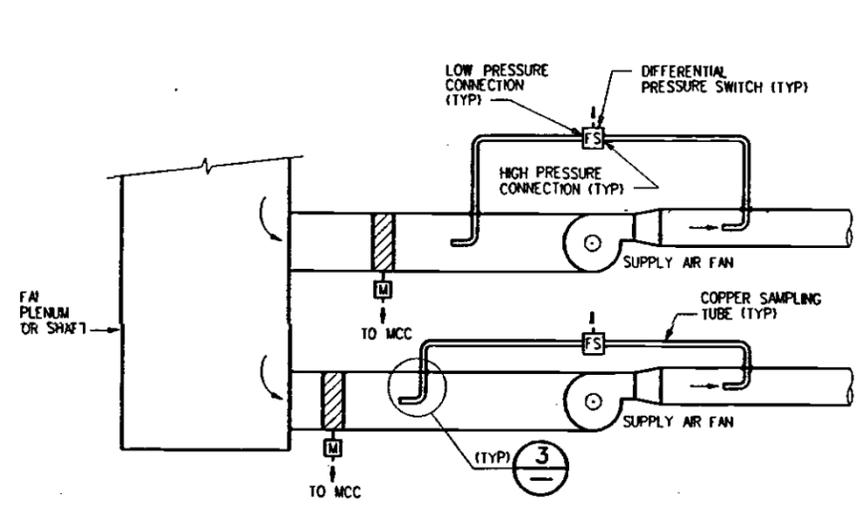
DESIGNED BY
EMC
DRAWN BY
J. IONESCU
CHECKED BY
B. REAL
IN CHARGE
E. BENCZE
DATE
12 APR 94



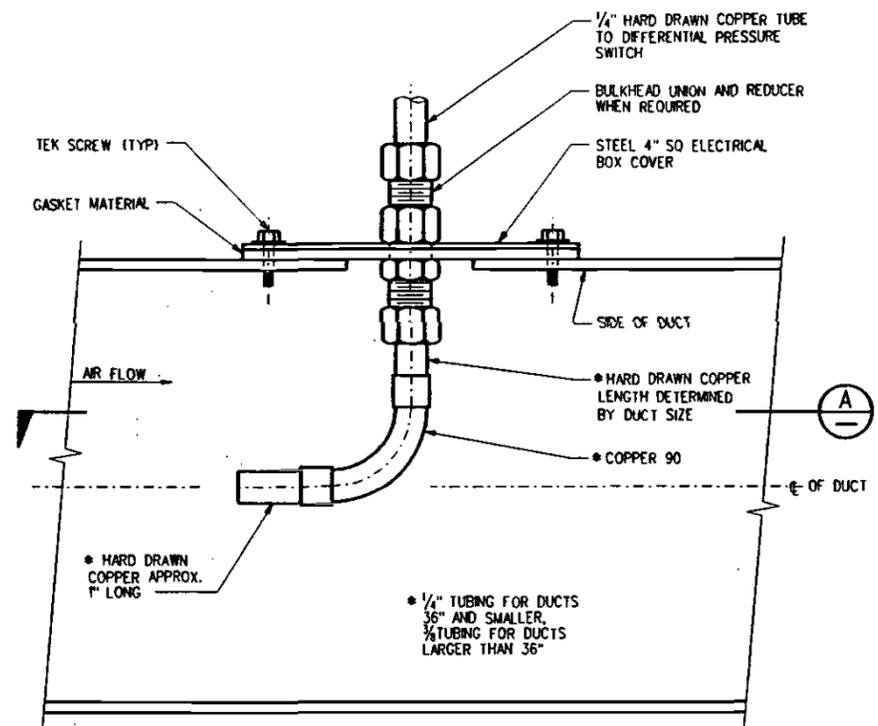
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
ENGINEERING MANAGEMENT CONSULTANT
Submitted by: E. Bencze
Approved by: [Signature]

MECHANICAL STANDARD PIPE HANGER AND SUPPORT DETAILS

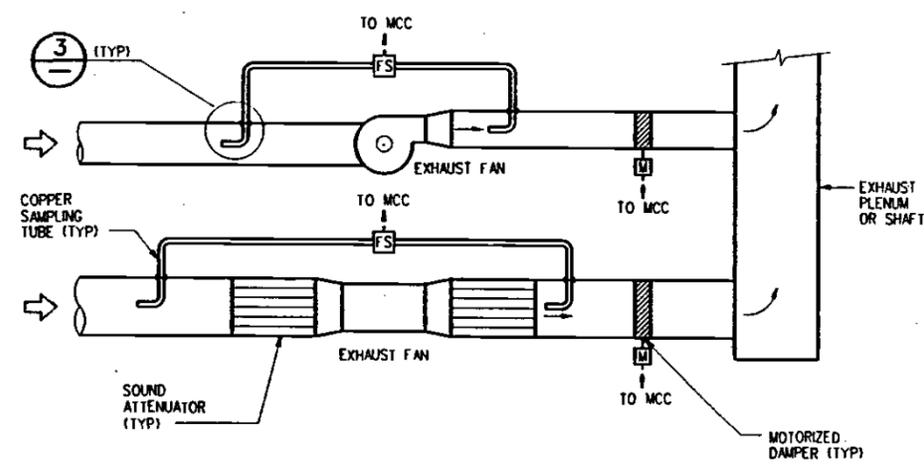
CONTRACT NO.	
DRAWING NO.	MS-014
REV.	0
SCALE	NO SCALE
SHEET NO.	



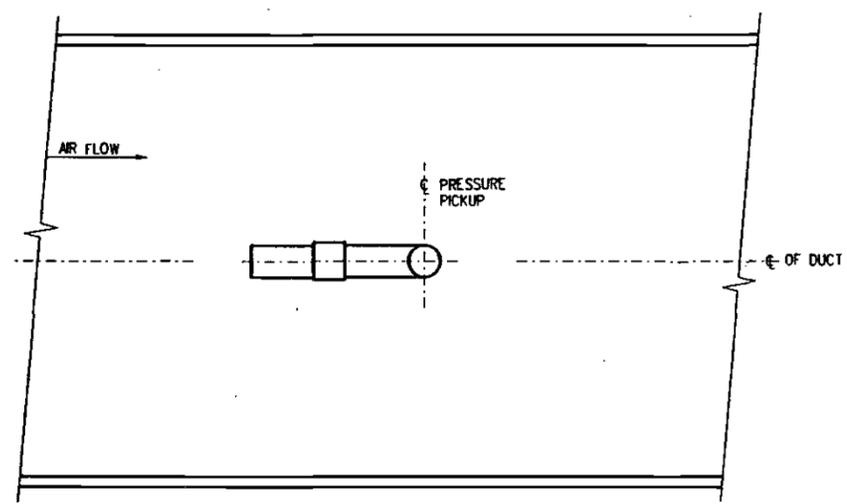
FLOW SWITCH INSTALLATION DETAIL-SUPPLY FAN (1)



PRESSURE PICKUP DETAIL (3)



FLOW SWITCH INSTALLATION DETAIL-EXHAUST FAN (2)



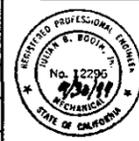
SECTION A

NOTES:

1. LOCATE PRESSURE PICKUPS TO OBTAIN MAXIMUM TOTAL (STATIC PLUS VELOCITY) PRESSURE DIFFERENTIAL. AVOID INCONSISTENT AIR-FLOW AREAS, SUCH AS FOUND NEAR ELBOWS.
2. INSERT PRESSURE PICKUPS WELL INTO THE AIR STREAM, AS NEAR THE DUCT CENTERLINE AS PRACTICAL, FACING THE AIR FLOW, AND PARALLEL TO THE LONGITUDINAL CENTERLINES OF THE DUCT. PROVIDE STIFFENERS AS REQUIRED TO MAINTAIN THE CORRECT POSITION OF THE PICKUP.
3. WHEN THE FAN ROOM IS USED AS A PLENUM, MOUNT THE LOW-PRESSURE PICKUP IN THE ROOM. SUBMIT PICKUP TYPE AND LOCATION FOR APPROVAL.
4. DIFFERENTIAL PRESSURE SWITCH MAY BE MOUNTED ON THE DUCT, FAN, OR WALL. PROVIDE VIBRATION ISOLATION AS REQUIRED TO PREVENT MALFUNCTION AND DECREASED SERVICE LIFE.
5. PROVIDE STAINLESS STEEL MATERIALS FOR BATTERY ROOM EXHAUST FAN SYSTEMS. INCLUDE STAINLESS STEEL SCREWS, PLATE, TUBING AND TUBING FITTINGS.
6. SEE MANUFACTURER'S INSTRUCTIONS OR CONTRACT DRAWINGS FOR BI-DIRECTIONAL AND OTHER SPECIAL-TYPES OF FLOW INDICATORS AND SWITCHES.
7. PROVIDE COMPENSATION FOR EXPANDING, FLEXING, AND VIBRATION WHERE TUBING CROSSES FLEXIBLE CONNECTIONS OR OTHER AREAS OF DIFFERENTIAL MOVEMENT.

REV	DATE	BY	SUB	APP	DESCRIPTION
0	12/29/95	EMC			BASELINE ISSUE PER DB 300-58CN22.00

DESIGNED BY
EMC
DRAWN BY
R. SOLIS
CHECKED BY
B. REAL
IN CHARGE
E. BENCZE
DATE
29 DEC 95



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

ENGINEERING MANAGEMENT CONSULTANT

Submitted by: *Julian B. Bortol*

Approved by: *[Signature]*

MECHANICAL STANDARD
HVAC FLOW SWITCH DETAILS

CONTRACT NO.	
DRAWING NO.	MS-015
REV	0
SCALE	NO SCALE
SHEET NO.	



BASELINE STATUS REPORT: DIRECTIVE/STANDARD DRAWINGS

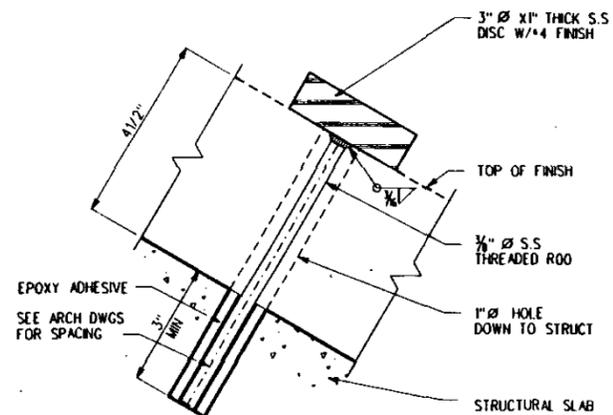
DRAWING NO.	REV.	DATE MODIFIED	DRAWING TITLE / Change Title	REMARKS
R92-DE306-05 STANDARD DRAWINGS: ARCHITECTURAL				
AS-000	0 1	02/21/94 09/19/94	ARCHITECTURAL STANDARD INDEX OF DRAWINGS Initial baseline issue sbcn# : de306-sbcn-11.00	
AS-001	0 1 2	02/21/94 09/19/94 11/29/95	ARCHITECTURAL STANDARD ABBREVIATIONS, SYMBOLS AND GENERAL NOTES Initial baseline issue sbcn# : de306-sbcn-11.00 Revised and redrawn per de306-sbcn-22.00	
AS-002	0 1 2	02/21/94 09/19/94 06/08/95	ARCHITECTURAL STANDARD ESCALATOR DETAILS Initial baseline issue sbcn# : de306-sbcn-11.00 sbcn# : de306-sbcn-16.00	
AS-003	0 1	02/21/94 09/19/94	ARCHITECTURAL STANDARD ENTRANCE STAIR DETAILS Initial baseline issue sbcn# : de306-sbcn-11.00	
AS-004	0 1	02/21/94 09/19/94	ARCHITECTURAL STANDARD MEZZANINE TO PLATFORM STAIR & MEZZANINE GUARDRAIL SECTIONS & DETAILS Initial baseline issue sbcn# : de306-sbcn-11.00	
AS-005	0 1 2	02/21/94 09/19/94 11/29/95	ARCHITECTURAL STANDARD PLATFORM PLANS AND DETAILS Initial baseline issue sbcn# : de306-sbcn-11.00 Revised and redrawn per de306-sbcn-22.00	
AS-006	0 1	02/21/94 09/19/94	ARCHITECTURAL STANDARD ROLL-UP GRILL HOUSING AND SUPPORT DETAILS Initial baseline issue sbcn# : de306-sbcn-11.00	
AS-007	0 1	02/21/94 09/19/94	ARCHITECTURAL STANDARD TICKET VENDING MACHINE ENCLOSURE SHEET 1 OF 3 Initial baseline issue sbcn# : de306-sbcn-11.00	
AS-008	0 1	02/21/94 09/19/94	ARCHITECTURAL STANDARD TICKET VENDING MACHINE ENCLOSURE SHEET 2 OF 3 Initial baseline issue sbcn# : de306-sbcn-11.00	
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AS-010	0 1 2	02/21/94 09/19/94 06/08/95	ARCHITECTURAL STANDARD HYDRAULIC ELEVATOR HOISTWAY DETAILS SHEET 1 OF 3 Initial baseline issue sbcn# : de306-sbcn-11.00 sbcn# : de306-sbcn-16.00	
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AS-013	0 1	02/21/94 09/19/94	ARCHITECTURAL STANDARD PHONE BOOTH/MAP CASE DETAILS SHEET 1 OF 2 Initial baseline issue sbcn# : de306-sbcn-11.00	
AS-014	0 1	02/21/94 09/19/94	ARCHITECTURAL STANDARD PHONE BOOTH/MAP CASE DETAILS SHEET 2 OF 2 Initial baseline issue sbcn# : de306-sbcn-11.00	
AS-015	0 1	02/21/94 09/19/94	ARCHITECTURAL STANDARD PUBLIC TELEPHONE Initial baseline issue sbcn# : de306-sbcn-11.00	

BASELINE STATUS REPORT: DIRECTIVE/STANDARD DRAWINGS

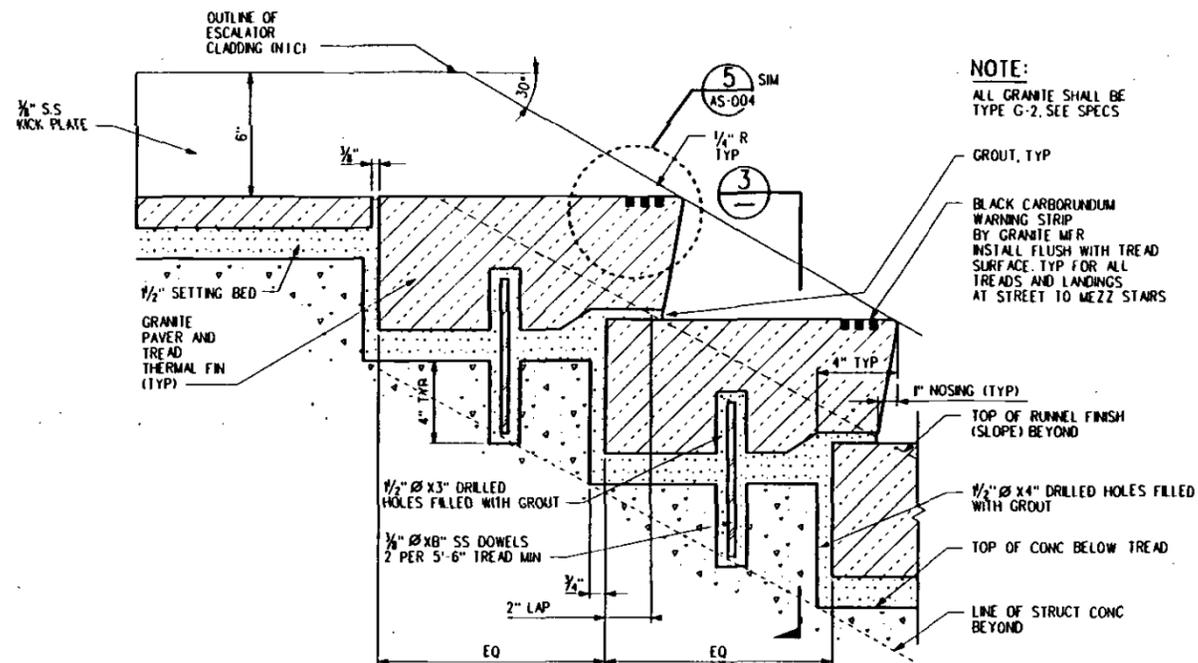
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AS-017	0 1	02/21/94 09/19/94	ARCHITECTURAL STANDARD RECESSED FIRE HOSE CABINET DETAILS Initial baseline issue sbcn# : de306-sbcn-11.00	
AS-018	0 1 2	02/21/94 09/19/94 11/29/95	ARCHITECTURAL STANDARD RECESSED CABINETS AND CONTROL ENCLOSURES Initial baseline issue sbcn# : de306-sbcn-11.00 Revised and redrawn per de306-sbcn-22.00	
AS-019	0 1	02/21/94 09/19/94	ARCHITECTURAL STANDARD ASH RECEPTACLE DETAILS Initial baseline issue sbcn# : de306-sbcn-11.00	
AS-020	0 1	02/21/94 09/19/94	ARCHITECTURAL STANDARD TRASH RECEPTACLE DETAILS Initial baseline issue sbcn# : de306-sbcn-11.00	
AS-021	0 1	02/21/94 09/19/94	ARCHITECTURAL STANDARD EDGE LIGHT SUPPORT DETAILS Initial baseline issue sbcn# : de306-sbcn-11.00	
AS-022	0 1	02/21/94 09/19/94	ARCHITECTURAL STANDARD TRANSVERSE SIGN BAND AND EDGE LIGHT DETAILS Initial baseline issue sbcn# : de306-sbcn-11.00	
AS-023	0 1	02/21/94 09/19/94	ARCHITECTURAL STANDARD GRATINGS AND BIKE RACK DETAILS Initial baseline issue sbcn# : de306-sbcn-11.00	
AS-024	0 1	02/21/94 09/19/94	ARCHITECTURAL STANDARD PLATFORM END GATE DETAILS Initial baseline issue sbcn# : de306-sbcn-11.00	
AS-025	0 1	02/21/94 09/19/94	ARCHITECTURAL STANDARD FLOOR FINISH DETAILS Initial baseline issue sbcn# : de306-sbcn-11.00	
AS-026	0 1	02/21/94 09/19/94	ARCHITECTURAL STANDARD MISCELLANEOUS DETAILS Initial baseline issue sbcn# : de306-sbcn-11.00	
AS-027	0 1	02/21/94 09/19/94	ARCHITECTURAL STANDARD DOOR CONTROL DIAGRAMS Initial baseline issue sbcn# : de306-sbcn-11.00	
AS-028	0 1	02/21/94 09/19/94	ARCHITECTURAL STANDARD STATION MARKER Initial baseline issue sbcn# : de306-sbcn-11.00	
AS-029	0 1	02/21/94 09/19/94	ARCHITECTURAL STANDARD FREE STANDING MAP CASE DETAILS SHEET 1 OF 2 Initial baseline issue sbcn# : de306-sbcn-11.00	
AS-030	0 1	02/21/94 09/19/94	ARCHITECTURAL STANDARD FREE STANDING MAP CASE DETAILS SHEET 2 OF 2 Initial baseline issue sbcn# : de306-sbcn-11.00	
AS-031	0 1	02/21/94 09/19/94	ARCHITECTURAL STANDARD TRACK CROSSING & WALKWAY CONFIGURATION Initial baseline issue sbcn# : de306-sbcn-11.00	
AS-032	0 1	02/21/94 09/19/94	ARCHITECTURAL STANDARD CURB, RAMPS AND PARKING DETAILS Initial baseline issue sbcn# : de306-sbcn-11.00	
AS-033	0 1	02/21/94 09/19/94	ARCHITECTURAL STANDARD EMERGENCY STAIR DETAILS Initial baseline issue sbcn# : de306-sbcn-11.00	

BASELINE STATUS REPORT: DIRECTIVE/STANDARD DRAWINGS

DRAWING ND.	REV.	DATE MODIFIED	DRAWING TITLE / Change Title	REMARKS
<u>R92-DE306-05</u>			STANDARD DRAWINGS: ARCHITECTURAL	
AS-034			ARCHITECTURAL STANDARD COMMUNICATIONS AND ELECTRICAL VAULT DETAILS	
	0	02/21/94	Initial baseline issue	
	1	09/19/94	sbcn#: de306-sbcn-11.00	
AS-035			ARCHITECTURAL STANDARD FENCE DETAILS	
	0	02/21/94	Initial baseline issue	
	1	09/19/94	sbcn#: de306-sbcn-11.00	

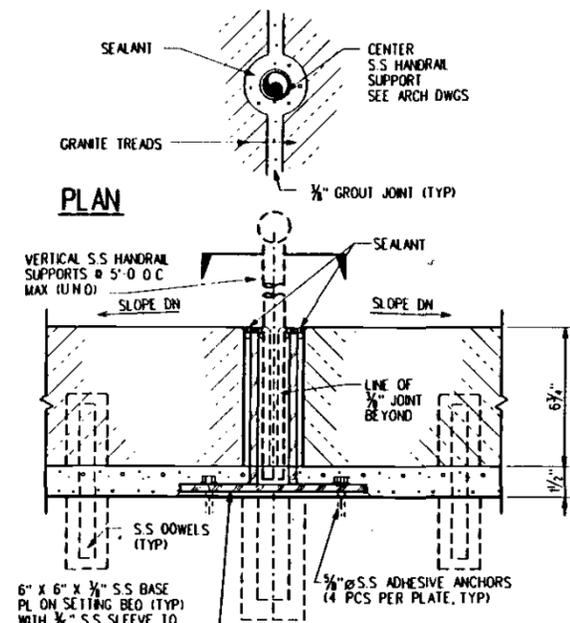


ANTI-SLIDE DEVICE
 HALF FULL SIZE
 4 AS-003

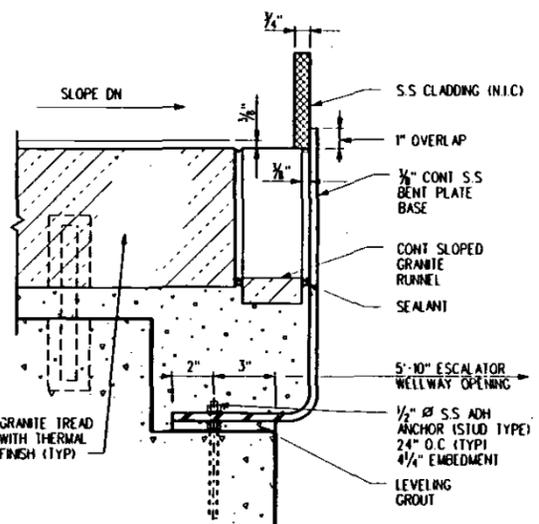


GRANITE STAIR TREAD DETAIL
 3'-1'-0"
 1 AS-003

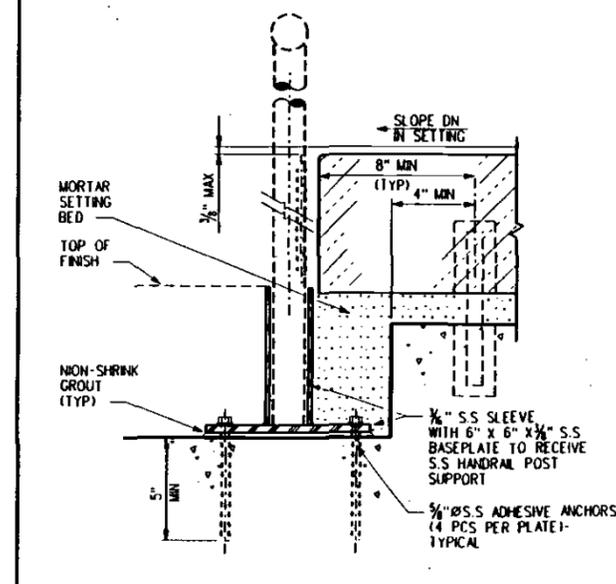
NOTE:
 ALL GRANITE SHALL BE TYPE G-2. SEE SPECS
 GROUT, TYP
 BLACK CARBORUNDUM WARNING STRIP BY GRANITE MFR. INSTALL FLUSH WITH TREAD SURFACE. TYP FOR ALL TREADS AND LANDINGS AT STREET TO MEZZ STAIRS



POST MOUNTING AT CENTER OF STAIR
 3'-1'-0"
 5 AS-003



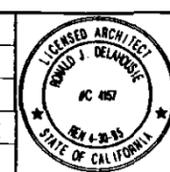
RUNNEL AND KICK PLATE AT ESCALATOR CLADDING
 3'-1'-0"
 3 AS-003



POST MOUNTING AT RUNNEL SIDE OF STAIR
 3'-1'-0"
 2 AS-003

REV	DATE	BY	CHK	APP	DESCRIPTION
0	2.21.94	J. HEGEDE			BASELINE ISSUE
1	3.19.94	F. PANILIO			REVISED & REDRAWN PER DE 306-SBCN-1100

DESIGNED BY
J. HEGEDE
 DRAWN BY
F. PANILIO
 CHECKED BY
I. ROQUE
 IN CHARGE
R. DELAHOUSIE
 DATE
21 FEB 94

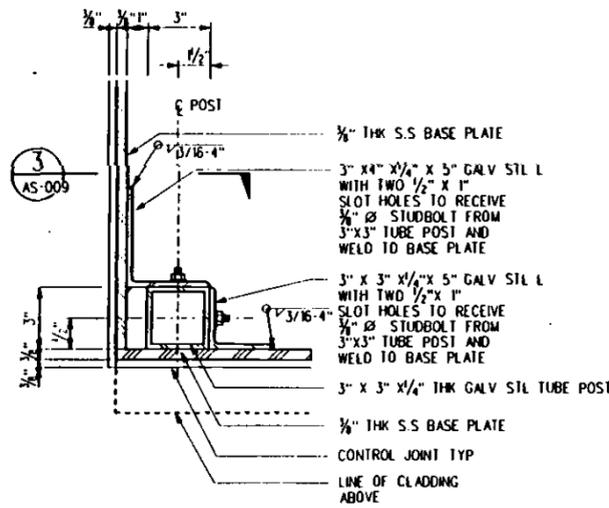


LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
 ENGINEERING MANAGEMENT CONSULTANT
 SUBMITTED *Ronald J. Delahousie*
 APPROVED *[Signature]*

ARCHITECTURAL STANDARD
ENTRANCE STAIR DETAILS

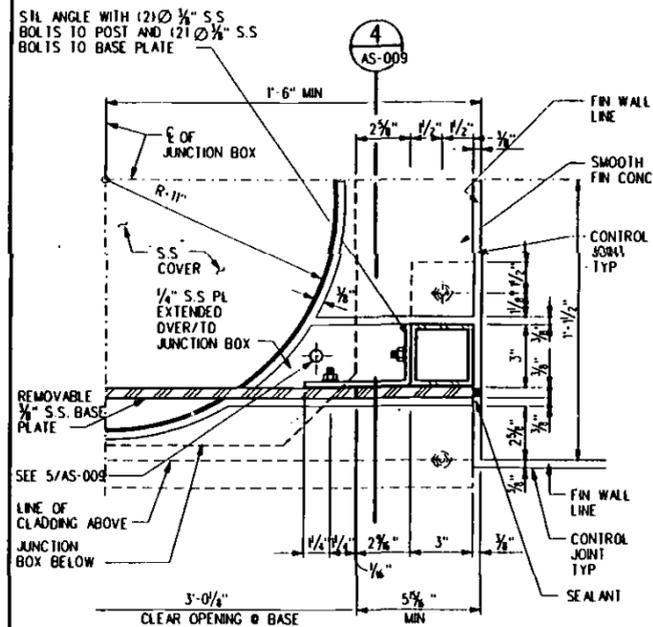
CONTRACT NO.	OPWING NO.	REV
	AS-003	1
SCALE	AS NOTED	
SHEET NO.		

PLOTTED BY: ebs@edmc.com

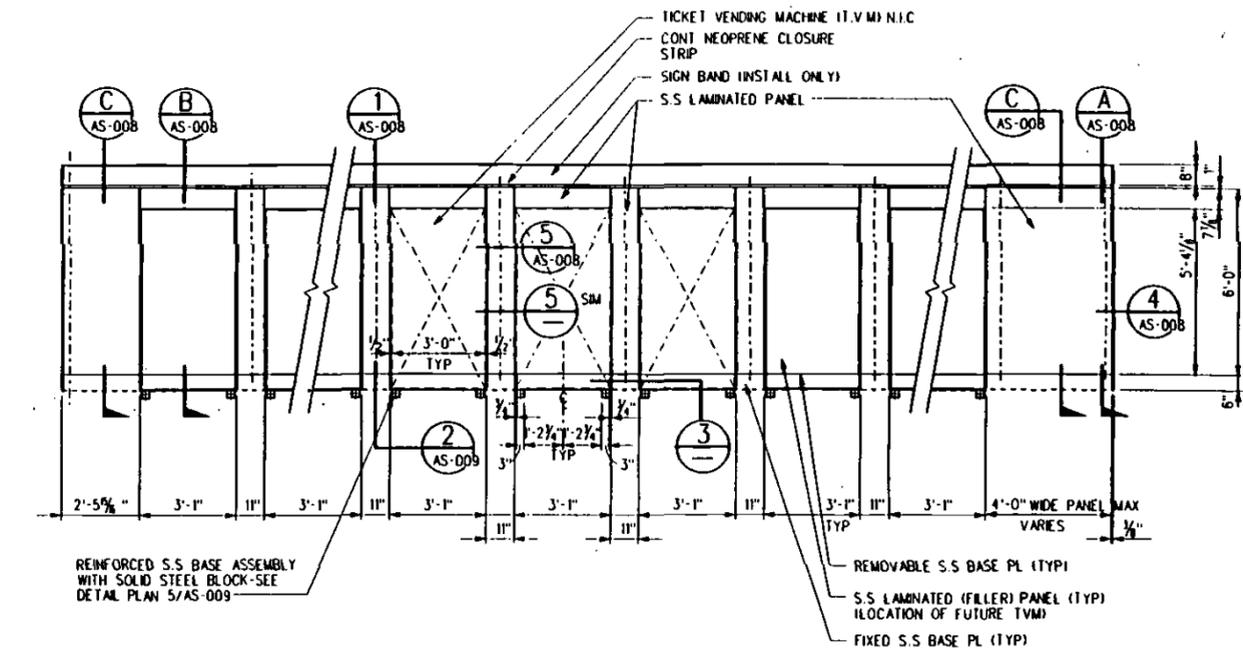


NOTE: ALL FILED WELDS ARE 1/8" MIN UNDO

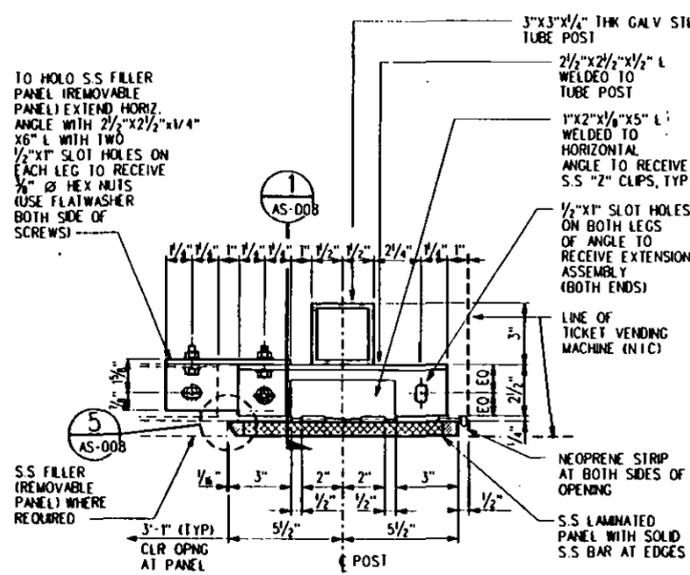
BASE DETAIL PLAN AT CORNER (4)
3'-1'-0" AS-007



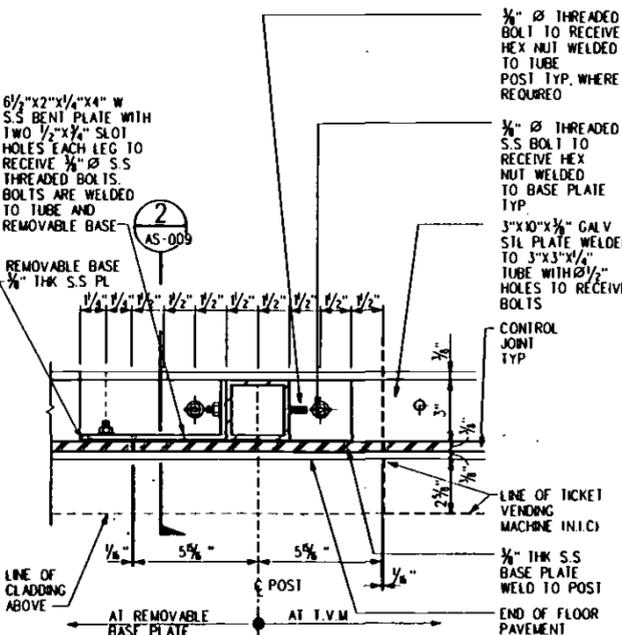
BASE AT JUNCTION BOX DETAIL (2)
3'-1'-0" AS-007



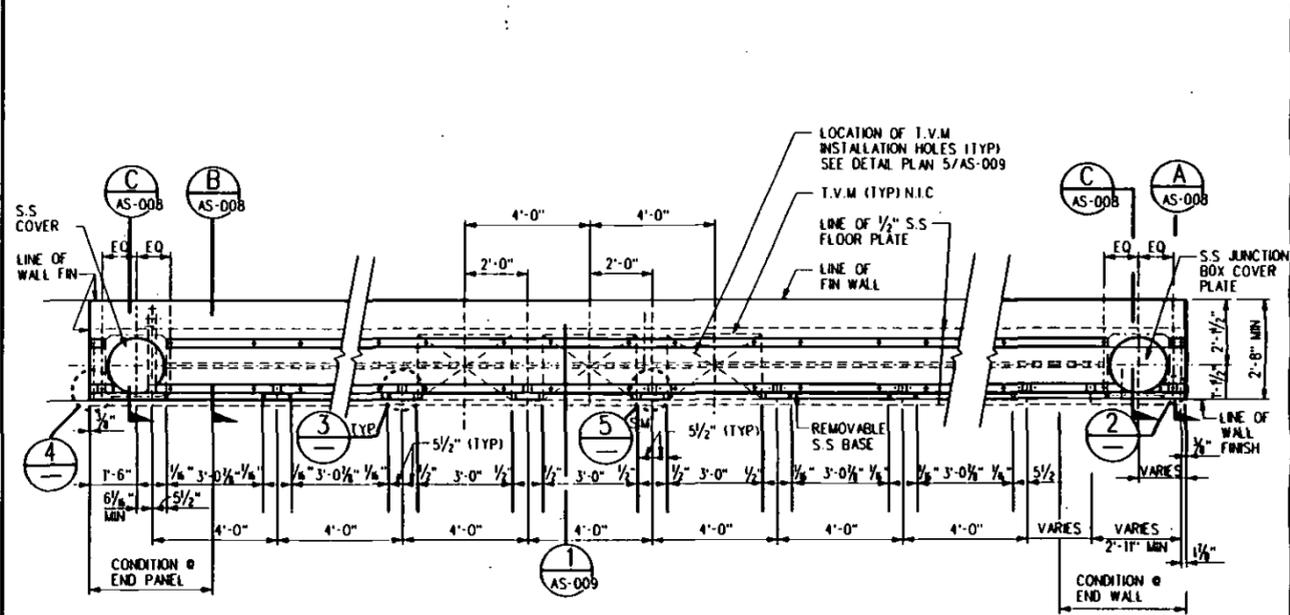
PROTOTYPICAL TICKET VENDING MACHINE ELEVATION (A)
3'-1'-0" AS-007



TYPICAL CENTRAL PANEL DETAIL (5)
3'-1'-0" AS-007



BASE DETAIL AT CORNER PANEL (3)
3'-1'-0" AS-007



TYPICAL PLAN OF TICKET VENDING MACHINE ARRAYS (1)
3'-1'-0" AS-007

REV	DATE	BY	CHK	APP	DESCRIPTION
0	2/21/94	J. HEGEDE	F. PANILLO	I. ROQUE	REVISED & REDRAWN PER DE 306-SBCH-11-00 BASELINE ISSUE

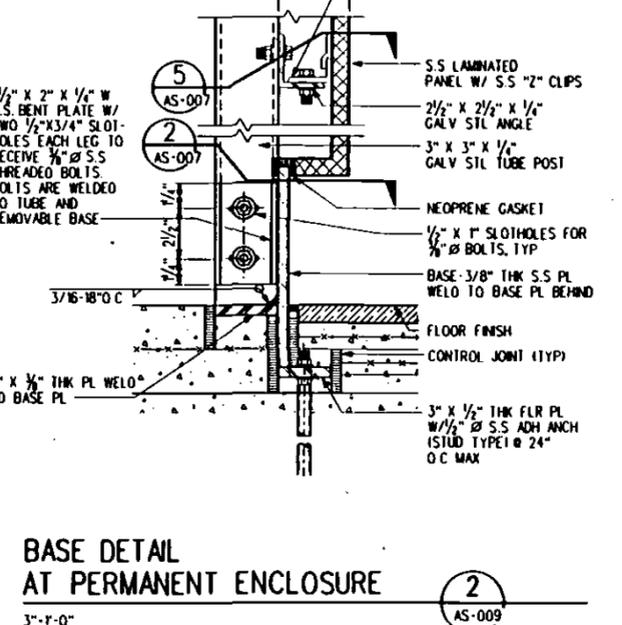
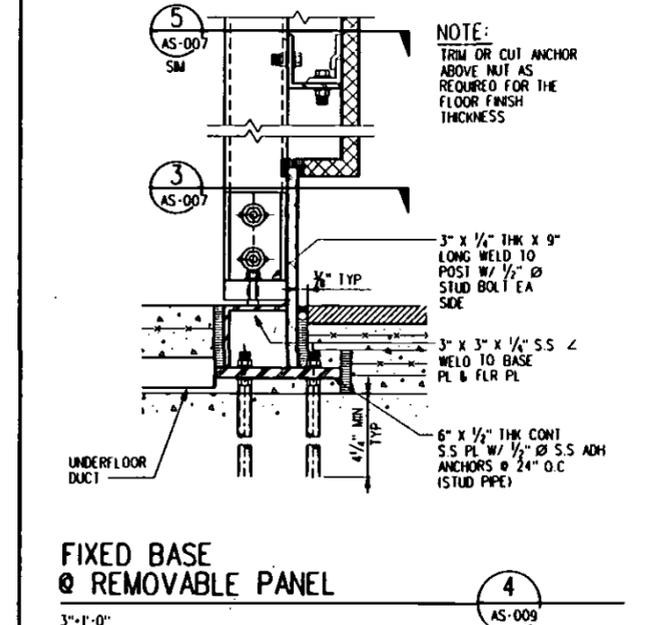
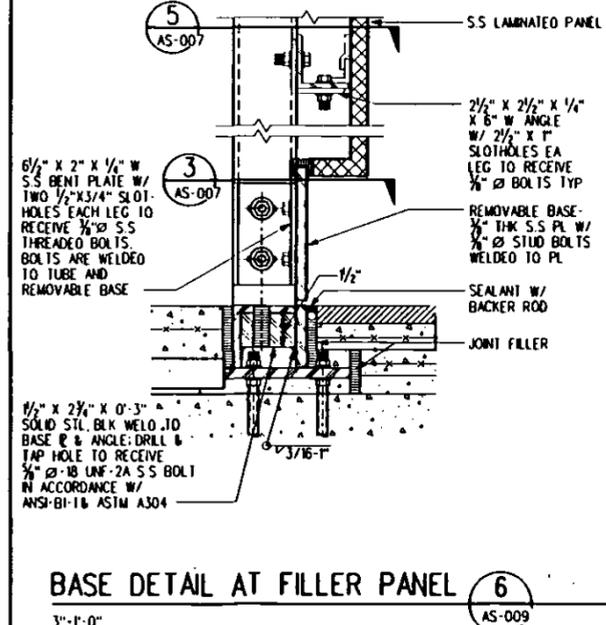
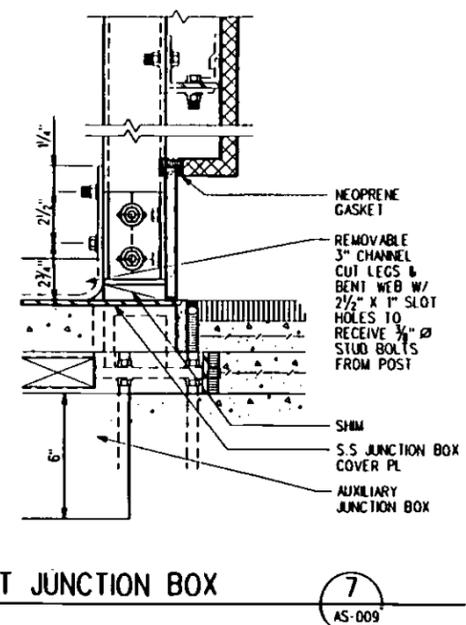
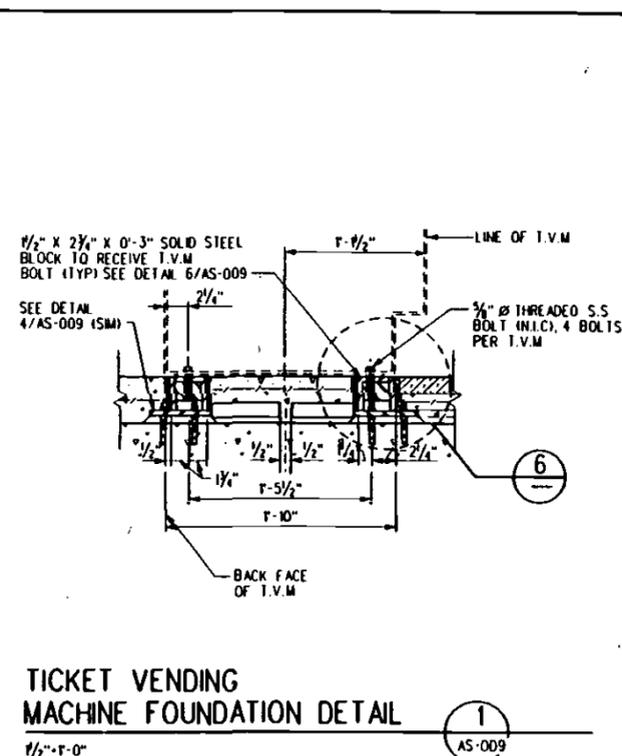
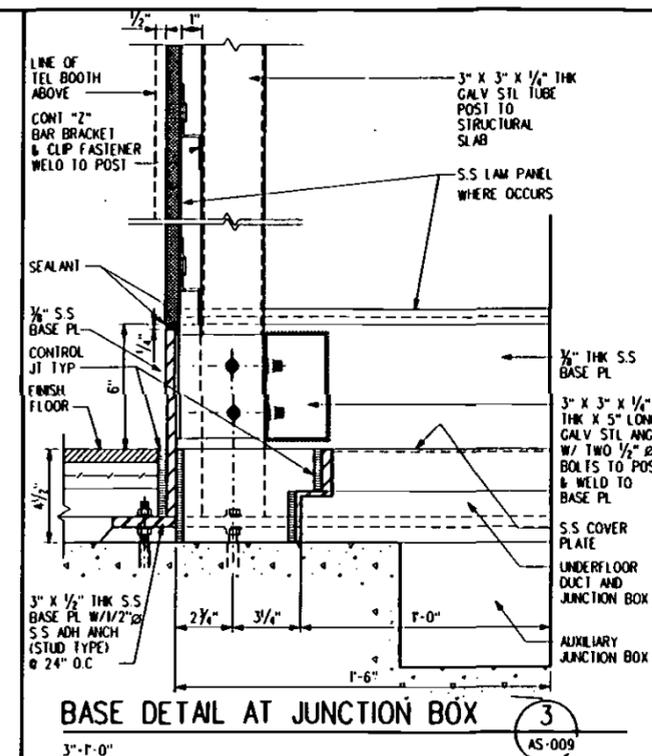
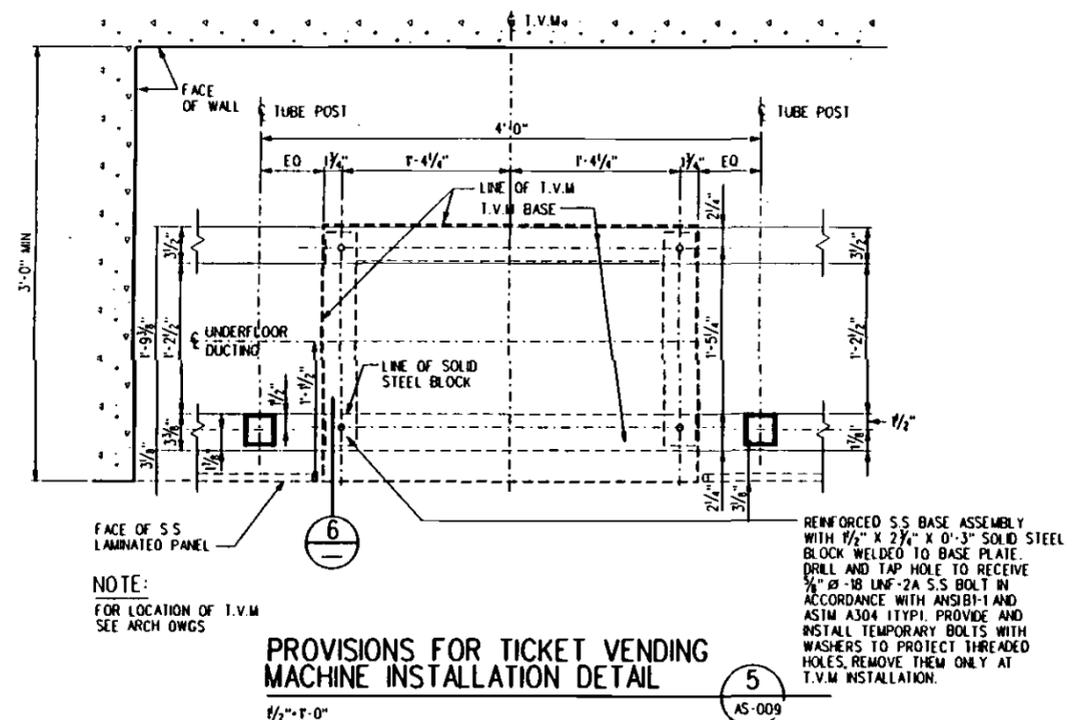
DESIGNED BY
J. HEGEDE
DRAWN BY
F. PANILLO
CHECKED BY
I. ROQUE
IN CHARGE
R. DELAHOUSIE
DATE
21 FEB 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
ENGINEERING MANAGEMENT CONSULTANT
SUBMITTED: [Signature]
APPROVED: [Signature]

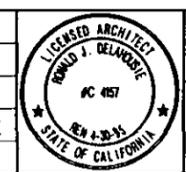
ARCHITECTURAL STANDARD
TICKET VENDING MACHINE ENCLOSURE
SHEET 1 OF 3

CONTRACT NO.	
DRAWING NO.	AS-007
REV	1
SCALE	AS NOTED
SHEET NO.	



REV	DATE	BY	CHKD	APP	DESCRIPTION
0	2.21.94	C.H.	J.M.	GEN	REVISED & REDRAWN PER DE 306-SBCN-1100 BASELINE ISSUE

DESIGNED BY
J. HEGEDE
DRAWN BY
F. PANLILIO
CHECKED BY
I. ROQUE
IN CHARGE
R. DELAHOUSIE
DATE
21 FEB 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
ENGINEERING MANAGEMENT CONSULTANT
SUBMITTED: *Ronald J. Delahousie*
APPROVED: *[Signature]*

ARCHITECTURAL STANDARD
TICKET VENDING MACHINE ENCLOSURE
SHEET 3 OF 3
CONTRACT NO.
DRAWING NO. **AS-009** REV **1**
SCALE **AS NOTED**
SHEET NO.

PLAZA TO MEZZANINE ELEVATOR

EXTERIOR FACE OF HOISTWAY				
FIXTURE CUTOUT	DIMENSION		ELEVATOR LANDING	QUANTITY
	HEIGHT	WIDTH		
HALL LANTERN	3.50"	9.75"	PLAZA	1
ACCESS KEY SWITCH	4.75"	3.25"	PLAZA	1
HALL CALL BUTTON	9.75"	3.50"	PLAZA	1
FIREMAN'S KEY SWITCH	9.75"	3.50"	PLAZA	1
HALL LANTERN	3.50"	9.75"	MEZZANINE	1
ACCESS KEY SWITCH	4.75"	3.25"	MEZZANINE	1
HALL CALL BUTTON	9.75"	3.50"	MEZZANINE	1
TOTAL CUTOUTS				7

FOR CUTOUTS AT INTERIOR FACE OF HOISTWAY AND HOISTWAY FRAME INTERSECTION SEE TABLE FOR MEZZANINE TO PLATFORM ELEVATOR

MEZZANINE TO PLATFORM ELEVATOR

EXTERIOR FACE OF HOISTWAY				
FIXTURE CUTOUT	DIMENSION		ELEVATOR LANDING	QUANTITY
	HEIGHT	WIDTH		
HALL LANTERN	3.50"	9.75"	MEZZANINE	1
ACCESS KEY SWITCH	4.75"	3.25"	MEZZANINE	1
HALL CALL BUTTON	5.25"	11.25"	MEZZANINE	1
FIREMAN'S KEY SWITCH	5.25"	11.25"	MEZZANINE	1
HALL LANTERN	3.50"	9.75"	PLATFORM	1
ACCESS KEY SWITCH	4.75"	3.25"	PLATFORM	1
HALL CALL BUTTON	5.25"	11.25"	PLATFORM	1
TOTAL CUTOUTS				7

INTERIOR FACE OF HOISTWAY				
FIXTURE CUTOUT	HEIGHT	WIDTH	ELEVATOR LANDING	QUANTITY
ACCESS W/ S.S. COVER PLATES	5.00"	8.00"		8
HOISTWAY DOOR INTERLOCK	2.00"	2.00"	MEZZANINE	1
HOISTWAY DOOR INTERLOCK	2.00"	2.00"	PLATFORM	1
TOP LIMIT SWITCH	2.50"	2.875"		1
BOTTOM LIMIT SWITCH	2.50"	2.875"		1
ZONE SWITCH	2.50"	2.875"		1
PIT LIGHT SWITCH	2.50"	2.875"		1
TOTAL CUTOUTS				21

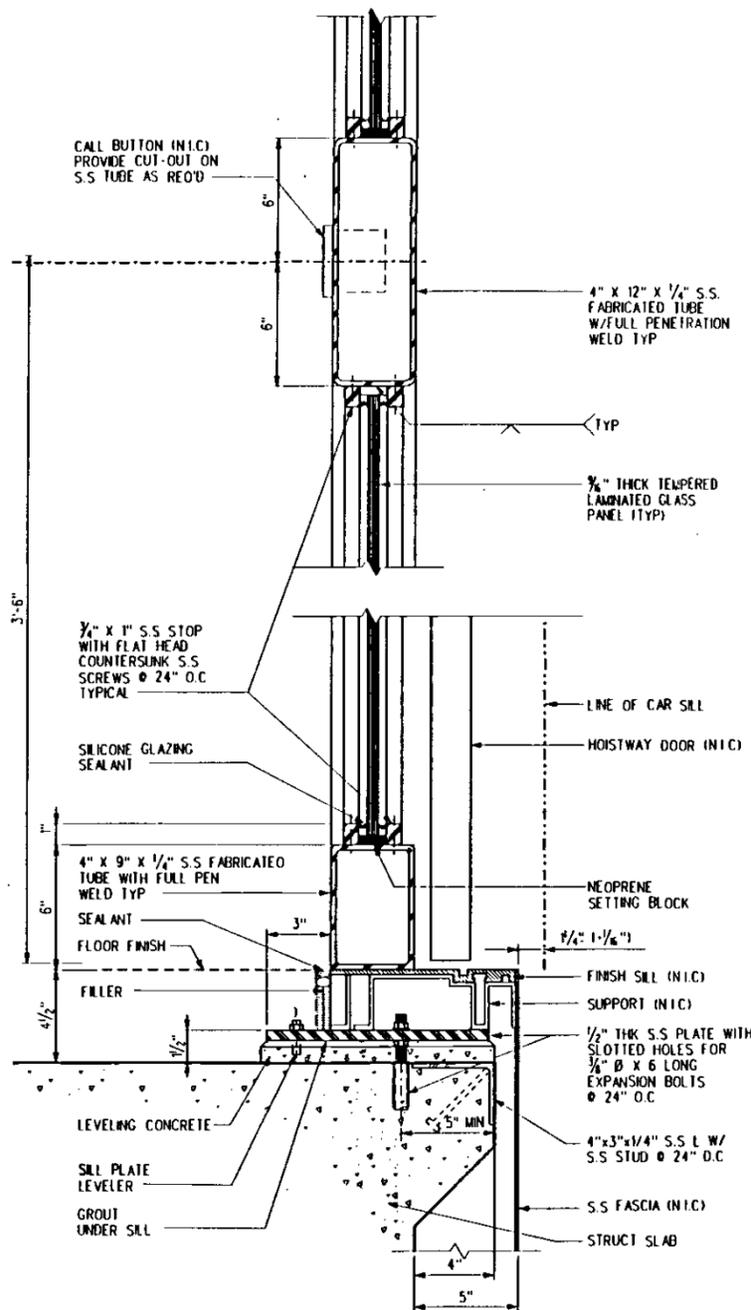
HOISTWAY FRAME INTERSECTION				
ACCESS CUTOUT	DIMENSION		HORIZONTAL FRAME INTERSECTION	QUANTITY
	HEIGHT	WIDTH		
AT POST	5.00"	2.00"	4" X 9" / 4" X 12"	18
AT POST	2.00"	2.00"	4" X 4"	1
TOTAL ACCESS CUTOUT				19

NOTE: SEE GENERAL NOTE NO. 2 AND 3 ON DRAWING AS-010

HOISTWAY CUTOUT SCHEDULE

NO SCALE

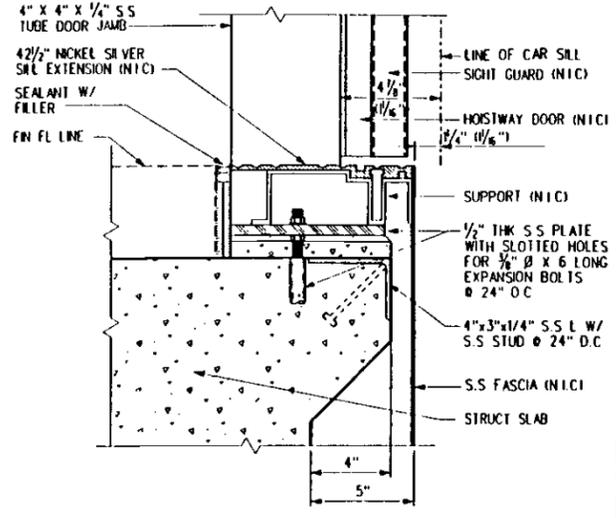
6 AS-011



SECTION

3'-1'-0"

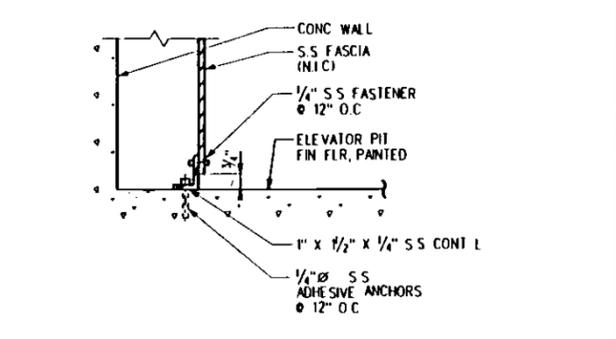
5 AS-011



ELEVATOR SILL

3'-1'-0"

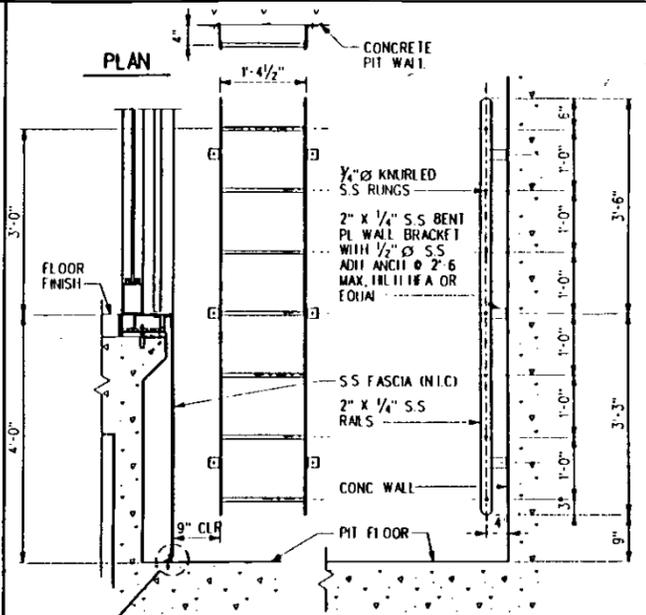
3 AS-011



BASE OF FASCIA

3'-1'-0"

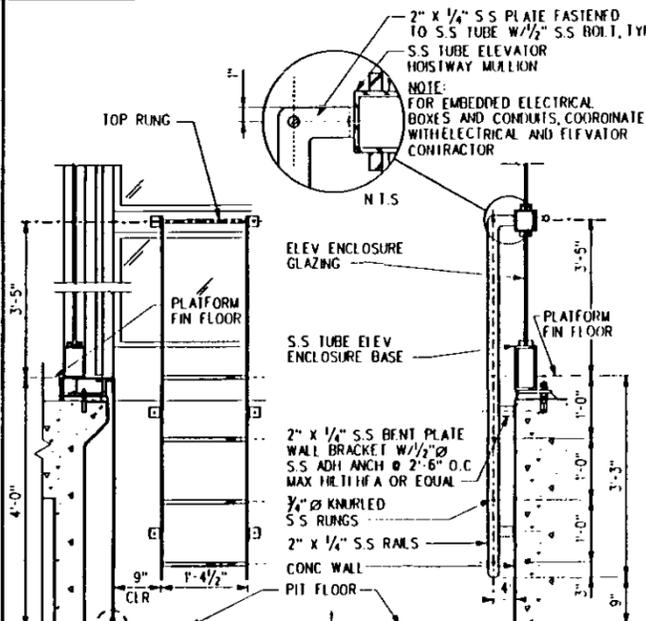
4 AS-011



ELEVATOR PIT LADDER

3'-1'-0"

1 AS-011



ELEVATOR PIT LADDER

3'-1'-0"

2 AS-011

REV	DATE	BY	CHKD	APPD	DESCRIPTION
0	2.21.94				BASELINE ISSUE
1	9.19.94				REVISED & REDRAWN PER DE.306-SBCH-16.00
2	8.8.95				REVISED & REDRAWN PER DE.306-SBCH-11.00

DESIGNED BY J. HEGEDE	A SIGNED & SEALED ORIGINAL OF REV 0 OF THIS DRAWING IS MAINTAINED BY NTA
DRAWN BY F. PANLILIO	
CHECKED BY I. ROQUE	
IN CHARGE R. DELAHOUSIE	
DATE 21 FEB 94	

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

ENGINEERING MANAGEMENT CONSULTANT

SUBMITTED: **R. J. DELAHOUSIE**

APPROVED: **K. N. MURTHY**

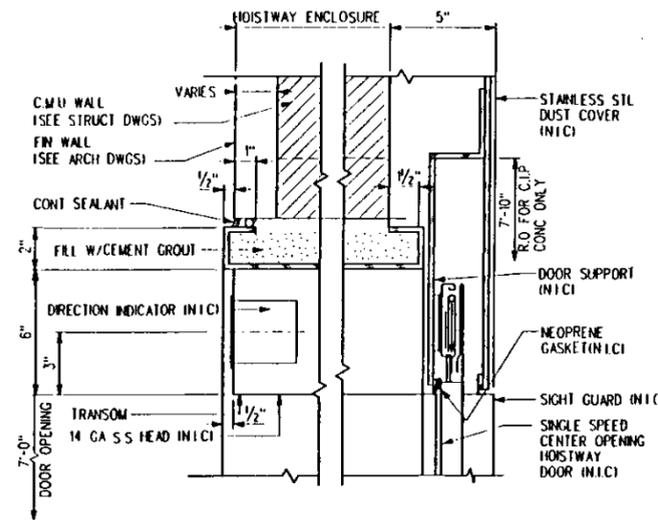
ARCHITECTURAL STANDARD

HYDRAULIC ELEVATOR HOISTWAY DETAILS

SHEET 2 OF 3

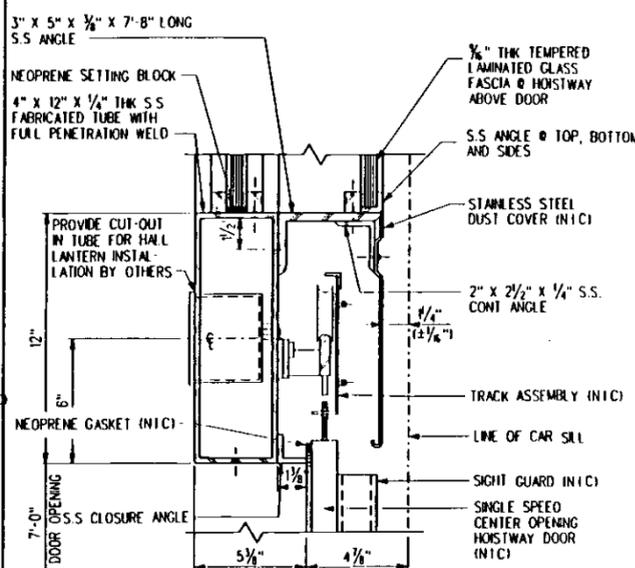
AS-011

AS NOTED



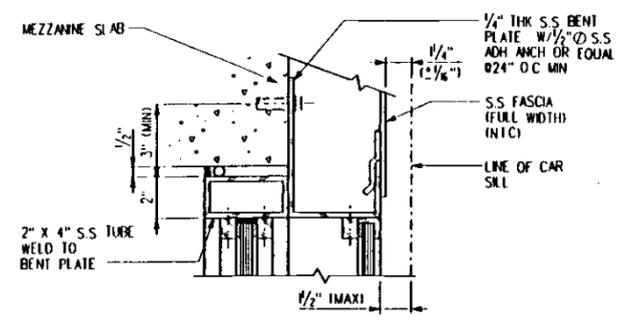
HEAD DETAIL - HOISTWAY DOOR (7)

AS-012



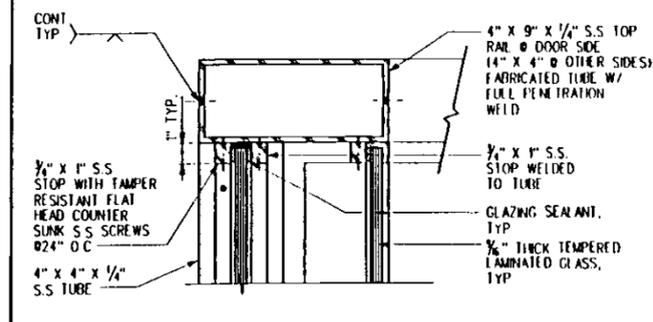
HEAD DETAIL - HOISTWAY DOOR (5)

AS-012



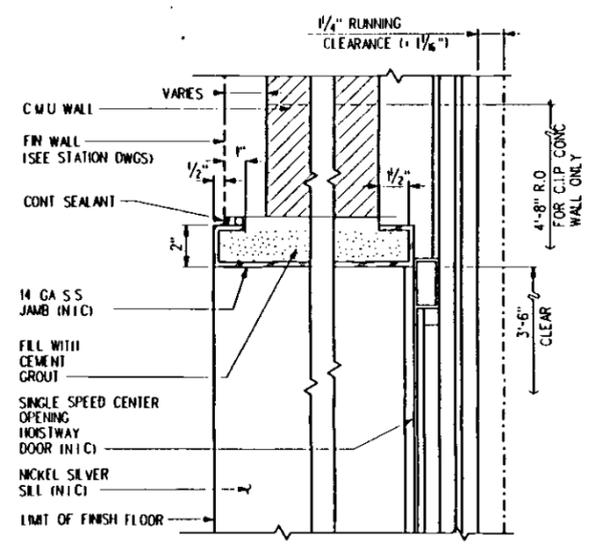
DETAIL AT MEZZANINE SLAB (3)

AS-012



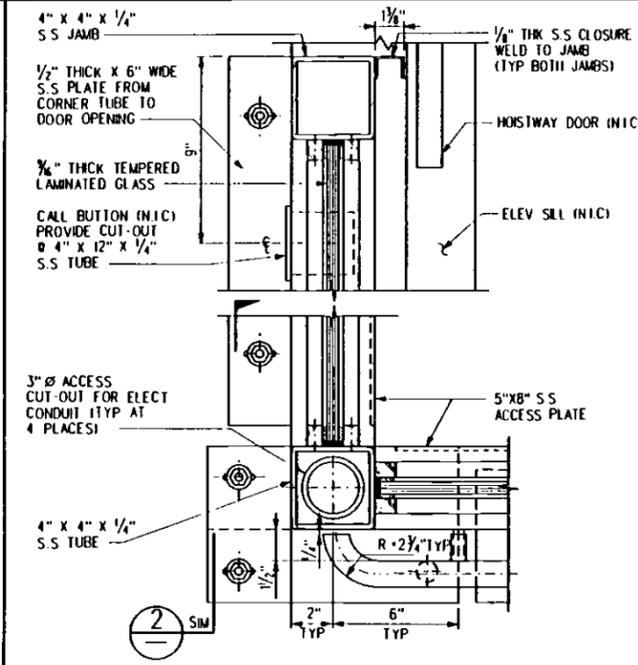
TOP OF HOISTWAY DETAIL (1)

AS-012



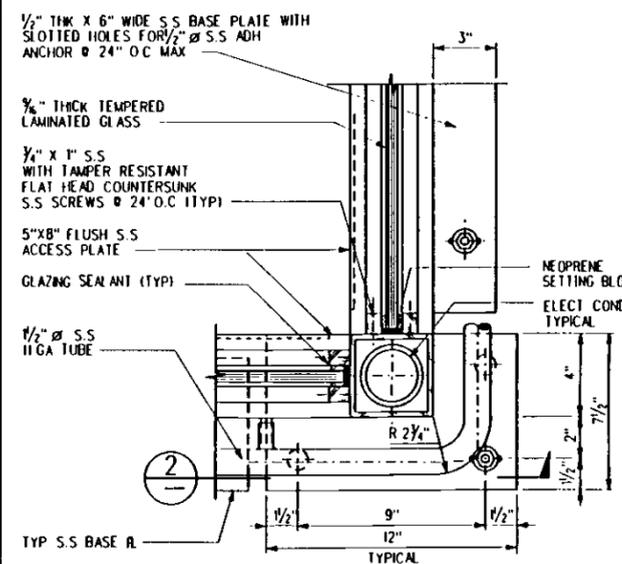
JAMB DETAIL - HOISTWAY DOOR (8)

AS-012



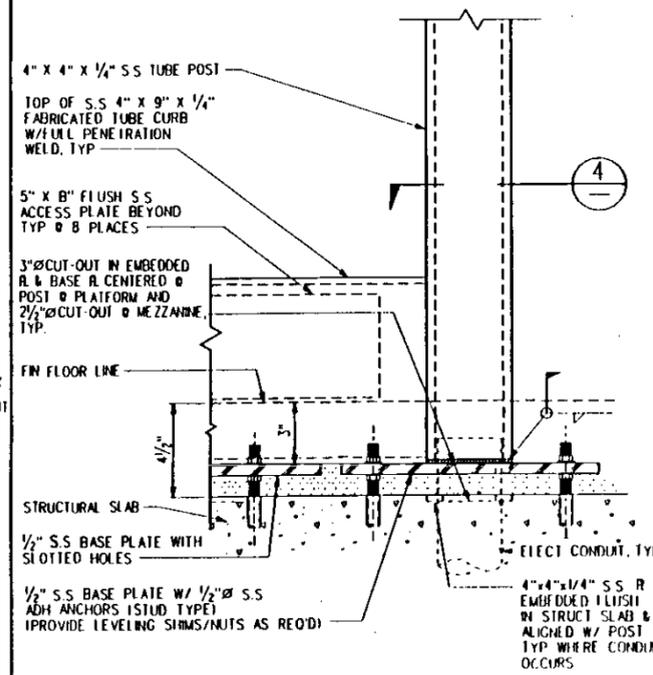
DETAIL THRU HOISTWAY DOOR ENCLOSURE (6)

AS-012



DETAIL AT CORNER SUPPORT (4)

AS-012



SECTION THRU BASE PLATE (2)

AS-012

REV	DATE	BY	CHKD	APP'D	DESCRIPTION
6	8 95	PL	AL	JJ	REVISED & REDRAWN PER DE 306-SBCN 16 00
5	9 19 94	CY	AL	GMC	REVISED & REDRAWN PER DE 306-SBCN 11 00
0	2 21 94				BASELINE ISSUE

DESIGNED BY
J. HEGEDE
DRAWN BY
F. PANLILIO
CHECKED BY
I. ROQUE
IN CHARGE
R. DELAHOUSIE
DATE
21 FEB 94

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

ENGINEERING MANAGEMENT CONSULTANT

A SIGNED & SEALED ORIGINAL OF REV 0 OF THIS DRAWING IS MAINTAINED BY MTA

SUBMITTED BY R. J. DELAHOUSIE
APPROVED BY K. N. MURTHY

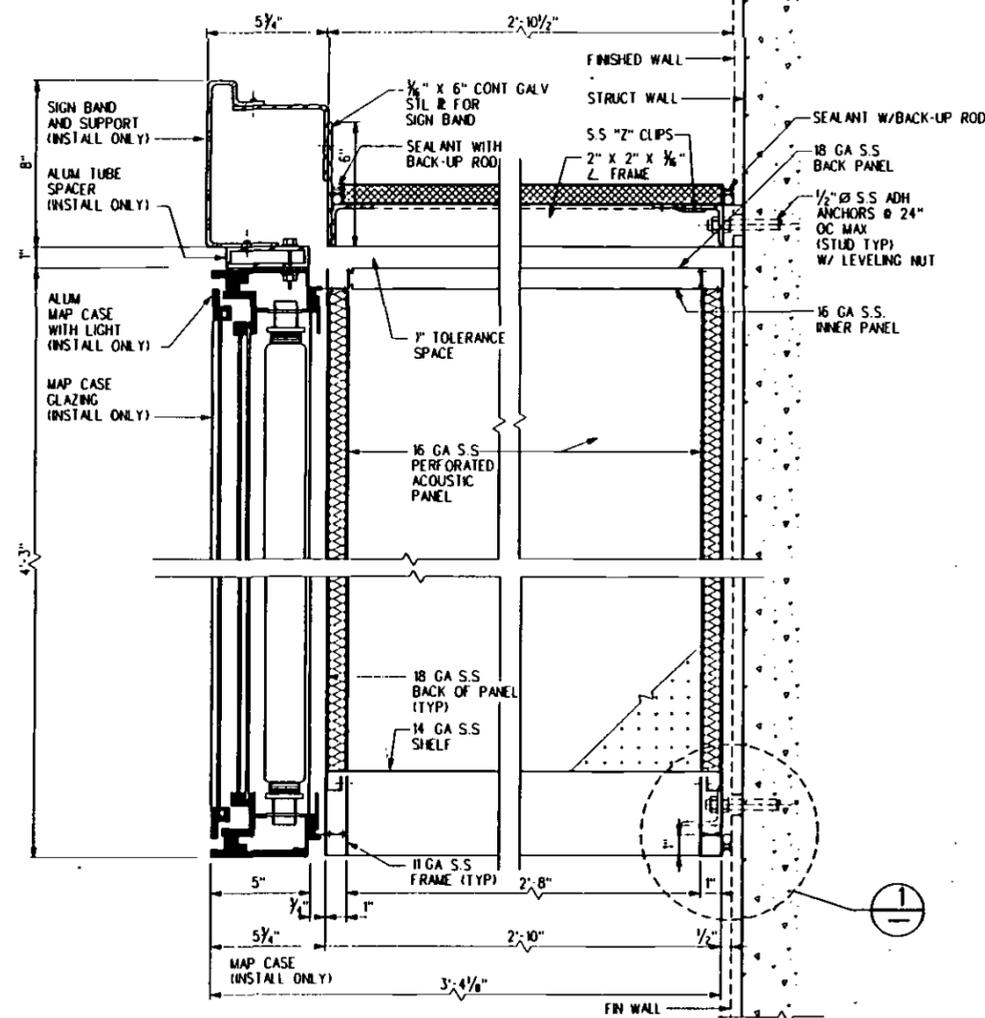
ARCHITECTURAL STANDARD

HYDRAULIC ELEVATOR HOISTWAY DETAILS

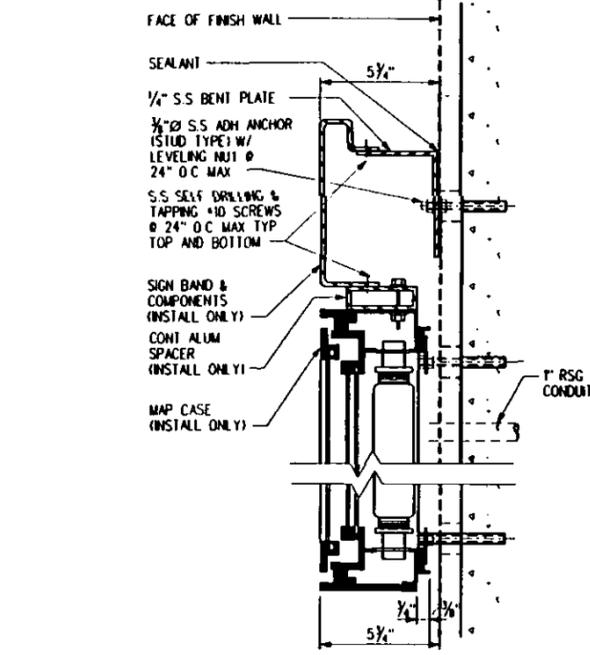
SHEET 3 OF 3

CONTRACT NO. AS-012

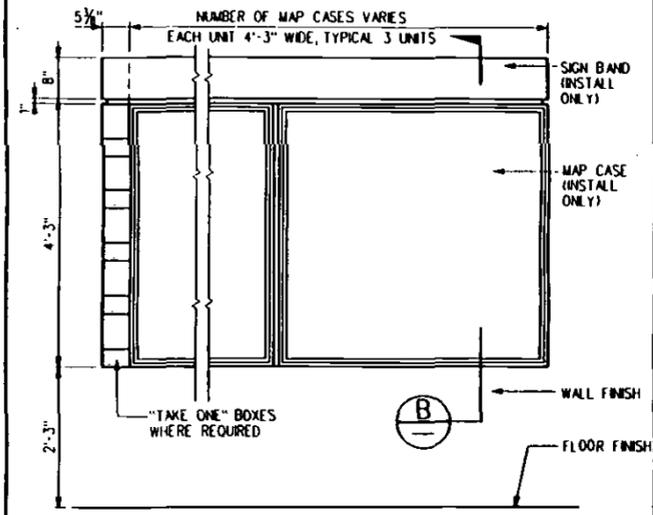
SCALE 3"=1'-0"



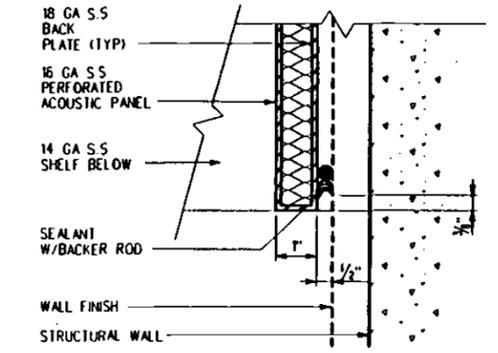
SECTION THRU PHONE BOOTH/
MAP CASE ASSEMBLY
3" - 1'-0" (C) AS-014



WALL HUNG MAP CASE-SECTION (B) AS-014
3" - 1'-0"



WALL HUNG
MAP CASE - ELEVATION (A) AS-014
1/2" - 1'-0"

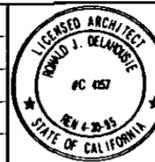


TELEPHONE BOOTH
@ WALL FINISH (I) AS-014
HALF FULL SIZE

REV	DATE	BY	CHK	APP	DESCRIPTION
0	2.21.94	C. J. [Signature]			REVISED & REDRAWN PER DE 306-SBCH-11-00 BASELINE ISSUE

DESIGNED BY
J. HEGEDE
DRAWN BY
F. PANLILIO
CHECKED BY
I. ROQUE
IN CHARGE
R. DELAHOUSIE
DATE
21 FEB 94

REVISIONS



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

ENGINEERING MANAGEMENT CONSULTANT

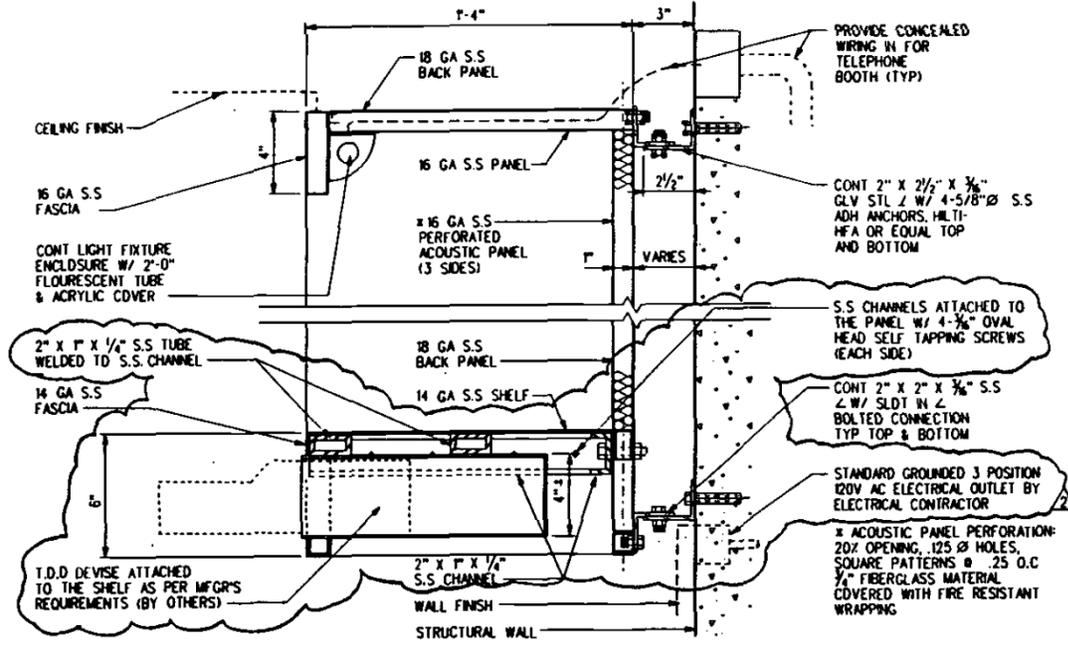
Submitted: [Signature]

Approved: [Signature]

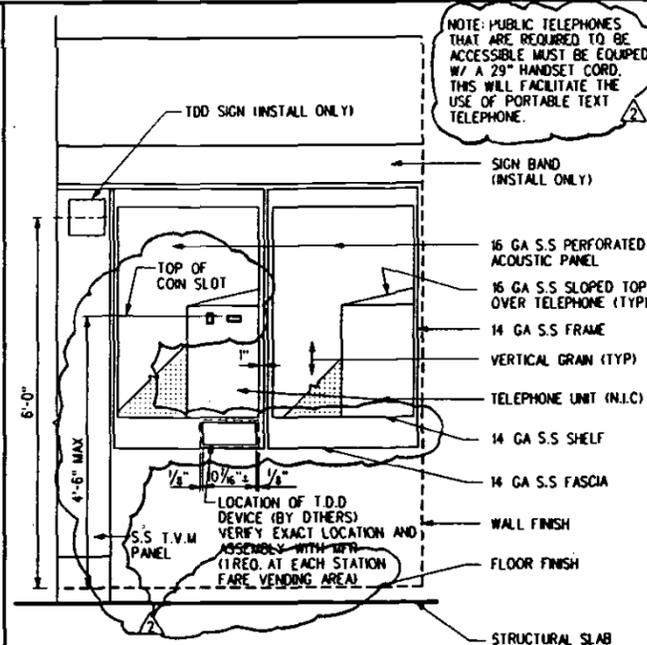
ARCHITECTURAL STANDARD

PHONE BOOTH/MAP CASE DETAILS
SHEET 2 OF 2

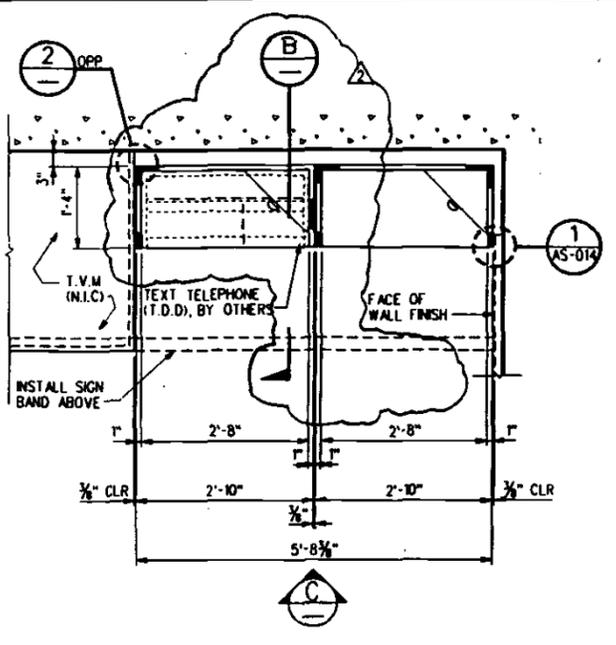
CONTRACT NO.	
DRAWING NO.	AS-014
REV.	1
SCALE	AS NOTED
SHEET NO.	



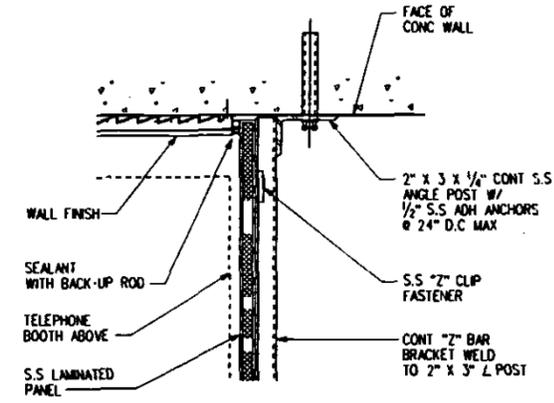
SECTION THRU PUBLIC TELEPHONE BOOTH (D) AS-015
3'-1'-0"



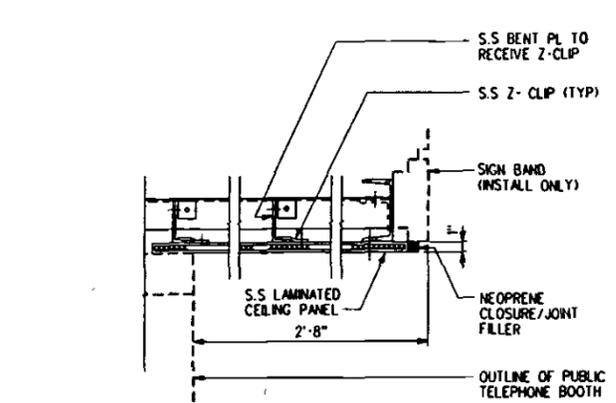
PUBLIC TELEPHONE BOOTH ELEVATION (C) AS-015
3/4" - 1'-0"



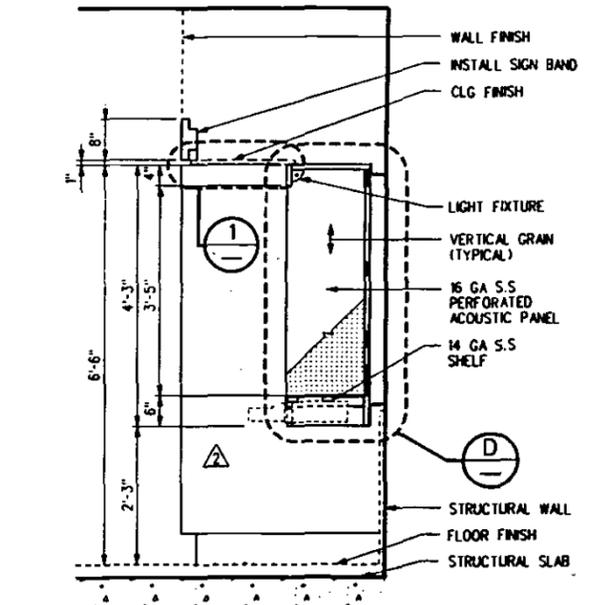
PUBLIC TELEPHONE BOOTH PLAN (A) AS-015
3/4" - 1'-0"



WALL DETAIL TELEPHONE BOOTH (2) AS-015
3'-1'-0"



DETAIL THRU TELEPHONE BOOTH SOFFIT (1) AS-015
1/2" - 1'-0"



TELEPHONE BOOTH SECTION (B) AS-015
3/4" - 1'-0"

CHRIS HLAVINKA FOR REVISION NO.2, DE.306-SBCH-28.00, LIC. NO. C20377 EXP 12/31/97

REV	DATE	BY	SUB	APP	DESCRIPTION
0	2.21.94				BASELINE ISSUE
1	9.19.94	CY	RJD	GMC	REVISED & REDRAWN PER DE.306-SBCH-11.00
2	8/11/97				REVISED PER DE.306-SBCH-28.00

DESIGNED BY J. HEGEDE
 DRAWN BY F. PANILIO
 CHECKED BY I. ROQUE
 IN CHARGE R. DELAHOUSIE
 DATE 21 FEB 94

A SIGNED & SEALED ORIGINAL OF REV 0 OF THIS DRAWING IS MAINTAINED BY MTA

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

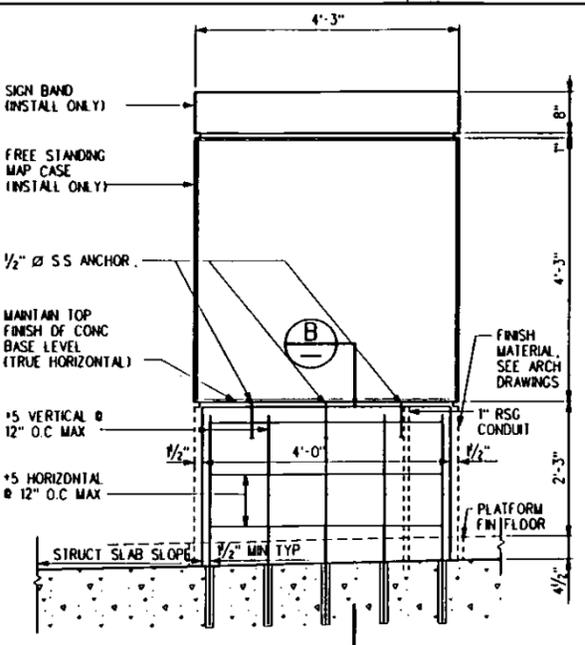
ENGINEERING MANAGEMENT CONSULTANT

SUBMITTED R. J. DELAHOUSIE
 APPROVED K. N. MURTHY

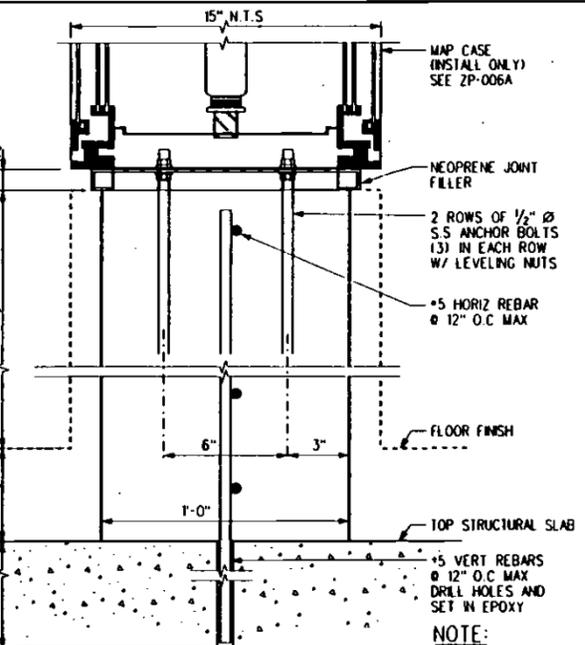
ARCHITECTURAL STANDARD
 PUBLIC TELEPHONE

CONTRACT NO.	
DRAWING NO.	AS-015
REV	2
SCALE	AS NOTED
SHEET NO.	

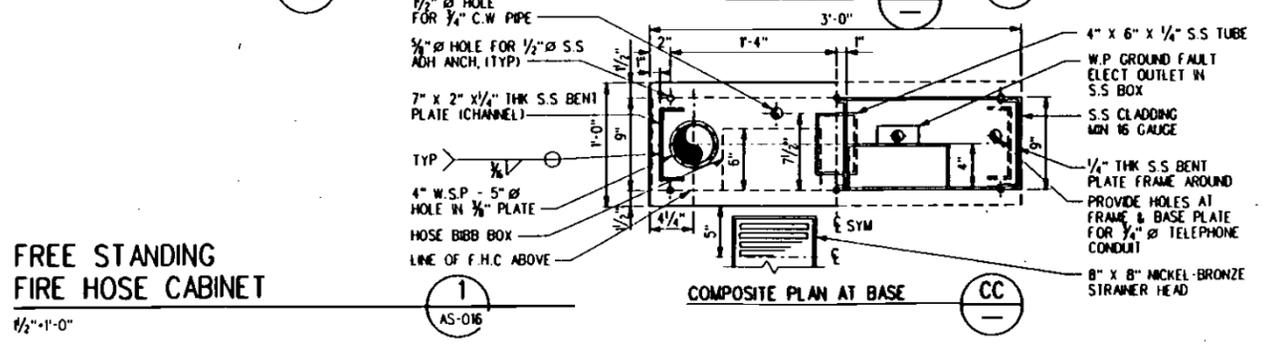
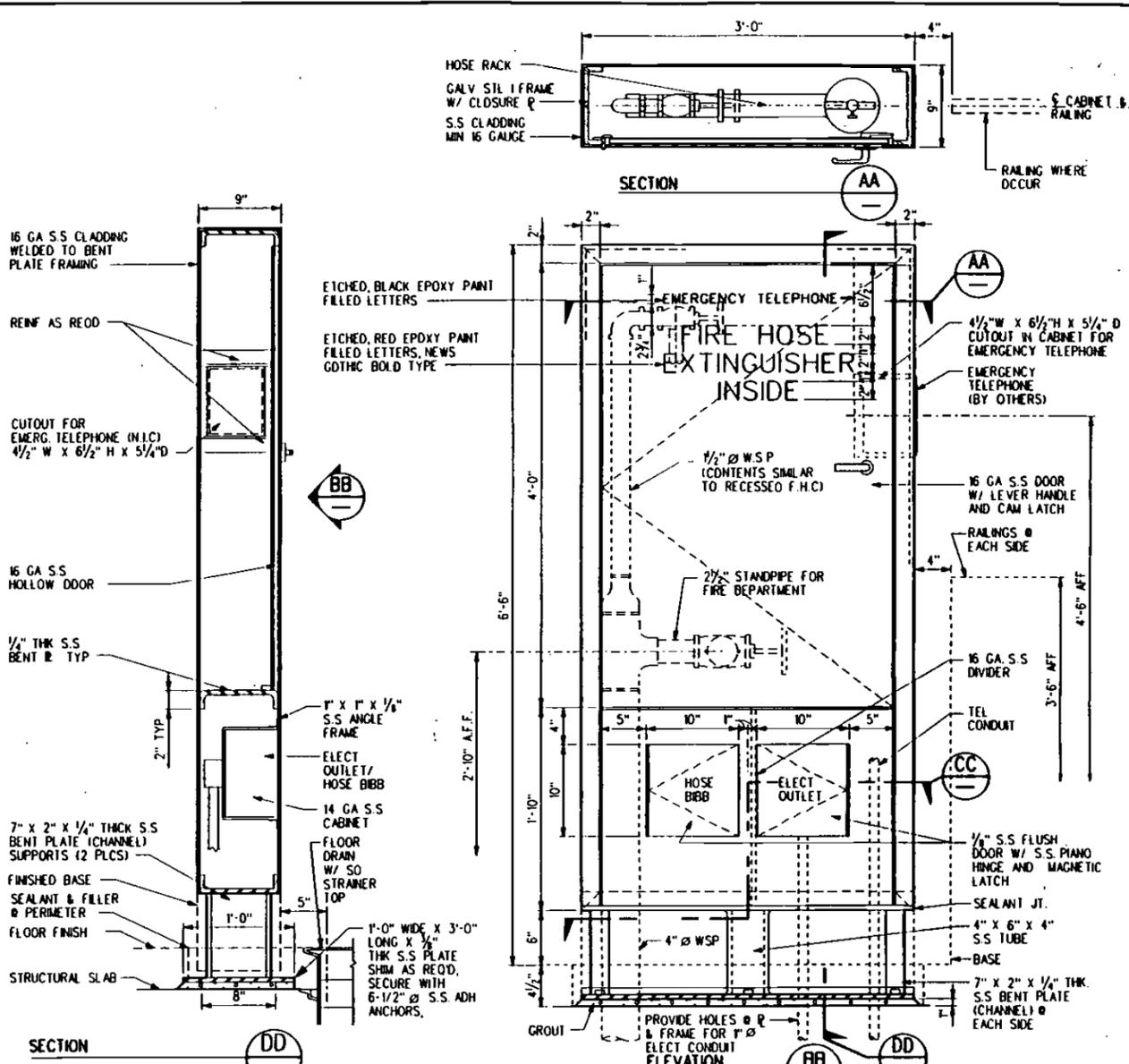
PLOTTED BY: app-04



SECTION THRU FREE STANDING MAP CASE - CONC BASE
1/4" x 1'-0"
AS-016



SECTION THRU FREE STANDING MAP CASE BASE
3" x 1'-0"
AS-016



FREE STANDING FIRE HOSE CABINET
1/2" x 1'-0"
AS-016

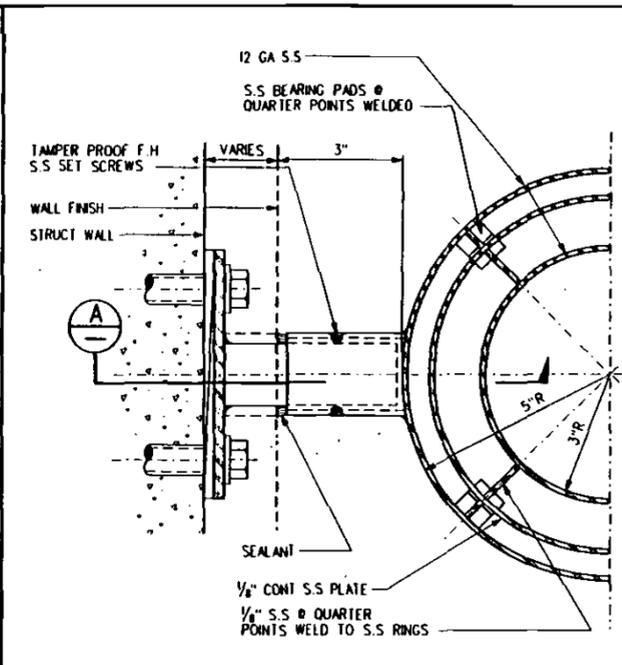
REV	DATE	BY	APP	DESCRIPTION
0	2/21/94	J. Hege		REVIS & REDRAWN PER DE306-SBCN-1100
1	2/21/94	R. Delahousie		BASELINE ISSUE

DESIGNED BY
J. HEGEDE
DRAWN BY
F. PANILILIO
CHECKED BY
I. ROQUE
IN CHARGE
R. DELAHOUSIE
DATE
21 FEB 94

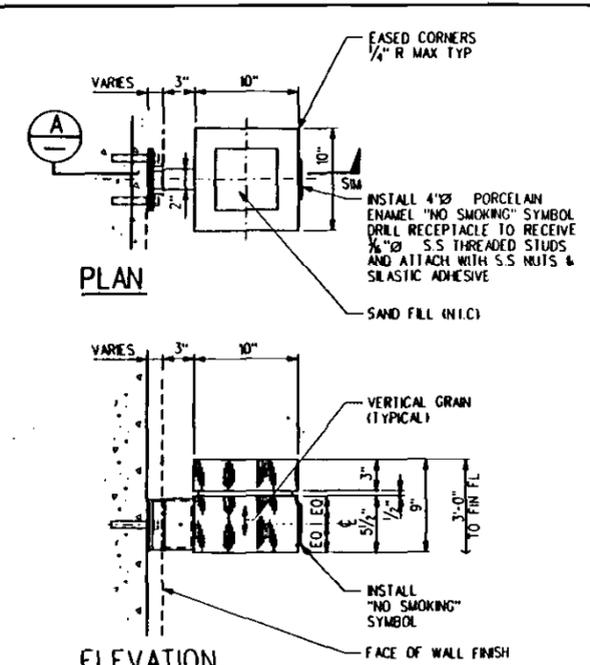


LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
ENGINEERING MANAGEMENT CONSULTANT
Submitted: [Signature]
Approved: [Signature]

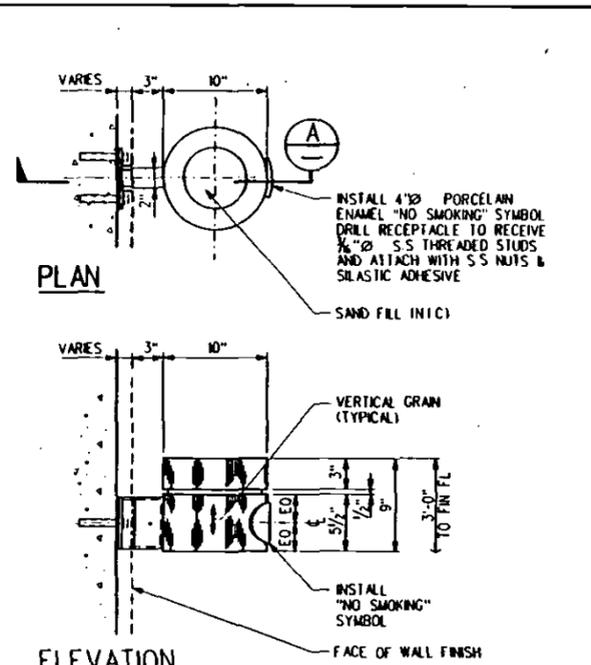
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FREE STANDING FIRE HOSE CABINET AND MAP CASE
CONTRACT NO.
DRAWING NO. AS-016
SCALE AS NOTED
SHEET NO.



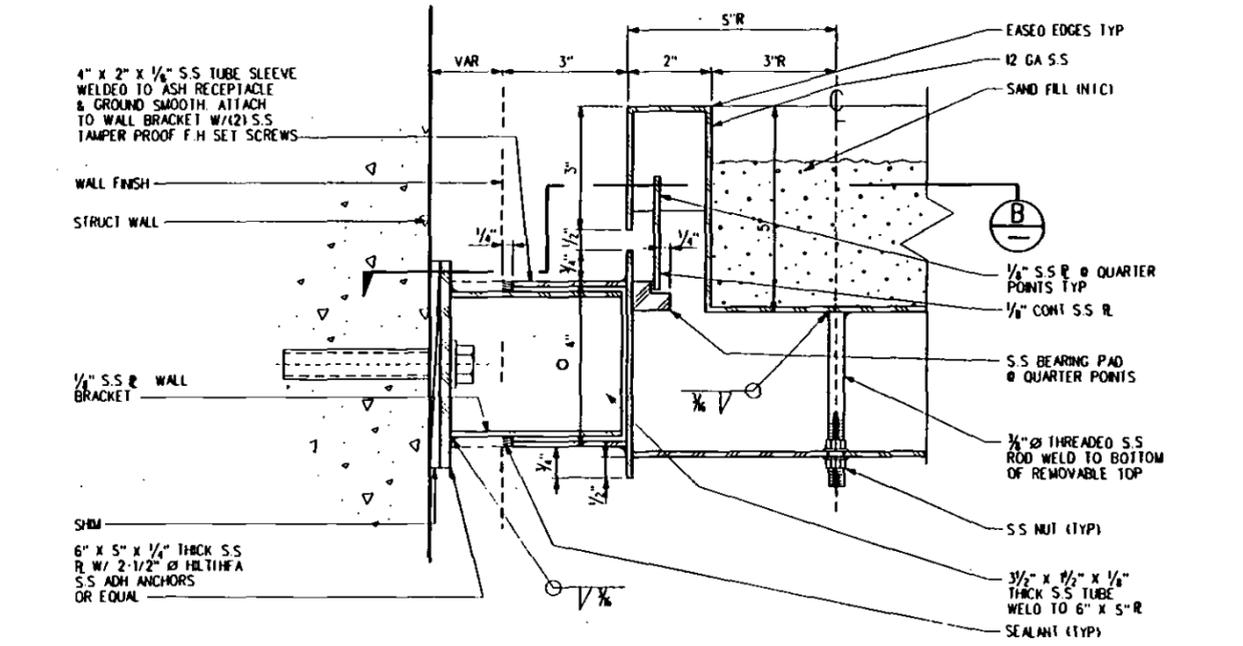
ROUND ASH RECEPTACLE (SQUARE SIMILAR)
 HALF FULL SIZE
 (B) AS-019



SQUARE ASH RECEPTACLE
 1/2" x 1'-0"
 (2) AS-019



ROUND ASH RECEPTACLE
 1/2" x 1'-0"
 (1) AS-019



ROUND ASH RECEPTACLE (SQUARE SIMILAR)
 HALF FULL SIZE
 (A) AS-019

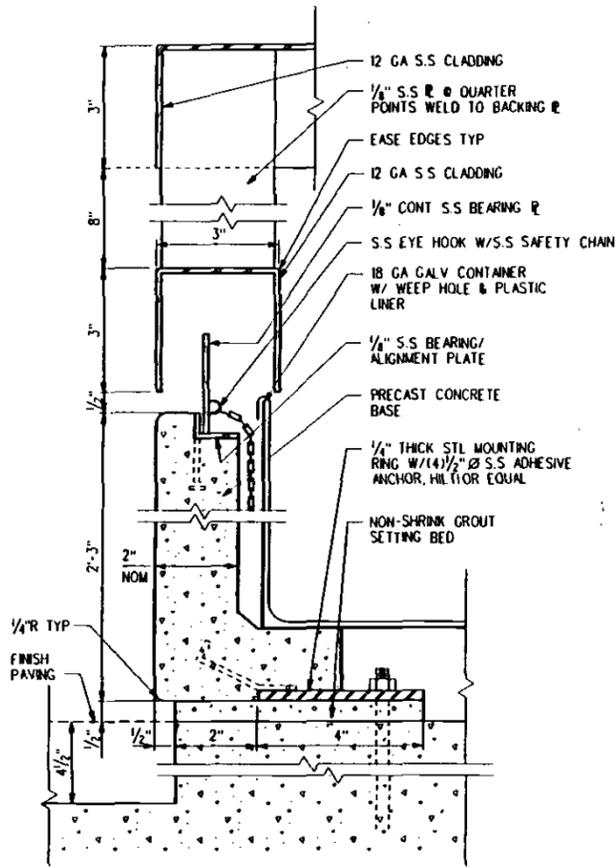
REV	DATE	BY	SUB	APP	DESCRIPTION
2	2194				REVISED & REDRAWN PER DE 306-SBCH-11 00 BASELINE ISSUE

DESIGNED BY
J. HEGEDE
 DRAWN BY
F. PANILLO
 CHECKED BY
I. ROQUE
 IN CHARGE
R. DELAHOUSE
 DATE
21 FEB 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
 ENGINEERING MANAGEMENT CONSULTANT
 SUBMITTED: *[Signature]*
 APPROVED: *[Signature]*

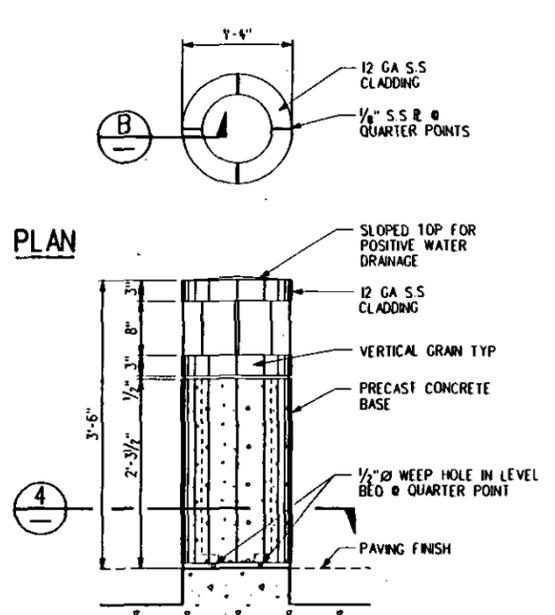
CONTRACT NO.	
DRAWING NO.	REV
AS-019	1
SCALE	
AS NOTED	
SHEET NO.	



PRECAST TRASH RECEPTACLE SECTION

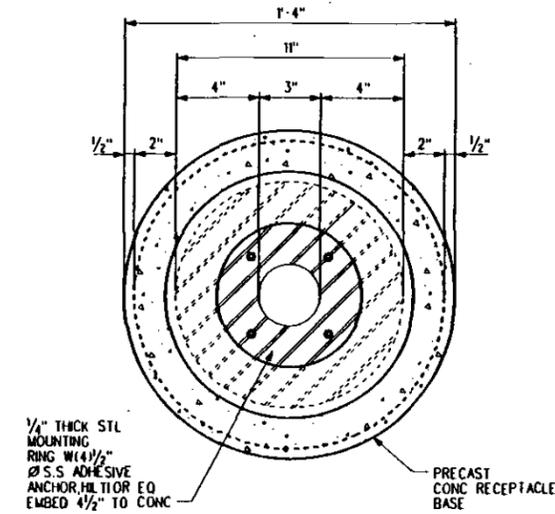
HALF FULL SIZE

B
AS-020



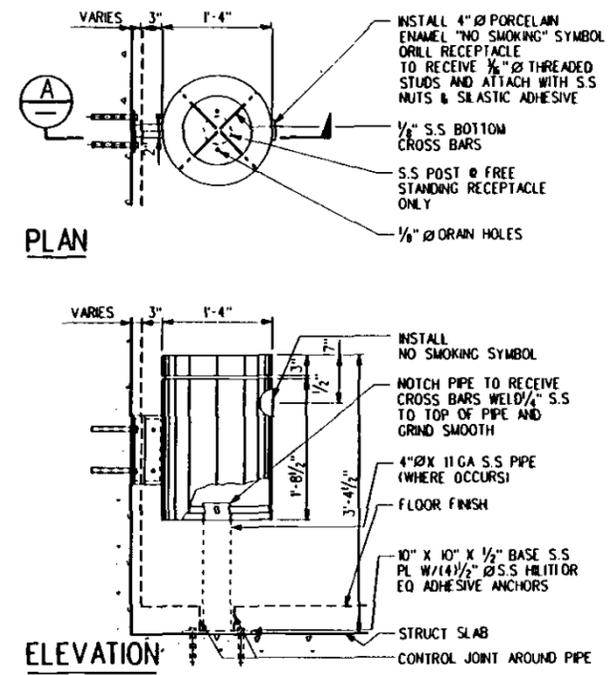
ELEVATION PLAZA TRASH RECEPTACLE

1'-1'-0" **3** AS-020



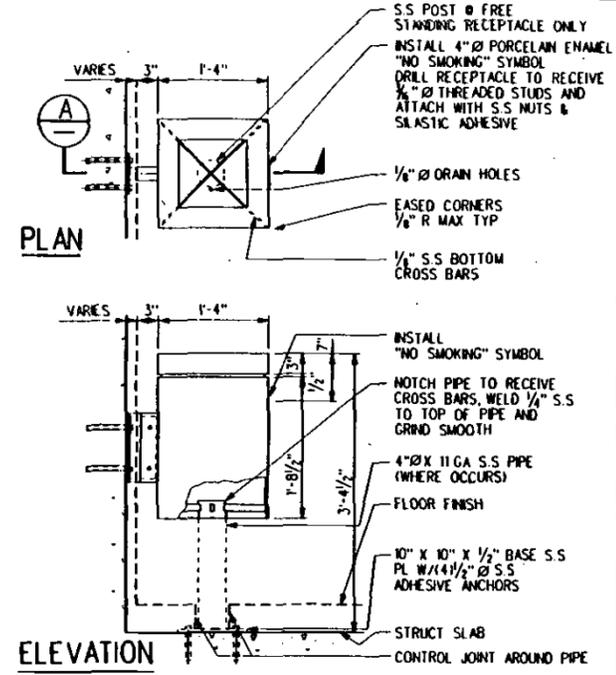
PLAZA RECEPTACLE SECTION

3'-1'-0" **4** AS-020



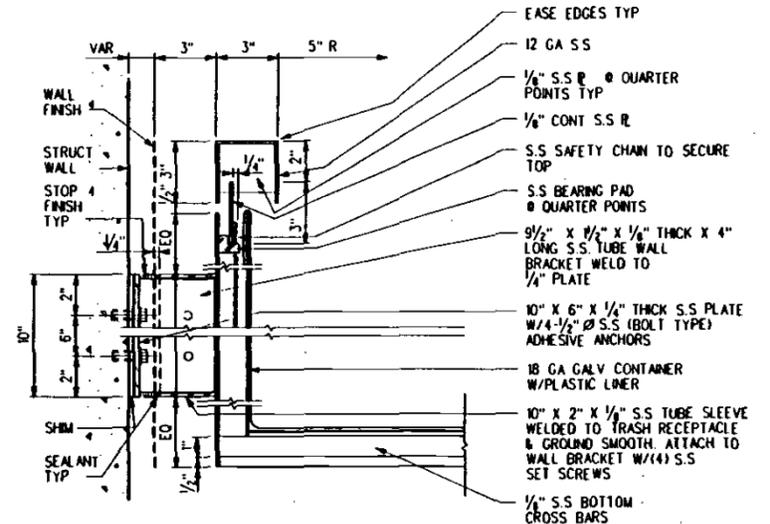
ELEVATION ROUND TRASH RECEPTACLE

1'-1'-0" **2** AS-020



ELEVATION SQUARE TRASH RECEPTACLE

1'-1'-0" **1** AS-020

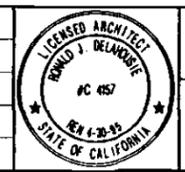


TRASH RECEPTACLE SECTION

3'-1'-0" **A** AS-020

REV	DATE	BY	APP	DESCRIPTION
0	2/21/94	J. Hegede		BASELINE ISSUE
1	9/19/94	R. Delahousie		REVISED & REDRAWN PER DE 306-SBCH-11-00

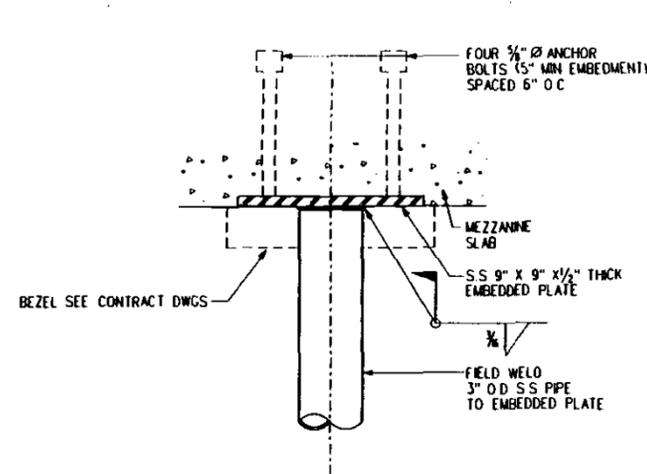
DESIGNED BY
J. HEGEDE
DRAWN BY
F. PANLILIO
CHECKED BY
I. ROQUE
IN CHARGE
R. DELAHOUSIE
DATE
21 FEB 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
ENGINEERING MANAGEMENT CONSULTANT
SUBMITTED: *[Signature]*
APPROVED: *[Signature]*

ARCHITECTURAL STANDARD TRASH RECEPTACLE DETAILS

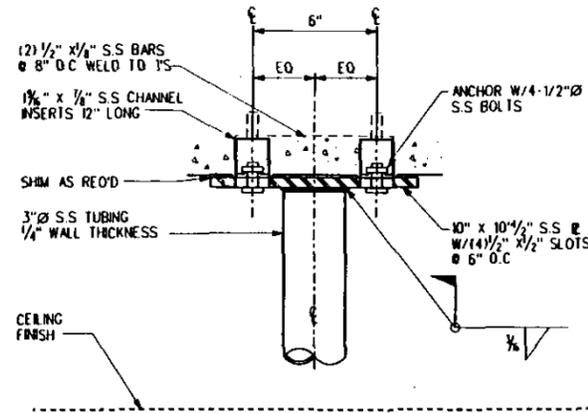
CONTRACT NO.	
DRAWING NO.	AS-020
REV	1
SCALE	AS NOTED
SHEET NO.	



EDGE LIGHT PENDANT MOUNTING
DETAIL AT EXPOSED CONCRETE

3'-1'-0"

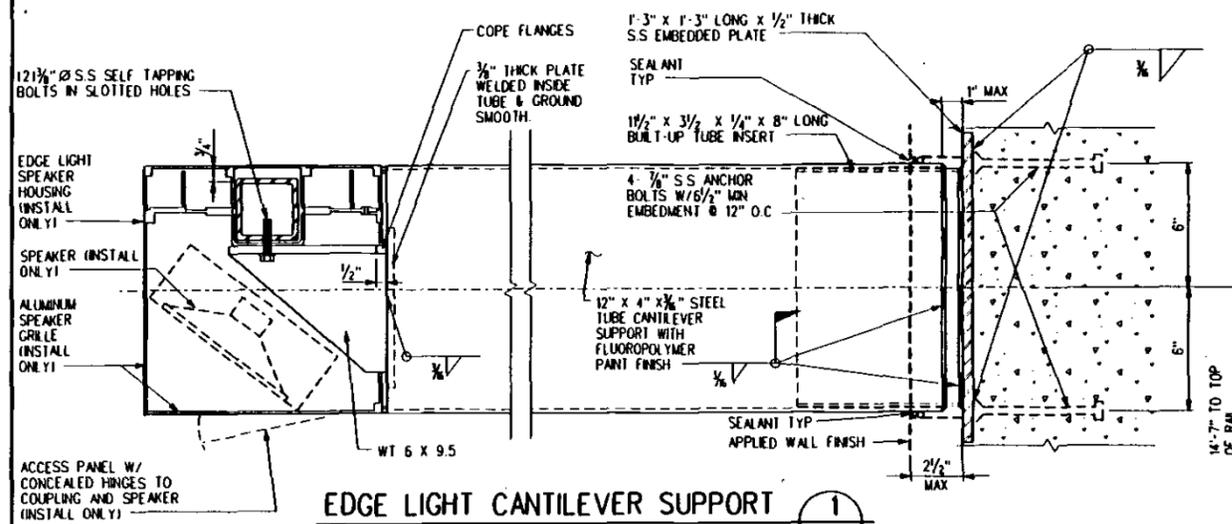
5
AS-021



EDGE LIGHT PENDANT MOUNTING DETAIL

3'-1'-0"

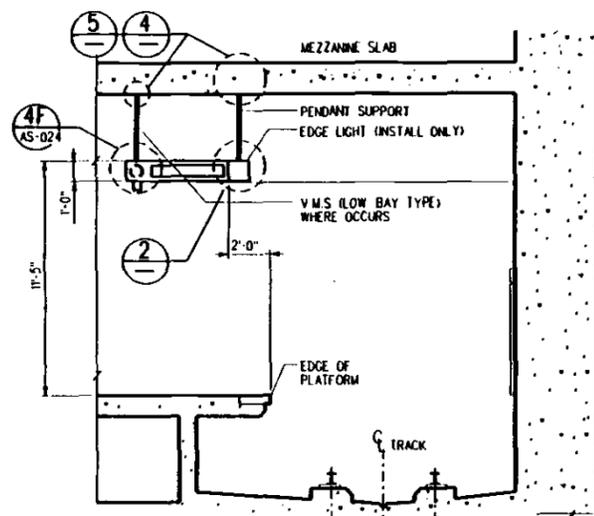
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AS-021



EDGE LIGHT CANTILEVER SUPPORT

3'-1'-0"

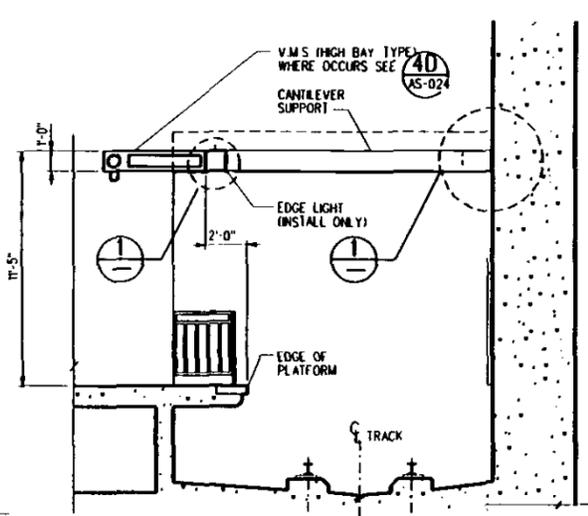
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AS-021



EDGE LIGHT LOCATION
SECTION - LOW BAY AREA

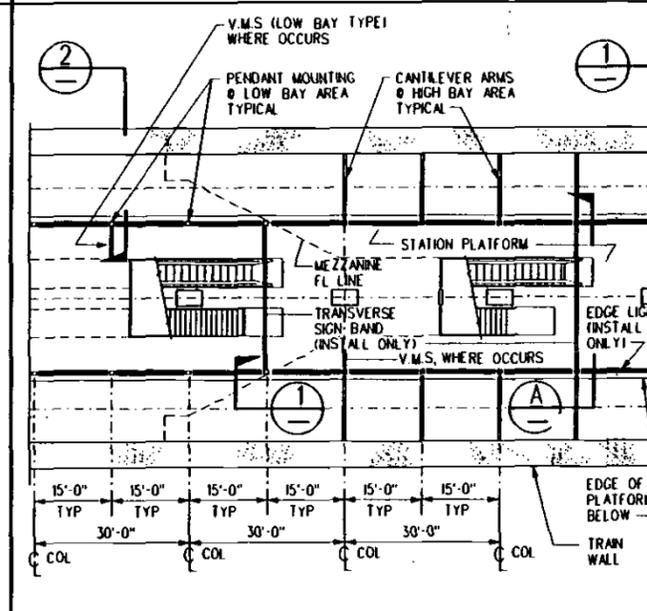
EDGE LIGHT

1/4"-1'-0"



EDGE LIGHT LOCATION
SECTION - HIGH BAY AREA

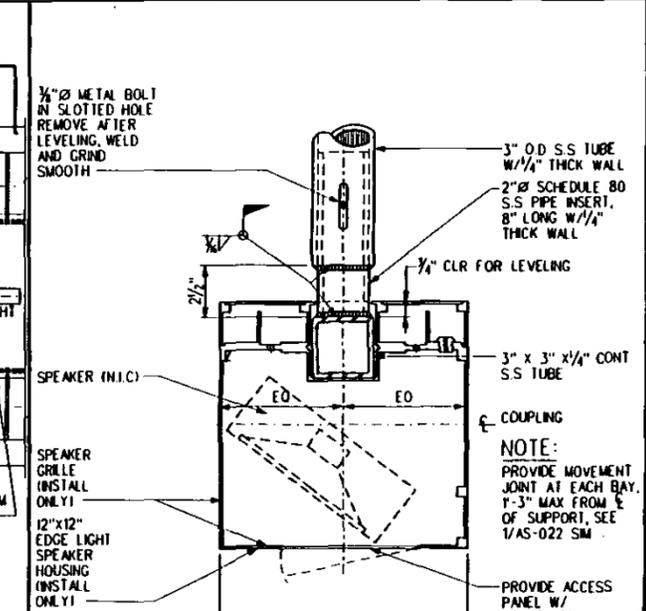
1/4"-1'-0"



PARTIAL MOUNTING PLAN
CENTER OR END PLATFORM

1/4"-1'-0"

3
AS-021



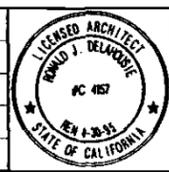
EDGE LIGHT PENDANT SUPPORT

3'-1'-0"

2
AS-021

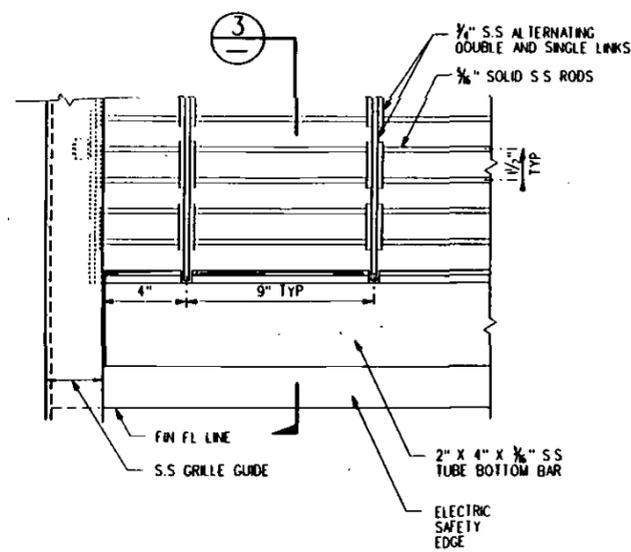
REV	DATE	BY	CHKD	APPV	DESCRIPTION
0	2.21.94				BASELINE ISSUE
1	9.19.94				REVISED & REDRAWN PER DE 306-SRON-1100

DESIGNED BY
J. HEGEDE
DRAWN BY
F. PANILLO
CHECKED BY
I. ROQUE
IN CHARGE
R. OELAHOUSIE
DATE
21 FEB 94

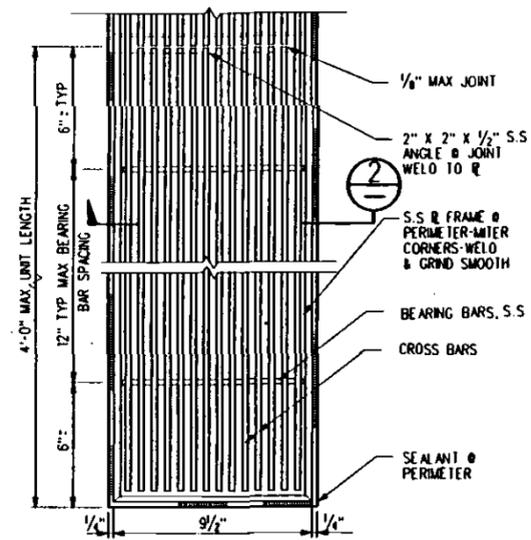


LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
ENGINEERING MANAGEMENT CONSULTANT
SUBMITTED: [Signature]
APPROVED: [Signature]

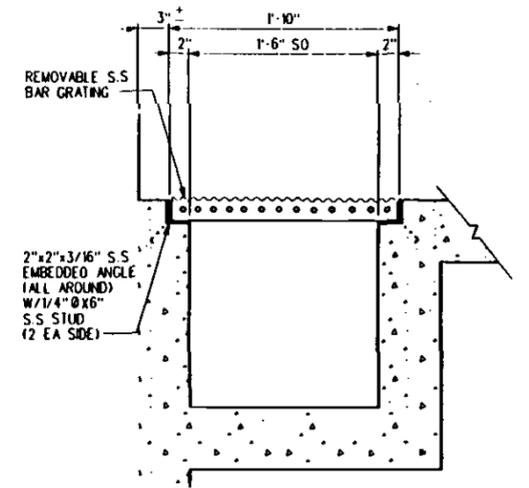
ARCHITECTURAL STANDARD
EDGE LIGHT SUPPORT DETAILS
CONTRACT NO.
DRAWING NO. AS-021
SCALE AS NOTED
REV 1



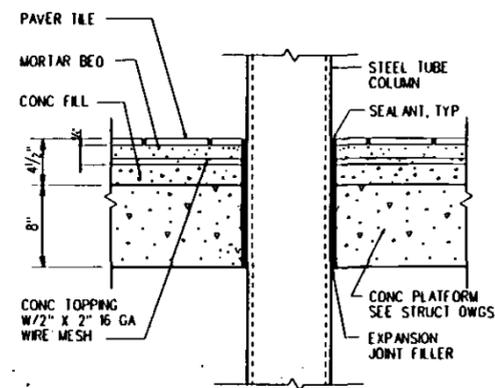
GRILLE ELEVATION B
3'-1'-0" AS-023



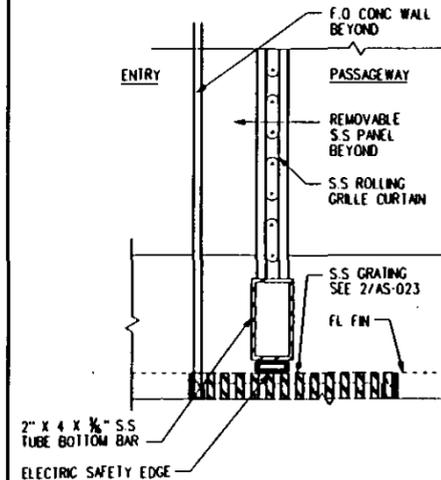
PLAN - TRENCH DRAIN GRATING A
3'-1'-0" AS-023



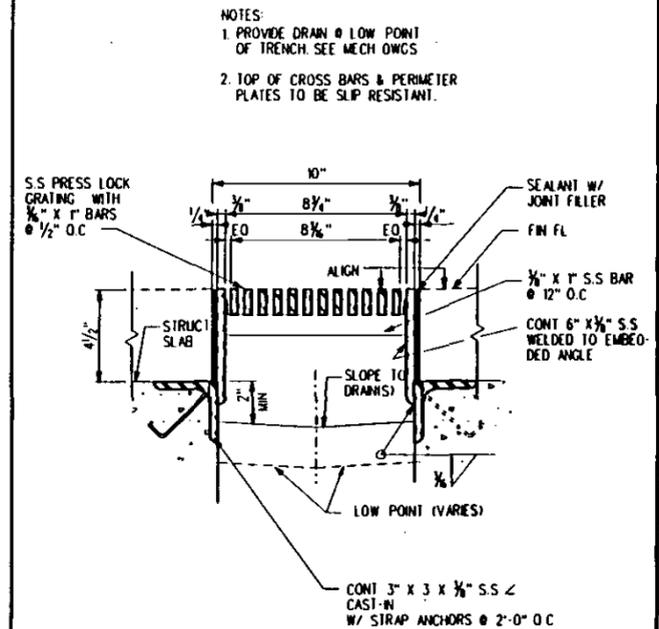
SUMP PIT GRATING 1
1/2'-1'-0" AS-023



PAVER TILE AT COLUMN 4
1/2'-1'-0" AS-023



BOTTOM OF GRILLE 3
3'-1'-0" AS-023

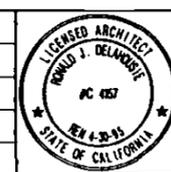


TRENCH DRAIN GRATING DETAIL 2
3'-1'-0" AS-023

NOTES:
1. PROVIDE DRAIN @ LOW POINT OF TRENCH. SEE MECH OWGS.
2. TOP OF CROSS BARS & PERIMETER PLATES TO BE SLIP RESISTANT.

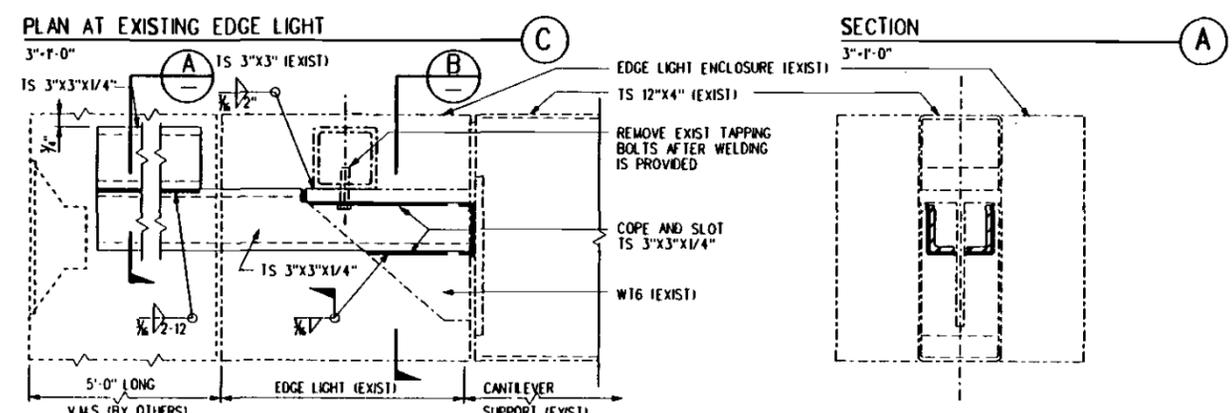
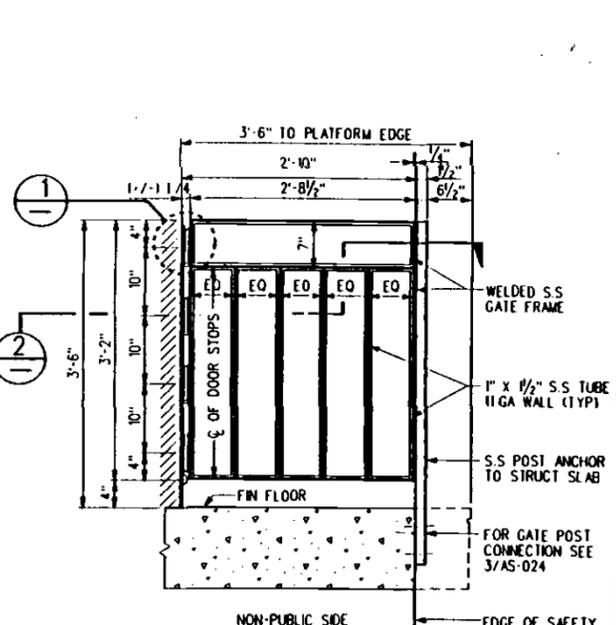
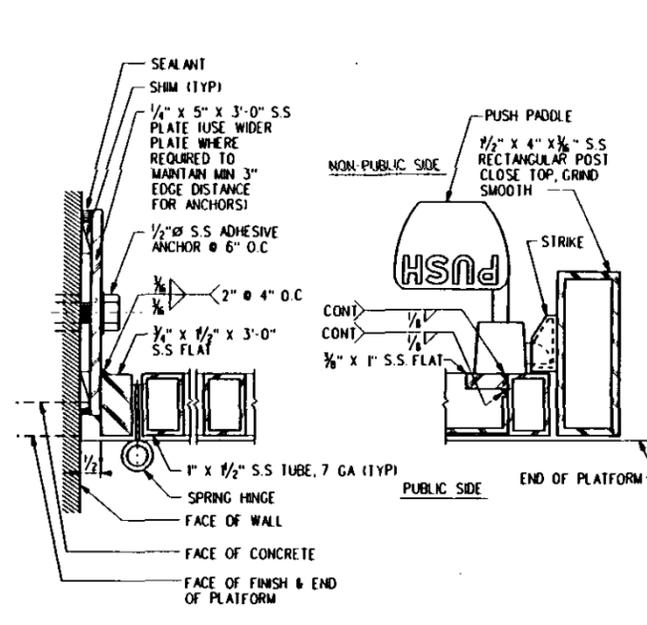
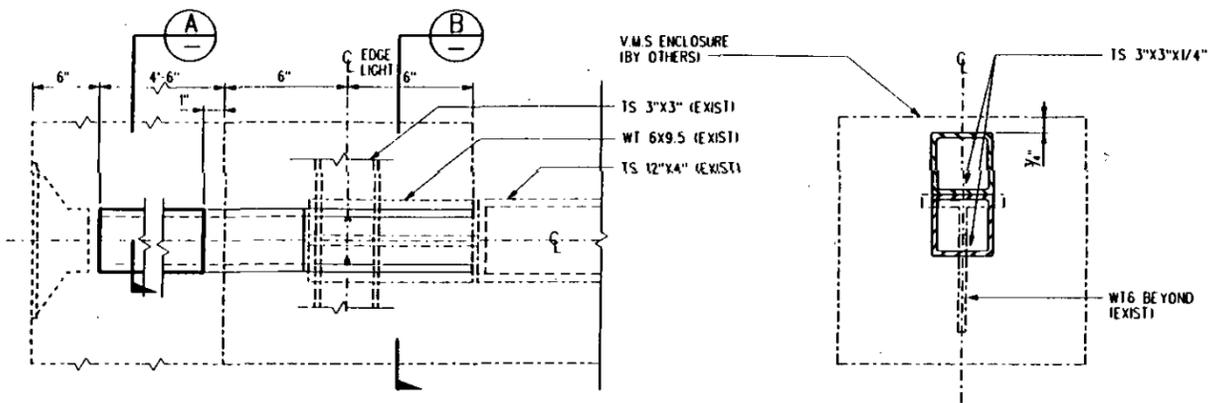
REV	DATE	BY	CHK	APP	DESCRIPTION
0	2/21/94				BASELINE ISSUE
1	9/19/94				REVISED & REDRAWN PER DE 306-SBCH-1100

DESIGNED BY
J. HEGEDE
DRAWN BY
F. PANILLO
CHECKED BY
I. ROQUE
IN CHARGE
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DATE
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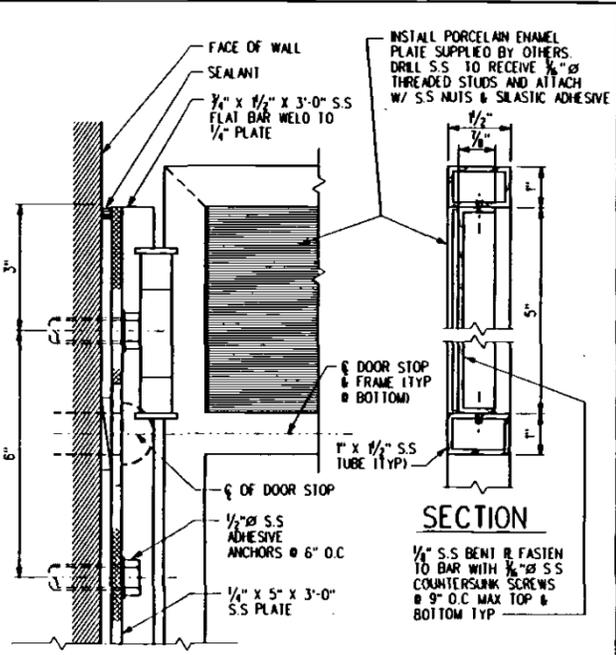
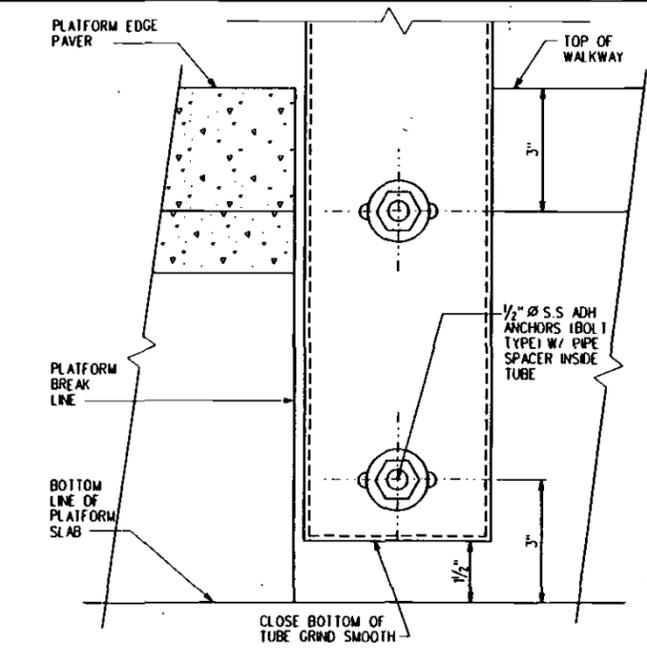
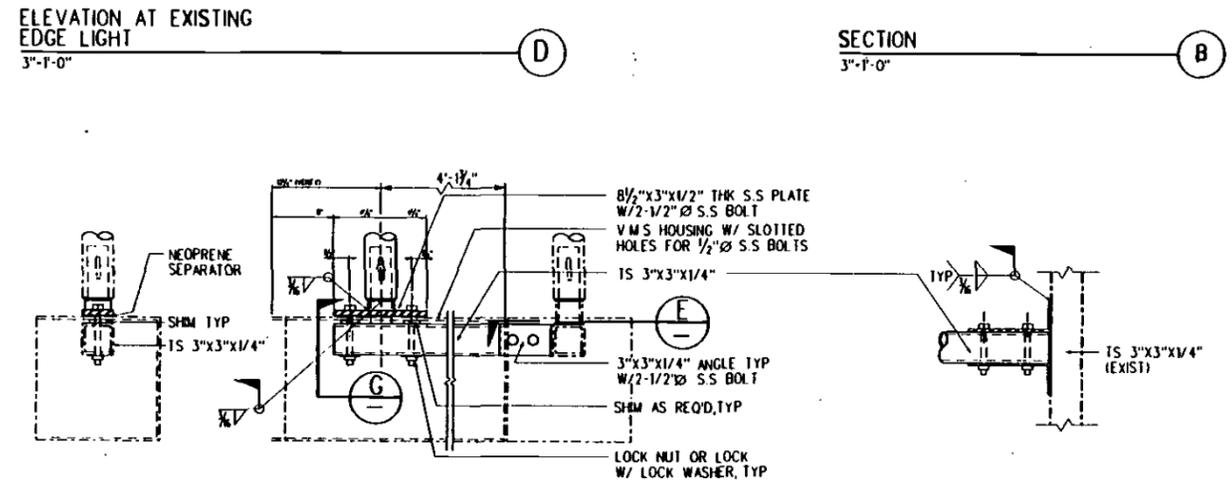
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
ENGINEERING MANAGEMENT CONSULTANT
SUBMITTED: *[Signature]*
APPROVED: *[Signature]*

ARCHITECTURAL STANDARD
GRATINGS DETAILS
CONTRACT NO.
DRAWING NO. **AS-023** REV **1**
SCALE **AS NOTED**
SHEET NO.



GATE HINGE & POST SECTION
 HALF FULL SIZE
 AS-024

GATE ELEVATION
 1\"/>



V.M.S. SUPPORT DETAILS
 AS NOTED

GATE POST CONNECTION
 HALF FULL SIZE
 AS-024

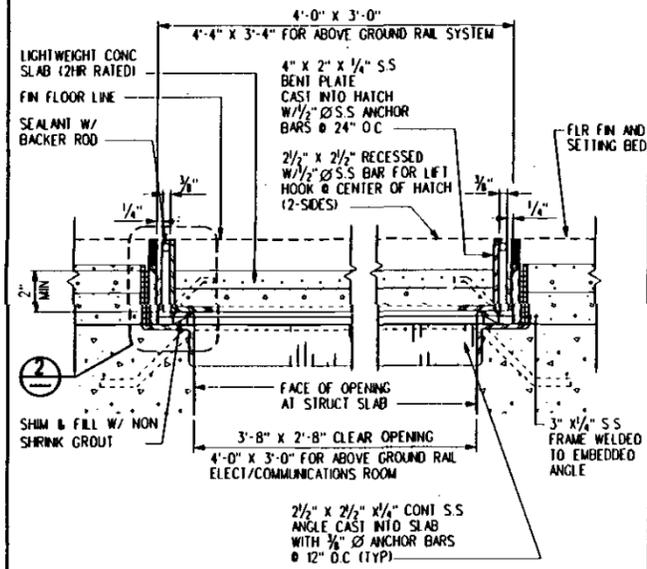
GATE HINGE DETAIL
 HALF FULL SIZE
 AS-024

REV	DATE	BY	CHKD	APP	DESCRIPTION
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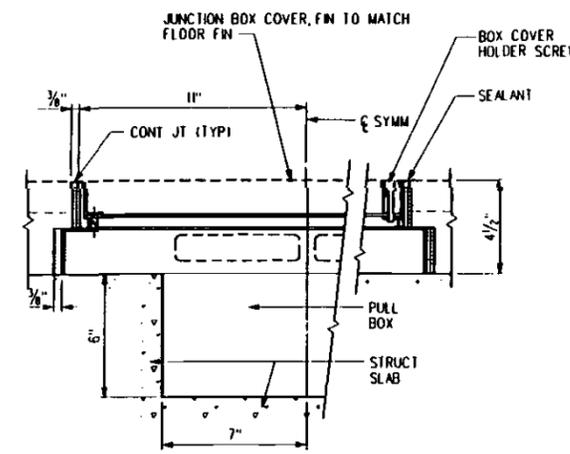
DESIGNED BY
J. HEGEDE
 DRAWN BY
F. PANILLO
 CHECKED BY
I. ROQUE
 IN CHARGE
R. DELAHOUSIE
 DATE
21 FEB 94

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
 ENGINEERING MANAGEMENT CONSULTANT
 SUBMITTED: *[Signature]*
 APPROVED: *[Signature]*

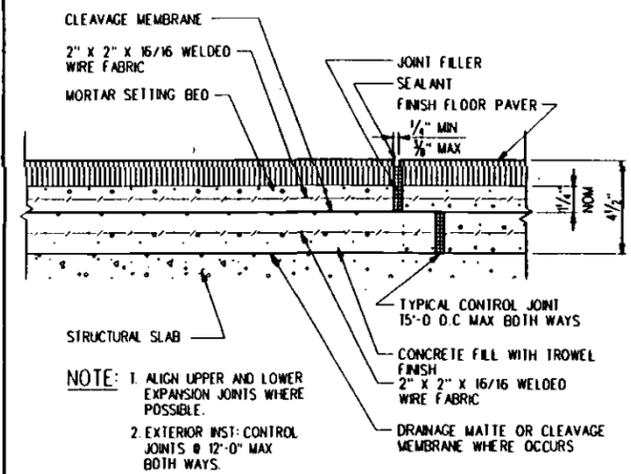
ARCHITECTURAL STANDARD
PLATFORM END GATE AND V.M.S. SUPPORT DETAILS
 CONTRACT NO. _____
 DRAWING NO. **AS-024** REV 1
 SCALE: **AS NOTED**
 SHEET NO. _____



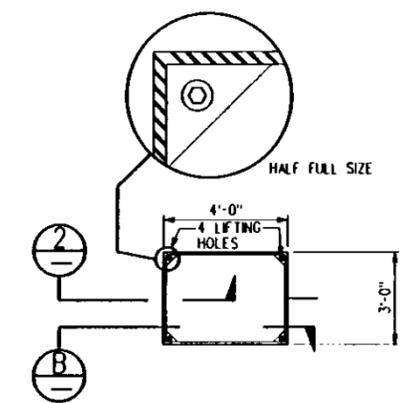
SECTION THRU ELECTRIC HANDHOLE ACCESS HATCH
3'-1'-0"
B AS-025



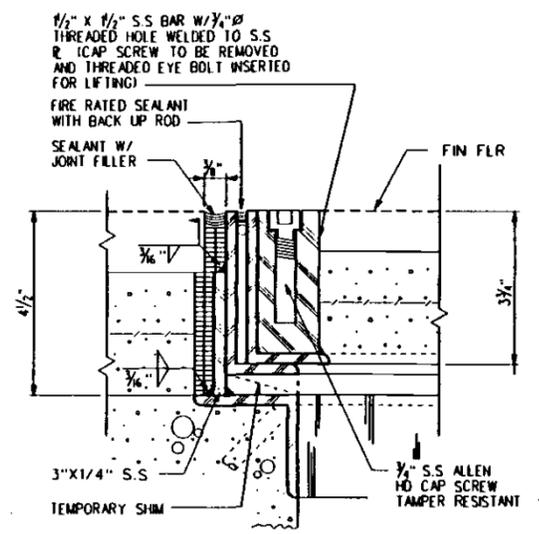
UNDER FLOOR DUCT JUNCTION BOX
3'-1'-0"
3 AS-025



FLOOR PAVING DETAIL
3'-1'-0"
1 AS-025



ELECTRIC HANDHOLE ACCESS HATCH PLAN
3/8"-1'-0"
A AS-025



SECTION AT LIFTING HOOK
HALF FULL SIZE
2 AS-025

REV	DATE	BY	SUB	APP	DESCRIPTION
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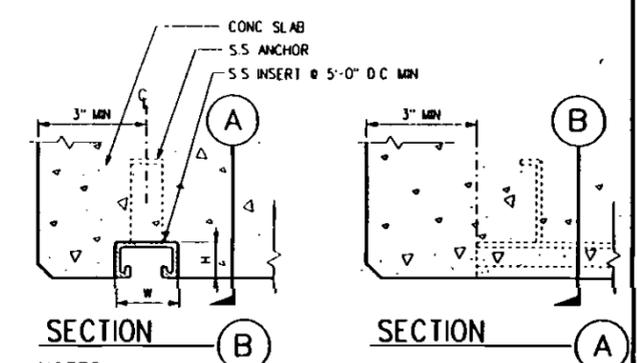
DESIGNED BY
J. HEGEDE
DRAWN BY
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R. DELAHOUSIE
DATE
21 FEB 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
ENGINEERING MANAGEMENT CONSULTANT
Submitted: *R. Delahousie*
Approved: *[Signature]*

ARCHITECTURAL STANDARD
FLOOR FINISH DETAILS

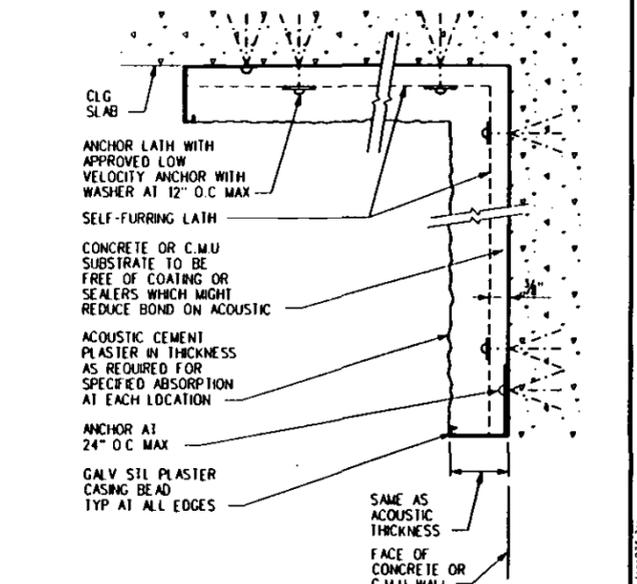
CONTRACT NO.	
DRAWING NO.	AS-025
REV.	1
SCALE	AS NOTED
SHEET NO.	



- NOTES:**
1. S.S CHANNEL INSERTS SHALL INCLUDE S.S CLOSURES, END CAPS AND ANCHORS.
 2. MINIMUM THICKNESS : 12 GA
 3. MANUFACTURER : UNISTRUT, HALFEN, B-LINE, OR APPROVED EQUAL.
 4. FOR INSERT SIZE AND LAYOUT SEE ARCHITECTURAL DRAWINGS.
 5. FOR BOTTOM REINFORCING BAR (REBAR) DIRECTION SEE STRUCTURAL DRAWINGS.

SIZE (SEE NOTE 4) WXH	MAX ALLOWABLE POINT LOAD IN LBS	MAX ALLOWABLE UNIFORM LOAD IN LBS/FT	LAYOUT, PARALLEL OR PERPENDICULAR TO BOTTOM REBAR
1 1/2" X 7/8"	1500	1500	EITHER WAY
1 1/2" X 1 1/2"	2000	2000	PARALLEL
1 1/2" X 7/8"	2300	4500	EITHER WAY

STAINLESS STEEL INSERT 1
NO SCALE AS-026



TYPICAL ACOUSTIC PLASTER SYSTEM 2
3"-1'-0" AS-026

REV.	DATE	BY	CHKD.	APP.	DESCRIPTION
0	2/21/94				BASELINE ISSUE
1	2/21/94				REVISED & REDRAWN PER DE 306-SBCN-1100

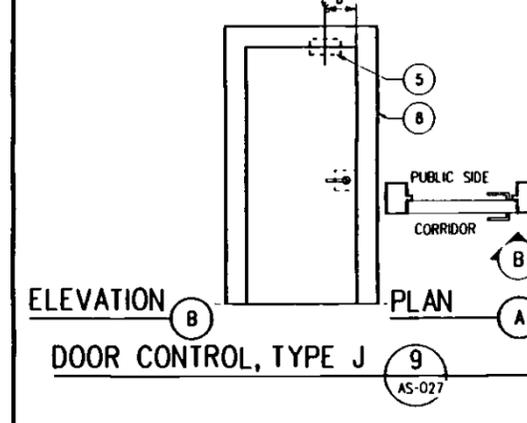
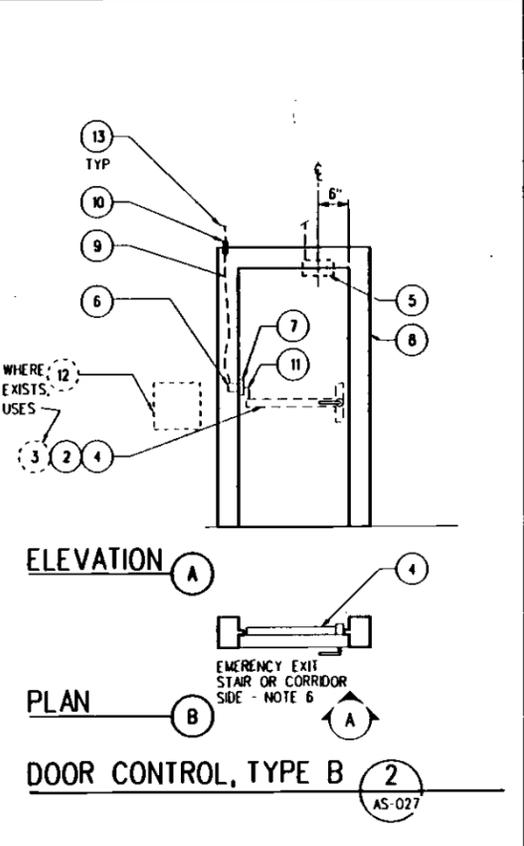
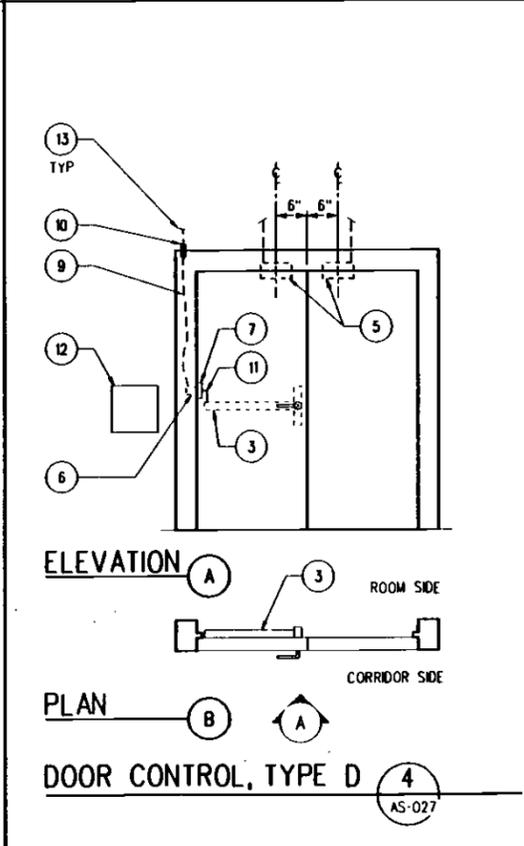
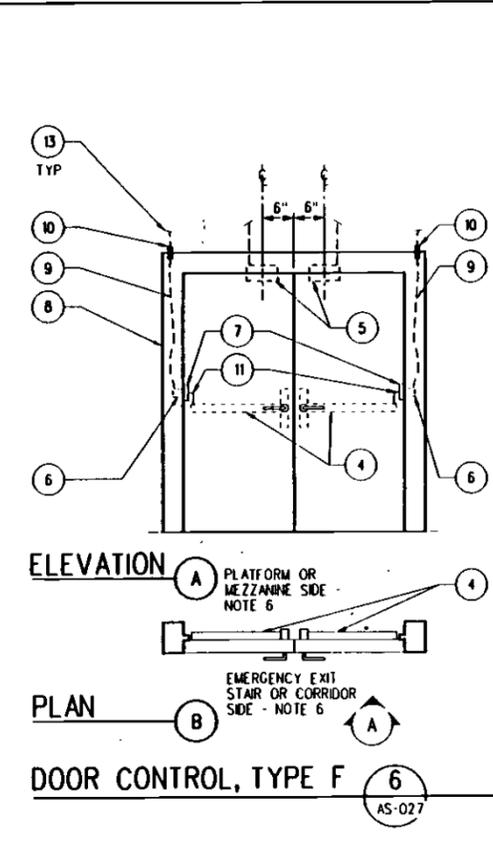
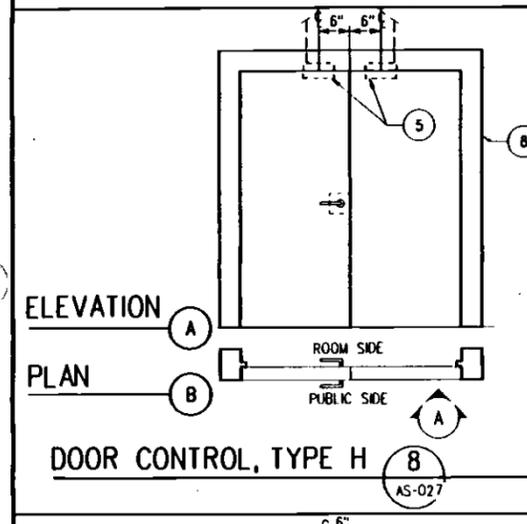
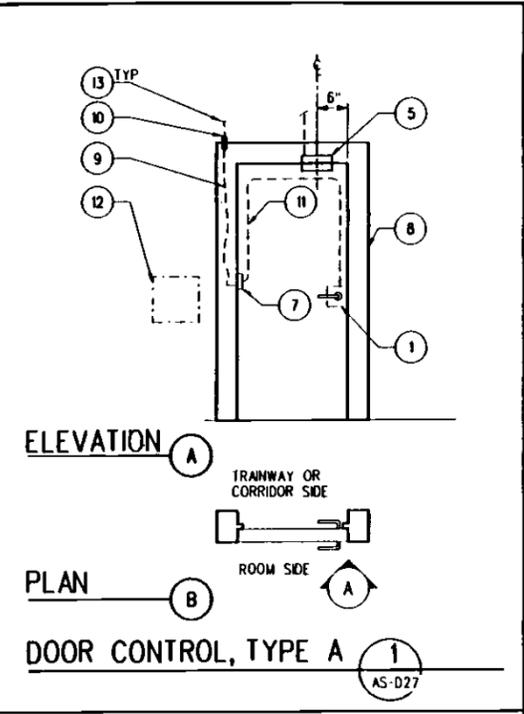
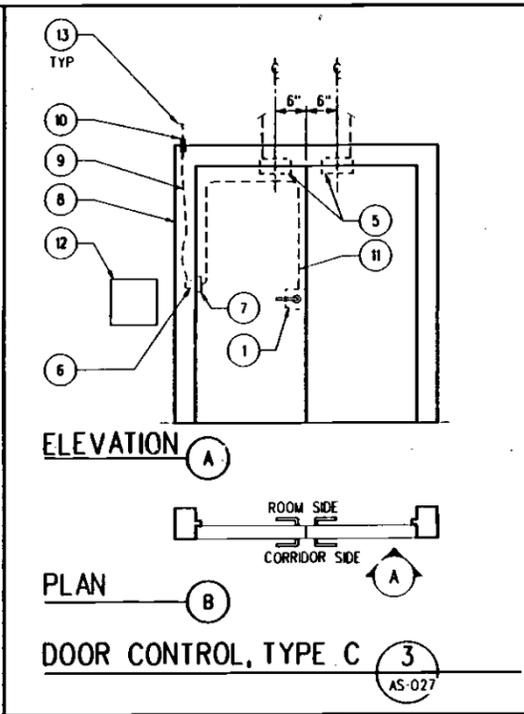
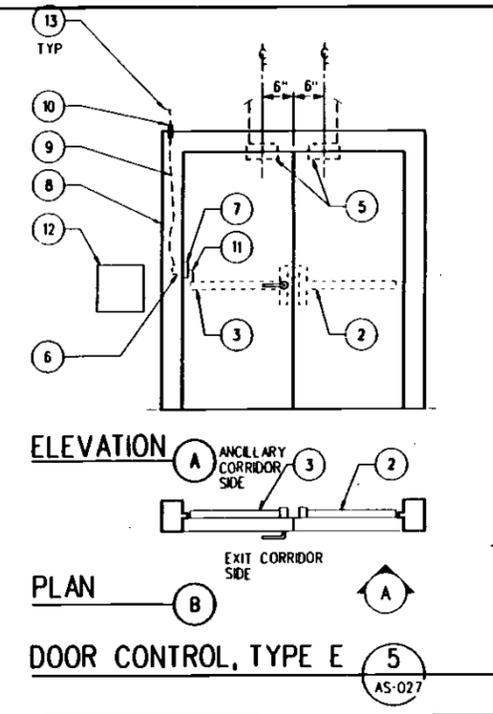
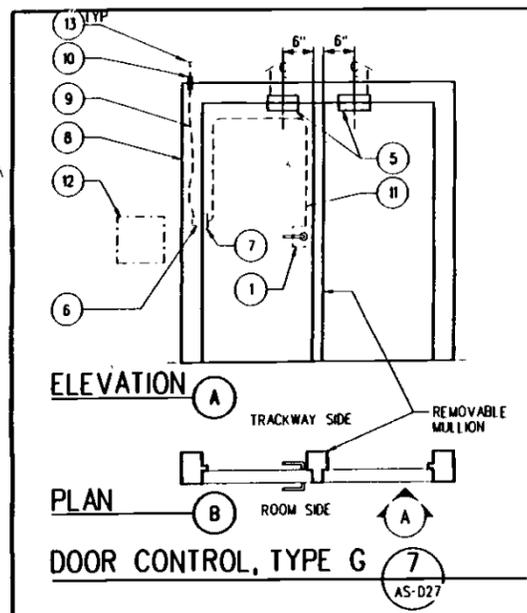
DESIGNED BY
J. HEGEDE
DRAWN BY
F. PANILIO
CHECKED BY
I. ROQUE
IN CHARGE
R. DELAHOUSIE
DATE
21 FEB 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
ENGINEERING MANAGEMENT CONSULTANT
SUBMITTED BY: *[Signature]*
APPROVED: *[Signature]*

ARCHITECTURAL STANDARD
MISCELLANEOUS DETAILS

CONTRACT NO.	
DRAWING NO.	AS-026
REV.	1
SCALE	AS NOTED
SHEET NO.	



NOTES:

1. DRAWINGS SHOWN ARE DIAGRAMATIC AND ARE NOT TO SCALE.
2. DOOR CONTROL TYPE REFERS TO THE TYPE OF ELECTRICAL CONTROL OF THE DOOR.
3. DOOR CONTROL TYPES ARE NOT LIMITED TO THE TYPES SHOWN ON THIS DRAWING. FOR ADDITIONAL DOOR CONTROL TYPES AND VARIANCE OF EACH TYPE SEE DOOR AND FRAME SCHEDULE.
4. DOOR HARDWARE, JUNCTION BOX, AND CONDUITS ARE SHOWN TO IDENTIFY THE ELECTRICAL CONTROL ELEMENTS OF THE DOOR FOR COORDINATION PURPOSES ONLY FOR COMPLETE HARDWARE SET OF DOORS SEE DOOR AND FRAME SCHEDULE.
5. FOR HINGE SIDE OF SINGLE DOORS SEE FLOOR PLANS.
6. FOR APPLICABLE ROOM/SPACE ADJACENT TO DOOR SEE FLOOR PLANS.

DOOR CONTROL TYPE	LOCATION
A	<ul style="list-style-type: none"> ELECTRICAL (CABLE) ROOM ELECTRICAL EQUIPMENT ROOM SPRINKLER VALVE ROOM TUNNEL VALVE ROOM
B	<ul style="list-style-type: none"> EMERGENCY EXIT STAIR EXIT CORRIDOR
C	<ul style="list-style-type: none"> TRAIN CONTROL AND COMMUNICATIONS ROOM
D	<ul style="list-style-type: none"> AUXILIARY POWER ELECT. ROOM T.P.S.S. ROOM
E	<ul style="list-style-type: none"> ANCILLARY CORRIDOR
F	<ul style="list-style-type: none"> EMERGENCY EXIT STAIR EXIT CORRIDOR
G	<ul style="list-style-type: none"> TRACKWAY TUNNEL
H & J	<ul style="list-style-type: none"> MEZZANINE TO ANCILLARY CORRIDOR

- KEY NOTES:**
- 1 ELECTROMECHANICAL LOCKSET
 - 2 PANIC EXIT DEVICE
 - 3 PANIC EXIT DEVICE - ELECTRICALLY OPERATED
 - 4 PANIC EXIT DEVICE - ELECTRICALLY OPERATED W/ INTERNAL HORN AND BYPASS KEY
 - 5 INTRUSION ALARM - SURFACE MOUNTED, TYP
 - 6 JUNCTION BOX WELDED TO DOOR FRAME BY DOOR MANUFACTURER, TYP
 - 7 ELECTRICAL BUTT HINGE (TRANSFER HINGE)
 - 8 DOOR FRAME
 - 9 3/4" Ø LIQUIDTIGHT FLEXIBLE METAL CONDUIT INSTALLED IN DOOR FRAME BY STATION CONTRACTOR, SEE ELECT DWG
 - 10 CONDUIT FLUSH COUPLING POSITIONED AT CENTER OF DOOR JAMB, SEE ELECT DWG
 - 11 INTERNAL 1/2" GALV TUBING BY DOOR MANUFACTURER
 - 12 CARD READER (NIC) - SHOWN FOR INFO ONLY FOR SPECIFIC LOCATION SEE FLOOR PLANS
 - 13 CONDUIT AND WIRING, SEE ELECT DWG

REV	DATE	BY	CHK	APP	DESCRIPTION
0	2 21 94				REVISD & REDRAWN PER DE 306-SBCN-1100 BASELINE ISSUE
1	3 19 94				

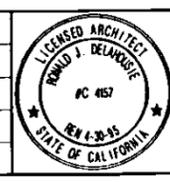
DESIGNED BY
J. HEGEDE

DRAWN BY
F. PANILIO

CHECKED BY
I. ROQUE

IN CHARGE
R. DELAHOUSIE

DATE
21 FEB 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

ENGINEERING MANAGEMENT CONSULTANT

Submitted: *Ronald J. Delahousie*

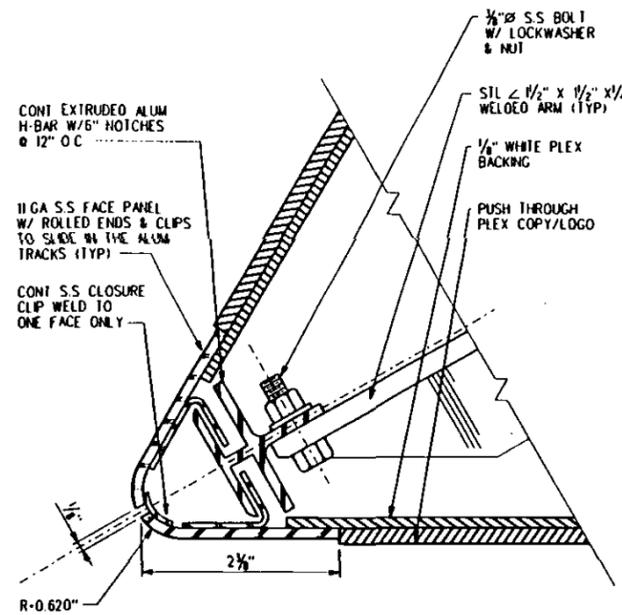
Approved: *[Signature]*

ARCHITECTURAL STANDARD

DOOR CONTROL DIAGRAMS

CONTRACT NO.	
ISSUING NO.	AS-027
REV.	1
SCALE	NO SCALE
PLOT NO.	

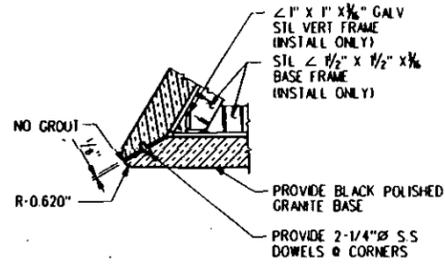
PLOTTED BY: [illegible]



PANEL @ CORNERS

FULL SIZE

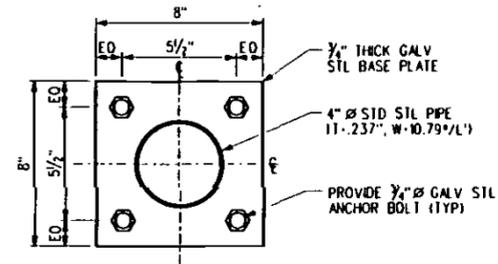
3
AS-028



GRANITE BASE @ CORNERS

3"-1'-0"

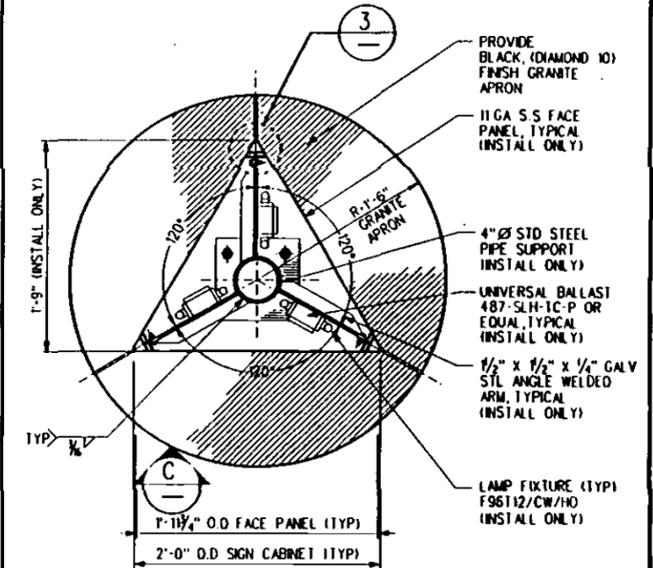
2
AS-028



BASE PLATE (INSTALL ONLY)

3"-1'-0"

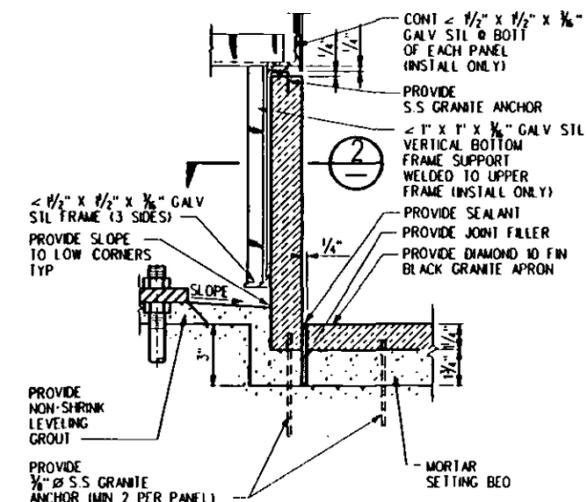
1
AS-028



PLAN

1/2"-1'-0"

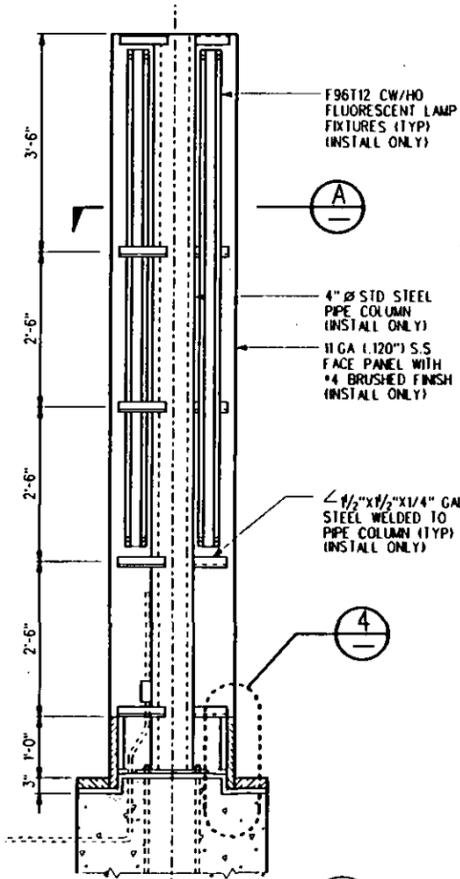
A
AS-028



GRANITE BASE

3"-1'-0"

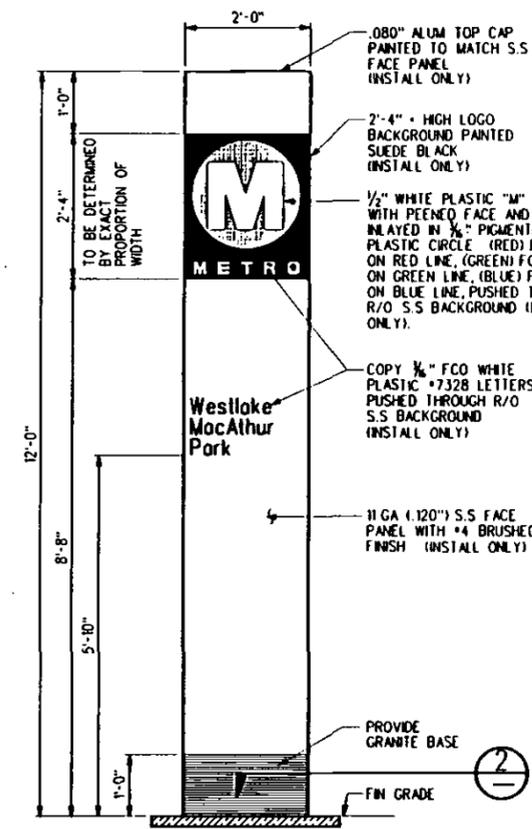
4
AS-028



SECTION

1/2"-1'-0"

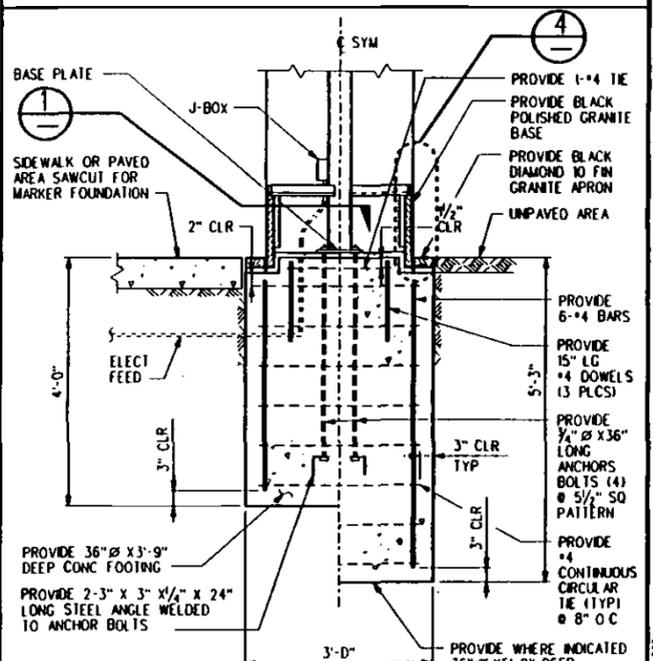
D
AS-028



ELEVATION

1/2"-1'-0"

C
AS-028

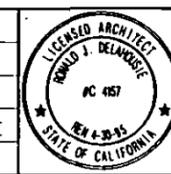


FOUNDATION SECTION @ CONC
SIDEWALK AND UNPAVED AREAS

1/2"-1'-0"

B
AS-028

REV	DATE	BY	CHKD	APP	DESCRIPTION
0	2 19 94	J. HEGEDE	F. PANLILIO	I. ROQUE	DESIGNED BY J. HEGEDE DRAWN BY F. PANLILIO CHECKED BY I. ROQUE
1	2 21 94	R. DELAHOUSIE			REVISED & REDRAWN PER DE 306-SBCN-11-00 BASELINE ISSUE
					DATE 21 FEB 94



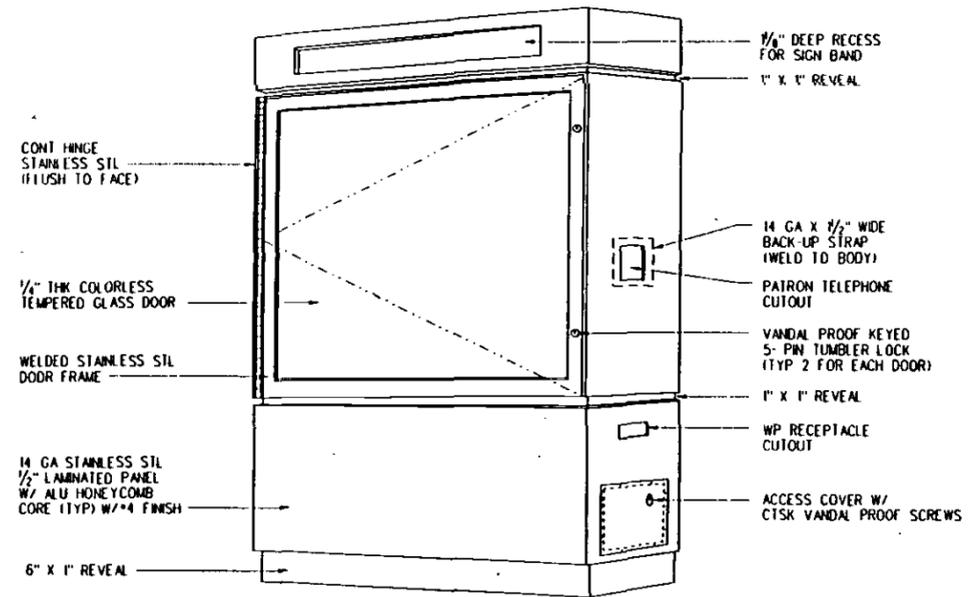
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

ENGINEERING MANAGEMENT CONSULTANT

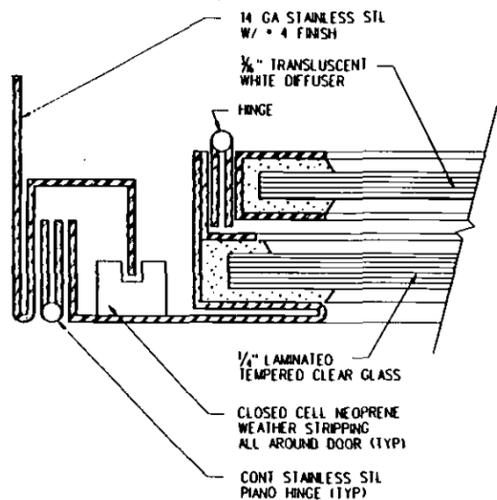
Submitted: *Ronald J. DelaHousie*

Approved: *[Signature]*

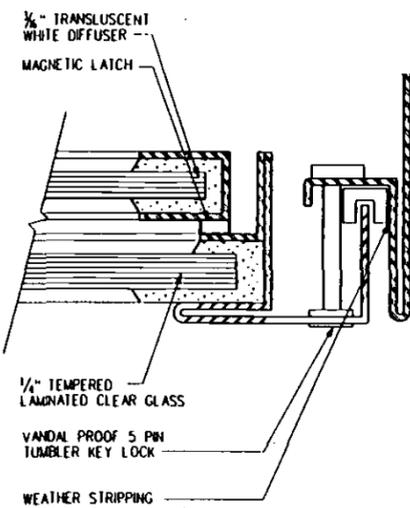
ARCHITECTURAL STANDARD		CONTRACT NO.
STATION MARKER		DRAWING NO. AS-028
		REV 1
		SCALE AS NOTED
		SHEET NO.



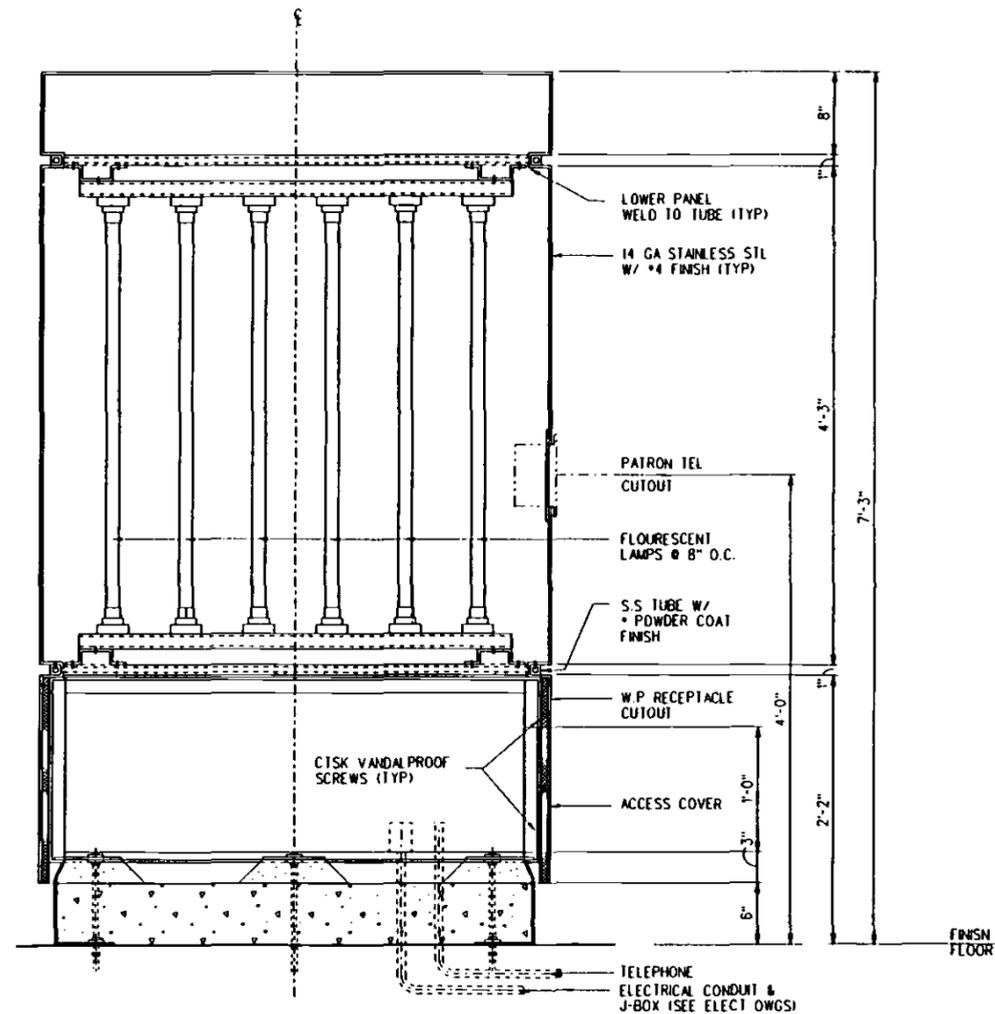
PERSPECTIVE
N.T.S.



MAP CASE JAMB - HINGE SIDE 2
FULL SIZE AS-030



MAP CASE JAMB - LOCK SIDE 1
FULL SIZE AS-030



SECTION A
1/2" = 1'-0" AS-030

REV	DATE	BY	CHKD	DESCRIPTION
0	2/21/94	C.Y.	R.D.	REVISED & REDRAWN PER DE 306-SBCH-1100 BASELINE ISSUE

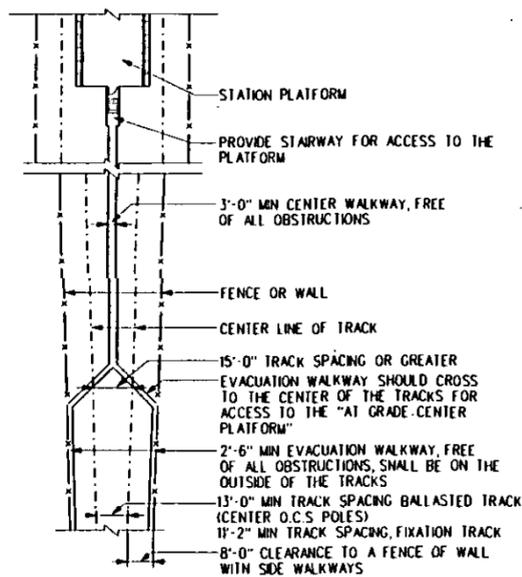
DESIGNED BY
J. HEGEDE
 DRAWN BY
C. YU
 CHECKED BY
I. ROQUE
 BY CHANGED
R. DELAHOUSIE
 DATE
21 FEB 94



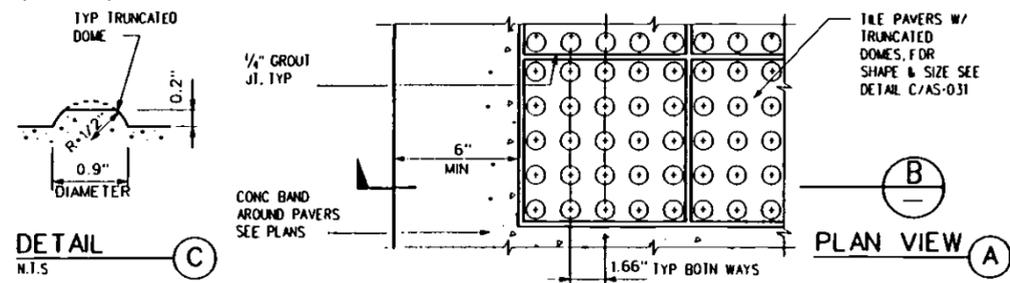
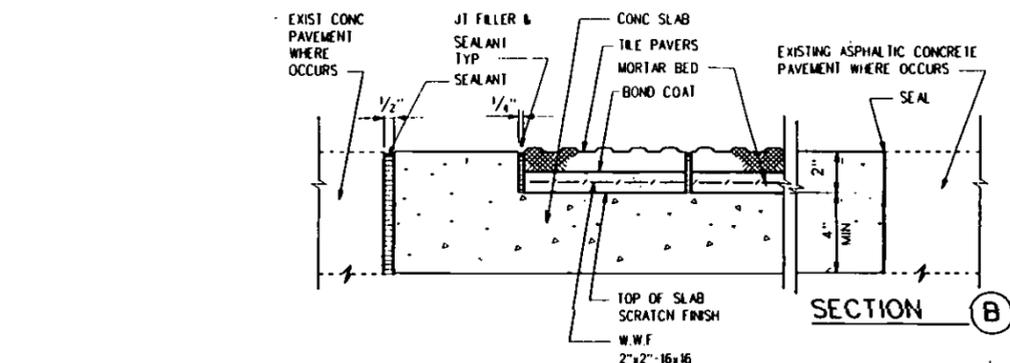
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
 ENGINEERING MANAGEMENT CONSULTANT
 SUBMITTED *[Signature]*
 APPROVED *[Signature]*

ARCHITECTURAL STANDARD
FREE STANDING MAP CASE DETAILS
SHEET 2 OF 2

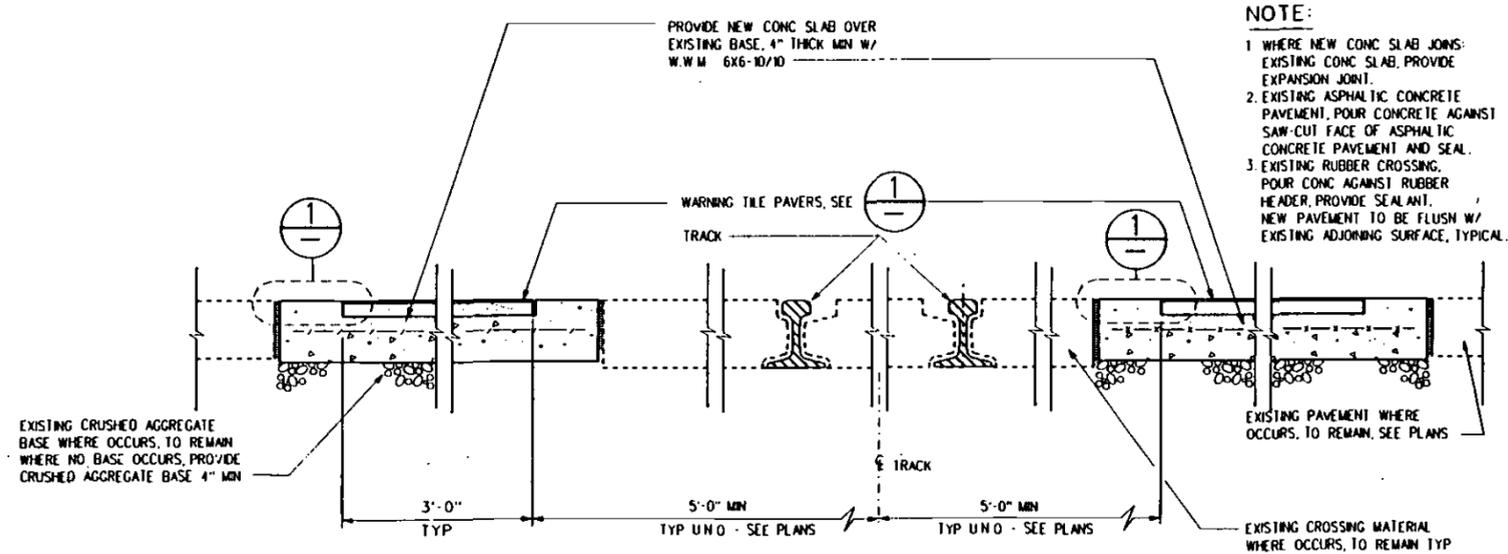
CONTRACT NO.	
DRAWING NO.	AS-030
REV	1
SCALE	AS NOTED
SHEET NO.	



WALKWAY CONFIGURATION
 1/8" = 1'-0"
 AS-031



WARNING TILE PAVERS
 3" = 1'-0"
 AS-031

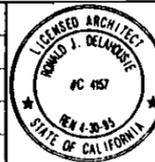


NOTE:
 1. WHERE NEW CONC SLAB JOINS EXISTING CONC SLAB, PROVIDE EXPANSION JOINT.
 2. EXISTING ASPHALTIC CONCRETE PAVEMENT, POUR CONCRETE AGAINST SAW-CUT FACE OF ASPHALTIC CONCRETE PAVEMENT AND SEAL.
 3. EXISTING RUBBER CROSSING, POUR CONC AGAINST RUBBER HEADER, PROVIDE SEALANT. NEW PAVEMENT TO BE FLUSH W/ EXISTING ADJOINING SURFACE, TYPICAL.

TRACK CROSSING
 1/2" = 1'-0"
 AS-031

REV	DATE	BY	SYD	APP	DESCRIPTION
0	2/21/94				BASELINE ISSUE
1	3/19/94				REVISED & REDRAWN PER DE 306-SBCN-11.00

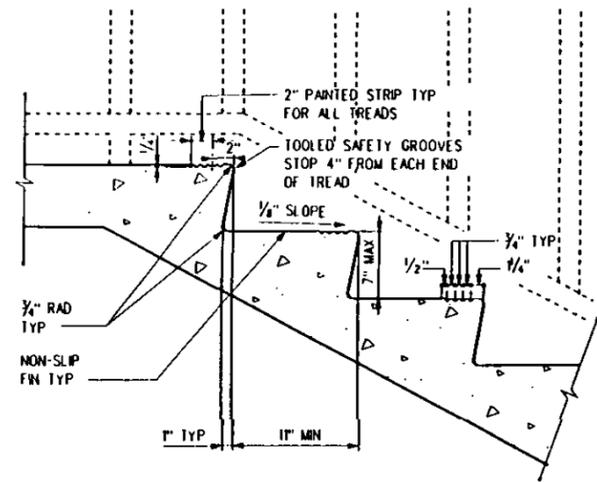
DESIGNED BY
J. HEGEDE
 DRAWN BY
F. PANILILIO
 CHECKED BY
I. ROQUE
 IN CHARGE
R. DELAHOUSIE
 DATE
21 FEB 94



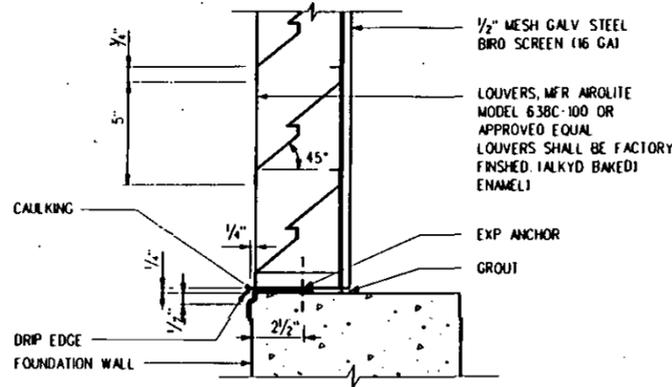
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
 ENGINEERING MANAGEMENT CONSULTANT
 Submitted: *R. Delahousie*
 Approved: *[Signature]*

ARCHITECTURAL STANDARD
TRACK CROSSING & WALKWAY CONFIGURATION

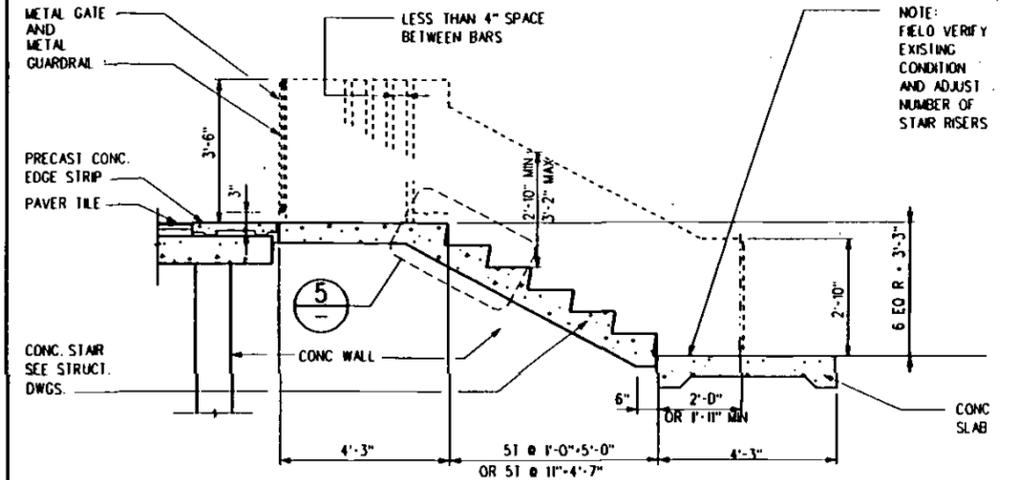
CONTRACT NO.	
DRAWING NO.	AS-031
REV.	1
SCALE	AS NOTED
SHEET NO.	



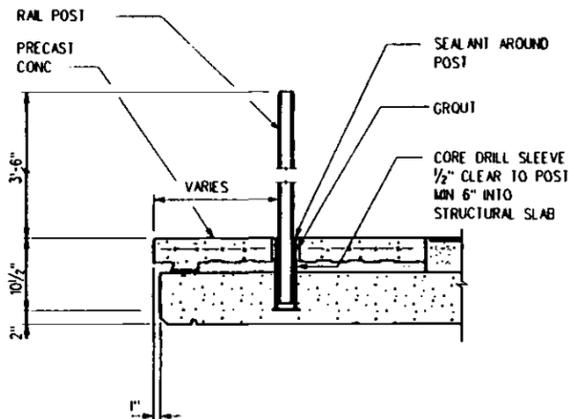
TYPICAL CONCRETE STEP DETAIL 5
3"-1'-0"



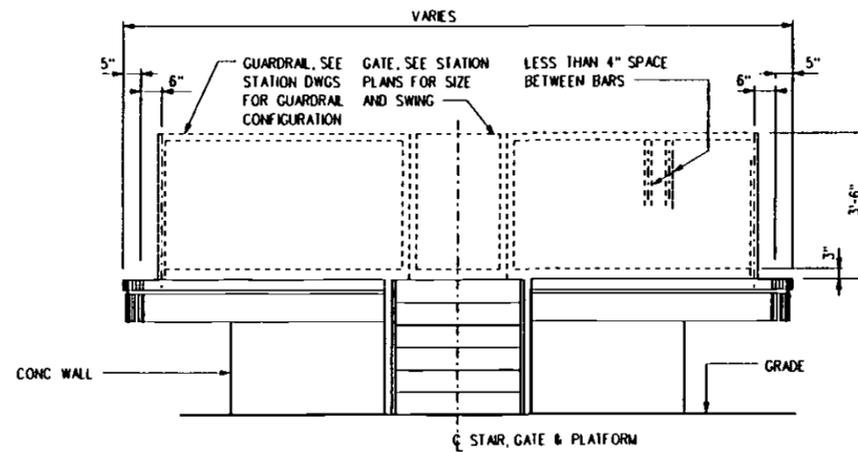
AIR LOUVER AT FOUNDATION WALL 3
3"-1'-0"



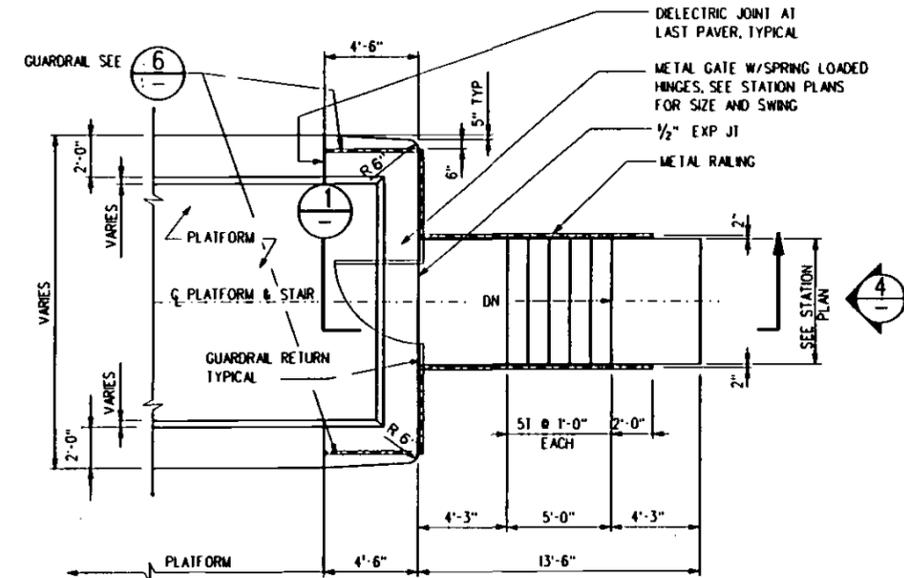
SECTION - EMERGENCY EXIT STAIR 1
1/2"-1'-0"



GUARDRAIL POST ANCHOR DETAIL 6
1"-1'-0"



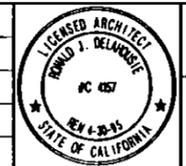
ELEVATION - EMERGENCY EXIT STAIR 4
1/2"-1'-0"



PLAN - EMERGENCY EXIT STAIR 2
1/4"-1'-0"

REV	DATE	BY	CHK	APP	DESCRIPTION
0	2.21.94				BASELINE ISSUE
1	3.19.94				REVISED & REDRAWN PER DE 306-SBCN-11.00

DESIGNED BY
J. HEGEDE
DRAWN BY
F. PANILLO
CHECKED BY
I. ROQUE
IN CHARGE
R. DELAHOUSIE
DATE
21 FEB 94

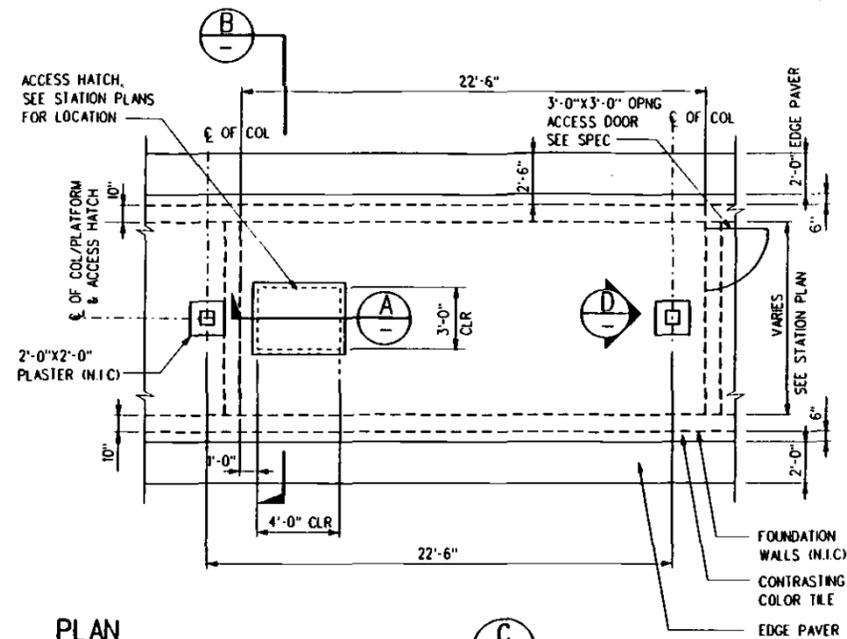


LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
ENGINEERING MANAGEMENT CONSULTANT
SUBMITTED: [Signature]
APPROVED: [Signature]

ARCHITECTURAL STANDARD
EMERGENCY STAIR DETAILS

CONTRACT NO.	
DRAWING NO.	AS-033
REV	1
SCALE	AS NOTED
SHEET NO.	

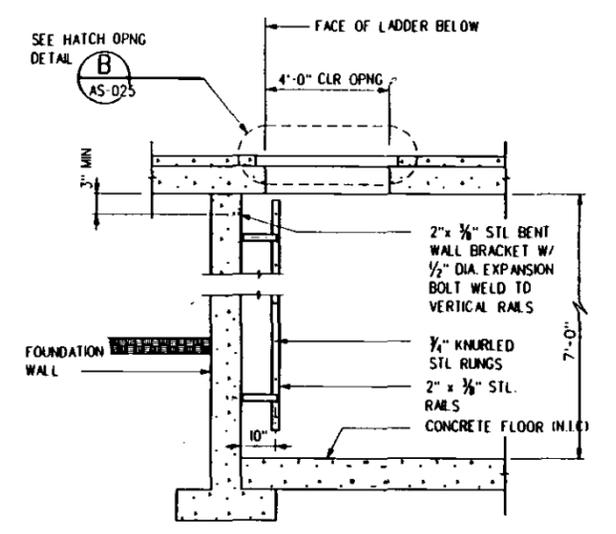
PLOTTED BY: [Name]



PLAN

1/4"=1'-0"

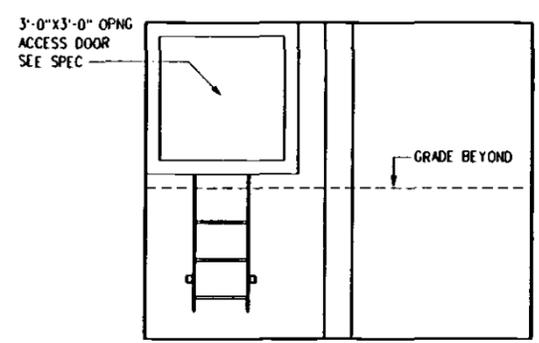
C
AS-034



SECTION

1/2"=1'-0"

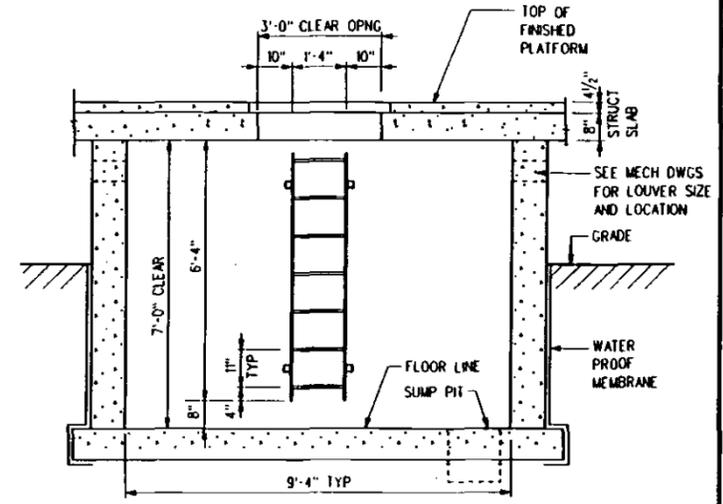
A
AS-034



END ELEVATION

1/2"=1'-0"

D
AS-034



SECTION

1/2"=1'-0"

B
AS-034

ACCESS HATCH - COMMUNICATIONS & ELECTRICAL ENCLOSURE

AS NOTED

1
AS-034

REV	DATE	BY	SUB	APP	DESCRIPTION
0	2.21.94				BASELINE ISSUE
1	9.19.94				REVISED & REDRAWN PER DC306-SBON-11.00

DESIGNED BY
J. HEGEDE
DRAWN BY
F. PANILLO
CHECKED BY
I. ROQUE
IN CHARGE
R. DELAHOUSIE
DATE
21 FEB 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
ENGINEERING MANAGEMENT CONSULTANT
SUBMITTED: [Signature]
APPROVED: [Signature]

ARCHITECTURAL STANDARD
COMMUNICATIONS AND ELECTRICAL
ENCLOSURE DETAILS

CONTRACT NO.	
DRAWING NO.	AS-034
REV.	1
SCALE	AS NOTED
SHEET NO.	



BASELINE STATUS REPORT: DIRECTIVE/STANDARD DRAWINGS

DRAWING NO.	REV.	DATE MODIFIED	DRAWING TITLE / Change Title	REMARKS
R92-DE306-06 STANDARD DRAWINGS: ELECTRICAL				
ES-001	0	04/19/94	INDEX OF DRAWINGS	
	1	10/10/94	Baseline issue	
	2	07/25/95	Revised & resealed per sbcn-de 306.06-10 Revised & resealed per sbcn-de 306.06-17.00	
ES-061	0	04/19/94	TYPE A HIGH INTENSITY DISCHARGE AREA LIGHT	
	1	10/10/94	Baseline issue Revised & resealed per sbcn-de 306.06-10	
ES-062	0	04/19/94	TYPE B HIGH INTENSITY DISCHARGE AREA LIGHT	
	1	10/10/94	Baseline issue Revised & resealed per sbcn-de 306.06-10	
ES-063	0	04/19/94	TYPE C HIGH INTENSITY DISCHARGE AREA LIGHT	
	1	10/10/94	Baseline issue Revised & resealed per sbcn-de 306.06-10	
ES-064	0	04/19/94	TYPE D FLUORESCENT STEP LIGHT	
	1	10/10/94	Baseline issue Revised & resealed per sbcn-de 306.06-10	
ES-065	0	04/19/94	TYPE E LIGHT EMITTING DIODE EXIT LIGHT	
	1	10/10/94	Baseline issue Revised & resealed per sbcn-de 306.06-10	
ES-068	0	04/19/94	TYPE H FLUORESCENT ANCILLARY LIGHT	
	1	10/10/94	Baseline issue Revised & resealed per sbcn-de 306.06-10	
ES-069	0	04/19/94	TYPE I FLUORESCENT ANCILLARY LIGHT	
	1	10/10/94	Baseline issue Revised & resealed per sbcn-de 306.06-10	
ES-070	0	04/19/94	TYPE J FLUORESCENT ANCILLARY LIGHT	
	1	10/10/94	Baseline issue Revised & resealed per sbcn-de 306.06-10	
ES-072	0	04/19/94	TYPE L HIGH INTENSITY DISCHARGE DOWNLIGHT	
	1	10/10/94	Baseline issue Revised & resealed per sbcn-de 306.06-10	
ES-073	0	04/19/94	TYPE M HIGH INTENSITY DISCHARGE DOWNLIGHT	
	1	10/10/94	Baseline issue Revised & resealed per sbcn-de 306.06-10	
ES-074	0	04/19/94	TYPE N HIGH INTENSITY DISCHARGE DOWNLIGHT	
	1	10/10/94	Baseline issue Revised & resealed per sbcn-de 306.06-10	
ES-075	0	04/19/94	TYPE O HIGH INTENSITY DISCHARGE DOWNLIGHT	
	1	10/10/94	Baseline issue Revised & resealed per sbcn-de 306.06-10	
ES-076	0	04/19/94	TYPE P HIGH INTENSITY DISCHARGE UP/DOWNLIGHT	
	1	10/10/94	Baseline issue Revised & resealed per sbcn-de 306.06-10	
ES-077	0	04/19/94	TYPE Q HIGH INTENSITY DISCHARGE UP/DOWNLIGHT	
	1	10/10/94	Baseline issue Revised & resealed per sbcn-de 306.06-10	
ES-078	0	04/19/94	TYPE R HIGH INTENSITY DISCHARGE LANDSCAPE LIGHT	
	1	10/10/94	Baseline issue Revised & resealed per sbcn-de 306.06-10	
ES-081	0	04/19/94	TYPE U HANDRAIL LIGHT, EXTERIOR USE	
	1	10/10/94	Baseline issue Revised & resealed per sbcn-de 306.06-10	
ES-083	0	04/19/94	TYPE W WALL WASHER AT PUBLIC AREAS	
	1	10/10/94	Baseline issue Revised & resealed per sbcn-de 306.06-10	
ES-099	0	04/19/94	12 FOOT HEIGHT LIGHT POLE EXTERIOR MOUNTING CONDITION	
	1	10/10/94	Baseline issue Revised & resealed per sbcn-de 306.06-10	
ES-100	0	04/19/94	25 FOOT HEIGHT LIGHT POLE EXTERIOR MOUNTING CONDITION	
	1	10/10/94	Baseline issue Revised & resealed per sbcn-de 306.06-10	

BASELINE STATUS REPORT: DIRECTIVE/STANDARD DRAWINGS

DRAWING NO.	REV.	DATE MODIFIED	DRAWING TITLE / Change Title	REMARKS
R92-DE306-06 STANDARD DRAWINGS: ELECTRICAL				
ES-101	0 1	04/19/94 10/10/94	CORROSION CONTROL COATING, BONDING AND TEST BOX WIRING Baseline issue Resealed per sbcn-de 306.06-10	
ES-102	0 1	04/19/94 10/10/94	CORROSION CONTROL INSULATING JOINTS, TEST BOX AND ANODE Baseline issue Resealed per sbcn-de 306.06-10	
ES-104	0 1	04/19/94 10/10/94	STRAY CURRENT MONITORING FACILITES - SHEET 1 OF 2 Baseline issue Resealed per sbcn-de 306.06-10	
ES-105	0 1	04/19/94 10/10/94	STRAY CURRENT MONITORING FACILITES - SHEET 2 OF 2 Baseline issue Revised & resealed per sbcn-de 306.06-10	
ES-106	0 1	04/19/94 10/10/94	TYPE X FLUORSCENT TUNNEL/STATION LIGHT Revised & redrawn per dcn 93-81, 93-51, 92-59 Revised & resealed per sbcn-de 306.06-10	
ES-107	0 1 2	04/19/94 10/10/94 12/22/95	TYPE Y TUNNEL EXIT LIGHT Baseline issue Revised & resealed per sbcn-de 306.06-10 Revised per de306 sbcn-22.00	
ES-111	0	07/25/95	TYPE AA ACCENT LIGHT Baseline issue per sbcn-de 306.06-17.00	
ES-112	0	07/25/95	TYPE BB AREA LIGHT Baseline issue per sbcn-de 306.06-17.00	
ES-113	0	07/25/95	TYPE CC METAL HALIDE UPLIGHT Baseline issue per sbcn-de 306.06-17.00	
ES-114	0	07/25/95	TYPE DD METAL HALIDE AREA LIGHT Baseline issue per sbcn-de 306.06-17.00	
ES-115	0	07/25/95	TYPE EE METAL HALIDE AREA LIGHT Baseline issue per sbcn-de 306.06-17.00	
ES-116	0	07/25/95	TYPE FF METAL HALIDE UPLIGHT Baseline issue per sbcn-de 306.06-17.00	
ES-117	0	07/25/95	TYPE GG METAL HALIDE DOWNLIGHT Baseline issue per sbcn-de 306.06-17.00	
ES-118	0	07/25/95	TYPE HH FLUORESCENT COVE LIGHT Baseline issue per sbcn-de 306.06-17.00	
ES-119	0	07/25/95	TYPE II FLUORESCENT SIGN LIGHT Baseline issue per sbcn-de 306.06-17.00	
ES-120	0	07/25/95	TYPE JJ METAL HALIDE DOWNLIGHT Baseline issue per sbcn-de 306.06-17.00	

DRAWING NUMBER	DRAWING TITLE
	COVER SHEET
ES-001	INDEX OF DRAWINGS
ES-061	TYPE A HIGH INTENSITY DISCHARGE AREA LIGHT
ES-062	TYPE B HIGH INTENSITY DISCHARGE AREA LIGHT
ES-063	TYPE C HIGH INTENSITY DISCHARGE AREA LIGHT
ES-064	TYPE D FLUORESCENT STEP LIGHT
ES-065	TYPE E LIGHT EMITTING DIODE EXIT LIGHT
ES-068	TYPE H FLUORESCENT ANCILLARY LIGHT
ES-069	TYPE I FLUORESCENT ANCILLARY LIGHT
ES-070	TYPE J FLUORESCENT ANCILLARY LIGHT
ES-072	TYPE L HIGH INTENSITY DISCHARGE DOWNLIGHT
ES-073	TYPE M HIGH INTENSITY DISCHARGE DOWNLIGHT
ES-074	TYPE N HIGH INTENSITY DISCHARGE DOWNLIGHT
ES-075	TYPE O HIGH INTENSITY DISCHARGE DOWNLIGHT
ES-076	TYPE P HIGH INTENSITY DISCHARGE UP/DOWNLIGHT
ES-077	TYPE Q HIGH INTENSITY DISCHARGE UP/DOWNLIGHT
ES-078	TYPE R HIGH INTENSITY DISCHARGE LANDSCAPE LIGHT
ES-081	TYPE U HANDRAIL LIGHT, EXTERIOR USE
ES-083	TYPE W WALL WASHER AT PUBLIC AREAS
ES-099	12 FOOT HEIGHT LIGHT POLE EXTERIOR MOUNTING CONDITION
ES-100	25 FOOT HEIGHT LIGHT POLE EXTERIOR MOUNTING CONDITION
ES-101	CORROSION CONTROL COATING, BONDING, AND TEST BOX WIRING
ES-102	CORROSION CONTROL INSULATING JOINTS, TEST BOX AND ANODE
ES-104	STRAY CURRENT MONITORING FACILITIES, SHEET 1 OF 2
ES-105	STRAY CURRENT MONITORING FACILITIES, SHEET 2 OF 2
ES-106	TYPE X FLUORESCENT TUNNEL/STATION LIGHT
ES-107	TYPE Y TUNNEL EXIT LIGHT

DRAWING NUMBER	DRAWING TITLE
ES-111	TYPE AA ACCENT LIGHT
ES-112	TYPE BB AREA LIGHT
ES-113	TYPE CC METAL HALIDE UPLIGHT
ES-114	TYPE DD METAL HALIDE AREA LIGHT
ES-115	TYPE EE METAL HALIDE AREA LIGHT
ES-116	TYPE FF METAL HALIDE UPLIGHT
ES-117	TYPE GG METAL HALIDE DOWNLIGHT
ES-118	TYPE HH FLUORESCENT COVE LIGHT
ES-119	TYPE II FLUORESCENT SIGN LIGHT
ES-120	TYPE JJ METAL HALIDE DOWNLIGHT

REV	DATE	BY	SUB	APP	DESCRIPTION
0	19 94	CY	AHL	CMC	BASELINE ISSUE
1	25 94	RE	JBB		REVISION 1 RESEALED PER SBCH-DE
2	10 94	CC			REVISION 2 RESEALED PER SBCH-DE

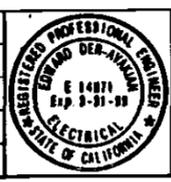
DESIGNED BY
C. YU

DRAWN BY
B.H. CHAMBERS

CHECKED BY
P. YU

IN CHARGE
E. DER AVAKIAN

DATE
19 APR 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

ENGINEERING MANAGEMENT CONSULTANT

Submitted: *[Signature]*

Approved: *[Signature]*

**ELECTRICAL STANDARD
INDEX OF DRAWINGS**

CONTRACT NO	
DRAWING NO	ES-001
REV	2
SCALE	NO SCALE
SHEET NO	

GENERAL DESCRIPTION

ROUND CYLINDER ARM MOUNTED H.I.D. AREA LIGHT FOR INTERIOR AND EXTERIOR USE.

FIXTURE OPTIONS

A1
 LAMP: 175W, M.H., CLEAR, HORIZ, 4400°K
 INITIAL LUMENS: 15,000
 BALLAST: HPF, RATED FOR 20°F START
 INPUT WATTS: 210
 DIMENSIONS: APPROX. 17" x 21" HOUSING DIA
 EFFICIENCY: 70%

A2
 LAMP: 400W, M.H., CLEAR, HORIZ, 4000°K
 INITIAL LUMENS: 40,000
 BALLAST: HPF, RATED FOR 20°F START
 INPUT WATTS: 455
 DIMENSIONS: APPROX. 25" HOUSING DIA
 EFFICIENCY: 73%

A3
 LAMP: 400W, H.P.S., CLEAR, 2200°K
 INITIAL LUMENS: 45,000
 BALLAST: HPF, RATED FOR 20°F START
 INPUT WATTS: 465
 DIMENSIONS: APPROX. 25" HOUSING DIA
 EFFICIENCY: 69%
 APPLICATION: PARKING LOTS ONLY

PHOTOMETRIC OPTIONS

1. TYPE I DISTRIBUTION
2. TYPE II DISTRIBUTION
3. TYPE III DISTRIBUTION
4. TYPE IV DISTRIBUTION
5. TYPE V DISTRIBUTION

MOUNTING OPTIONS

1. WALL MOUNTING HARDWARE
2. POLE MOUNTING HARDWARE

ACCESSORIES OPTIONS

1. HOUSEHOLD SHIELD
2. PHOTOCELL
3. TAMPER RESISTANT LATCH

FINISH MATERIALS

- HARDCOAT, FADE RESISTANT ELECTROSTATICALLY APPLIED POLYURETHANE PAINT.
- SEE ARCHITECTURAL SPECIFICATIONS FOR COLOR.

SAFETY LISTING

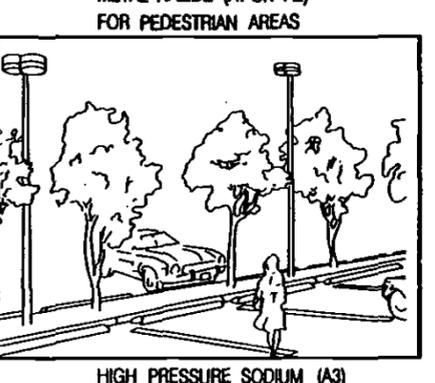
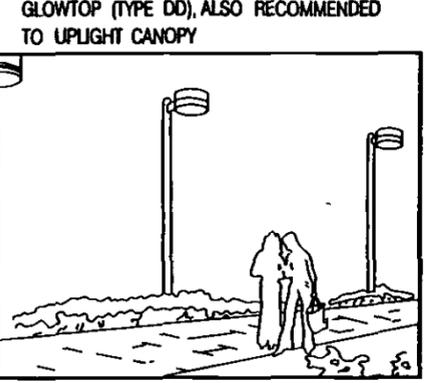
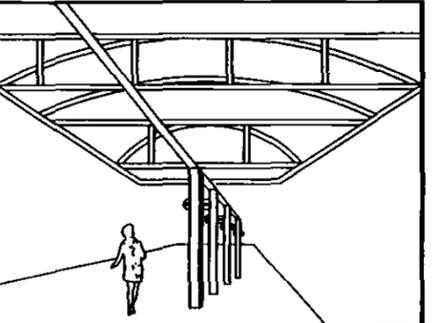
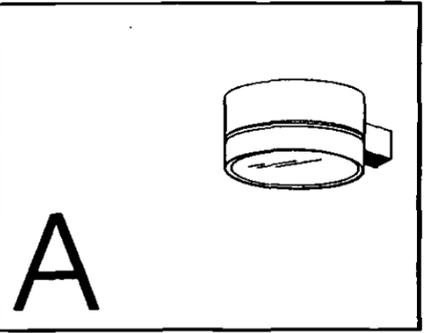
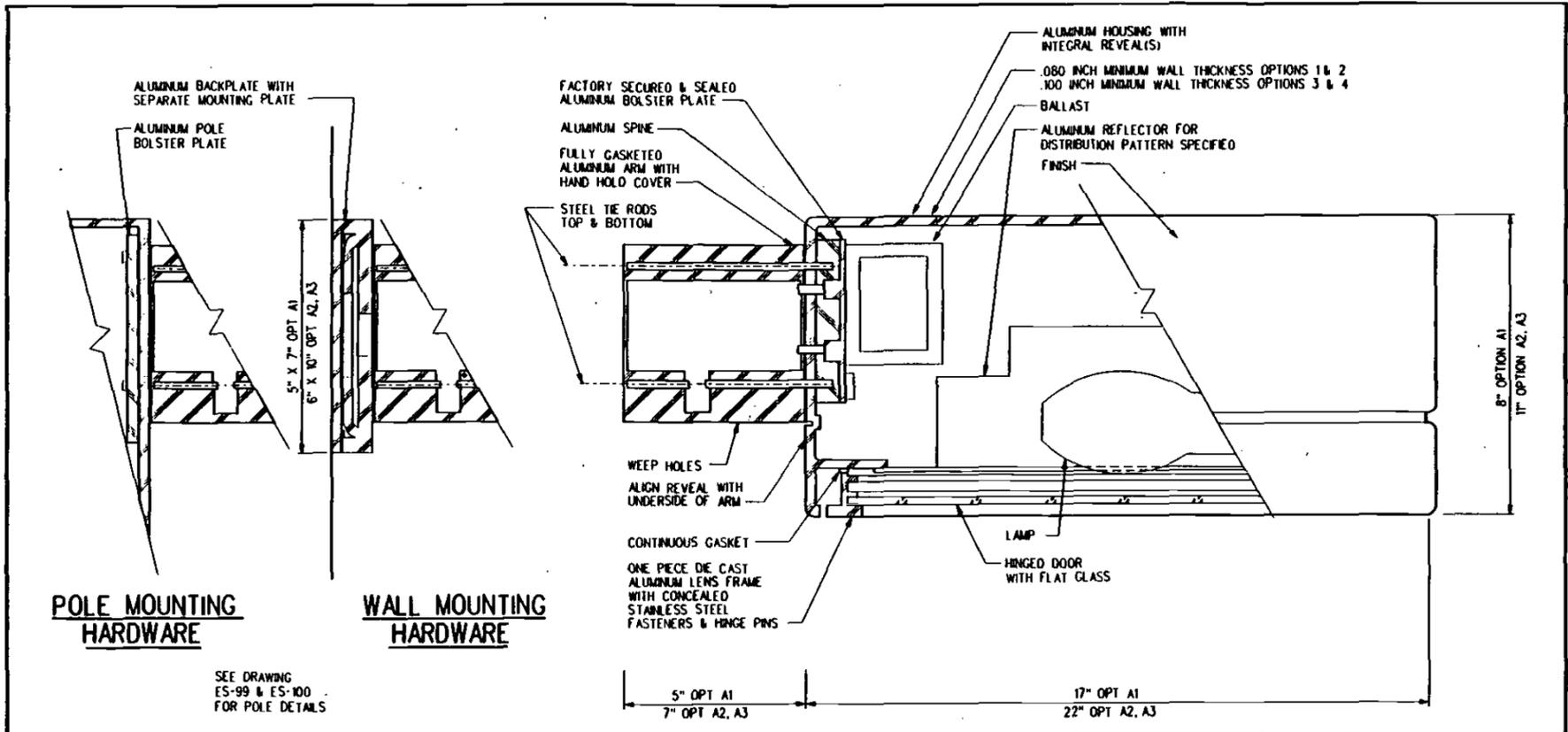
- WET

REMARKS

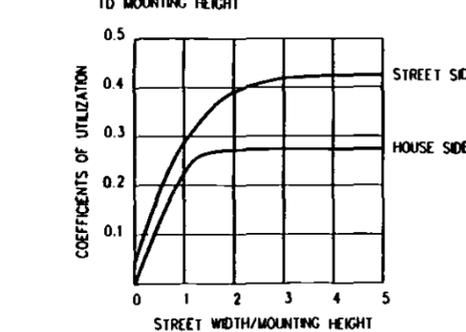
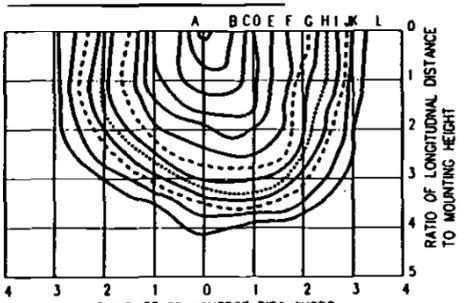
- ALL PHOTOMETRIC TYPES I, II, IV, AND V TO BE USED. SPECIFICATION SHEET INDICATES ONLY TYPES III AND V. REFER TO MANUFACTURER'S INFORMATION FOR OTHER TYPES.

MANUFACTURERS

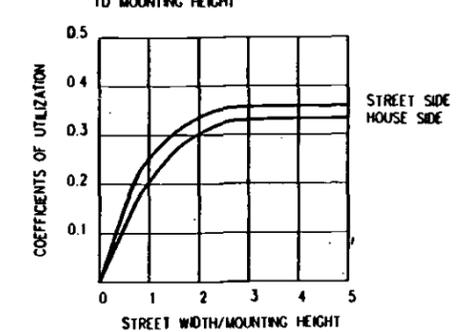
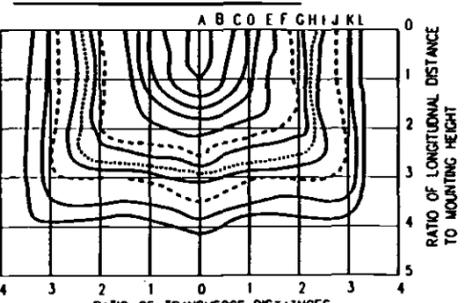
- KIM "CCL" SERIES
- GARDCO "FORM 10 CW" SERIES
- STERNER "ELEMENTS, FRANKLIN" SERIES



TYPE III PHOTOMETRY



TYPE V PHOTOMETRY



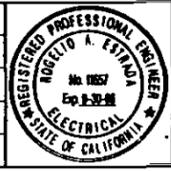
FOOTCANDLE VALUES

		FOOTCANDLES PER 1000 LAMP LUMENS												
MOUNTING HEIGHT CONFIGURATION	30' 1	A	B	C	D	E	F	G	H	HA	I	J	K	L
			.14	.1	.064	.040	.025	.016	.010	.0064	.0052	.0040	.0025	.0016

NOTE:
 FOOTCANDLE VALUES ABOVE ARE FOR 30' POLE MOUNTING HEIGHT. PHOTOMETRY IS AVAILABLE ONLY AS A SPECIFICATION GUIDELINE. CALCULATIONS MUST BE PERFORMED USING INDIVIDUAL MANUFACTURERS' INFORMATION.

REV	DATE	BY	SHD	APP	DESCRIPTION
0	4.19.94	CY	APL	CMC	REVISED & RESEALED PER SHOW-DE BASELINE ISSUE

DESIGNED BY: C. YU
 DRAWN BY: B.H. CHAMBERS
 CHECKED BY: C. ROBINOL
 IN CHARGE: J. BOOTH
 DATE: 19 APR 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

ENGINEERING MANAGEMENT CONSULTANT

SUBMITTED: [Signature]

APPROVED: [Signature]

ELECTRICAL STANDARD

TYPE A HIGH INTENSITY DISCHARGE AREA LIGHT

CONTRACT NO. []

DRAWING NO. ES-061

SCALE: ND SCALE

SHEET NO. 1

GENERAL DESCRIPTION

RECTANGULAR ARM MOUNTED H.I.D. AREA LIGHT FOR INTERIOR AND EXTERIOR USE.

FIXTURE OPTIONS

B1

LAMP: 175W, M.H., CLEAR, HORIZ., 4400°K
 INITIAL LUMENS: 15,000
 BALLAST: HPF, RATED FOR -20° F START
 INPUT WATTS: 217
 DIMENSIONS: 8" H. 16" X 22" W. FIX. ONLY
 EFFICIENCY: 63%

B2

LAMP: 400W, M.H. BT-28 CLEAR., 4000°K
 INITIAL LUMENS: 36,000
 BALLAST: HPF, RATED FOR -20° F START
 INPUT WATTS: 455
 DIMENSIONS: 8" H. 16" X 22" W. FIX. ONLY
 EFFICIENCY: 63%

B3

LAMP: 400W, H.P.S., CLEAR, 2200°K
 INITIAL LUMENS: 48,000
 BALLAST: HPF, RATED FOR -20° F START
 INPUT WATTS: 465
 DIMENSIONS: 16" X 22" W. FIX. ONLY
 EFFICIENCY: 63%
 APPLICATION: PARKING LOTS ONLY

PHOTOMETRIC OPTIONS

1. TYPE I DISTRIBUTION
2. TYPE II DISTRIBUTION
3. TYPE III DISTRIBUTION
4. TYPE IV DISTRIBUTION
5. TYPE V DISTRIBUTION

MOUNTING OPTIONS

1. WALL MOUNTING HARDWARE
2. POLE MOUNTING HARDWARE

ACCESSORIES OPTIONS

1. HOUSESIDE SHIELD
2. PHOTOCELL
3. TAMPER RESISTANT LATCH

FINISH MATERIALS

- THERMOSTAT POLYESTER POWERCOAT PAINT.
- SEE ARCHITECTURAL SPECIFICATION FOR COLOR.

SAFETY LISTING

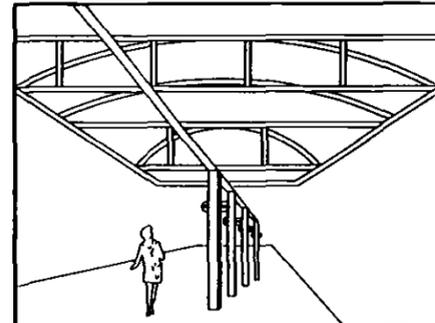
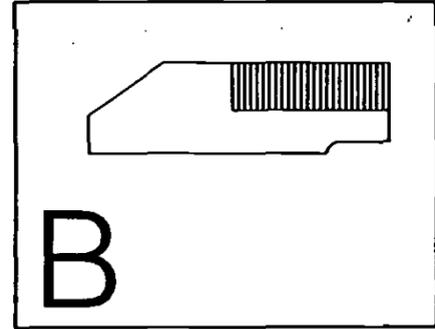
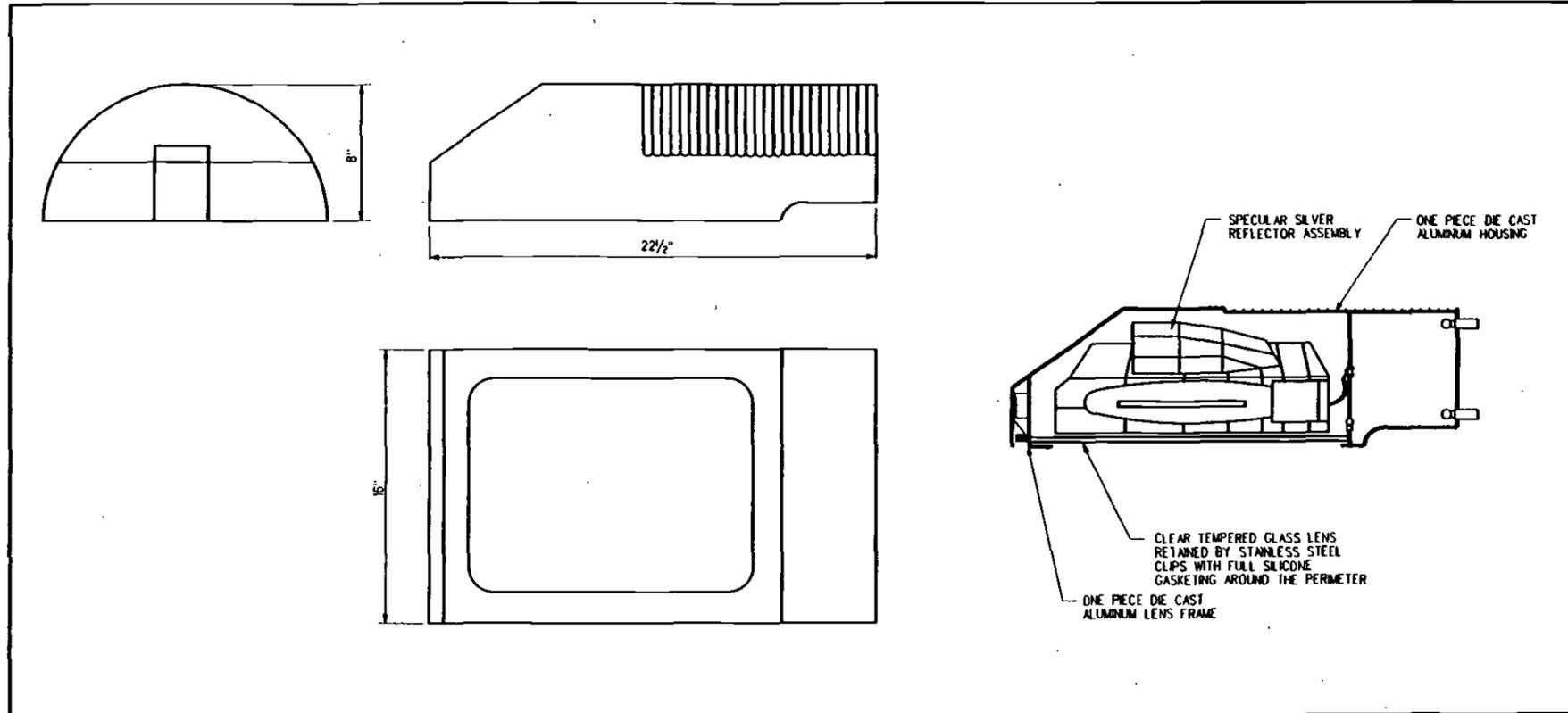
- WET

REMARKS

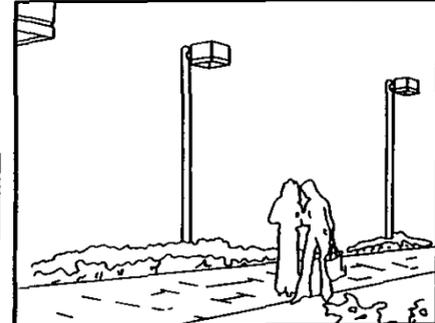
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MANUFACTURER OPTIONS

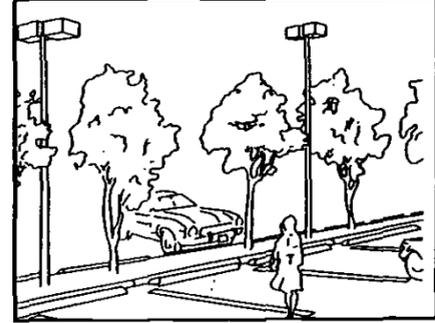
- KM "ARCHITYPE" SERIES
- GARDCO
- STERNER



GLOWTOP (TYPE DD), ALSO RECOMMENDED TO UPLIGHT CANOPY

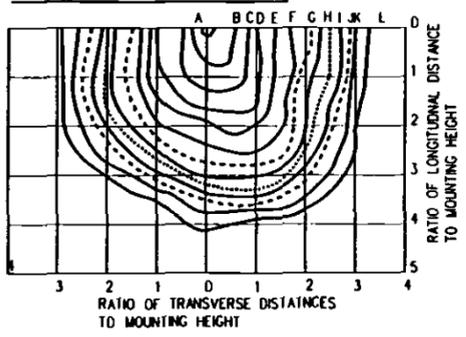


METAL HALIDE (B1 OR B2) FOR PEDESTRIAN AREAS

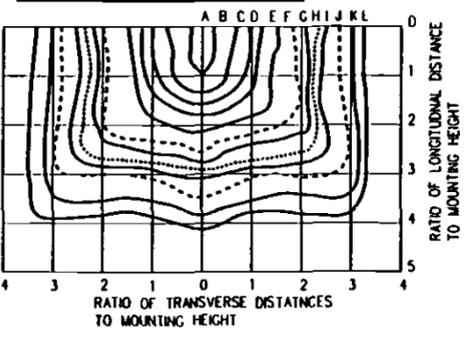


HIGH PRESSURE SODIUM (B3) FOR VEHICULAR AREAS ONLY

TYPE III PHOTOMETRY



TYPE V PHOTOMETRY

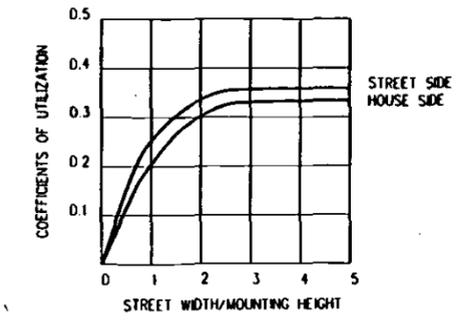
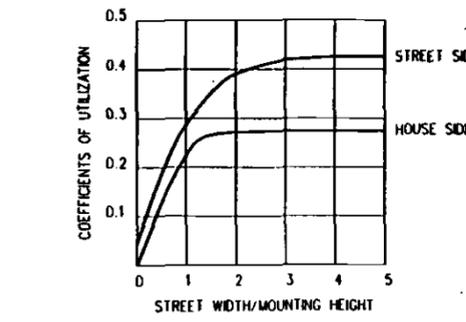


FOOTCANDLE VALUES

		FOOTCANDLES PER 1000 LAMP LUMENS											
MOUNTING HEIGHT CONFIGURATION	30' 1'	A	B	C	D	E	F	G	H	I	J	K	L
			.14	.1	.064	.040	.025	.016	.010	.0064	.0052	.0040	.0025

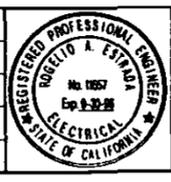
NOTE:

FOOTCANDLE VALUES ABOVE ARE FOR 30' POLE MOUNTING HEIGHT. PHOTOMETRY IS AVAILABLE ONLY AS A SPECIFICATION GUIDELINE. CALCULATIONS MUST BE PERFORMED USING INDIVIDUAL MANUFACTURERS' INFORMATION.



REV	DATE	BY	APP	DESCRIPTION
D	4/19/94	CR	AVL	REVISED & RESEALED PER SBON-DE 304 (A)-11
				BASELINE ISSUE

DESIGNED BY
C. ROBENIOL
 DRAWN BY
B.H. CHAMBERS
 CHECKED BY
C. YU
 IN CHARGE
J. BOOTH
 DATE
19 APR 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
 ENGINEERING MANAGEMENT CONSULTANT
 SUBMITTED: *[Signature]*
 APPROVED: *[Signature]*

ELECTRICAL STANDARD
TYPE B HIGH INTENSITY DISCHARGE AREA LIGHT
 CONTRACT NO. _____
 DRAWING NO. **ES-062** REV **1**
 SCALE: **NO SCALE**
 SHEET NO. _____

GENERAL DESCRIPTION

ROUND SPHERICAL ARM MOUNTED H.I.D. AREA LIGHT FOR INTERIOR AND EXTERIOR USE.

FIXTURE OPTIONS

C1
 LAMP: 175W. M.H., CLEAR, HORIZ. 4400°K
 INITIAL LUMENS: 15,000
 BALLAST: HPF, RATED FOR 20°F START
 INPUT WATTS: 210
 DIMENSIONS: APPROX. 17" X 21" HOUSING DIA.
 EFFICIENCY: 70%

C2
 LAMP: 400W. M.H., CLEAR, HORIZ. 4200°K
 INITIAL LUMENS: 40,000
 BALLAST: HPF, RATED FOR 20°F START
 INPUT WATTS: 455
 DIMENSIONS: APPROX. 25" HOUSING DIA.
 EFFICIENCY: 73%

C3
 LAMP: 400W. H.P.S., CLEAR, 2200°K
 INITIAL LUMENS: 45,000
 BALLAST: HPF, RATED FOR 20°F START
 INPUT WATTS: 465
 DIMENSIONS: APPROX. 25" HOUSING DIA.
 EFFICIENCY: 70%
 APPLICATION: PARKING LOTS ONLY

PHOTOMETRIC OPTIONS

1. TYPE I DISTRIBUTION
2. TYPE II DISTRIBUTION
3. TYPE III DISTRIBUTION
4. TYPE IV DISTRIBUTION
5. TYPE V DISTRIBUTION

MOUNTING OPTIONS

1. WALL MOUNTING HARDWARE
2. POLE MOUNTING HARDWARE

ACCESSORIES OPTIONS

1. HOUSEHOLD SHIELD
2. PHOTOCCELL
3. TAMPER RESISTANT LATCH

FINISH MATERIALS

- HARDCOAT, FADE RESISTANT ELECTROSTATICALLY APPLIED POLYURETHANE PAINT.
- SEE ARCHITECTURAL SPECIFICATIONS FOR COLOR.

SAFETY LISTING

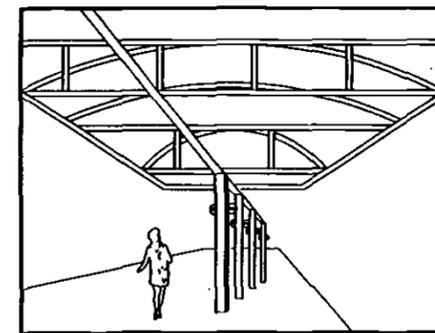
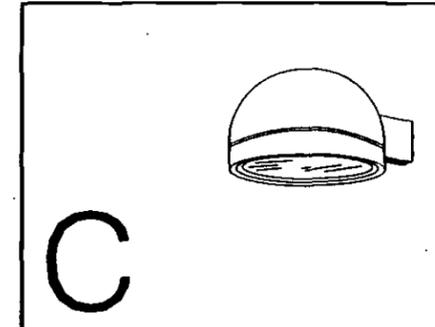
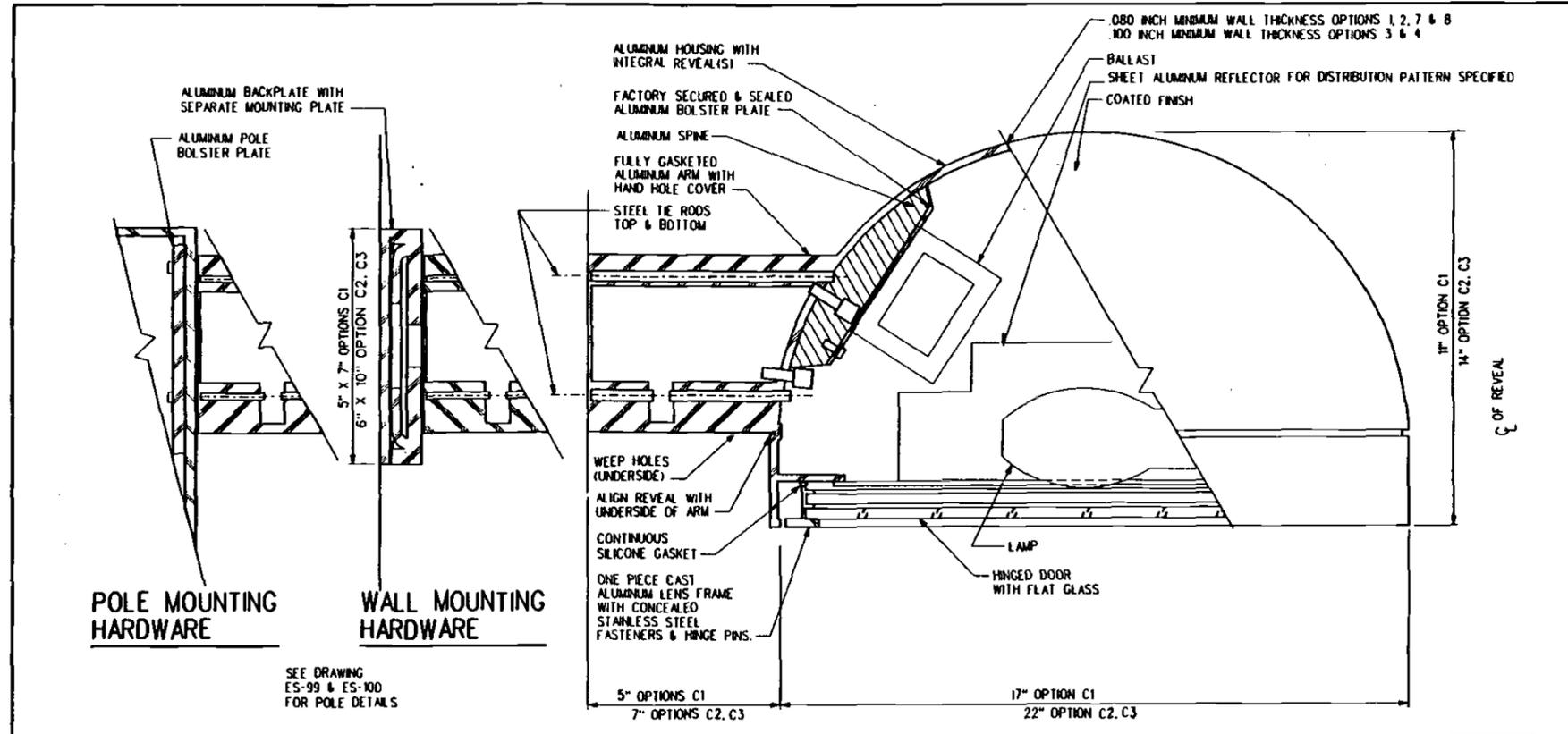
- WET

REMARKS

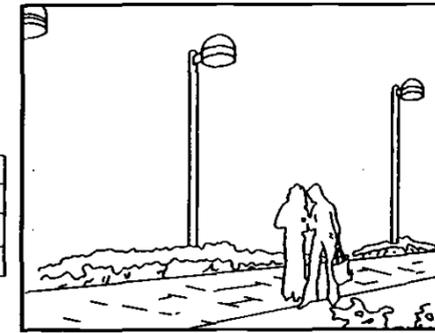
- ALL PHOTOMETRIC TYPES III, IV, AND V TO BE USED. SPECIFICATION SHEET INDICATES ONLY TYPES III AND V. REFER TO MANUFACTURER'S INFORMATION FOR OTHER TYPES.

MANUFACTURERS

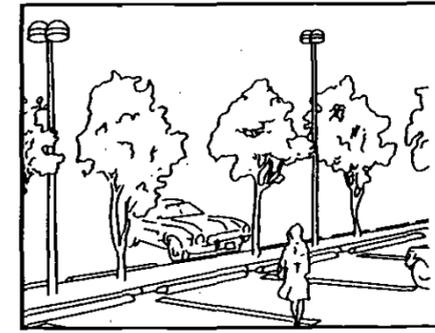
- KIM
- GARDCO "FORM 10 MW" SERIES
- STERNER ELEMENTS



GLOWTOP (TYPE DD), ALSO RECOMMENDED TO UPLIGHT CANOPY

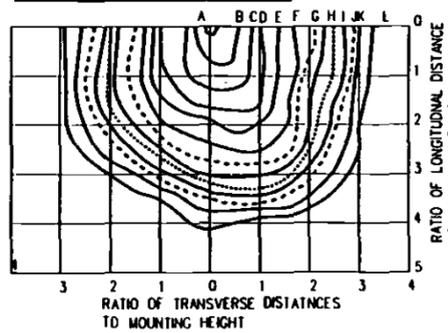


METAL HALIDE (C1 OR C2) FOR PEDESTRIAN AREAS

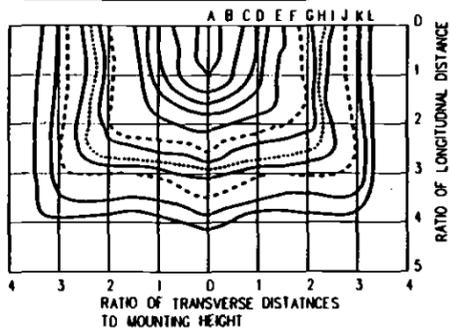


HIGH PRESSURE SODIUM, (C3) FOR VEHICULAR AREAS ONLY

TYPE III PHOTOMETRY



TYPE V PHOTOMETRY

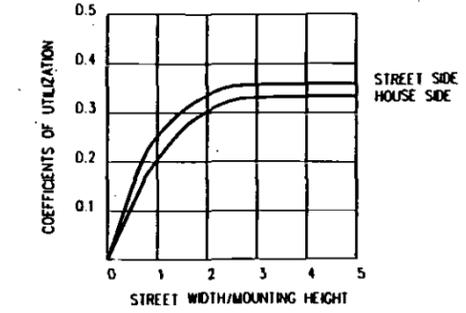


FOOTCANDLE VALUES

MOUNTING HEIGHT (FOOT)	FOOTCANDLES PER 1000 LAMP LUMENS												
	A	B	C	D	E	F	G	H	I	J	K	L	
30	.14	.1	.064	.040	.025	.016	.010	.0064	.0052	.0040	.0025	.0016	.0010

NOTE:

FOOTCANDLE VALUES ABOVE ARE FOR 30' POLE MOUNTING HEIGHT. PHOTOMETRY IS AVAILABLE ONLY AS A SPECIFICATION GUIDELINE. CALCULATIONS MUST BE PERFORMED USING INDIVIDUAL MANUFACTURERS' INFORMATION.



REV	DATE	BY	SUB	APP	DESCRIPTION
1	10/10/94	CY	FAH	GMC	REVISED & RESEALED PER SUBCN-DE 308.08-10
2	1/19/94	CY	FAH	GMC	BASELINE ISSUE

DESIGNED BY: C. YU
 DRAWN BY: B. H. CHAMBERS
 CHECKED BY: C. ROBINOL
 IN CHARGE: J. BOOTH
 DATE: 19 APR 94

REGISTERED PROFESSIONAL ENGINEER
 MODEL & ESTYKA
 No. 19557
 Exp. 12-31-98
 ELECTRICAL
 STATE OF CALIFORNIA

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

ENGINEERING MANAGEMENT CONSULTANT
 an association of
 Parsons Brinckerhoff Smith & Douglas, Inc.
 Parke, Stone, Johnson & Associates
 CF Mosser Engineering, Ltd. Corp.
 Leonard J. Pines & Associates
 Johnson, Egert, McLaughlin, Inc.
 The Hertzberg Group, Inc.

SUBMITTED: *Philip A. Edwards*
 APPROVED: *Joy*

ELECTRICAL STANDARD

TYPE C
 HIGH INTENSITY DISCHARGE
 AREA LIGHT

CONTRACT NO.
 DRAWING NO: ES-063
 REV: 1
 SCALE: NO SCALE
 SHEET NO.

GENERAL DESCRIPTION
LED EXIT LIGHT WITH STENCIL FACE(S) FOR STATION AND TUNNEL INTERIORS.

FIXTURE OPTIONS

E1
LAMP: LED
LUMENS: NA
BALLAST: INTEGRAL
NEUT. WALLS: APPROX. 7
DIMENSIONS: APPROX. 12" W, 9" H, 2" D
EFFICIENCY: NA

E2
REMARKS: SIMILAR TO E1 BUT (2) SIDED
LAMP: LED
LUMENS: NA
BALLAST: INTEGRAL
NEUT. WALLS: 14 (DOUBLE FACE)
DIMENSIONS: APPROX. 12" W, 9" H, 2" D
EFFICIENCY: NA

PHOTOMETRIC OPTIONS

- 1. RED LIGHT
- 2. GREEN LIGHT

MOUNTING OPTIONS

- 1. SURFACE WALL MOUNTING HARDWARE
- 2. BRACKET WALL MOUNTING HARDWARE
- 3. BRACKET CEILING MOUNTING HARDWARE
- 4. PENDANT MOUNTING HARDWARE

ACCESSORIES

- 1. LEFT OR RIGHT ARROWS
- 2. VANDAL RESISTANT SHIELD

FINISH MATERIALS

- BRUSHED ALUMINUM OR ELECTROSTATICALLY APPLIED, THERMAL CURED POLYESTER POWDERCOAT TRIM.

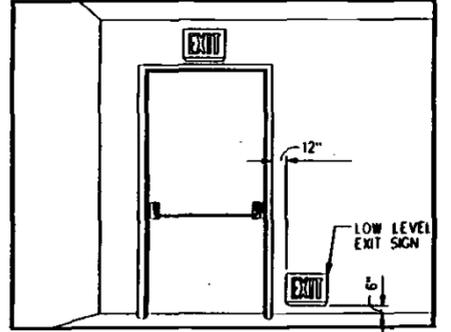
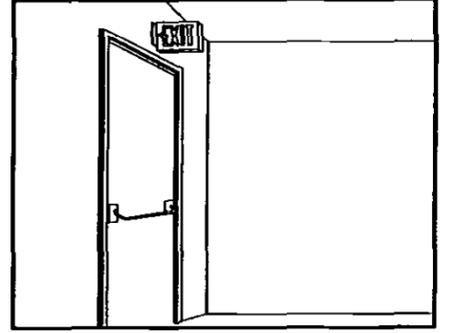
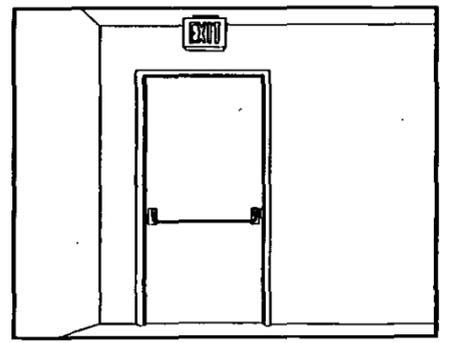
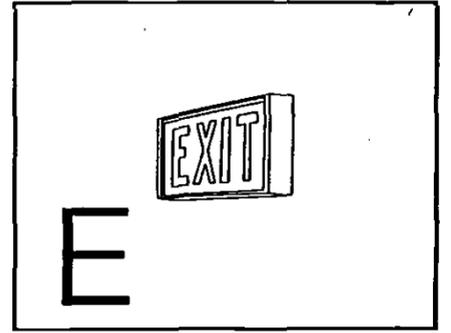
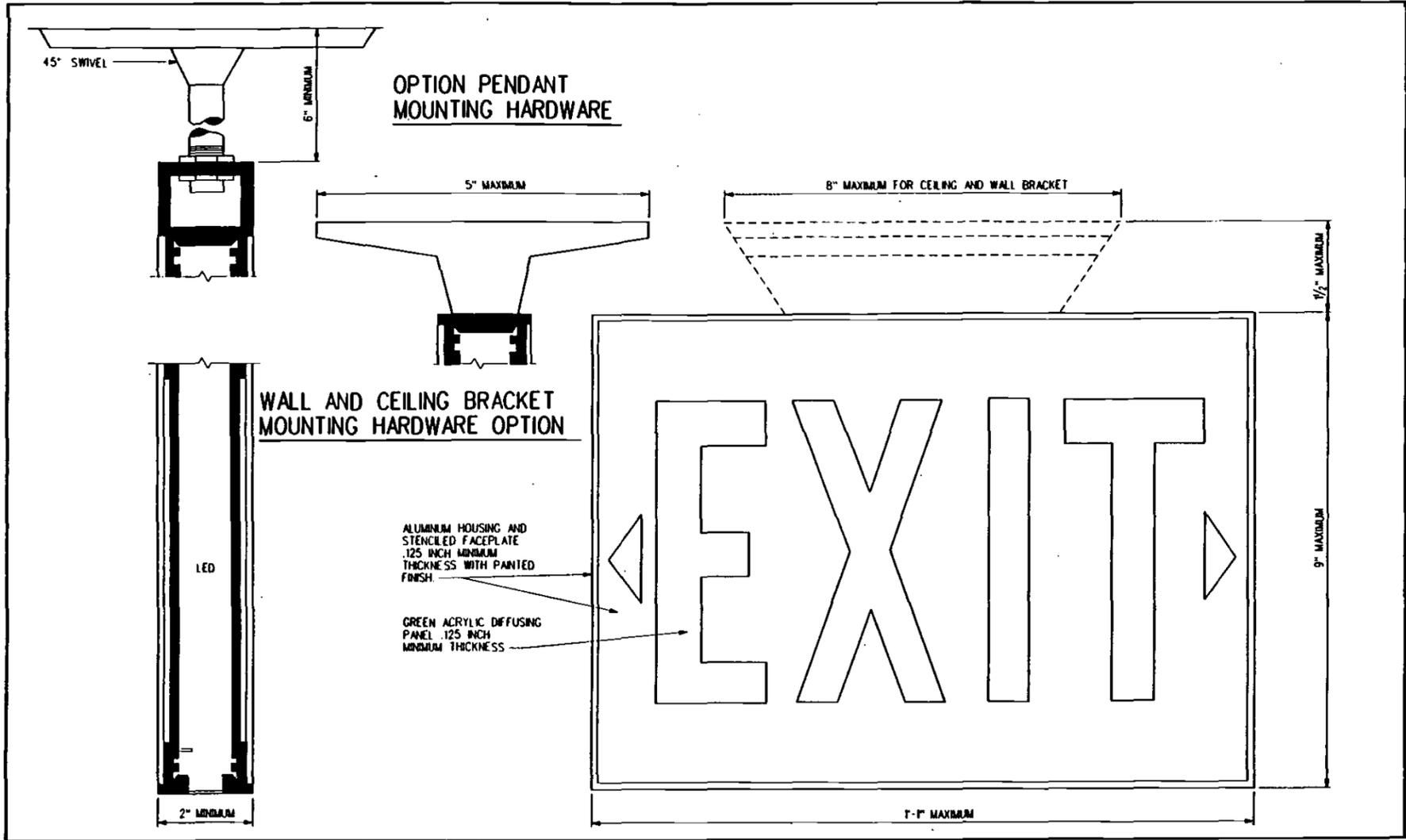
SAFETY LISTING

- DAMP, WET

REMARKS

MANUFACTURER OPTIONS

- CW COLE
- PRESCOLITE "DIECAST LED"
- LITHONIA "SIGNATURE LES"



NO.	DATE	BY	CHK	APP	DESCRIPTION
0	4/19/94	CY	ML	GMC	BASELINE ISSUE
1	10/10/94	ML	ML	ML	REVISED & RESEALED PER SBON/DE 306/06-07

DESIGNED BY: C. YU
 DRAWN BY: B.H. CHAMBERS
 CHECKED BY: C. ROBENIOL
 IN CHARGE: J. BODTH
 DATE: 19 APR 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
 ENGINEERING MANAGEMENT CONSULTANT
 SUBMITTED: [Signature]
 APPROVED: [Signature]

ELECTRICAL STANDARD
 TYPE E
 LIGHT EMITTING DIODE EXIT LIGHT

CONTRACT NO.
 DRAWING NO. ES-065
 SCALE: ND SCALE
 SHEET NO. 1

GENERAL DESCRIPTION

CEILING MOUNTED INDUSTRIAL FLUORESCENT FIXTURE WITH 10% UPLIGHT AND WIREGUARD FOR INTERIOR USE.

FIXTURE OPTIONS

H1
 LAMP: (2) 32W, T8, 3500°K
 LUMENS: 5700/ 4 FOOT SECTION
 BALLAST: HPF, ELECTRONIC, RAPID START
 INPUT WATTS: 70/4 FOOT SECTION
 DIMENSIONS: APPROX. 6-1/2" H, 14" W, 4" L
 EFFICIENCY: 90%

H2
 LAMP: (4) 32W, T8, 3500°K
 LUMENS: 11400/ 8 FOOT SECTION
 BALLAST: HPF, ELECTRONIC, RAPID START
 INPUT WATTS: 140/ 8 FOOT SECTION
 DIMENSIONS: APPROX. 6-1/2" H, 14" W, 8" L
 EFFICIENCY: 90%

PHOTOMETRIC OPTIONS

- 1. CANDLEPOWER DISTRIBUTION

MOUNTING OPTIONS

- 1. PENDANT MOUNTING HARDWARE FOR FOUR OR EIGHT FOOT LENGTHS - CONCEALED.
- 2. JUNCTION BOX MOUNTING HARDWARE FOR FOUR OR EIGHT FOOT LENGTHS - EXPOSED.

ACCESSORIES OPTIONS

- 0. NO WIREGUARD
- 1. WIREGUARD

FINISH MATERIALS

- HIGH GLOSS BAKED WHITE ENAMEL.

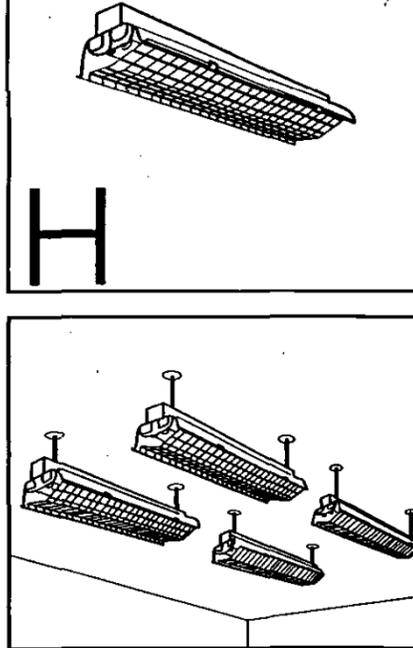
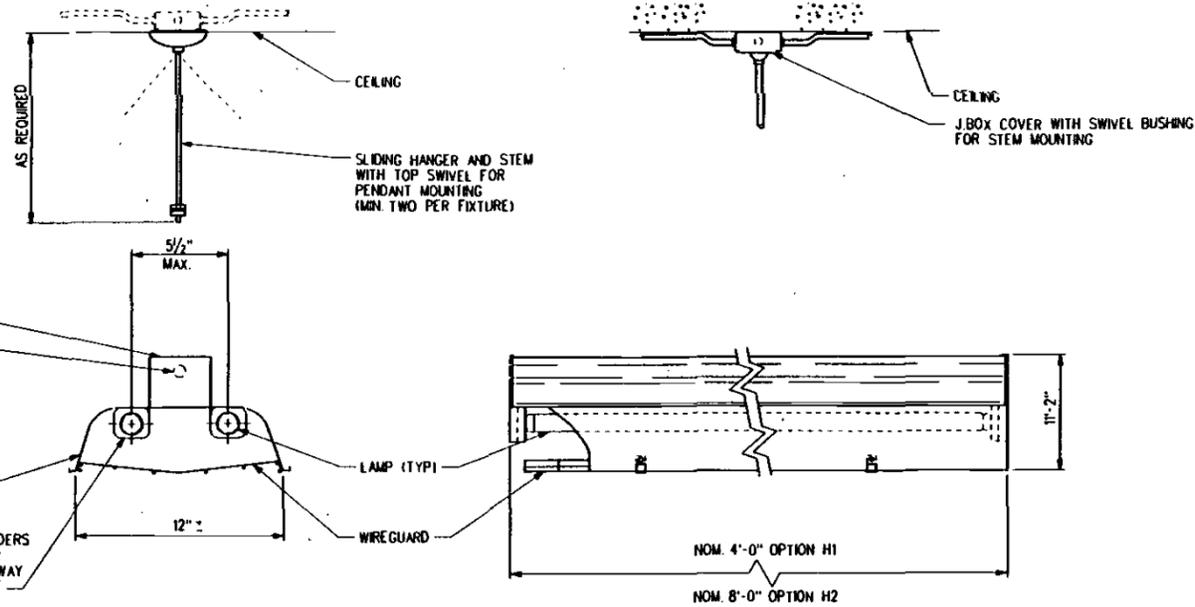
SAFETY LISTING

- DAMP

REMARKS

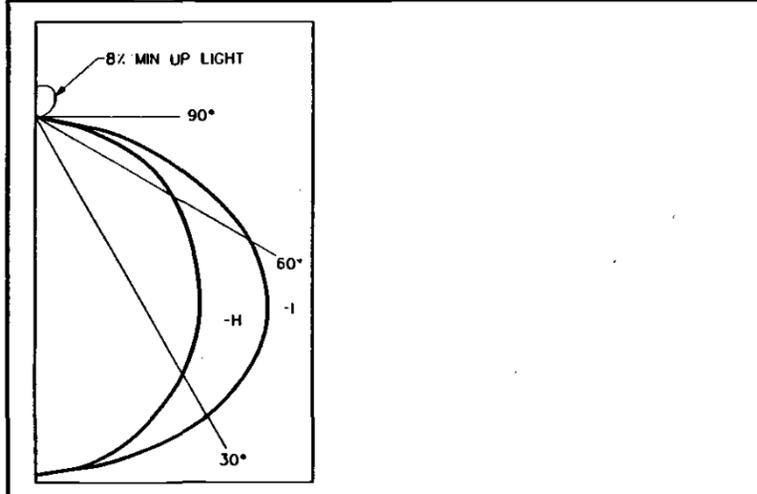
MANUFACTURERS

- COLUMBIA "KL" SERIES
- DAY-BRITE "INDUSTRIAL FL" SERIES
- LITHONIA "AF" SERIES



CANDLEPOWER DISTRIBUTION
 FIXTURE OPTION: H1, H2

LAMP: 32W, T8



ILLUMINATION DATA
 COEFFICIENT OF UTILIZATION

2 LAMP		ZONAL CAVITY													
ROOM CAVITY RATIO	PFC	20 %													
	PCC	80%				70%				50%		30%			
	PW	70%	50%	30%	10%	70%	50%	30%	10%	50%	30%	10%			
1		92	88	84	81	90	86	83	80	82	80	77	79	77	75
2		84	77	71	66	81	75	70	65	72	68	64	69	66	62
3		76	67	60	55	74	66	60	54	63	58	53	61	56	52
4		69	59	52	46	67	58	51	46	56	50	45	54	49	44
5		63	52	44	38	61	51	44	38	49	43	38	47	42	37
6		58	46	38	33	56	45	38	33	44	37	32	42	36	32
7		53	41	33	28	52	40	33	28	39	33	28	38	32	28
8		49	37	29	24	47	36	29	24	35	28	24	34	28	24
9		45	33	25	21	43	32	25	20	31	25	20	30	24	20
10		42	30	23	18	40	29	23	18	28	22	18	28	22	18

C.U. TABLE NOTES:
 FOR T8 LAMP MULTIPLY BY 0.95

REV	DATE	BY	CHK	APP	DESCRIPTION
0	4.19.94	CR			REVISED & RESEALED PER SBCN-DE 306.06-10
1	10.10.94				BASELINE ISSUE

DESIGNED BY
C. RDBENIDL
 DRAWN BY
B.H. CHAMBERS
 CHECKED BY
C. YU
 IN CHARGE
J. BOOTH
 DATE
19 APR 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

ENGINEERING MANAGEMENT CONSULTANT

Submitted by: *[Signature]*

Approved by: *[Signature]*

ELECTRICAL STANDARD

TYPE H
 FLUORESCENT ANCILLARY LIGHT

CONTRACT NO

DRAWING NO
ES-068

SCALE
NO SCALE

SHEET NO

REV 1

GENERAL DESCRIPTION

CEILING MOUNTED FLUORESCENT STRIPLIGHT FOR INTERIOR USE.

FIXTURE OPTIONS

11

LAMP: (1) 32W, T8, 3500°K
 INITIAL LUMENS: 2,850
 BALLAST: HPF, ELECTRONIC, RAPID START
 INPUT WATTS: 38
 DIMENSIONS: APPROX. 4-1/4" W, 48" L
 EFFICIENCY: 90%

12

LAMP: (2) 32W, T8, 3500°K
 INITIAL LUMENS: 2,850 EACH LAMP
 BALLAST: HPF, ELECTRONIC, RAPID START
 INPUT WATTS: 70
 DIMENSIONS: APPROX. 4-1/4" W, 48" L
 EFFICIENCY: 90%

PHOTOMETRIC OPTIONS

0. NO OPTIONS

MOUNTING OPTIONS

- 1. SURFACE MOUNTING HARDWARE
- 2. PENDANT MOUNTING HARDWARE
- 3. OVER 8 FOOT METAL FRAMING

ACCESSORIES

0. NO ACCESSORIES

FINISH MATERIALS

- REFER TO MANUFACTURER CATALOG INFORMATION

SAFETY LISTING

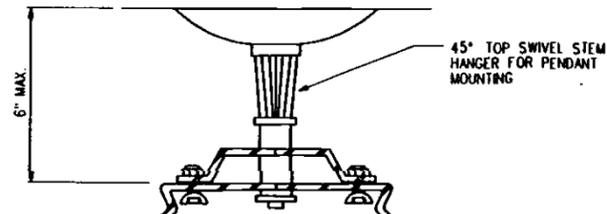
- DAMP

REMARKS

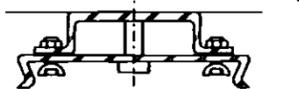
- FOR TANDEM MOUNTING OVER EIGHT FOOT LENGTHS, USE SEPARATE SUSPENDED METAL FRAMING SYSTEM.

MANUFACTURERS

- 1. COLUMBIA "CS 200" SERIES
- 2. DAY-BRITE "STANDARD STRIP"
- 3. LITHONIA "LN MD/240" SERIES



PENDANT MOUNTING OPTION



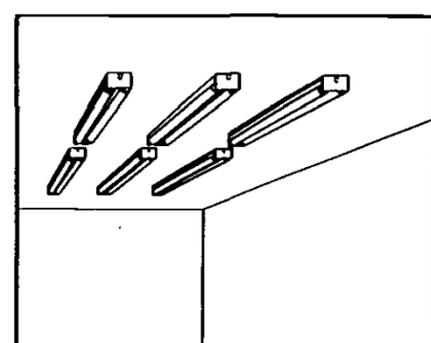
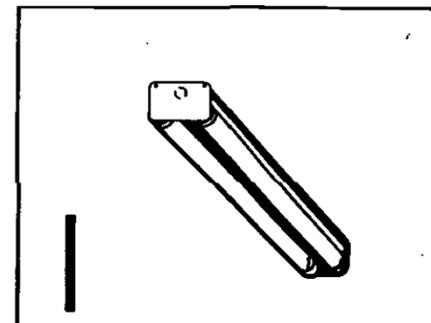
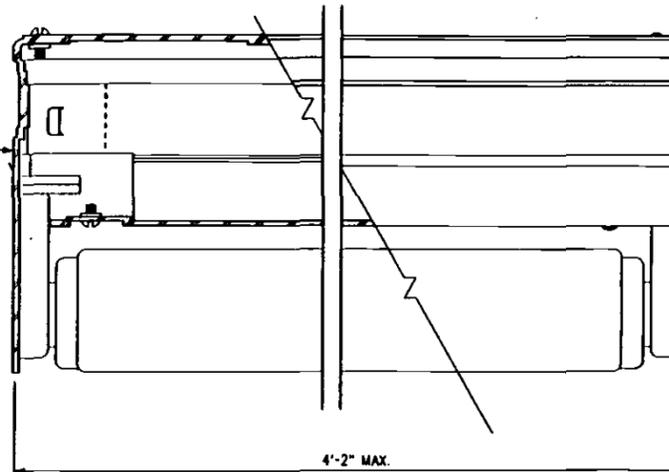
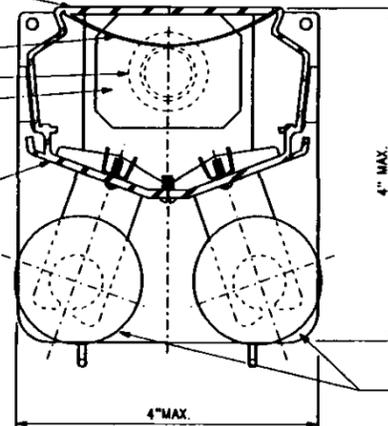
HANGER FOR SURFACE MOUNTING OPTION

ONE PIECE 4' AND 8' METALLIC CHANNEL .036 MIN. THICKNESS WITH BAKED ENAMEL FINISH

WIRE RETAINER
 KNOCK OUT
 BALLAST

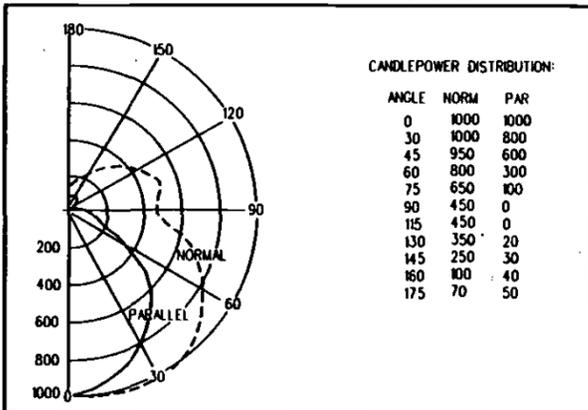
METALLIC WIREWAY COVER WITH BAKED ENAMEL FINISH

METALLIC END PIECE WITH BAKED ENAMEL FINISH



FIXTURE OPTION: 11, 12

LAMP: 32W T8



CANDELA POWER DISTRIBUTION NOTES:
 VALUES BASED ON A TWO-LAMP UNIT
 6200 INITIAL LAMP LUMENS.
 FOR 5700 LUMENS MULTIPLY BY 0.95

COEFFICIENTS OF UTILIZATION

ROOM CAVITY RATIO	CEILING REFLECTANCE				WALL REFLECTANCE			
	70	50	10	0	50	30	10	0
1	.80	.76	.72	.69	.58	.56	.51	
2	.68	.63	.62	.57	.50	.47	.41	
3	.60	.53	.54	.48	.43	.40	.34	
4	.53	.45	.47	.42	.38	.34	.28	
5	.46	.39	.42	.35	.34	.29	.24	
6	.41	.34	.37	.31	.30	.26	.20	
7	.37	.30	.33	.27	.27	.23	.17	
8	.33	.26	.30	.24	.24	.20	.15	
9	.30	.23	.27	.21	.22	.17	.12	
10	.27	.20	.24	.19	.20	.16	.11	

BASED ON A 20% FLOOR CAVITY REFLECTANCE

C.U. TABLE NOTES:

FOR FIXTURE WITH WIRE GUARD MULTIPLY VALUES BY 0.80

REV	DATE	BY	CHK	APP	DESCRIPTION
1	10 10 94	CY			REVISED & RESEALED PER SUBCONTRACTOR
0	4 19 94	CY			BASELINE ISSUE

DESIGNED BY
C. YU
 ORDERED BY
B.H. CHAMBERS
 CHECKED BY
C. ROBINOL
 IN CHARGE
J. BOOTH
 DATE
19 APR 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
 ENGINEERING MANAGEMENT CONSULTANT
 10000 Wilshire Blvd, Suite 1000, Beverly Hills, CA 90210
 (310) 206-1000

SUBMITTED: *[Signature]*
 APPROVED: *[Signature]*

ELECTRICAL STANDARD
 TYPE I
 FLUORESCENT ANCILLARY LIGHT

CONTRACT NO.
 DRAWING NO. ES-069
 SCALE: NO SCALE
 SHEET NO.

GENERAL DESCRIPTION

CEILING MOUNTED FLUORESCENT STRIPLIGHT WITH WRAP AROUND LENS FOR INTERIOR AND EXTERIOR USE.

FIXTURE OPTIONS

J1
 LAMP: (1) 32W. 18. 3500°K
 INITIAL LUMENS: 2,850
 BALLAST: HPF, ELECTRONIC, RAPID START
 INPUT WATTS: 38
 DIMENSIONS: APPROX. 5" W, 6" H, 48" L
 EFFICIENCY: 88%

J2
 LAMP: (2) 32W. 18. 3500°K
 INITIAL LUMENS: 2,850 EACH
 BALLAST: HPF, ELECTRONIC, RAPID START
 INPUT WATTS: 70
 DIMENSIONS: APPROX. 5" W, 6" H, 48" L
 EFFICIENCY: 75%

J3
 REMARKS: J2 EXCEPT LENGTH
 LAMP: (2) 32W. 18. 3500°K, IN TANDEM
 DIMENSIONS: APPROX. 5" W, 6" H, 96" L

J4
 REMARKS: J3 EXCEPT 4 LAMPS
 LAMP: (4) 32W. 18. 3500°K, IN TANDEM
 DIMENSIONS: APPROX. 5" W, 6" H, 96" L

PHOTOMETRIC OPTIONS

- 1. CLEAR LENS
- 2. WHITE LENS

MOUNTING OPTIONS

- 1. PENDANT MOUNTING HARDWARE
- 2. SURFACE MOUNTING HARDWARE
- 3. WALL MOUNTING HARDWARE

ACCESSORIES

- 0. NO ACCESSORIES
- 1. PROVIDE END LENS RETAINER AND JOINER BAND FOR CONTINUOUS ROW MOUNTING.

FINISH MATERIALS

- HIGH-REFLECTANCE WHITE BAKED ENAMEL

SAFETY LISTINGS

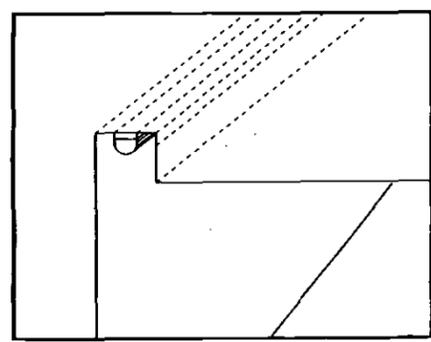
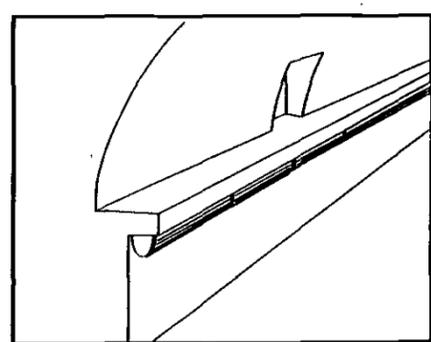
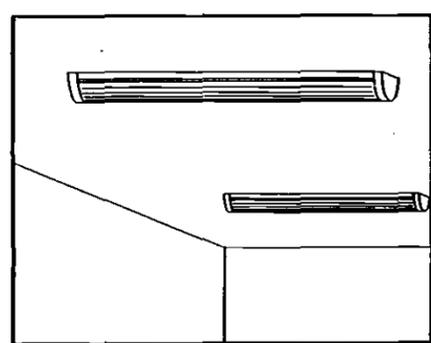
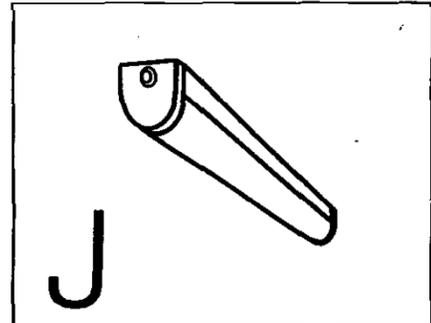
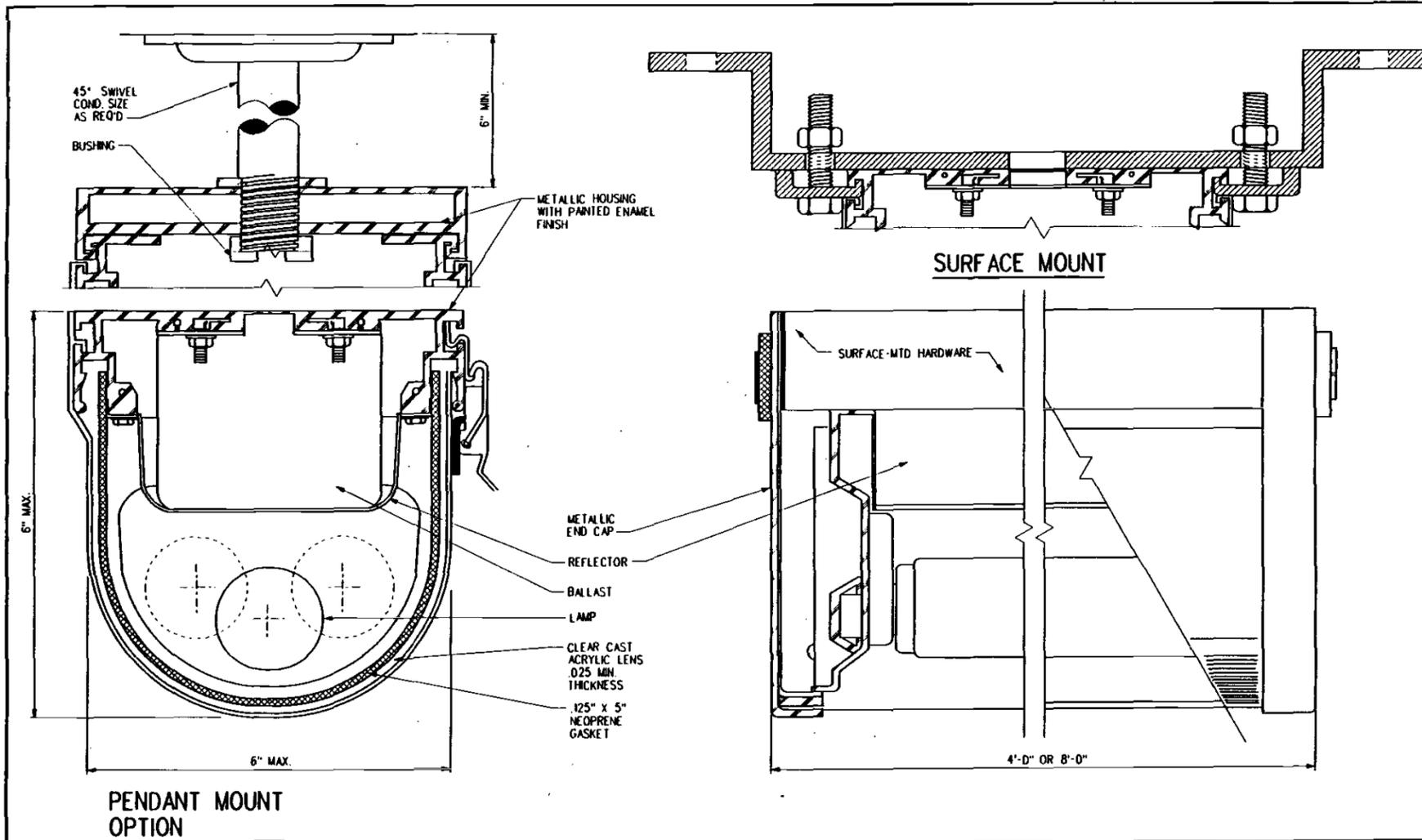
- DAMP

REMARKS

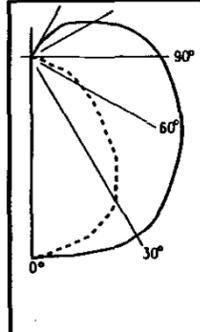
- FOR TANDEM MOUNTING OVER EIGHT FOOT LENGTHS, USE SEPARATE SUSPENDED METAL FRAMING SYSTEM.
- FIXTURE CAN BE MOUNTED DIRECTLY TO CONCRETE CEILING.

MANUFACTURERS

- 1. MCPHILBEN "LITEWAY 77" SERIES
- 2. PRUDENTIAL "P" SERIES
- 3. NATIONAL LIGHTING "WRAPAROUND" SERIES



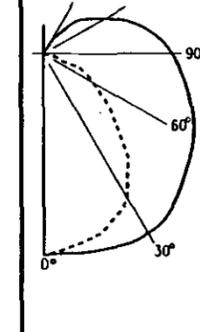
FIXTURE OPTION: J1, J3



COEFFICIENTS OF UTILIZATION																		
RC	80				70				50				0					
	RW	70	50	30	10	70	50	30	10	50	30	10		50	30	10	0	
0	93	93	93	93	89	89	89	89	81	81	81	74	74	74	68	68	68	64
1	83	78	73	69	78	74	70	67	67	64	61	61	59	56	55	53	52	49
2	74	66	60	54	70	63	57	52	57	52	48	52	48	45	47	44	41	38
3	67	58	50	44	63	55	48	43	50	44	40	45	41	37	41	37	34	31
4	61	50	43	37	58	48	41	36	44	38	33	40	35	31	36	32	29	26
5	55	44	36	30	52	42	35	29	38	32	28	35	30	26	32	27	24	21
6	51	39	31	26	48	37	30	25	34	28	23	31	26	22	28	24	20	18
7	47	35	28	22	44	34	27	22	31	25	20	28	23	19	25	21	18	16
8	43	31	24	19	41	30	23	19	28	22	17	25	20	16	23	18	15	13
9	40	28	21	16	38	27	20	16	25	19	15	23	18	14	21	16	13	11
10	37	26	19	14	45	25	18	14	21	17	13	21	16	12	19	14	11	10

C.U. TABLE NOTES:
 PHOTOMETRY FOR T12 LAMP. MULTIPLY VALUES BY .95 TO ADJUST FOR T8 LAMP.

FIXTURE OPTION: J2, J4

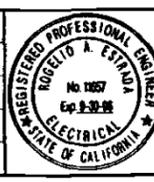


COEFFICIENTS OF UTILIZATION																		
RC	80				70				50				0					
	RW	70	50	30	10	70	50	30	10	50	30	10		50	30	10	0	
0	86	86	86	86	82	82	82	82	75	75	75	69	69	69	63	63	63	60
1	76	72	68	65	73	69	65	62	63	60	58	57	55	53	52	50	49	46
2	69	62	56	51	65	59	54	49	54	50	46	49	46	43	45	42	39	37
3	62	54	47	42	59	51	45	41	47	42	38	43	39	35	39	36	33	31
4	57	47	40	35	54	45	39	34	41	36	32	38	33	30	35	31	28	26
5	52	42	34	29	49	40	33	28	36	31	27	33	29	25	30	26	23	21
6	47	37	30	25	45	35	29	24	32	27	23	30	25	21	27	23	20	18
7	44	33	26	21	41	32	25	21	29	24	20	27	22	18	24	20	17	16
8	40	30	23	18	38	28	22	18	26	21	17	24	19	16	22	18	15	13
9	37	27	20	16	35	26	20	15	24	18	15	22	17	14	20	16	13	11
10	34	24	18	14	33	23	17	14	21	16	13	20	15	12	18	14	11	10

C.U. TABLE NOTES:
 PHOTOMETRY FOR T12 LAMP. MULTIPLY VALUES BY .95 TO ADJUST FOR T8 LAMP.

REV	DATE	BY	CHKD	APP'D	DESCRIPTION
1	10 10 94	ER	AHL	GMC	REVISED & RESEALED PER SPEC-DE 308 08-10
0	1 19 94	ER	AHL	GMC	BASELINE ISSUE

DESIGNED BY
C. ROBENIOL
 DRAWN BY
B.H. CHAMBERS
 CHECKED BY
C. YU
 IN CHARGE
J. BOOTH
 DATE
19 APR 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
 ENGINEERING MANAGEMENT CONSULTANT
 SUBMITTED: *Roberto A. Estrella*
 APPROVED: *[Signature]*

ELECTRICAL STANDARD
TYPE J
FLUORESCENT ANCILLARY LIGHT
 CONTRACT NO.
 DRAWING NO. **ES-070** REV **1**
 SCALE **NO SCALE**
 SHEET NO.

GENERAL DESCRIPTION

CEILING MOUNTED ROUND CYLINDER METAL HALIDE DOWNLIGHT FOR INTERIOR AND EXTERIOR USE.

FIXTURE OPTIONS

L1
 LAMP: 150W METAL HALIDE, PAR 38 VWF, 3200°K
 INITIAL LUMENS: 5,600
 BALLAST: HPF FOR -20 F STARTING
 INPUT WALLS: 135
 DIMENSIONS: APPROX 17" HEIGHT 10" DIA
 EFFICIENCY: 87%

L2
 LAMP: 150W METAL HALIDE, PAR 38 VWF, 3200°K
 INITIAL LUMENS: 9000
 BALLAST: HPF FOR -20 F STARTING
 INPUT WALLS: 185
 DIMENSIONS: 21" - 26" HEIGHT, 13" DIA MAX.
 EFFICIENCY: 87%

L3
 LAMP: 175W METAL HALIDE, R40 FLOOD, 4000°K
 INITIAL LUMENS: 12000
 BALLAST: HPF FOR -20 F STARTING
 INPUT WALLS: 215
 DIMENSIONS: APPROX 21" - 26" HEIGHT, 13" DIA MAX.
 EFFICIENCY: 57%

PHOTOMETRIC OPTIONS

- REFLECTOR
- GROOVED BLACK BAFFLE

MOUNTING OPTIONS

- SURFACE MOUNTING HARDWARE
- PENDANT MOUNTING HARDWARE

ACCESSORIES OPTIONS

- GLASS GUARD

FINISH MATERIALS

ELECTROSTATICALLY APPLIED, THERMAL CURED POLYESTER POWDERCOAT.

SAFETY LISTING

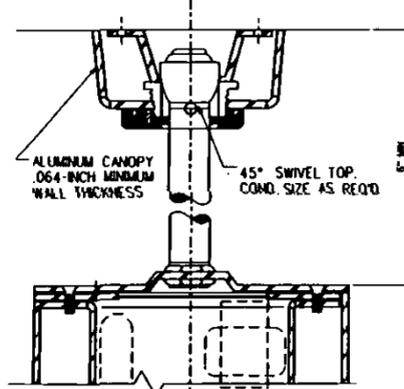
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REMARKS

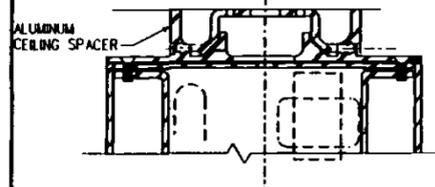
- BLACK BAFFLE DECREASES EFFICIENCY BY 30%
- FLOOD LAMP AVAILABLE FOR L1 AND L2 FOR CEILING HEIGHTS OVER 25 FEET.

MANUFACTURERS

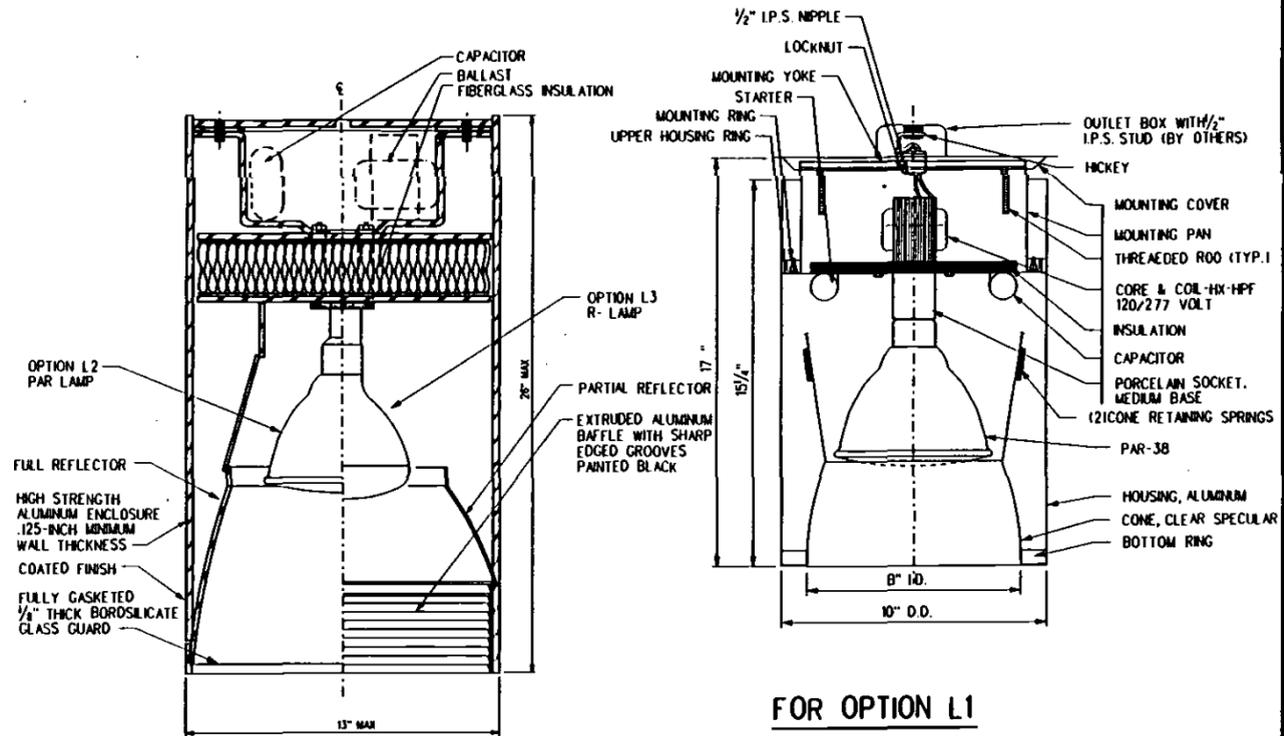
- DEVINE "C" SERIES
- KURT VERNER "S" SERIES
- MCPHILBEN "38" SERIES



PENDANT MOUNTING HARDWARE OPTION

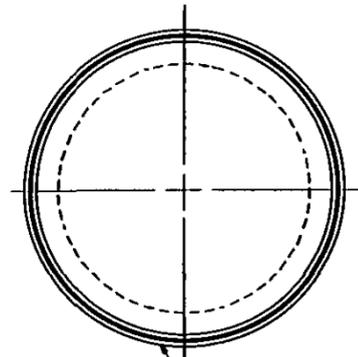


CEILING MOUNTING HARDWARE OPTION

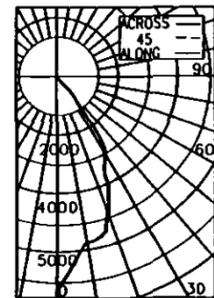


FOR OPTIONS L2, L3

FOR OPTION L1



DIE CAST ALUMINUM LAMP GUARD
 1/16-INCH WALL THICKNESS,
 MATTE BLACK FINISH



CANDLEPOWER SUMMARY

ANGLE	MEAN CP
0	7248
5	6549
10	5782
15	5523
20	4760
25	3661
30	2939
35	1325
40	207
45	29
50	0
55	0
60	0
65	0
70	0
75	0
80	0
85	0
90	0

CANDLEPOWER DISTRIBUTION NOTES:
 1. CANDLEPOWER VALUES BASED ON SPECULAR CLEAR REFLECTOR CONE
 2. FOR TYPE L, M, N, O, P, Q2 (RESPECTIVELY), MULTIPLY VALUES BY 1.6 TO ADJUST FOR 150 WATT PAR38 LAMP.

COEFFICIENTS OF UTILIZATION

% EFFECTIVE CEILING CAVITY REFLECTANCE

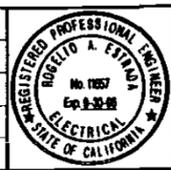
ROOM CAVITY RATIO	% WALL REFLECTANCE																		
	80			70			50			30			10			0			
	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	
1	.98	.96	.94	.96	.94	.93	.92	.91	.90	.89	.88	.87	.86	.85	.85	.83	.82	.80	.78
2	.93	.90	.88	.91	.89	.87	.89	.87	.85	.86	.85	.83	.84	.83	.82	.80	.78	.77	.75
3	.88	.85	.83	.87	.85	.82	.85	.83	.81	.83	.81	.80	.82	.80	.78	.77	.75	.74	.72
4	.85	.81	.78	.84	.81	.78	.82	.79	.77	.80	.78	.76	.79	.77	.75	.74	.72	.71	.69
5	.81	.77	.74	.80	.76	.74	.79	.76	.73	.77	.75	.73	.76	.74	.72	.71	.69	.68	.66
6	.78	.74	.71	.77	.73	.71	.76	.73	.70	.75	.72	.70	.74	.71	.69	.68	.66	.65	.63
7	.74	.70	.67	.74	.70	.67	.73	.69	.67	.72	.69	.66	.71	.68	.66	.65	.63	.62	.60
8	.71	.67	.64	.70	.67	.64	.70	.66	.64	.69	.66	.64	.68	.65	.63	.62	.60	.59	.57
9	.68	.64	.61	.67	.64	.61	.67	.63	.61	.65	.63	.60	.65	.62	.60	.59	.57	.56	.54
10	.65	.61	.58	.65	.61	.58	.64	.60	.58	.63	.60	.58	.63	.60	.58	.57	.56	.54	.52

20% FLOOR CAVITY REFLECTANCE

C.U. TABLE NOTES:
 1. C.U. VALUES BASED ON SPECULAR CLEAR REFLECTOR CONE.
 2. MULTIPLY VALUES BY .85 TO ADJUST FOR BLACK GROOVED BAFFLE

REV	DATE	BY	SUB	APP	DESCRIPTION
1	10/10/94	CY			REVISED & RESEALED PER SHEET 306.06-10
2	4/19/94	CY	AHL	GMC	BASELINE ISSUE

DESIGNED BY
C. YU
 DRAWN BY
B.H. CHAMBERS
 CHECKED BY
C. ROBINOL
 IN CHARGE
J. BOOTH
 DATE
19 APR 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
 ENGINEERING MANAGEMENT CONSULTANT
 SUBMITTED: *[Signature]*
 APPROVED: *[Signature]*

**ELECTRICAL STANDARD
 TYPE L
 HIGH INTENSITY DISCHARGE
 DOWNLIGHT**

CONTRACT NO.	
DRAWING NO.	ES-072
SCALE	NO SCALE
SHEET NO.	1

PLOTTED BY: approved
 11/11/94 17:35
 /rem/108/0002/0001/11/11/94/072.dwg

GENERAL DESCRIPTION

CEILING MOUNTED SQUARE CYLINDER METAL HALIDE DOWNLIGHT FOR INTERIOR AND EXTERIOR USE.

FIXTURE OPTIONS

M1

LAMP: 100W. M.H., PAR 38, VWF, 3200°K
 INITIAL LUMENS: 5600
 BALLAST: HPF, FOR -20°F STARTING
 INPUT WATTS: 135
 DIMENSIONS: 17" x 10" SQUARE
 EFFICIENCY: 87%

M2

LAMP: 150W. M.H., PAR 38, VWF, 3200°K
 INITIAL LUMENS: 9000
 BALLAST: HPF, FOR -20°F STARTING
 INPUT WATTS: 185
 DIMENSIONS: APPROX 21-26" HEIGHT, 13" SQUARE
 EFFICIENCY: 87%

M3

LAMP: 175W. M.H., R40, FLOOD, 4000°K
 INITIAL LUMENS: 12000
 BALLAST: HPF, FOR -20°F STARTING
 INPUT WATTS: 215
 DIMENSIONS: APPROX 21-26" HEIGHT, 13" SQUARE
 EFFICIENCY: 57%

PHOTOMETRIC OPTIONS

1. FULL REFLECTOR
2. GROOVED BAFFLE

MOUNTING OPTIONS

1. SURFACE MOUNTING HARDWARE
2. PENDANT MOUNTING HARDWARE
3. RECESS MOUNTING

ACCESSORIES OPTIONS

1. GLASS GUARD

FINISH MATERIALS

- ELECTROSTATICALLY APPLIED, THERMALLY CURED POLYESTER POWDERCOAT

SAFETY LISTING

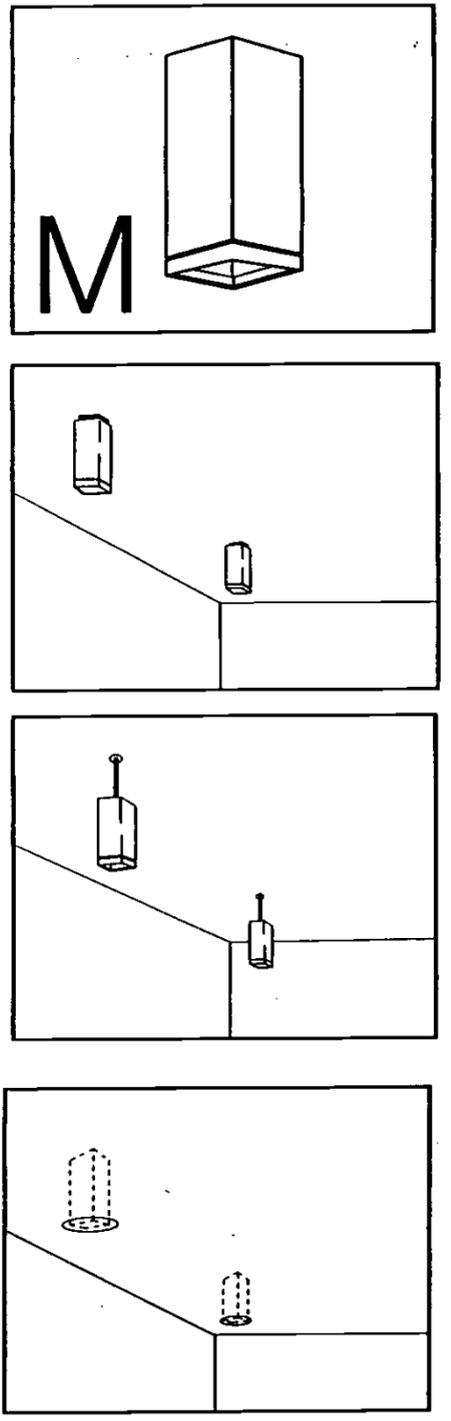
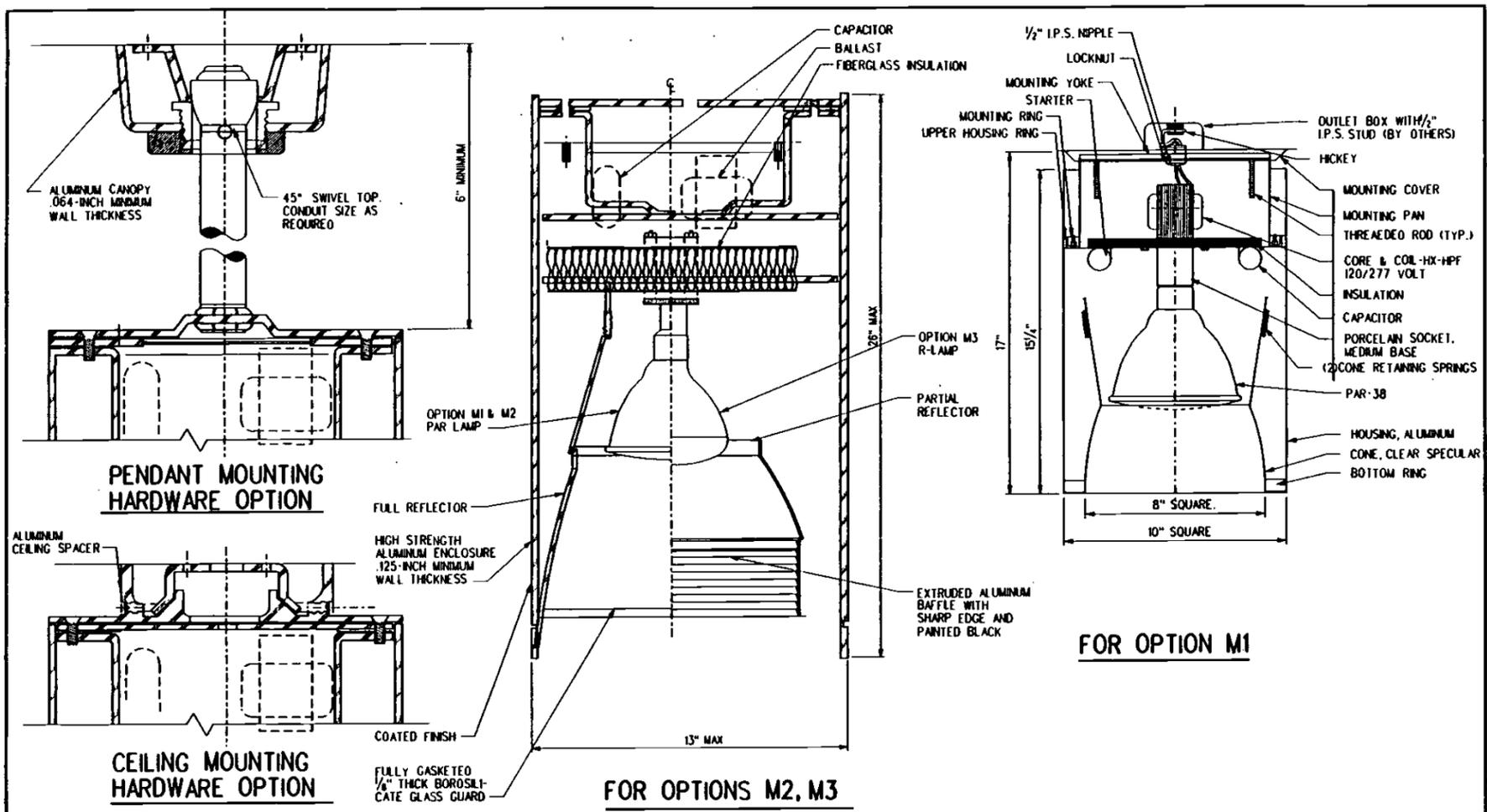
- DAMP

REMARKS

- BLACK BAFFLE DECREASES EFFICIENT BY 30%
- FLOOD LAMP AVAILABLE FOR M1 AND M2 FOR CEILING HEIGHTS OVER 25 FEET

MANUFACTURER OPTIONS

- DEVINE "C" SERIES
- KURT VERSEN "S" SERIES
- MCPHILBEN "68" SERIES



CANDLEPOWER SUMMARY

ANGLE	MEAN CP
0	7248
5	6549
10	5782
15	5523
20	4760
25	3661
30	2939
35	1325
40	207
45	29
50	0
55	0
60	0
65	0
70	0
75	0
80	0
85	0
90	0

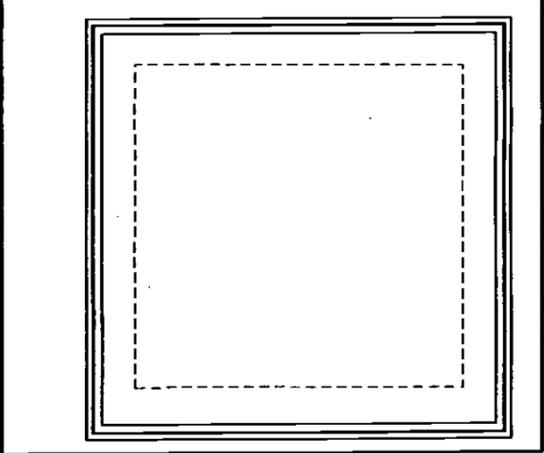
CANDLEPOWER DISTRIBUTION NOTES:
 1. CANDLEPOWER VALUES BASED ON SPECULAR CLEAR REFLECTOR CONE
 2. FOR TYPE L,M,N,O,P,Q2 (RESPECTIVELY), MULTIPLY VALUES BY 16 TO ADJUST FOR 150 WATT PAR38 LAMP.

COEFFICIENTS OF UTILIZATION
 % EFFECTIVE CEILING CAVITY REFLECTANCE

ROOM CAVITY RATIO	% WALL REFLECTANCE																			
	80			70			50			30			10			0				
	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10		
1	.98	.96	.94	.96	.94	.93	.92	.91	.90	.89	.88	.87	.86	.85	.85	.83	.84	.83	.82	.80
2	.93	.90	.88	.91	.89	.87	.89	.87	.85	.86	.85	.83	.83	.81	.80	.82	.80	.78	.77	.74
3	.88	.85	.83	.87	.85	.82	.85	.83	.81	.83	.81	.80	.80	.78	.76	.79	.77	.75	.74	.71
4	.85	.81	.78	.84	.81	.78	.82	.79	.77	.80	.78	.76	.77	.75	.73	.76	.74	.72	.71	.68
5	.81	.77	.74	.80	.76	.74	.79	.76	.73	.77	.75	.73	.77	.75	.73	.76	.74	.72	.71	.68
6	.78	.74	.71	.77	.73	.71	.76	.73	.70	.75	.72	.70	.74	.71	.69	.71	.68	.66	.65	.62
7	.74	.70	.67	.74	.70	.67	.73	.69	.67	.72	.69	.66	.71	.68	.66	.68	.65	.63	.62	.59
8	.71	.67	.64	.70	.67	.64	.70	.66	.64	.69	.66	.64	.68	.65	.63	.65	.62	.60	.59	.57
9	.68	.64	.61	.67	.64	.61	.67	.63	.61	.65	.63	.60	.65	.62	.60	.62	.59	.57	.56	.54
10	.65	.61	.58	.65	.61	.58	.64	.60	.58	.63	.60	.58	.63	.60	.58	.61	.58	.56	.55	.53

20% FLOOR CAVITY REFLECTANCE

C.U. TABLE NOTES:
 1. C.U. VALUES BASED ON SPECULAR CLEAR REFLECTOR CONE.
 2. MULTIPLY VALUES BY .85 TO ADJUST FOR BLACK GROOVED BAFFLE



REV	DATE	BY	SUB	APP	DESCRIPTION
0	10 10 94	CR			
0	4 19 94	CR			

DESIGNED BY
C. ROBINOL
 DRAWN BY
B.H. CHAMBERS
 CHECKED BY
C. YU
 IN CHARGE
J. BOOTH
 DATE
19 APR 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
 ENGINEERING MANAGEMENT CONSULTANT
 SUBMITTED: [Signature]
 APPROVED: [Signature]

ELECTRICAL STANDARD
 TYPE M
 HIGH INTENSITY DISCHARGE
 DOWNLIGHT
 CONTRACT NO.
 DRAWING NO. ES-073
 SCALE: NO SCALE
 SHEET NO. 1

GENERAL DESCRIPTION

WALL MOUNTED ROUND CYLINDER METAL HALIDE DOWNLIGHT FOR INTERIOR AND EXTERIOR USE.

FIXTURE OPTIONS

N1
 LAMP: 100W, M.H., PAR 38, VWF 3200°K
 INITIAL LUMENS: 5600
 BALLAST: HPF, FOR -20°F STARTING
 INPUT WATTS: 135
 DIMENSIONS: APPROX 21-26" HEIGHT, 13" DIA
 EFFICIENCY: 87%

N2
 LAMP: 150W, M.H., PAR 38, VWF 3200°K
 INITIAL LUMENS: 9000
 BALLAST: HPF, FOR -20°F STARTING
 INPUT WATTS: 185
 DIMENSIONS: APPROX 17" HEIGHT, 10" DIA
 EFFICIENCY: 87%

N3
 LAMP: 175W, M.H., R40, FLOOD, 4000°K
 INITIAL LUMENS: 12000
 BALLAST: HPF, FOR -20°F STARTING
 INPUT WATTS: 240
 DIMENSIONS: APPROX 21-26" HEIGHT 13" DIA
 EFFICIENCY: 57%

PHOTOMETRIC OPTIONS

1. FULL REFLECTOR
2. GROOVED BAFFLE

MOUNTING OPTIONS

1. WALL MOUNTING HARDWARE
2. POLE MOUNTING HARDWARE

ACCESSORIES OPTIONS

1. GLASS GUARD

FINISH MATERIALS

- ELECTROSTATICALLY APPLIED, THERMALLY CURED POLYESTER POWDERCOAT.

SAFETY LISTING

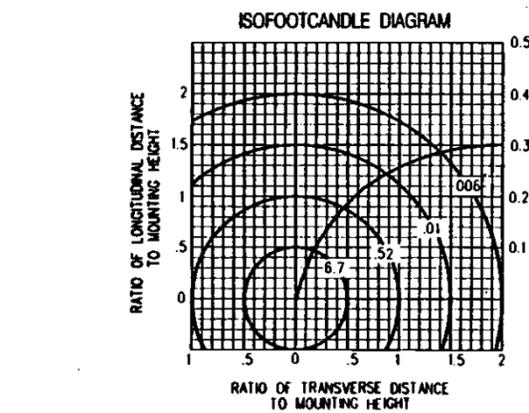
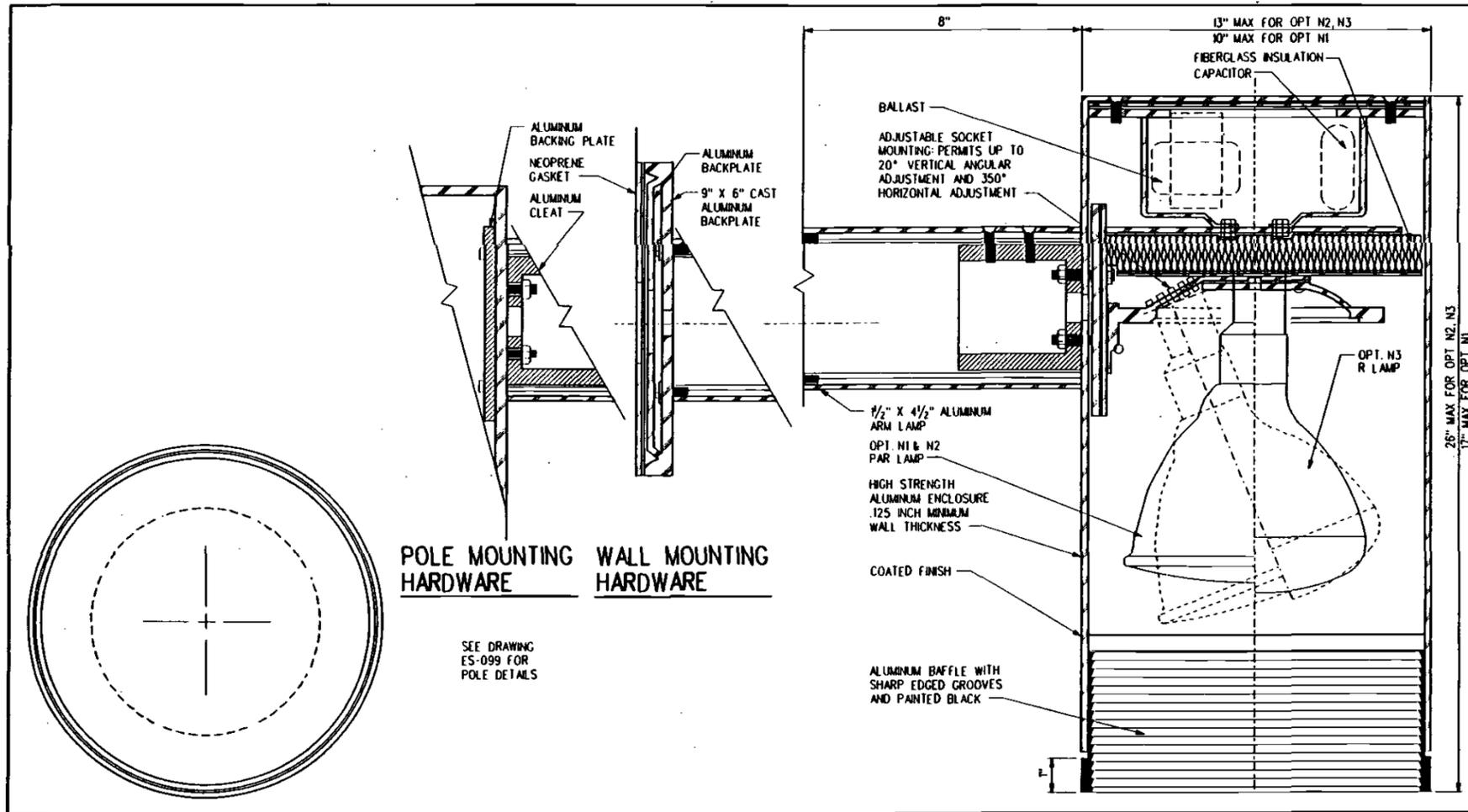
- DAMP

REMARKS

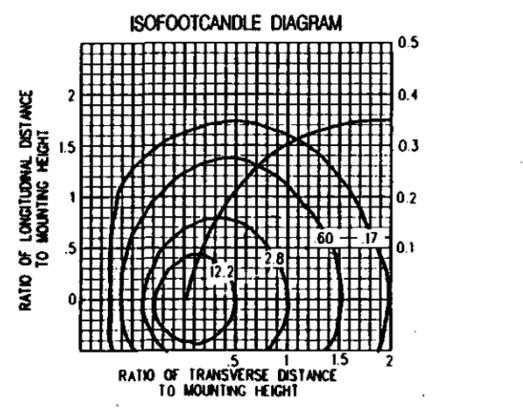
- BLACK BAFFLE DECREASES EFFICIENT BY 30%
- FLOOD LAMP AVAILABLE FOR N1 AND N2 FOR CEILING HEIGHTS OVER 25 FEET.

MANUFACTURERS OPTIONS

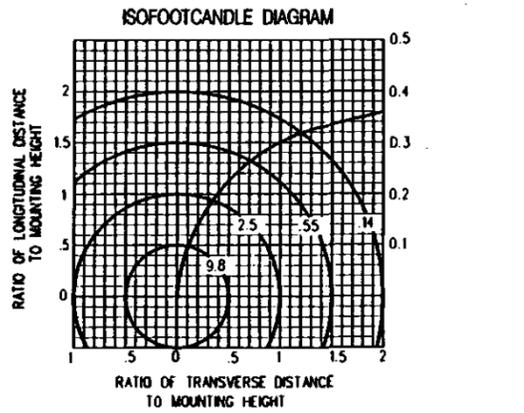
- DEVINE "C" SERIES
- KURT VENSEN "S" SERIES
- MCPHERSON "3B" SERIES



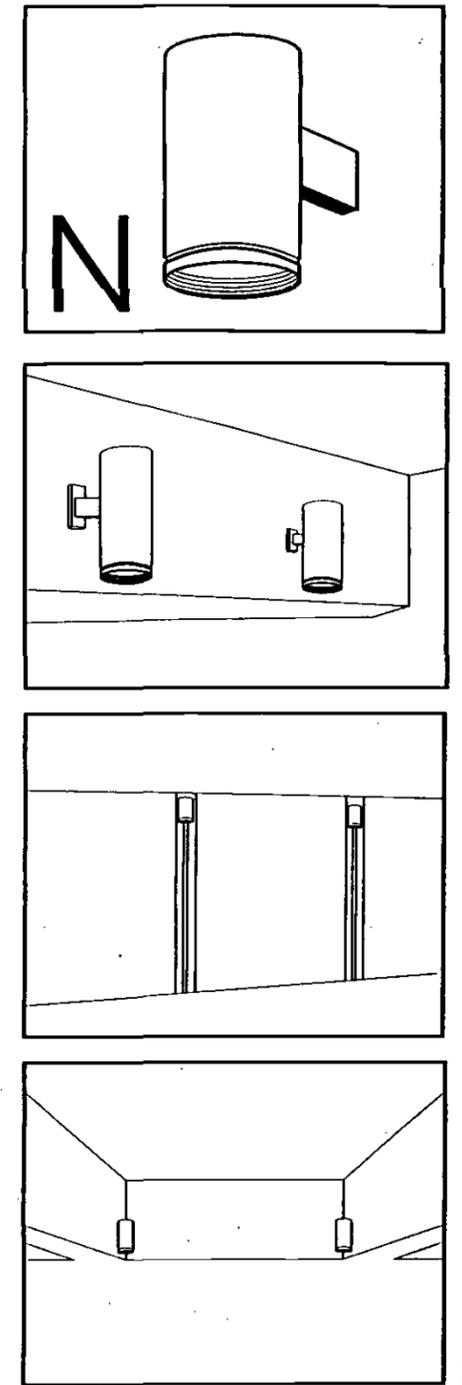
VALUES BASED ON: A SINGLE UNIT AT 10 FOOT MOUNTING HEIGHT WITH LAMP AIMED 0° FROM VERTICAL. TO CONVERT VALUES TO TWO LIGHTS MULTIPLY VALUES BY TWO.



VALUES BASED ON: A SINGLE UNIT AT 10 FOOT MOUNTING HEIGHT WITH LAMP AIMED 20° FROM VERTICAL. 11,400 INITIAL LAMP LUMENS.



VALUES BASED ON: TWO LIGHTS AT 10 FOOT MOUNTING HEIGHT WITH LAMPS AIMED 20° FROM VERTICAL. 5700 INITIAL LAMP LUMENS.



REV	DATE	BY	SUB	APP	DESCRIPTION
0	19 APR 94	CY	AFL	GMC	REVISED & RESEALED PER SBCHN OF 306.08-N BASELINE ISSUE

DESIGNED BY: C. YU
 DRAWN BY: B.H. CHAMBERS
 CHECKED BY: C. ROBENIOL
 IN CHARGE: J. BOOTH
 DATE: 19 APR 94

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

ENGINEERING MANAGEMENT CONSULTANT

REGISTERED PROFESSIONAL ENGINEER
 ROBERTO A. ESTAYO
 No. 11657
 Exp. 12-31-98
 ELECTRICAL
 STATE OF CALIFORNIA

SUBMITTED: *Roberto A. Estayo*
 APPROVED: *J. Booth*

ELECTRICAL STANDARD

TYPE N HIGH INTENSITY DISCHARGE DOWNLIGHT

CONTRACT NO.	
DRAWING NO.	ES-074
REV	1
SCALE	NO SCALE
SHEET NO.	

PLOTTED BY: [unreadable]

GENERAL DESCRIPTION

WALL MOUNTED SQUARE CYLINDER METAL HALIDE DOWNLIGHT FOR INTERIOR AND EXTERIOR USE.

FIXTURE OPTIONS

- O1**
 LAMP: 100W, M.H., PAR 38, VWF, 3200°K
 INITIAL LUMENS: 5600
 BALLAST: HPF, FOR -20°F STARTING
 INPUT WATTS: 135
 DIMENSIONS: APPROX 17" HEIGHT, 10" SQUARE
 EFFICIENCY: 87%
- O2**
 LAMP: 150W, M.H., PAR 38, VWF, 3200°K
 INITIAL LUMENS: 9000
 BALLAST: HPF, FOR -20°F STARTING
 INPUT WATTS: 185
 DIMENSIONS: APPROX 21-26" HEIGHT, 13" SQUARE
 EFFICIENCY: 87%
- O3**
 LAMP: 175W, M.H., R40, FLOODS, 4000°K
 INITIAL LUMENS: 12000
 BALLAST: HPF, FOR -20°F STARTING
 INPUT WATTS: 215
 DIMENSIONS: APPROX 21-26" HEIGHT, 13" SQUARE
 EFFICIENCY: 57%

PHOTOMETRIC OPTIONS

- FULL REFLECTOR
- GROOVED BLACK BAFFLE

MOUNTING OPTIONS

- SURFACE MOUNTING HARDWARE
- POLE MOUNTING HARDWARE

ACCESSORIES OPTIONS

- GLASS GUARD

FINISH MATERIALS

- ELECTROSTATICALLY APPLIED, THERMALLY CURED POLYESTER POWDERCOAT.

SAFETY LISTING

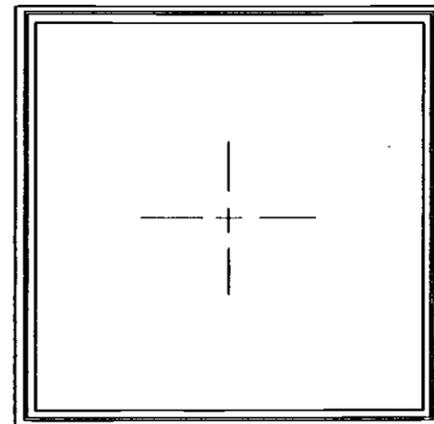
- DAMP

REMARKS

- BLACK BAFFLE DECREASES EFFICIENT BY 30%
- FLOOD LAMP AVAILABLE FOR O1 AND O2 FOR CEILING HEIGHTS OVER 25 FEET.

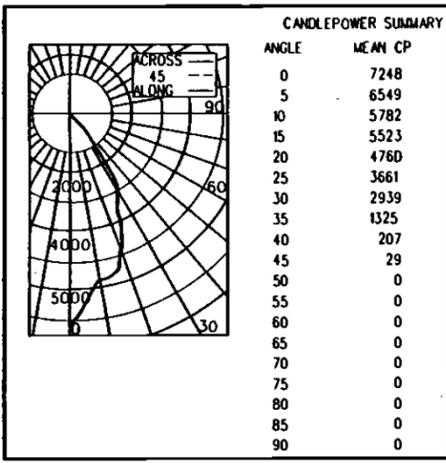
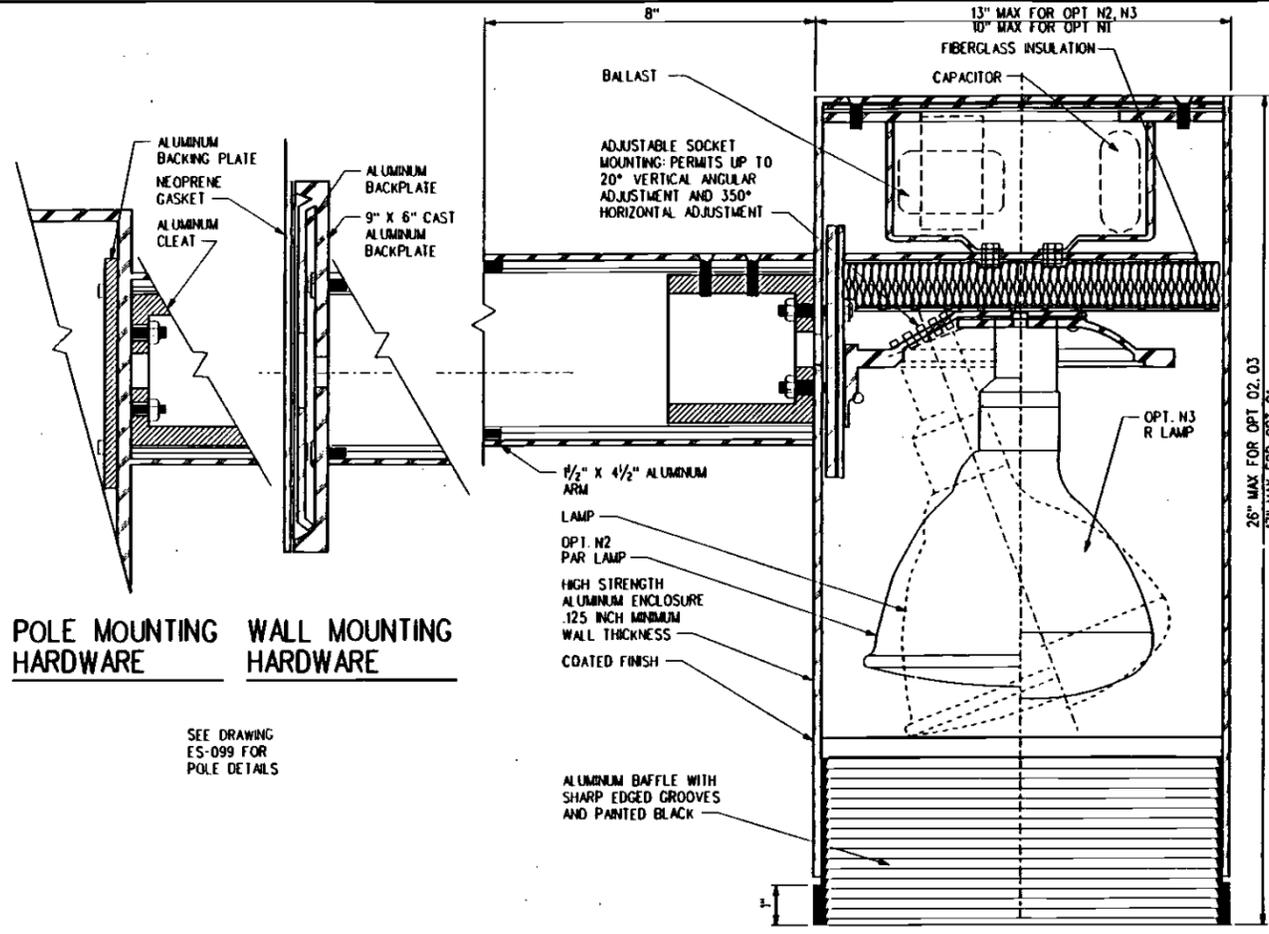
MANUFACTURERS

- DEVINE "C" SERIES
- KURT VERSEN "S" SERIES
- MCPHILBEN "GB" SERIES

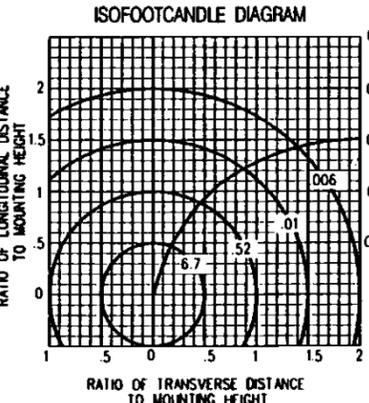


POLE MOUNTING HARDWARE WALL MOUNTING HARDWARE

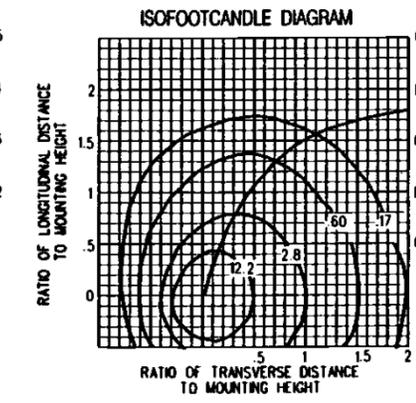
SEE DRAWING ES-099 FOR POLE DETAILS



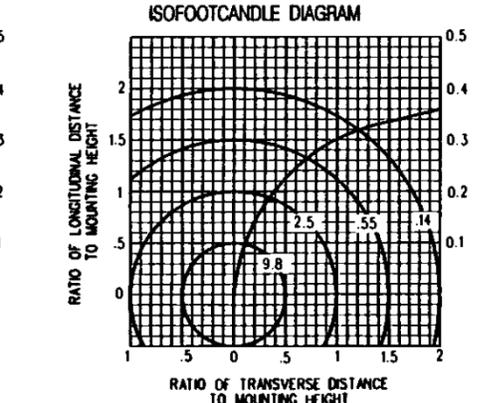
CANDLEPOWER DISTRIBUTION NOTES:
 1. CANDLEPOWER VALUES BASED ON SPECULAR CLEAR REFLECTOR CONE.
 2. FOR TYPE O, MULTIPLY VALUES BY 1.6 TO ADJUST FOR 150 WATT PAR38 LAMP.



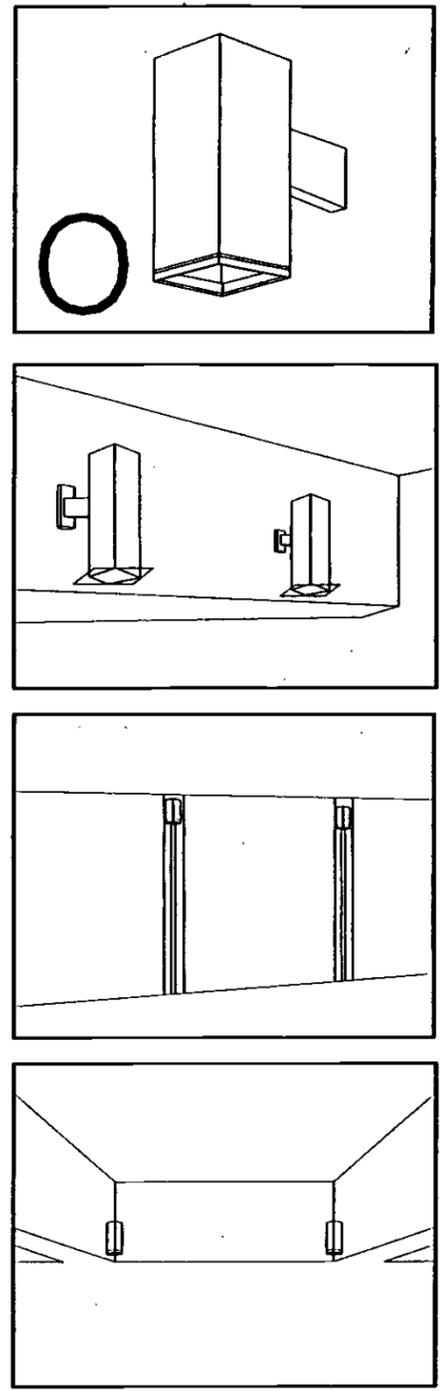
VALUES BASED ON A SINGLE UNIT AT 10 FOOT MOUNTING HEIGHT WITH LAMP AIMED 0° FROM VERTICAL. 5700 INITIAL LAMP LUMENS. TO CONVERT VALUES TO TWO LIGHTS MULTIPLY VALUES BY TWO.



VALUES BASED ON A SINGLE UNIT AT 10 FOOT MOUNTING HEIGHT WITH LAMP AIMED 20° FROM VERTICAL.



VALUES BASED ON TWO LIGHTS AT 10 FOOT MOUNTING HEIGHT WITH LAMPS AIMED 20° FROM VERTICAL.



REV	DATE	BY	CHKD	APP	DESCRIPTION
1	11.18.94	CR	JAH	GMC	REVISED & RESEALED PER SPEC. DE 308.08.94
0	4.19.94	CR	JAH	GMC	BASELINE ISSUE

DESIGNED BY: C. ROBENIOL
 DRAWN BY: S. EVANS
 CHECKED BY: C. YU
 IN CHARGE: J. BOOTH
 DATE: 19 APR 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
 ENGINEERING MANAGEMENT CONSULTANT
 Submitted: [Signature]
 Approved: [Signature]

ELECTRICAL STANDARD
 TYPE O
 HIGH INTENSITY DISCHARGE
 DOWNLIGHT

CONTRACT NO.
 DRAWING NO: ES-075
 SCALE: NO SCALE
 SHEET NO: 1

GENERAL DESCRIPTION

WALL MOUNTED ROUND CYLINDER METAL HALIDE UPLIGHT/DOWNLIGHT FOR INTERIOR AND EXTERIOR USE.

FIXTURE OPTIONS

P1
 LAMP: (2) 100W M.H. PAR 38, VWF, 3200°K
 INITIAL LUMENS: 5600 PER LAMP
 BALLAST: HPF, FOR -20°F STARTING
 INPUT WATTS: 270
 DIMENSIONS: APPROX. 35" MAX HT., 10" DIA.
 EFFICIENCY: 87%

P2
 LAMP: (2) 150W M.H. PAR 38, VWF, 3200°K
 INITIAL LUMENS: 9000 PER LAMP
 BALLAST: HPF, FOR -20°F STARTING
 INPUT WATTS: 370
 DIMENSIONS: 45" MAX HT., 13" DIA.
 EFFICIENCY: 87%

P3
 LAMP: (2) 175W M.H. R40, FLOOD, 4000°K
 INITIAL LUMENS: 12000 PER LAMP
 BALLAST: HPF, FOR -20°F STARTING
 INPUT WATTS: 420
 DIMENSIONS: APPROX. 45" MAX HT., 13" DIA.
 EFFICIENCY: 57%

PHOTOMETRIC OPTIONS

- 1. FULL REFLECTOR
- 2. GROOVED BAFFLE

MOUNTING OPTIONS

- 1. WALL MOUNTING HARDWARE

ACCESSORIES OPTIONS

- 0. NO ACCESSORIES
- 1. GLASS GUARD

FINISH MATERIALS

- ELECTROSTATICALLY APPLIED, THERMALLY CURED POLYESTER POWDERCOAT

SAFETY LISTINGS

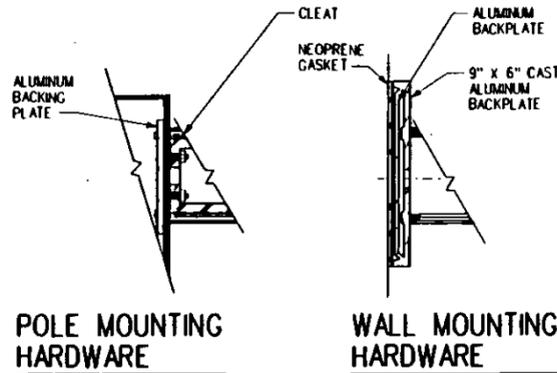
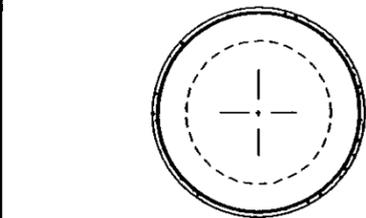
- DAMP

REMARKS

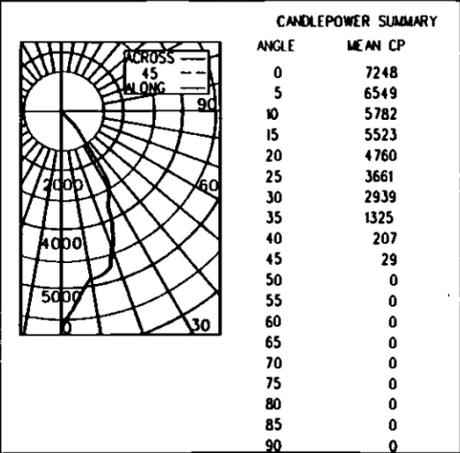
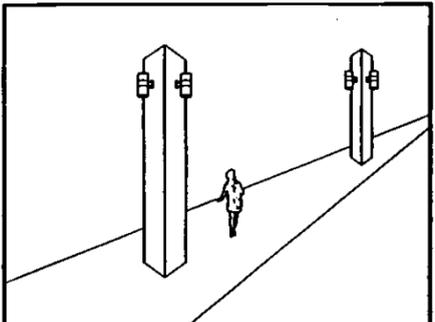
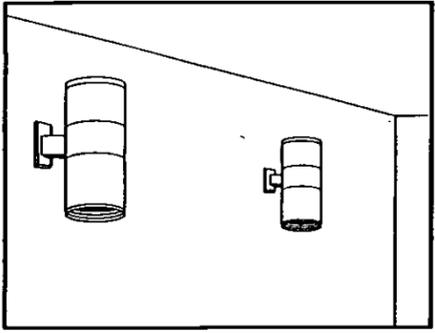
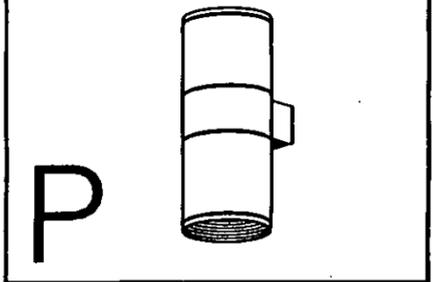
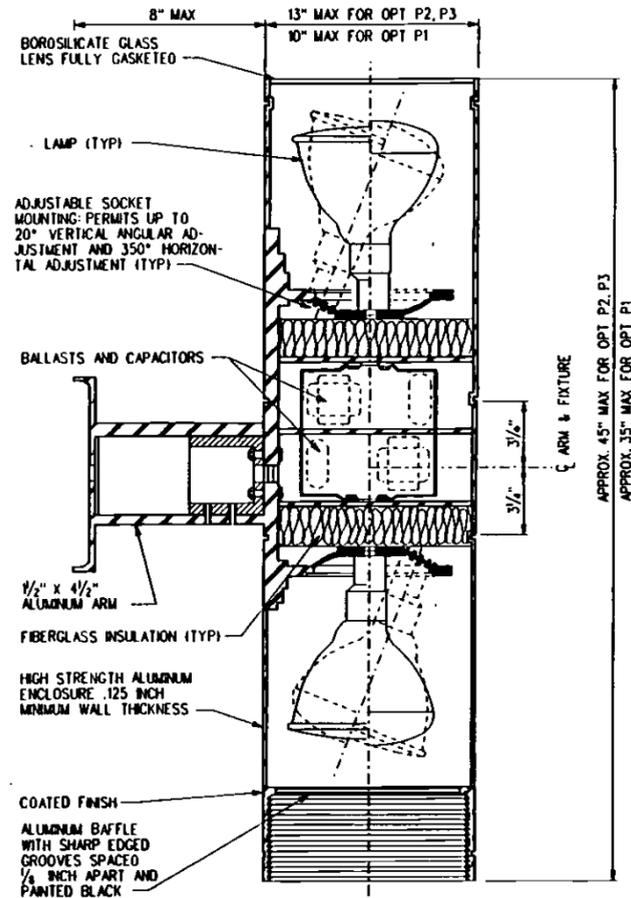
- BLACK BAFFLE DECREASES EFFICIENT BY 30%
- FLOOD LAMP AVAILABLE FOR P1 AND P2 FOR CEILING HEIGHTS OVER 25 FEET

MANUFACTURERS

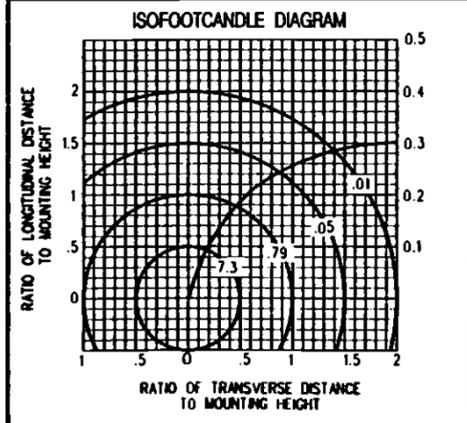
- DEVINE "C" SERIES
- KURT VERSEN "S" SERIES
- MCPHILBEN "38" SERIES



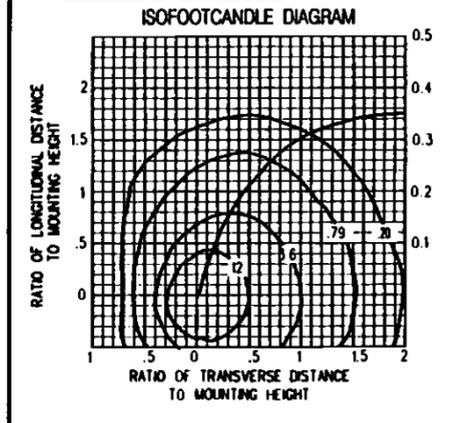
SEE DRAWING ES-099 FOR POLE DETAILS



CANDLEPOWER DISTRIBUTION NOTES:
 1. CANDLEPOWER VALUES BASED ON SPECULAR CLEAR REFLECTOR CONE.
 2. FOR TYPE Q, MULTIPLY VALUES BY 1.6 TO ADJUST FOR 150 WATT PAR38 LAMP.



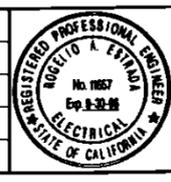
ISOFOOTCANDLE DIAGRAM NOTES:
 1. VALUES BASED ON A SINGLE UNIT AT 10 FOOT MOUNTING HEIGHT WITH LAMP AIMED 0° FROM VERTICAL.
 2. TO CONVERT VALUES TO TWO LIGHTS MULTIPLY VALUES BY TWO.



ISOFOOTCANDLE DIAGRAM NOTES:
 1. VALUES BASED ON A SINGLE UNIT AT 10 FOOT MOUNTING HEIGHT WITH LAMP AIMED 20° FROM VERTICAL.

REV	DATE	BY	SUB	APP	DESCRIPTION
1	10 10 94	CEY	AVL	GMC	REVISED & RESEALED PER SUBMITTAL
0	4 19 94	C.Y.	AVL	GMC	BASELINE ISSUE

DESIGNED BY: C. YU
 DRAWN BY: S. EVANS
 CHECKED BY: C. ROBINOL
 IN CHARGE: J. BOOTH
 DATE: 19 APR 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
 ENGINEERING MANAGEMENT CONSULTANT
 Submitted: [Signature]
 Approved: [Signature]

ELECTRICAL STANDARD
 TYPE P
 HIGH INTENSITY DISCHARGE
 UP/DOWNLIGHT

CONTRACT NO.	
DRAWING NO.	ES-076
REV	1
SCALE	NO SCALE
SHEET NO.	

GENERAL DESCRIPTION

WALL MOUNTED SQUARE CYLINDER METAL HALIDE UPLIGHT/DOWNLIGHT FOR INTERIOR AND EXTERIOR USE.

FIXTURE OPTIONS

Q1
 LAMP: (2) 100W, M.H., PAR 38, VWF, 3200° K
 INITIAL LUMENS: 5600 PER LAMP
 BALLAST: HPF FOR -20° F STARTING
 REFLECTOR WALLS: 270
 DIMENSIONS: 35" MAX HEIGHT, 10" SQUARE
 EFFICIENCY: 87%

Q2
 LAMP: (2) 150W, M.H., PAR 38, VWF, 3200° K
 INITIAL LUMENS: 9000 PER LAMP
 BALLAST: HPF FOR -20° F STARTING
 REFLECTOR WALLS: 335
 DIMENSIONS: 40" MAX HEIGHT, 13" SQUARE
 EFFICIENCY: 87%

Q3
 LAMP: (2) 175W, M.H., R40, FLOOD, 4000° K
 INITIAL LUMENS: 12000 PER LAMP
 BALLAST: HPF FOR -20° F STARTING
 REFLECTOR WALLS: 385
 DIMENSIONS: 40" MAX HEIGHT, 13" SQUARE
 EFFICIENCY: 57%

PHOTOMETRIC OPTIONS

- 1. FULL REFLECTOR
- 2. GROOVED BAFFLE

MOUNTING OPTIONS

- 1. WALL MOUNTING HARDWARE

ACCESSORIES OPTIONS

- 0. NO ACCESSORIES
- 1. GLASS GUARD

FINISH MATERIALS

- ELECTROSTATICALLY APPLIED, THERMALLY CURED POLYESTER POWDERCOAT

SAFETY LISTINGS

- DAMP, WET

REMARKS

- BLACK BAFFLE DECREASES EFFICIENT BY 30%
- FLOOD LAMP AVAILABLE FOR Q1 AND Q2 FOR CEILING HEIGHTS OVER 25 FEET

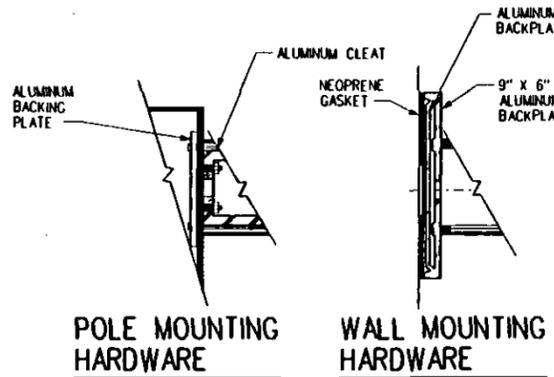
MANUFACTURER OPTIONS

- DEVINE "C" SERIES
- KURT VERSEN "S" SERIES
- MCPHILBEN "BB" SERIES

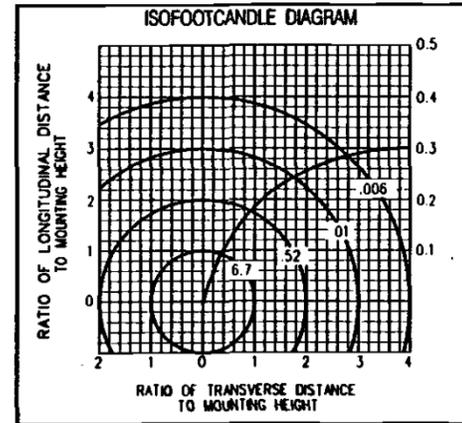
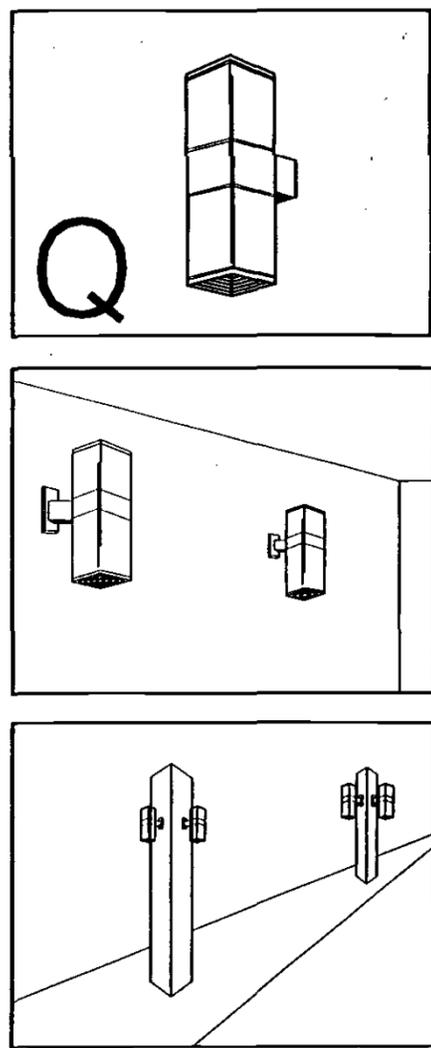
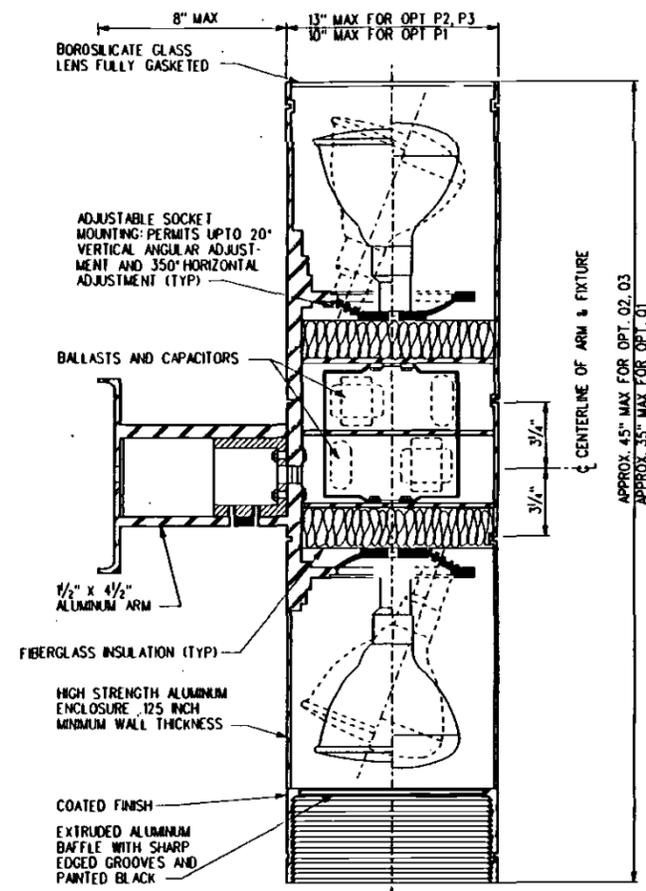
FIXTURE OPTION:

ANGLE	MEAN CP
0	7248
5	6549
10	5782
15	5523
20	4760
25	3661
30	2939
35	1325
40	207
45	29
50	0
55	0
60	0
65	0
70	0
75	0
80	0
85	0
90	0

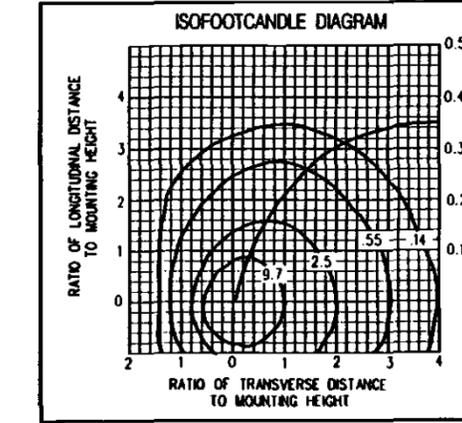
CANDLEPOWER DISTRIBUTION NOTES:
 1. CANDLEPOWER VALUES BASED ON SPECULAR CLEAR REFLECTOR CONE.
 2. FOR TYPE Q, MULTIPLY VALUES BY 1.6 TO ADJUST FOR 150 WATT PAR38 LAMP.



SEE DRAWING ES-099 FOR POLE DETAILS



ISOFOOTCANDLE DIAGRAM NOTES:
 1. VALUES BASED ON A SINGLE UNIT AT 10 FOOT MOUNTING HEIGHT WITH LAMP AIMED 0° FROM VERTICAL.
 2. TO CONVERT VALUES TO TWO LIGHTS MULTIPLY VALUES BY TWO.



ISOFOOTCANDLE DIAGRAM NOTES:
 1. VALUES BASED ON A SINGLE UNIT AT 10 FOOT MOUNTING HEIGHT WITH LAMP AIMED 20° FROM VERTICAL.

REV	DATE	BY	SUB	APP	DESCRIPTION
0	4.19.94	CR	AHL	GMC	REVISED & RESEALED PER SHEET ES-099
1	10.10.94	CR	AHL	GMC	REVISED & RESEALED PER SHEET ES-099

DESIGNED BY: C. ROBINOL
 DRAWN BY: S. EVANS
 CHECKED BY: C. YU
 IN CHARGE: J. BOOTH
 DATE: 19 APR 94

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

REGISTERED PROFESSIONAL ENGINEER
 ROBERT A. ESTUDER
 No. 11657
 Exp. 12-31-98
 ELECTRICAL
 STATE OF CALIFORNIA

ENGINEERING MANAGEMENT CONSULTANT
 an association of
 PERSONS BROUGHT TOGETHER BY DESIGN, INC.
 10700 Wilshire Blvd., Suite 1000
 Los Angeles, CA 90024
 (213) 746-1000
 Excludes: Fire Alarm Systems, Security Alarm Systems, and The Heating Group, Inc.

SUBMITTED: [Signature]
 APPROVED: [Signature]

ELECTRICAL STANDARD

TYPE Q
 HIGH INTENSITY DISCHARGE
 UP/DOWNLIGHT

CONTRACT NO.
 DRAWING NO. ES-077
 SCALE: NO SCALE
 SHEET NO. 1

GENERAL DESCRIPTION
METAL HALIDE LANDSCAPE ACCENT LIGHT

FIXTURE OPTIONS

R1
LAMP: 100W, M.H., PAR38, 3200°K
LUMENS: 5600
BALLAST: HPF, FOR -20°F STARTING
NEUT. WALLS: 135
DIMENSIONS: APPROX 12" H, 7" W
EFFICIENCY: 90%

PHOTOMETRIC OPTIONS

- 1. SPOT
- 2. FLOOD
- 3. WIDE FLOOD

MOUNTING OPTIONS

- 1. PAD
- 2. WALL
- 3. TREE

ACCESSORIES OPTION

- 1. GLARE HOOD

FINISH MATERIALS

- CAST BRONZE HOUSING

SAFETY LISTING

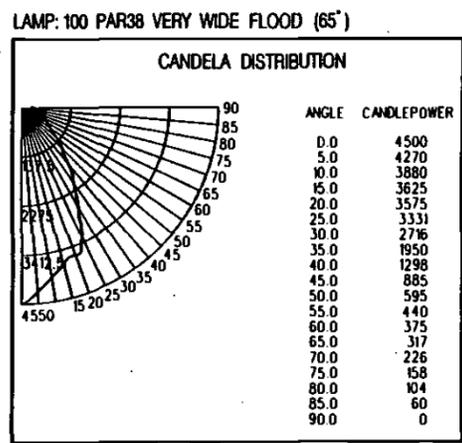
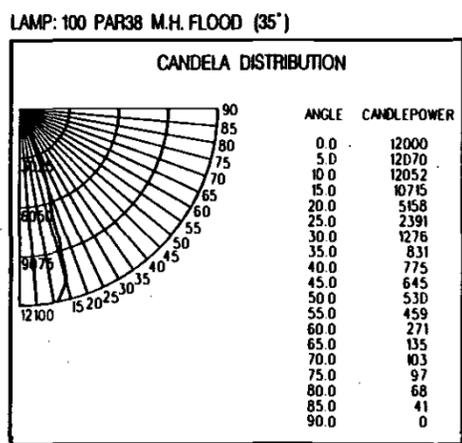
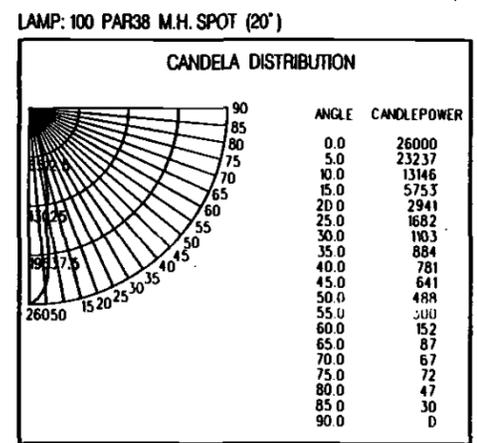
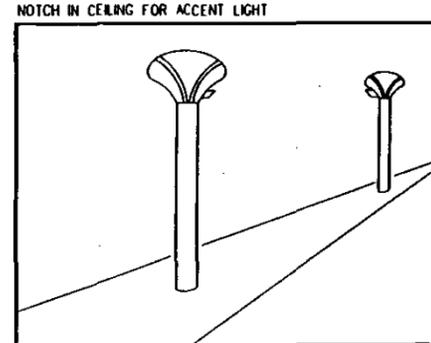
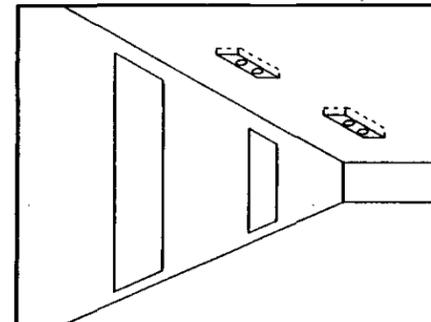
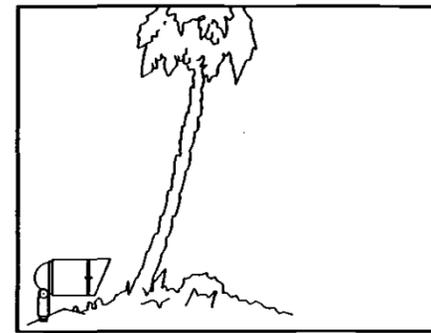
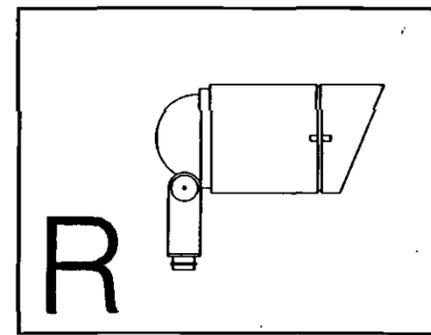
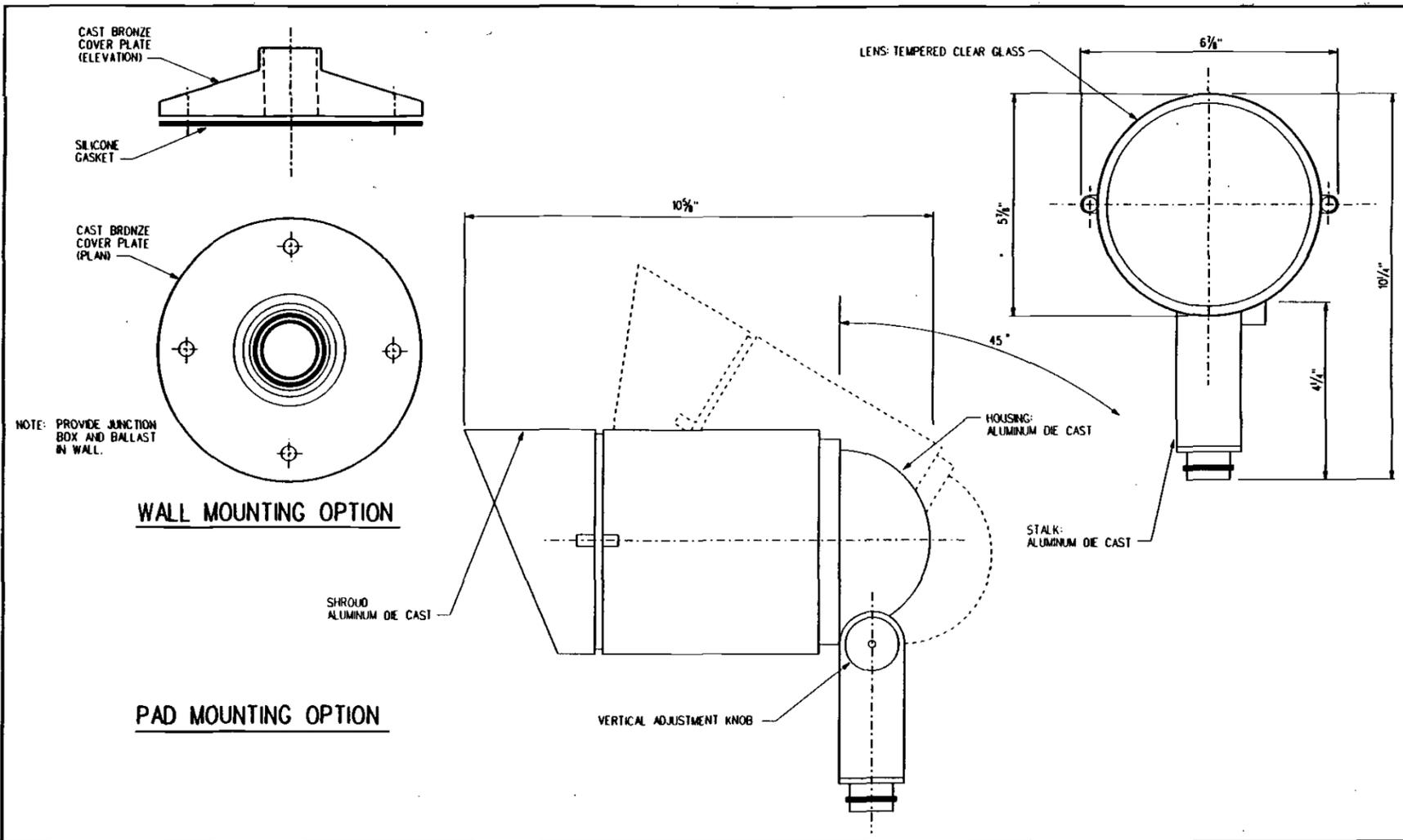
- WET

REMARKS

- MAXIMUM REMOTE BALLAST MOUNTING DISTANCE IS 5 FEET
- 120 VOLTS WHEN USED BELDW 8' MOUNTING
- GROUNDED ACCORDING TO NATIONAL ELECTRICAL CODE

MANUFACTURERS

- LIGHTOLIER
- HYDREL
- KM



REV	DATE	BY	SUB	APP	DESCRIPTION
1	10 10 94	CE	HL	GMC	REVISED & RESEALED PER SBCH-DE 306.06-10
0	1 19 94	CY	HL	GMC	BASELINE ISSUE

DESIGNED BY: C. YU
DRAWN BY: S. EVANS
CHECKED BY: C. ROSENBLUM
IN CHARGE: J. BOOTH
DATE: 19 APR 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
ENGINEERING MANAGEMENT CONSULTANT
SUBMITTED: [Signature]
APPROVED: [Signature]

ELECTRICAL STANDARD
TYPE R
HIGH INTENSITY DISCHARGE
LANDSCAPE LIGHT
CONTRACT NO: [Blank]
DRAWING NO: ES-078
REV: 1
SCALE: NO SCALE
SHEET NO: [Blank]

GENERAL DESCRIPTION
HANDRAIL MOUNTED FLUORESCENT FIXTURE

FIXTURE OPTIONS

U1
LAMP: 111 32W, T8, 3500°K
LUMENS: 2,850
BALLAST: HPF, ELECTRONIC, RAPID START
INPUT WATTS: 38 PER 4 FOOT SECTION
DIMENSIONS: APPROX. 3" WIDE X 6" HIGH
EFFICIENCY: NA

U2
LAMP: (2) 32W, T8, 3500°K
LUMENS: 2,850 EA.
BALLAST: HPF, ELECTRONIC, RS TO -20
INPUT WATTS: 70 PER 4 FOOT SECTION
DIMENSIONS: APPROX. 3" WIDE X 6" HIGH
EFFICIENCY: NA

U3
REMARKS: U1 EXCEPT ROUND
DIMENSIONS: APPROX. 4" DIAMETER

U4
REMARKS: U2 EXCEPT ROUND
DIMENSIONS: APPROX. 4" DIAMETER

PHOTOMETRIC OPTIONS
D NO OPTIONS

MOUNTING OPTIONS
D NO OPTIONS

ACCESSORIES OPTIONS
D NO OPTIONS

FINISH MATERIALS
ELECTROSTATICALLY APPLIED, THERMALLY CURED
POLYESTER POWDERCOAT.

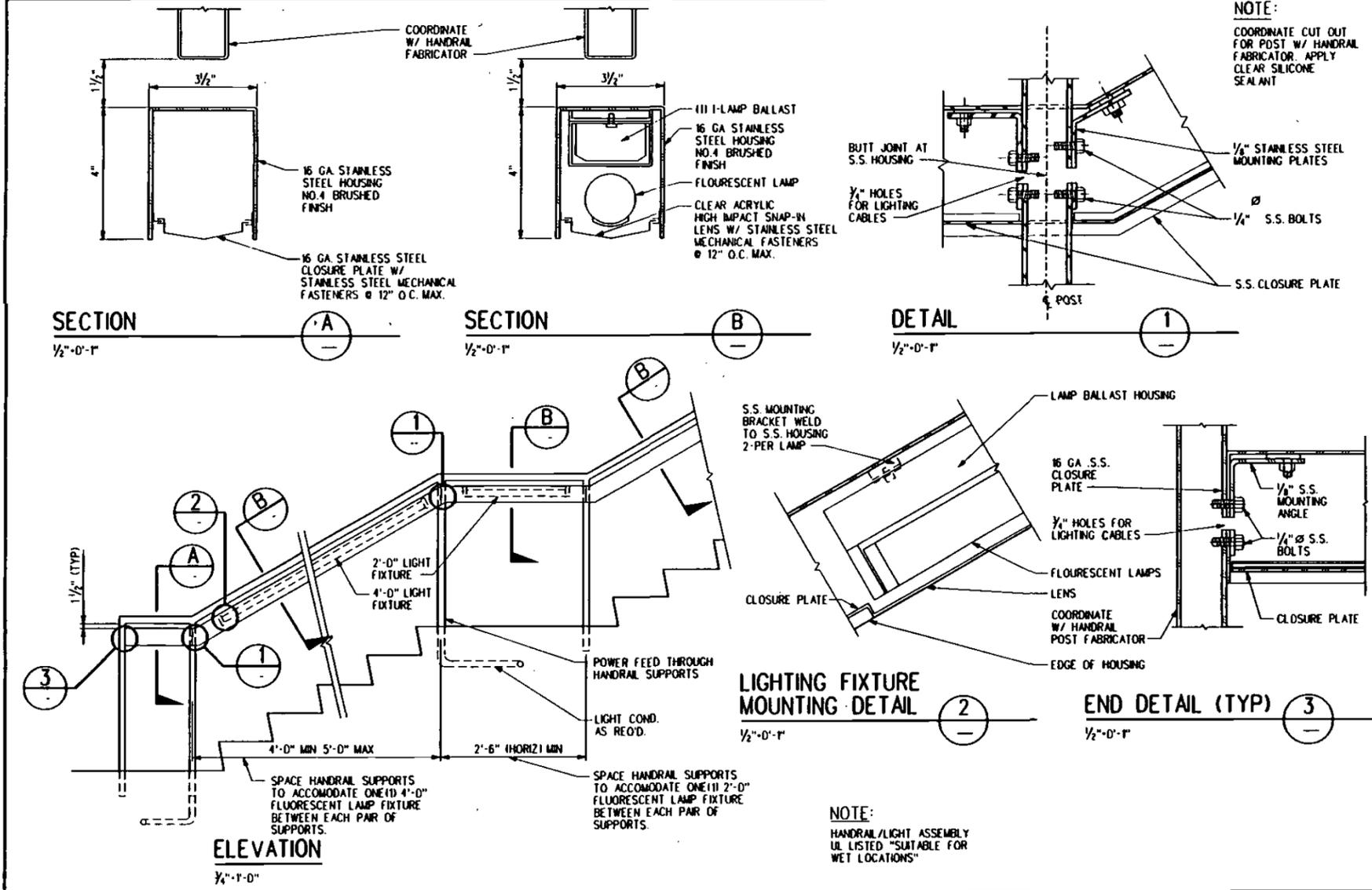
SAFETY LISTING
● DAMP

REMARKS

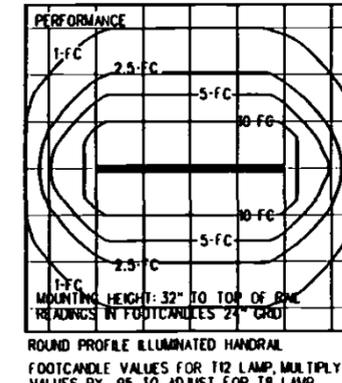
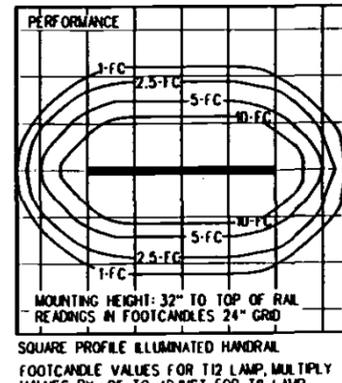
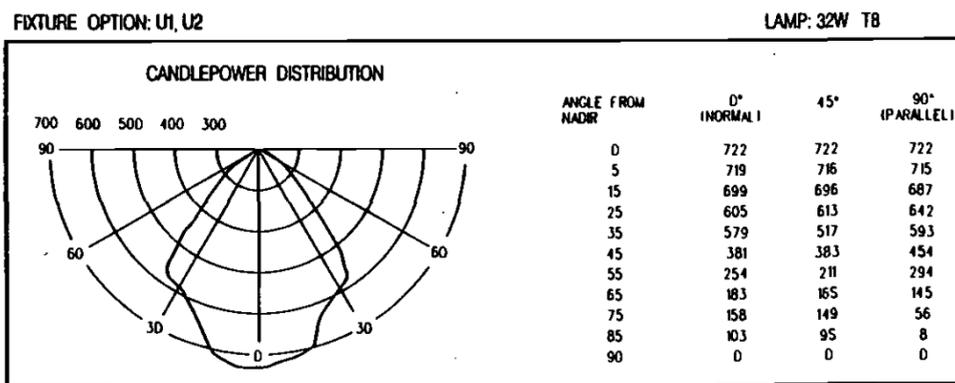
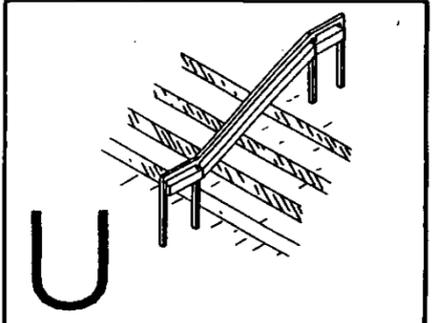
● DRAWING SHOWS LIGHTING INTENT ONLY. CONTRACTOR IS RESPONSIBLE FOR COORDINATING SPECIAL HANDRAIL DETAILING AS REQUIRED FOR THIS PROJECT. SEE ARCHITECTURAL DRAWINGS.

MANUFACTURERS

- CW COLE "LIGHTRAL" SERIES
- DEVDE "LUMIRAL"
- STERNER "LIGHTRAL"

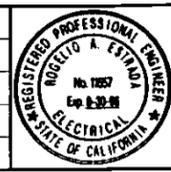


NOTE:
COORDINATE CUT OUT FOR POST W/ HANDRAIL FABRICATOR. APPLY CLEAR SILICONE SEALANT



REV	DATE	BY	CHKD	APP	DESCRIPTION
1	10/10/94	cy	ah	gmc	REVISED & RESEALED PER SUBCN-DE 3/16/06-10
2	11/19/94	cy	ah	gmc	BASELINE ISSUE

DESIGNED BY: C. ROBINOL
DRAWN BY: V. HOANG
CHECKED BY: C. YU
IN CHARGE: J. BOOTH
DATE: 19 APR 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

ENGINEERING MANAGEMENT CONSULTANT

Submitted: *Rogelio A. Estrella*
Approved: *[Signature]*

ELECTRICAL STANDARD

TYPE U
HANDRAIL LIGHT, EXTERIOR USE

CONTRACT NO. _____
DRAWING NO. ES-081
SCALE: AS NOTED
SHEET NO. 1

GENERAL DESCRIPTION

LINEAR FLUORESCENT WALL WASHER FOR INTERIOR AND EXTERIOR USE

FIXTURE OPTIONS

W1
 LAMP: (1) 32W, T8, 3500°K
 LUMENS: 2,850
 BALLAST: HPF, ELECTRONIC, RAPID START
 INPUT WATTS: 38
 DIMENSIONS: APPROX. 10-1/2" Q 4" H, 48" L
 EFFICIENCY: 68%

W2
 LAMP: (1) 39W, "BIAX", 3500°K
 LUMENS: 2,850
 BALLAST: HPF, ELECTRONIC, RAPID START
 INPUT WATTS: 45
 DIMENSIONS: APPROX. 10-1/2" Q 4" H, 24" L
 EFFICIENCY: 58%

PHOTOMETRIC OPTIONS

- 1. SPECULAR
- 2. REFLECTOR

MOUNTING OPTIONS

- 1. RECESSED CEILING MOUNTING
- 2. RECESSED WALL MOUNTING

ACCESSORIES OPTIONS

- 0. NO ACCESSORIES
- 1. CONTINUOUS MOUNTING ARRANGEMENT

FINISH MATERIALS

- PHOSPHATE UNDERCOATING
- BAKED WHITE ENAMEL

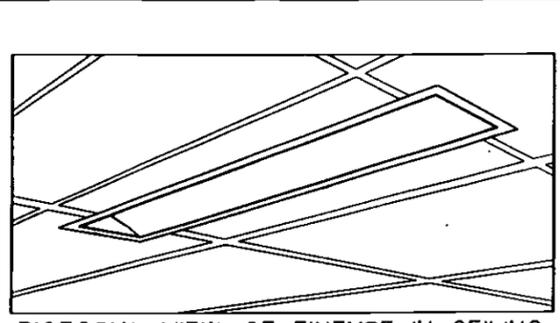
SAFETY LISTING

- DAMP

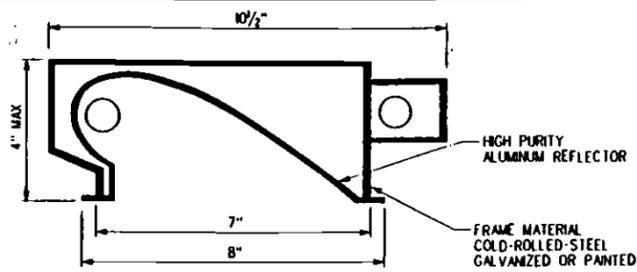
REMARKS

MANUFACTURERS

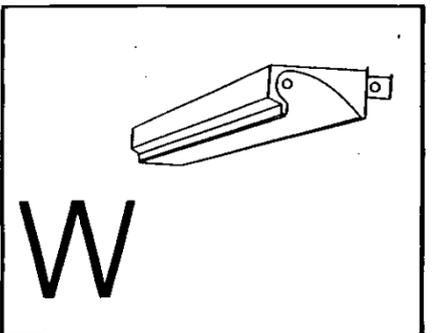
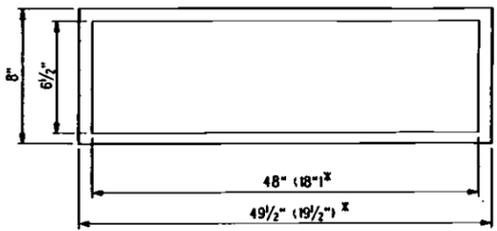
- ENGINEERED LIGHTING PRODUCTS "132 CL"
- LITECONTROL "WALL/WASH"
- LIGHTOLIER "WAL-LYTER"



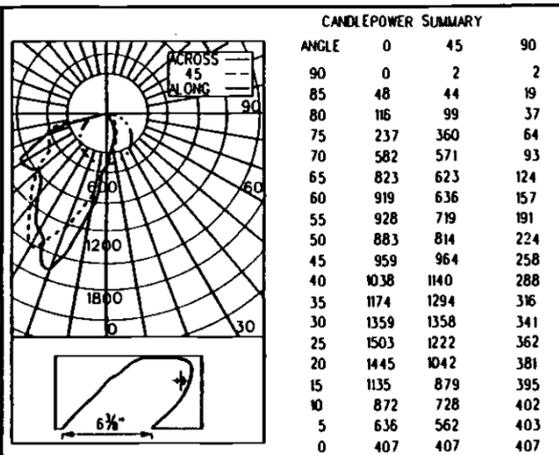
PICTORIAL VIEW OF FIXTURE IN CEILING



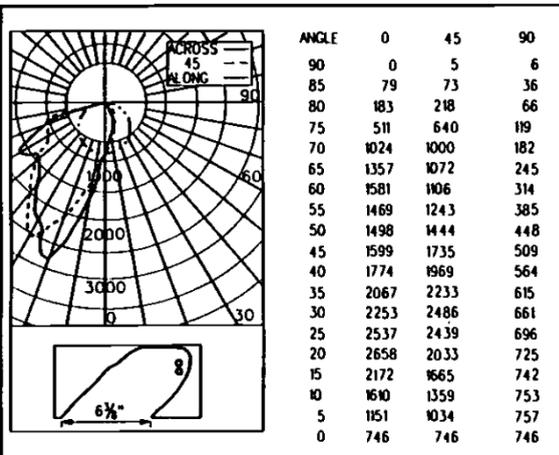
ROUGH IN DIM. - 10 1/2" X 48 1/2" X 4" 2900 LUMENS PER LAMP



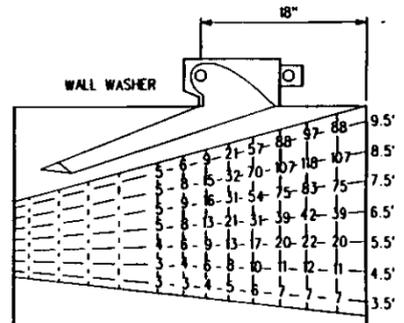
FIXTURE: W1 LAMP: 39 WATT BIAX



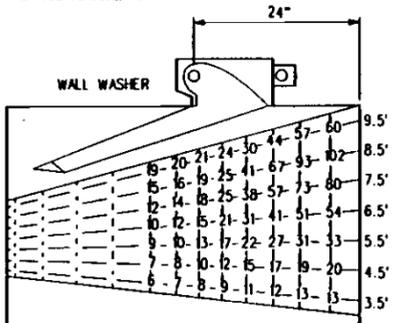
FIXTURE: W2 LAMP: 32 WATT T8



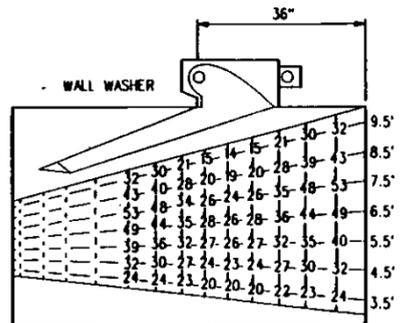
ROOM CAVITY RATIO	CEILING CAVITY REFLECTANCE					
	80		70		50	
	70	50	30	10	70	50
	WALL REFLECTANCE					
	70		50		30 10	
	COEFFICIENTS OF UTILIZATION FOR FL. CAV. REFL. - 20%					
0	.71	.71	.71	.71	.60	.60
1	.64	.61	.58	.56	.55	.52
2	.58	.53	.49	.45	.50	.46
3	.53	.47	.42	.38	.45	.40
4	.48	.41	.36	.31	.41	.35
5	.44	.36	.31	.27	.38	.31
6	.40	.32	.27	.23	.34	.28
7	.37	.29	.23	.19	.32	.25
8	.34	.26	.20	.17	.29	.22
9	.32	.23	.18	.15	.27	.20
10	.29	.21	.16	.13	.25	.18



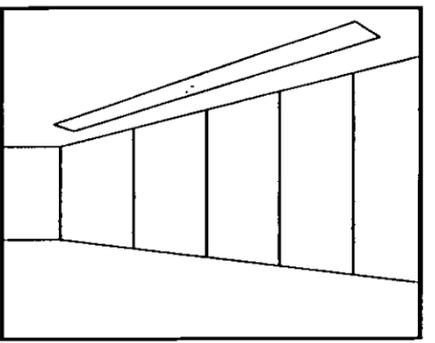
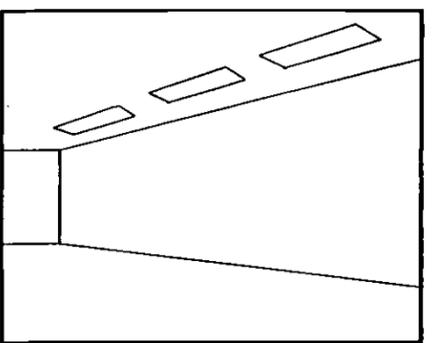
VERTICAL FOOTCANDLES ON WALL WITH A SINGLE FIXTURE 18" FROM WALL.



VERTICAL FOOTCANDLES ON WALL WITH A SINGLE 4" FIXTURE 24" FROM WALL.



VERTICAL FOOTCANDLES ON WALL WITH 4" FIXTURES ON 8" CENTERS, 36" FROM WALL.



CONTINUOUS W2 RECOMMENDED AT TICKET VENDING

REV.	DATE	BY	SUB	APP	DESCRIPTION
0	4.19.94	CY	AVL	GMC	REVISION & RESEALED PER SHEET 08-08-01
					BASELINE ISSUE

DESIGNED BY
C. ROBEINOL
 DRAWN BY
G. LONG
 CHECKED BY
C. YU
 IN CHARGE
J. BOOTH
 DATE
19 APR 94

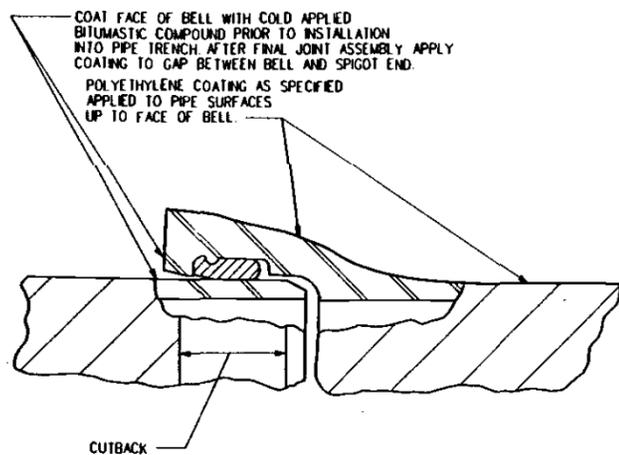


LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
 ENGINEERING MANAGEMENT CONSULTANT
 Submitted by: *Roberto A. Estada*

APPROVED: *[Signature]*

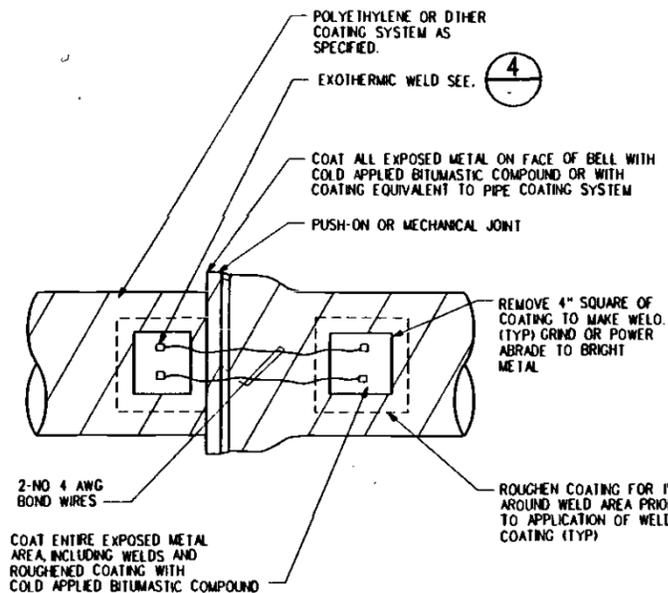
ELECTRICAL STANDARD
TYPE W
WALL WASHER AT PUBLIC AREAS

CONTRACT NO.	
DRAWING NO.	ES-083
REV.	1
SCALE	AS NOTED
SHEET NO.	

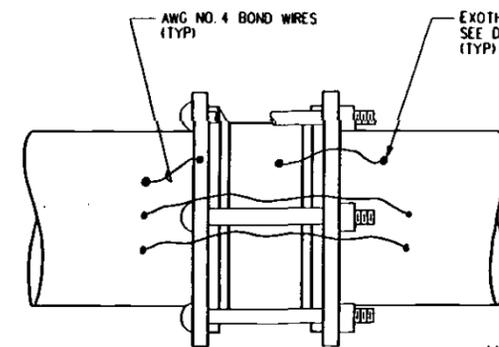


PUSH-ON JOINT COATING ARRANGEMENT TYPICAL DETAIL 5

PUSH-ON JOINT COATING ARRANGEMENT - TYPICAL

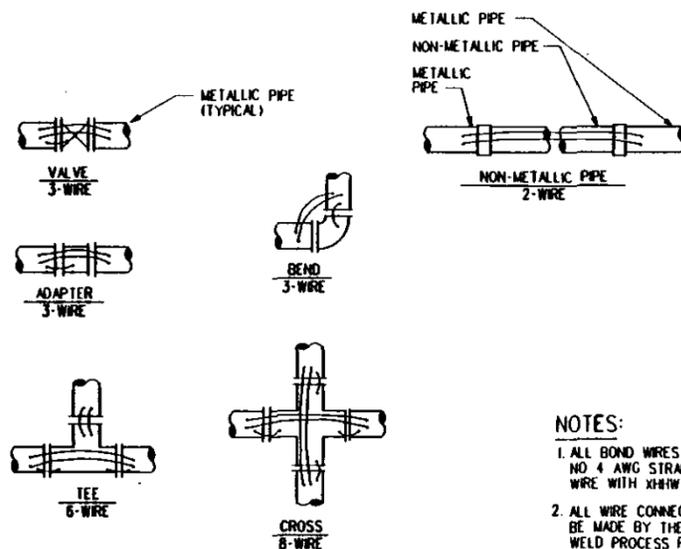


PUSH-ON OR MECHANICAL JOINT BOND DETAIL 3



NOTE:
ALL EXPOSED METAL SHALL BE COATED WITH PROTECTIVE COATING EQUIVALENT TO COATING ON LINE PIPE OR WITH COLD APPLIED BITUMASTIC COMPOUND ON ENTIRE FIXTURE.

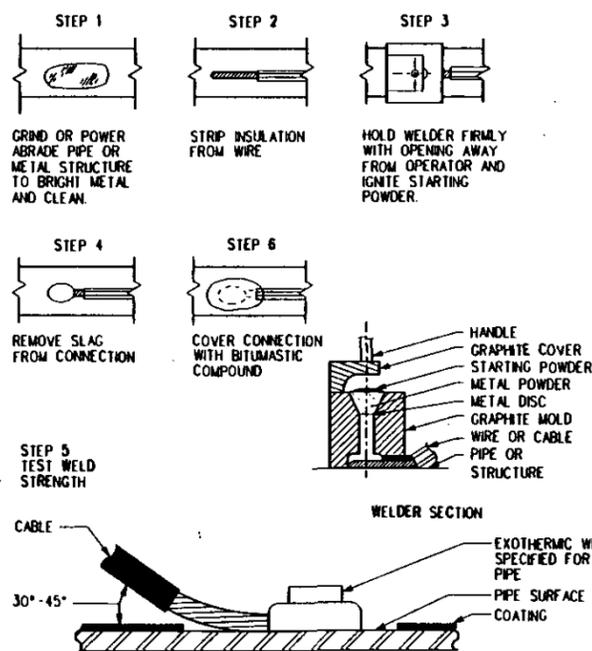
COUPLING BOND DETAIL 1



NOTES:
1. ALL BOND WIRES SHALL BE NO. 4 AWG STRANDED COPPER WIRE WITH XHHW INSULATION.
2. ALL WIRE CONNECTIONS SHALL BE MADE BY THE EXOTHERMIC WELD PROCESS PER DETAIL 4 ON THIS SHEET.
3. BOND WIRES SHALL NOT BE INSTALLED ACROSS INSULATING JOINTS OR NON-METALLIC PIPE INSERTS INTENDED AS INSULATORS.

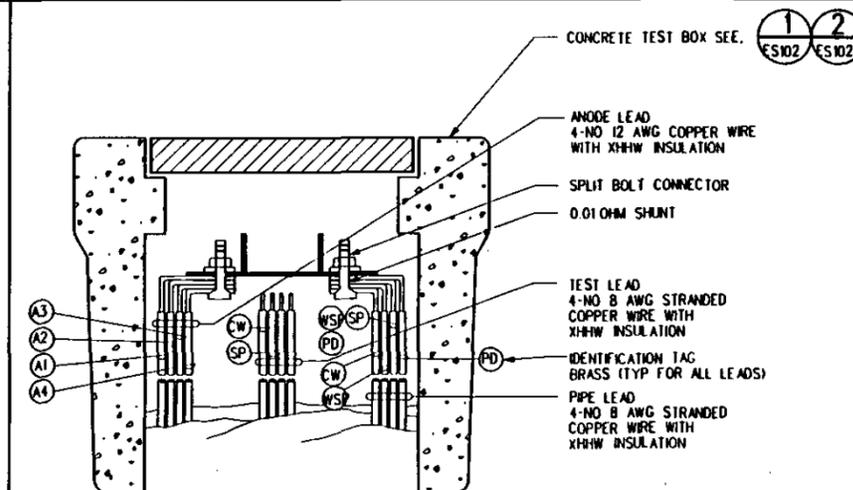
DETAIL 6

PIPE JOINT BONDING



NOTES:
1. WELDER SHOWN IS FOR HORIZONTAL SURFACES. FOR VERTICAL SURFACES SIDE-WELDER SHALL BE REQUIRED.
2. DO NOT MAKE MORE THAN ONE WIRE CONNECTION WITH A SINGLE WELD.
3. ALL EXPOSED METAL, WIRE WELDS, AND FITTING SHALL BE COATED WITH BITUMASTIC COMPOUND.
4. ALL WELD CARTRIDGES (METAL POWDER) TO BE ALLOY AND TYPE RECOMMENDED BY MANUFACTURER FOR METALS BEING WELDED.

EXOTHERMIC WELD DETAIL 4



WIRE TAG CODE
A - ANODE
CW - COLD WATER
SP - SPRINKLER PIPE
PD - PUMP DISCHARGE
WSP - WET STANDPIPE

NOTES:
1. QUANTITY OF ANODES PER LOCATION VARIES, SEE SITE PLAN FOR EXACT NUMBER REQUIRED.
2. QUANTITY OF TEST AND PIPE LEADS VARIES, SEE SITE PLAN FOR EXACT NUMBER REQUIRED.

TYPICAL TEST BOX WIRING DETAIL 2

REV	DATE	BY	SUB	APP	DESCRIPTION
0	11.14.94	CR			RESEALED PER SBON-DE 10/06/94
					BASELINE ISSUE

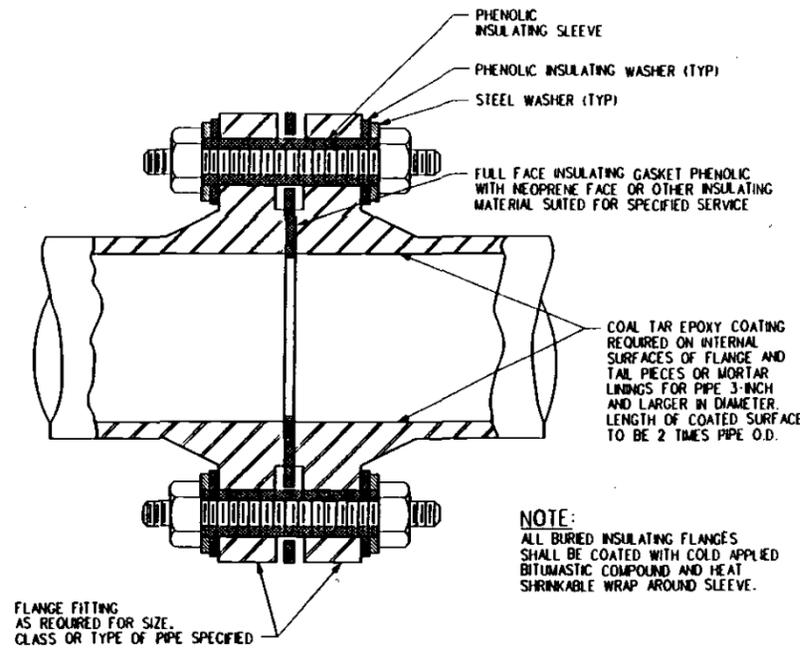
DESIGNED BY
C. ROBENIOL
DRAWN BY
V. HOANG
CHECKED BY
C. YU
IN CHARGE
J. BOOTH
DATE
19 APR 94

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
ENGINEERING MANAGEMENT CONSULTANT
REGISTERED PROFESSIONAL ENGINEER
No. 11657
Exp. 8-28-98
ELECTRICAL
STATE OF CALIFORNIA

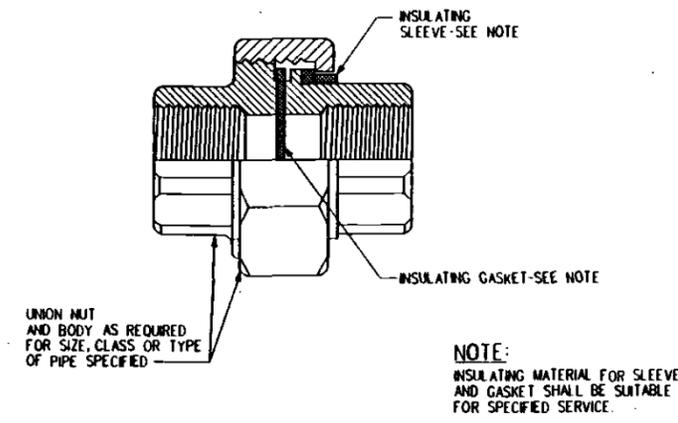
SUBMITTED
Robert C. Estabrook
APPROVED
[Signature]

ELECTRICAL STANDARD
CORROSION CONTROL COATING, BONDING AND TEST BOX WIRING

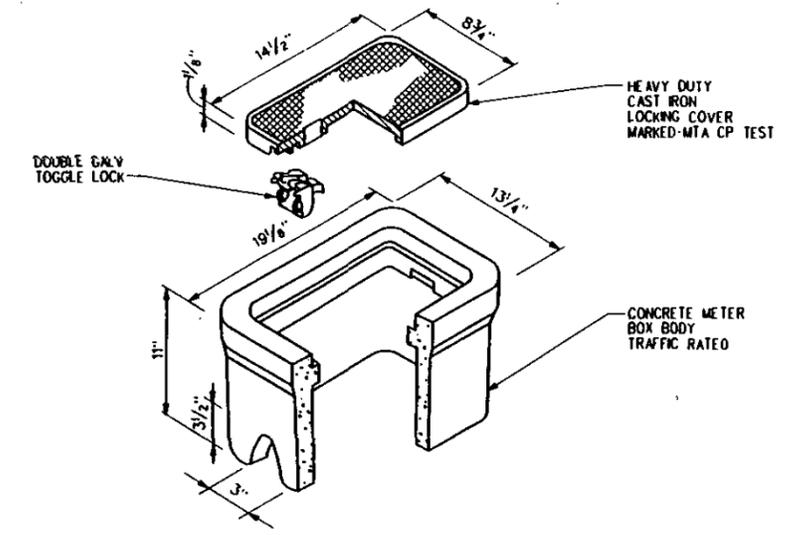
CONTRACT NO.	
DRAWING NO.	ES-101
REV	1
SCALE	NO SCALE
SHEET NO.	



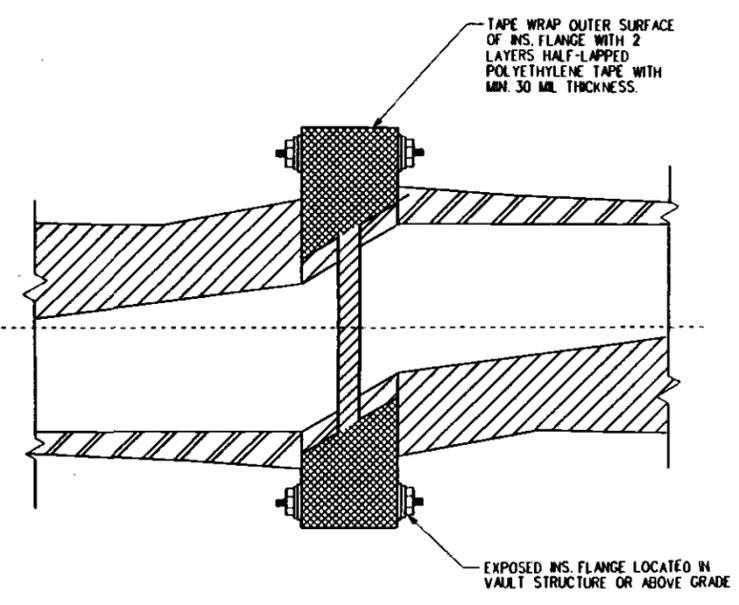
INSULATING FLANGE ASSEMBLY DETAIL 5



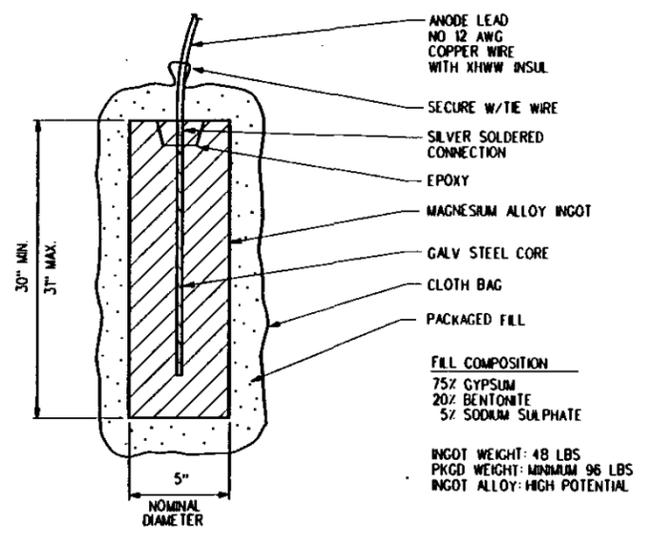
INSULATING UNION DETAIL 3



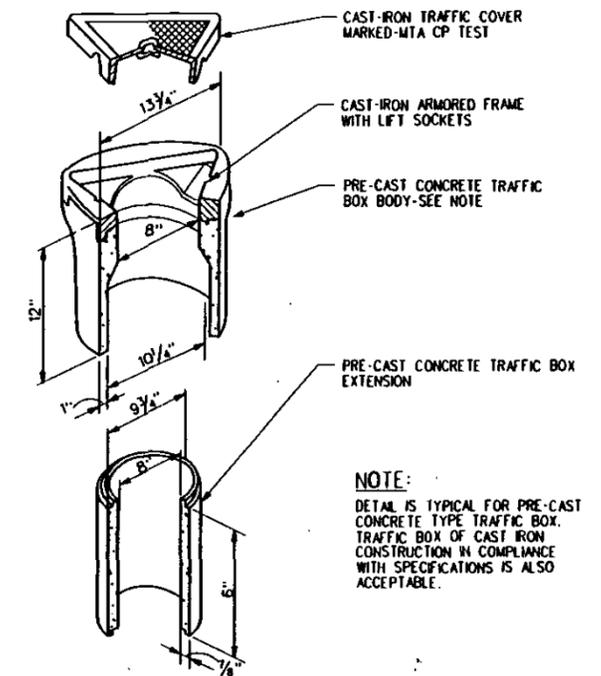
TEST BOX LOCATED IN SIDEWALK DETAIL 1



TAPE WRAP EXPOSED INSULATING FLANGE DETAIL 6



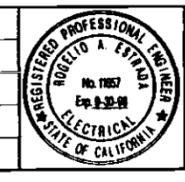
PREPACKAGED MAGNESIUM ANODE DETAIL 4



TEST BOX LOCATED IN AREA OTHER THAN SIDEWALK DETAIL 2

REV	DATE	BY	SUB	APP	DESCRIPTION
1	10 10 94	CH			RESCALE PER SBCH-DK 308.06-10
0	4 19 94	CY			BASELINE ISSUE

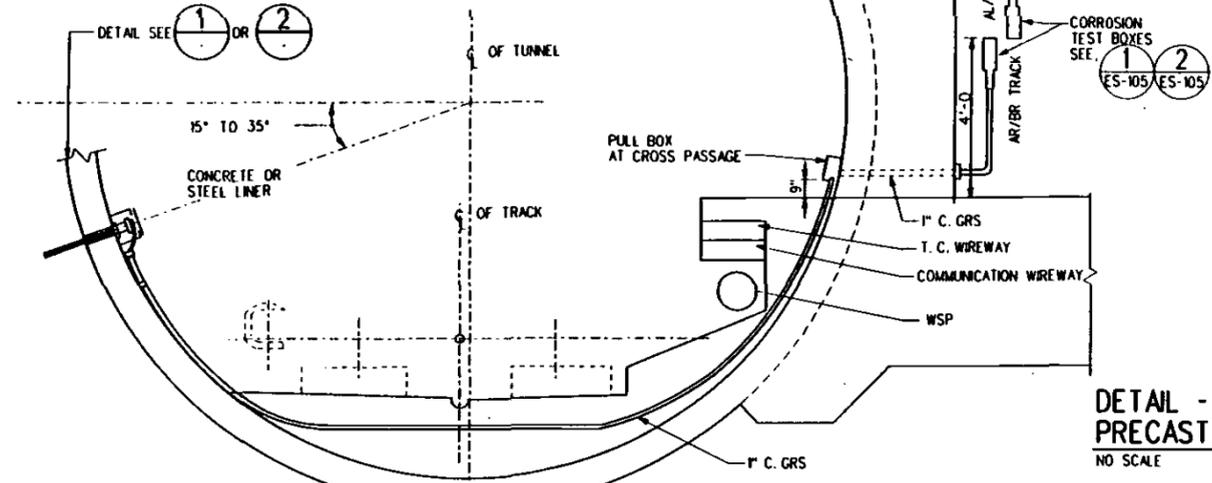
DESIGNED BY
C. YU
 DRAWN BY
V. HOANG
 CHECKED BY
C. ROBINOL
 IN CHARGE
J. BOOTH
 DATE
19 APR 94



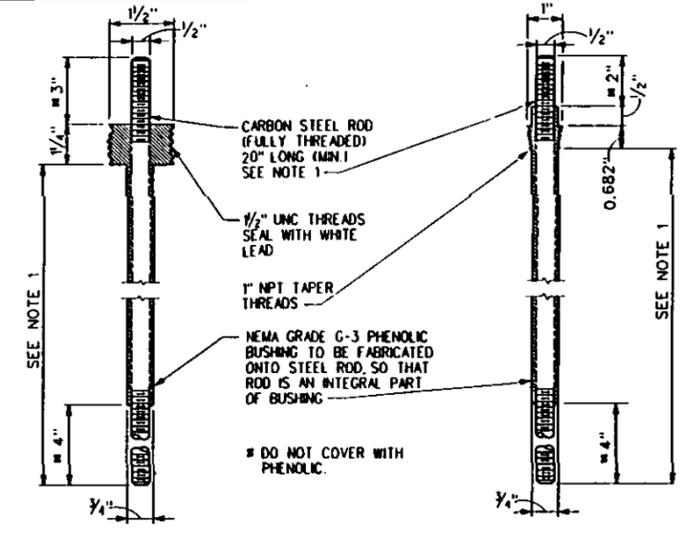
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
 ENGINEERING MANAGEMENT CONSULTANT
 SUBMITTED: [Signature]
 APPROVED: [Signature]

ELECTRICAL STANDARD
 CORROSION CONTROL
 INSULATING JOINTS, TEST BOX
 AND ANODE

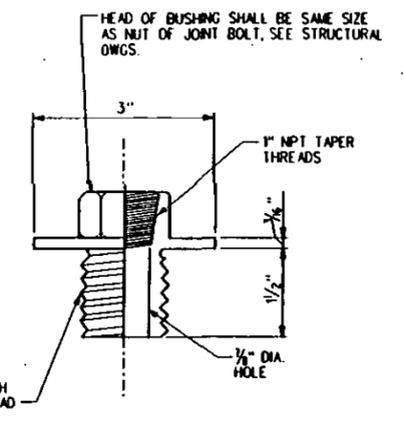
CONTRACT NO.	
DRAWING NO.	ES-102
REV	1
SCALE	NO SCALE
SHEET NO.	



DETAIL - TEST ELECTRODE FOR PRECAST & C.I.P. CONCRETE LINERS (3) NO SCALE

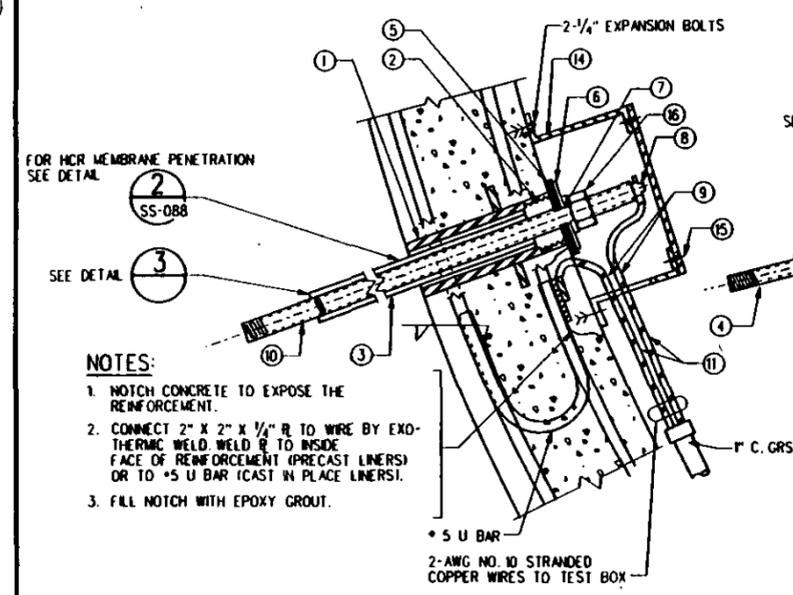


DETAIL - TEST ELECTRODE FOR STEEL TUNNEL LINERS (4) NO SCALE

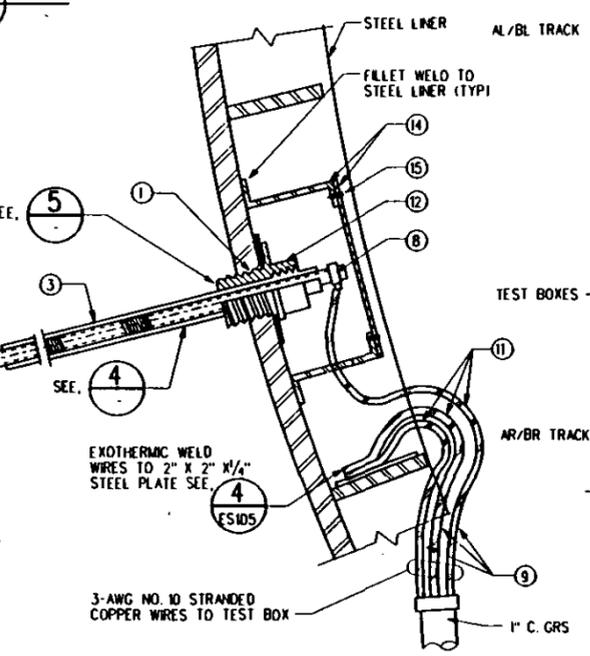


DETAIL - STEEL BUSHING FOR STEEL TUNNEL LINERS (5) NO SCALE

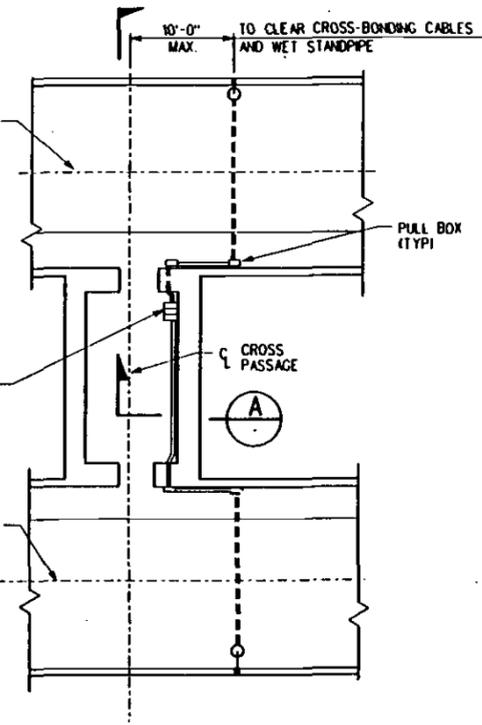
TYPICAL TUNNEL SECTION (A) 1/2\"/>



CONCRETE LINERS (1) NO SCALE



STEEL LINERS (2) NO SCALE



TYPICAL PLAN AT CROSS PASSAGE (A) 1/4\"/>

NOTES:
 1. INCREASE TOTAL LENGTH OF TEST ELECTRODE AS REQUIRED SO THAT END OF 1/2\"/>

IDENTIFICATION DETAILS

- (1) FOR TEST ELECTRODE INSTALLATION USE:
 A) AT PRECAST CONCRETE AND STEEL LINERS, THE GROUT HOLE CLOSEST TO THE INDICATED LOCATION
 B) AT THE CAST IN PLACE CONCRETE LINERS, THE HOLE SPECIALLY PROVIDED FOR THE TEST ELECTRODE
- (2) 1/2\"/>

REV	DATE	BY	SUB	APP	DESCRIPTION

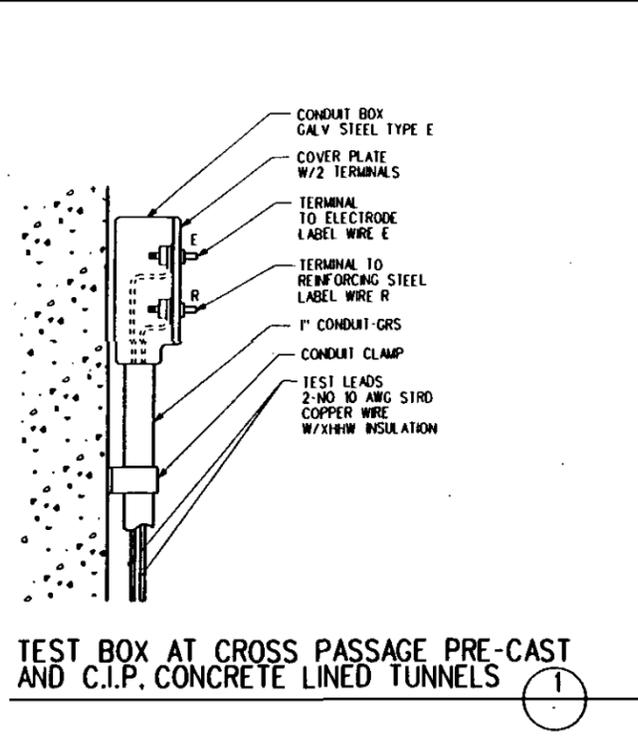
DESIGNED BY C. ROBINOL
 DRAWN BY V. HOANG
 CHECKED BY C. YU
 IN CHARGE J. BOOTH
 DATE 19 APR 94



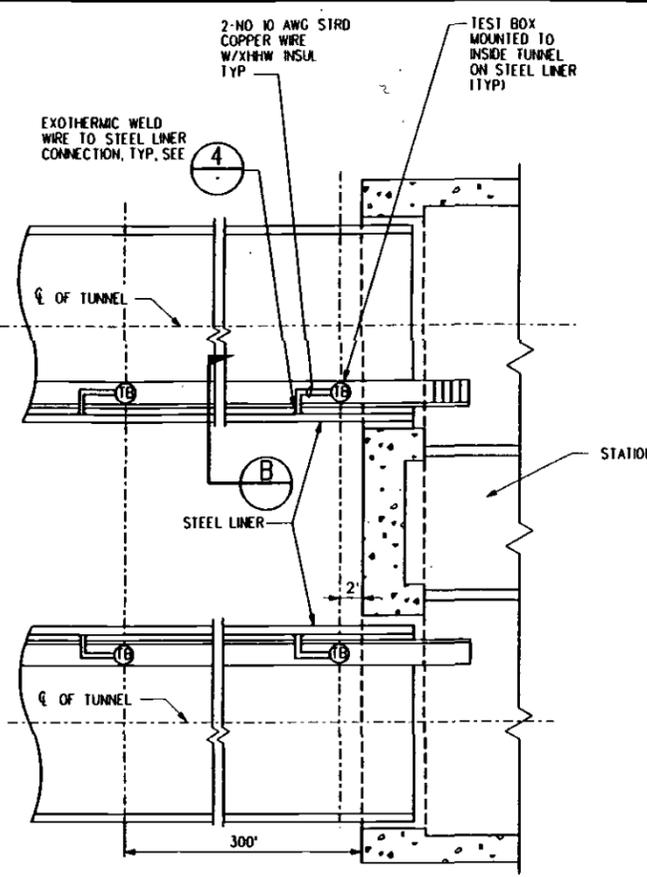
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
METRO RED LINE
 ENGINEERING MANAGEMENT CONSULTANT
 SUBMITTED [Signature]
 APPROVED [Signature]

ELECTRICAL STANDARD
 TUNNEL SUBWAY
 STRAY CURRENT
 MONITORING FACILITIES
 SHEET 1 OF 2

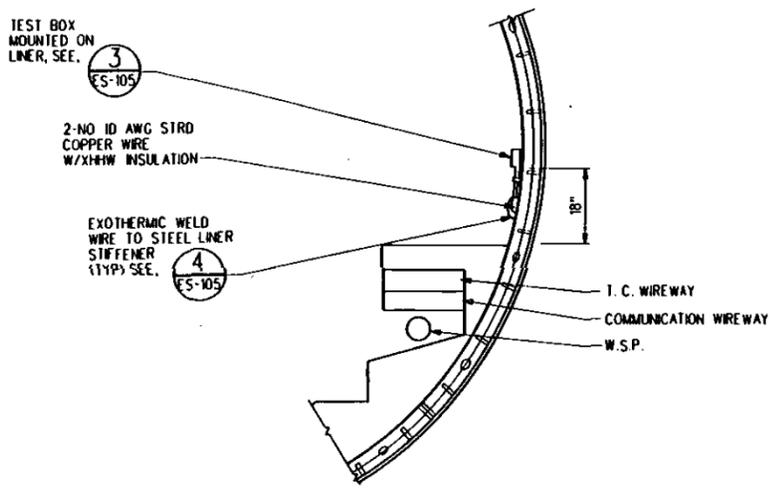
CONTRACT NO. [Blank]
 DRAWING NO. ES-104
 SCALE AS NOTED
 SHEET NO. 1



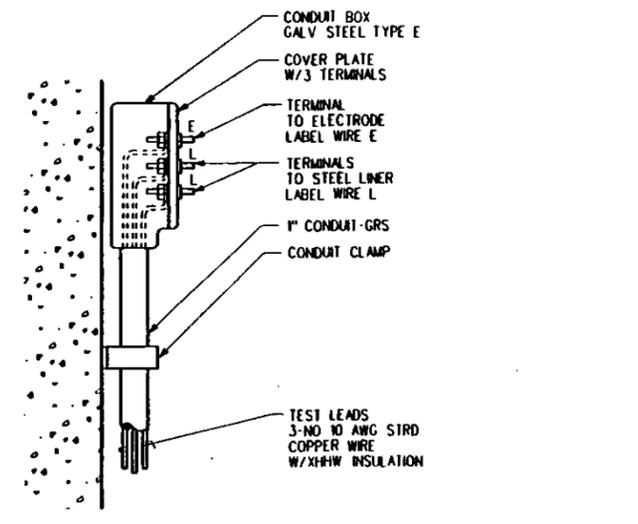
TEST BOX AT CROSS PASSAGE PRE-CAST AND C.I.P. CONCRETE LINED TUNNELS 1



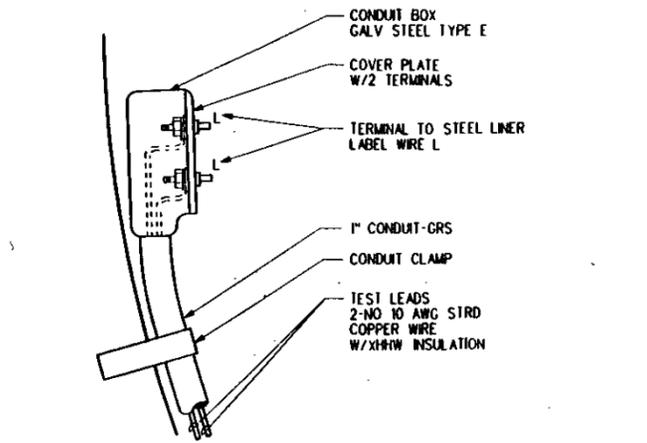
PLAN AT TUNNEL STATION INTERFACE TYPICAL TEST BOX-STEEL LINER



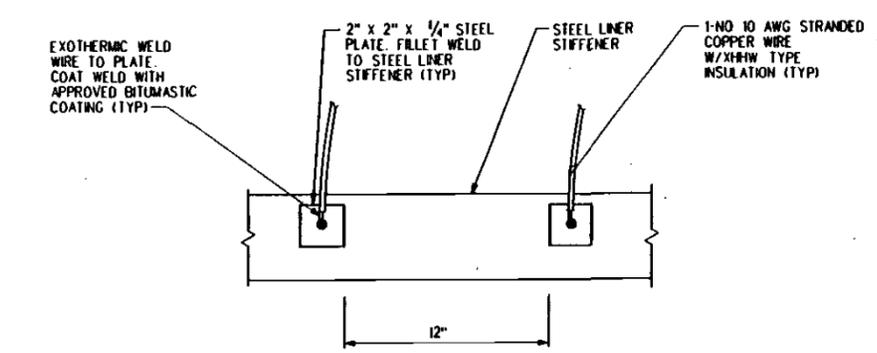
TEST BOX STEEL LINER SECTION A



TEST BOX AT CROSS PASSAGE STEEL LINED TUNNELS 2



TEST BOX AT STEEL TUNNEL LINER DETAIL 3



DETAIL 4

<table border="0"> <tr> <td>DESIGNED BY C. YU</td> <td rowspan="4"> </td> <td colspan="2">LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY</td> </tr> <tr> <td>DRAWN BY B.H. CHAMBERS</td> <td colspan="2">ENGINEERING MANAGEMENT CONSULTANT</td> </tr> <tr> <td>CHECKED BY C. ROBENIOL</td> <td colspan="2"> <small>Paramo-Bucknell Quate & Douglas, Inc. David R. Johnson & Associates C.F. Bauer Engineers & Consultants Economic Planning & Controls James G. Gandy, Inc. The MWH Group, Inc.</small> </td> </tr> <tr> <td>IN CHARGE J. BOOTH</td> <td>SUBMITTED</td> <td colspan="2"> </td> </tr> <tr> <td>DATE 19 APR 94</td> <td>APPROVED</td> <td colspan="2"> </td> </tr> </table>										DESIGNED BY C. YU		LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY		DRAWN BY B.H. CHAMBERS	ENGINEERING MANAGEMENT CONSULTANT		CHECKED BY C. ROBENIOL	<small>Paramo-Bucknell Quate & Douglas, Inc. David R. Johnson & Associates C.F. Bauer Engineers & Consultants Economic Planning & Controls James G. Gandy, Inc. The MWH Group, Inc.</small>		IN CHARGE J. BOOTH	SUBMITTED			DATE 19 APR 94	APPROVED			CONTRACT NO. 		DRAWING NO. ES-105		REV 1
DESIGNED BY C. YU		LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY																														
DRAWN BY B.H. CHAMBERS		ENGINEERING MANAGEMENT CONSULTANT																														
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IN CHARGE J. BOOTH		SUBMITTED																														
DATE 19 APR 94	APPROVED																															
ELECTRICAL STANDARD TUNNEL SUBWAY STRAY CURRENT MONITORING FACILITIES SHEET 2 OF 2						SCALE NO SCALE	SHEET NO.																									

GENERAL DESCRIPTION

WALL MOUNTED FLUORESCENT FIXTURE WITH CLEAR DIFFUSER FOR USE IN TUNNEL SECTIONS.

FIXTURE OPTIONS

X1
 LAMP: (1) 32W, T8, 3500°K
 LUMENS: 2,850
 BALLAST: HPF, ELECTRONIC, RAPID START
 INPUT WATTS: 38
 DIMENSIONS: APPROX. 6" H, 7" W, 48" L
 EFFICIENCY: 72%

X2
 LAMP: (2) 32W, T8, 3500°K
 LUMENS: 2,850 EACH
 BALLAST: HPF, ELECTRONIC, RAPID START
 INPUT WATTS: 70
 DIMENSIONS: APPROX. 6" H, 7" W, 48" L
 EFFICIENCY: 72%

X3
 DIMENSIONS: NOT USED
 REMARKS:

X4
 DIMENSIONS:
 REMARKS:
 SIMILAR TO X2 EXCEPT LAMPS WITH 80% OR HIGHER COLOR RENDERING INDEX (CRI) AND 3050 MINIMUM LUMEN OUTPUT. EACH LAMP TEMP. SHALL BE 4100 K OR HIGHER. EACH FIXTURE CONSISTS OF TWO SETS OF FLUORESCENT LAMP AND ELECTRONIC BALLAST EACH SET WITH ONE FLUORESCENT LAMP CONNECTED TO ONE BALLAST.

PHOTOMETRIC OPTIONS

- 1. CLEAR LENS
- 2. DIFFUSE LENS

MOUNTING OPTIONS:

- 1. SURFACE MOUNTING UNISTRUT WITH HARDWARE
- 2. PENDANT MOUNTING HARDWARE

ACCESSORIES OPTIONS:

- 0. NOT APPLICABLE
- 1. BLUE LENS

FINISH MATERIALS

STAINLESS STEEL POLISHED EXTERIOR, COLO. ROLLED STEEL SOCKET & REFLECTOR PLATES, BAKED WHITE ENAMEL

SAFETY LISTING:

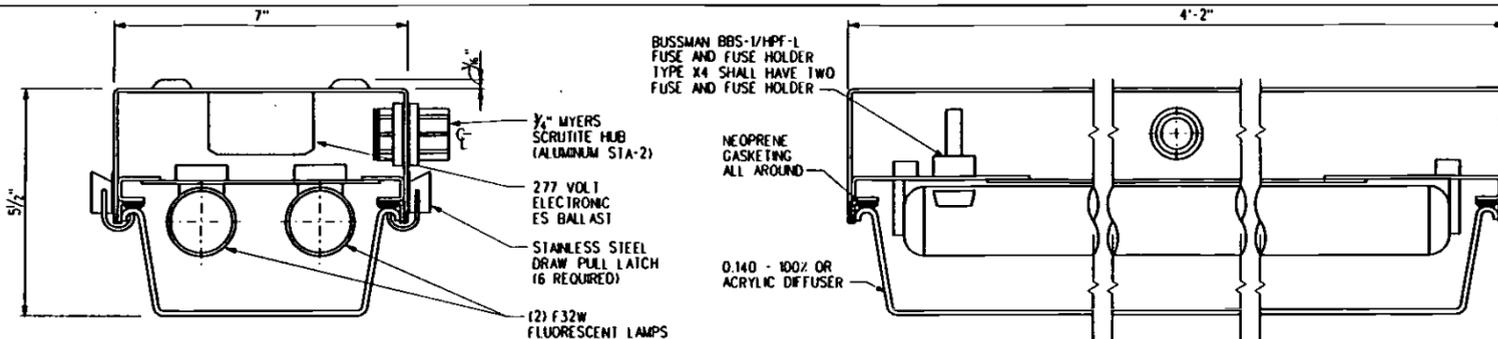
- WET

REMARKS:

- FIXTURE & MOUNTING SHALL WITHSTAND AIR PRESSURE WAVE RANGING FROM +80 PSF TO -80 PSF REPEATIVELY WITH EACH PASSING TRAIN REF. SPECIFICATIONS 16510 PART 2.1A
- LIGHTS NEAREST TO CROSS PASSAGES OR CORRIDOR SHALL BE PROVIDED WITH BLUE FILTERS AND LOCATED AT THE BLUE LIGHT STATION.

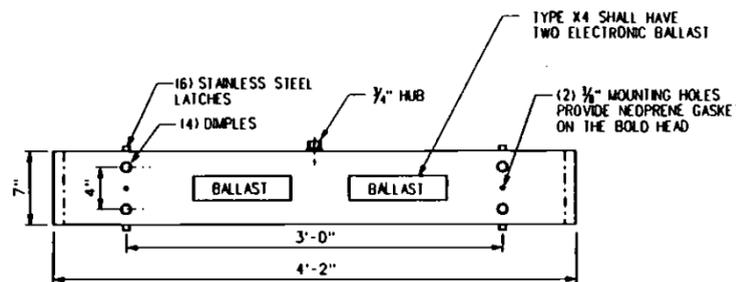
MANUFACTURERS:

- HOLOPHANE "7200" SERIES
- PRUDENTIAL
- PARAMOUNT INDUSTRIES

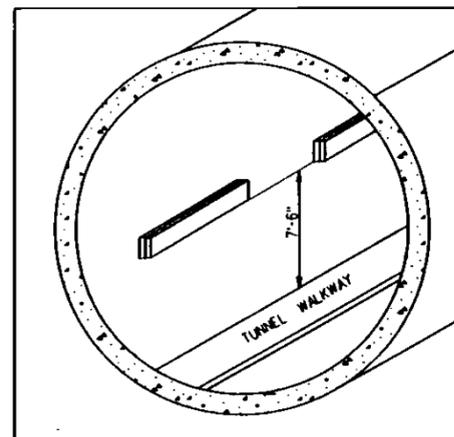


CROSS SECTION

LONGITUDINAL SECTION



TOP VIEW



ISOMETRIC VIEW

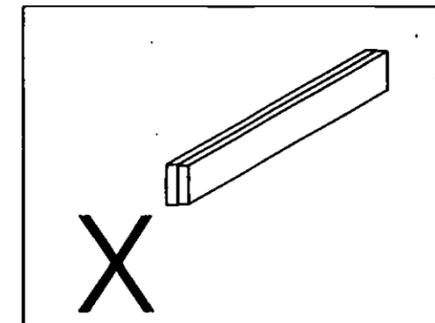
FIXTURE OPTION:	LAMP:			
	ANGLE DEGREES	CANDLE POWER	ANGLE DEGREES	CANDLE POWER
	0.0	1384	125.0	201
	5.0	1437	130.0	152
	10.0	1421	135.0	93
	15.0	1456	140.0	56
	20.0	1520	145.0	47
	25.0	1538	150.0	39
	30.0	1547	155.0	32
	35.0	1543	160.0	24
	40.0	1470	165.0	16
	45.0	1256	170.0	8
	50.0	972	175.0	0
	55.0	700	180.0	0
	60.0	487		
	65.0	355		
	70.0	296		
	75.0	263		
	80.0	231		
	85.0	210		
	90.0	204		
	95.0	247		
	100.0	327		
	105.0	373		
	110.0	367		
	115.0	308		
	120.0	198		

CANDLEPOWER DISTRIBUTION NOTES:
 1. VALUES BASED ON TWO T12 LAMPS. MULTIPLY VALUES BY 95 FOR T8 LAMPS

COEFFICIENTS OF UTILIZATION

PFC	20 PERCENT				30 PERCENT			
	50	30	10	50	30	10	0	
PCC								
WALL REFLECTANCE	0	.80	.80	.80	.69	.69	.69	.69
ZONAL CAVITY METHOD	1	.71	.68	.66	.62	.60	.58	.53
	2	.63	.59	.56	.55	.52	.50	.46
	3	.56	.51	.48	.50	.46	.44	.40
	4	.50	.45	.41	.45	.41	.38	.35
	5	.45	.40	.35	.40	.36	.33	.30
	6	.41	.35	.31	.36	.32	.29	.26
	7	.37	.31	.27	.33	.29	.25	.23
	8	.33	.27	.23	.29	.25	.22	.20
	9	.29	.24	.20	.26	.22	.19	.17
	10	.27	.21	.18	.24	.20	.17	.15

C.U. TABLE NOTES:
 1. BASED ON A 20% FLOOR CAVITY REFLECTANCE



NOTES:

- 1. THE TUNNEL LIGHTS THAT ARE NEAREST TO THE CROSS PASSAGES OR CORRIDOR SHALL BE DEDICATED AS A BLUE LIGHT.
- 2. LIGHTING IN BATTERY ROOM AND BLAST RELIEF SHAFT (BRS) SHALL BE TYPE X1 OR X2

REV	DATE	BY	SUB	APP	DESCRIPTION
0	4.19.94	AHL	CMC		BASELINE ISSUE
1	10.10.94	AHL	CMC		REVISED & RESEALED PER SBCH-DE 308 08-10

DESIGNED BY: C. YU
 DRAWN BY: V. HOANG
 CHECKED BY: C. ROBINOL
 IN CHARGE: J. BOOTH
 DATE: 19 APR 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
 ENGINEERING MANAGEMENT CONSULTANT
 SUBMITTED: [Signature]
 APPROVED: [Signature]

ELECTRICAL STANDARD
 TUNNEL/STATION
 TYPE X
 FLUORESCENT TUNNEL/STATION LIGHT

CONTRACT NO:
 DRAWING NO: ES-106
 SCALE: NO SCALE
 SHEET NO: 1

GENERAL DESCRIPTION

SURFACE AND CANTILEVER MOUNTED ADJUSTABLE ACCENT LIGHT FOR INTERIOR AND EXTERIOR USE.

FIXTURE OPTIONS

AA1

LAMP: (1) 70W, DOUBLE END MH, 3,000°K
 INITIAL LUMENS: 5,000
 BALLAST: HPF, -20° STARTING
 INPUT WATTS: 95
 DIMENSIONS: 5" H, 5" W, 12" L
 EFFICIENCY: 57%

PHOTOMETRIC OPTIONS

1. ASYMMETRIC

MOUNTING OPTIONS

1. WALL BRACKET MOUNTING HARDWARE
 2. CEILING PENDANT MOUNTING HARDWARE

ACCESSORIES OPTIONS

1. CUTOFF VISOR

FINISH MATERIALS

• ALUMINUM HOUSING, SEMISPECULAR ALUMINUM REFLECTOR

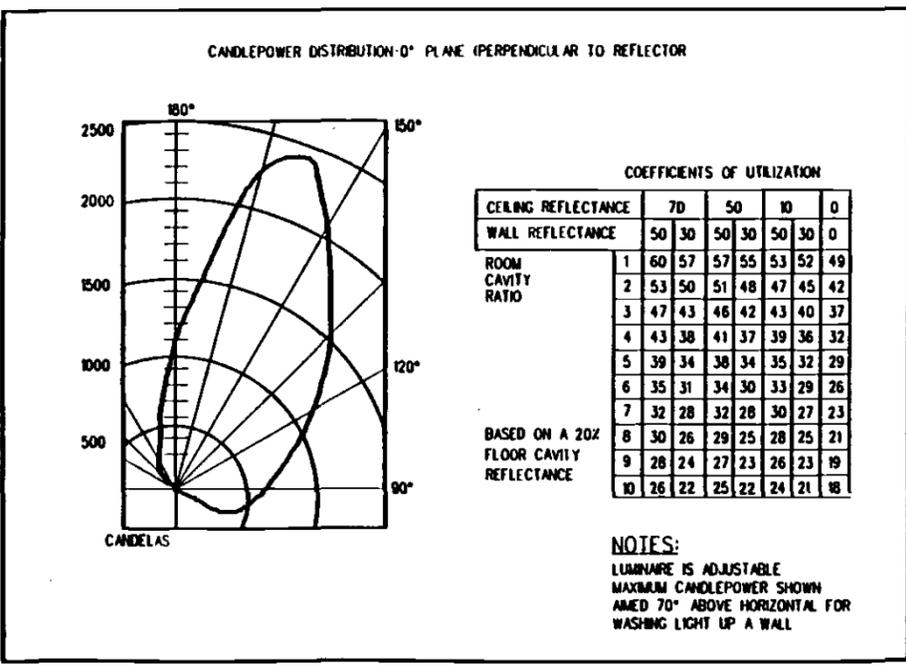
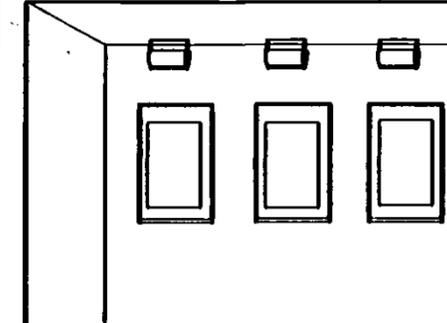
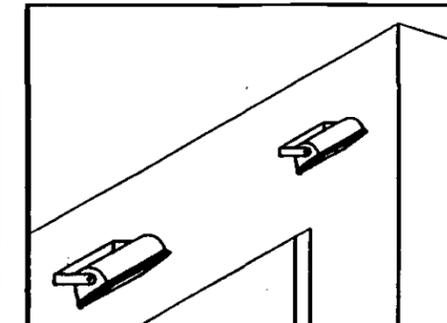
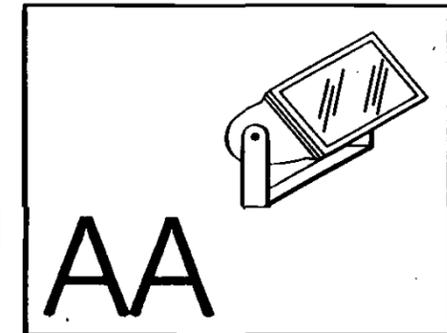
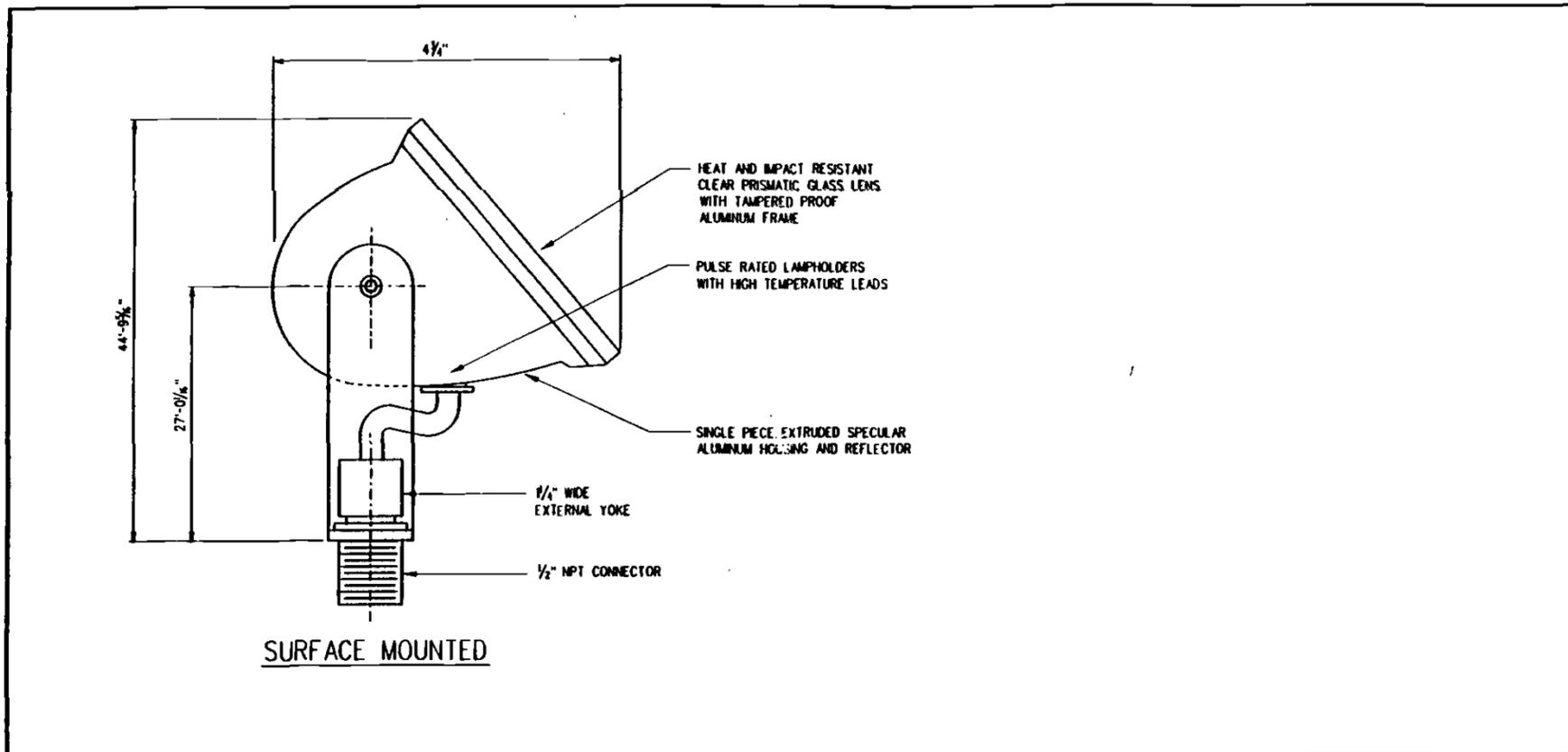
SAFETY LISTING

• WET

REMARKS

MANUFACTURERS

• ELLIPTIPAR
 • RAMBUSCH
 • OR APPROVED EQUAL



REV	DATE	BY	SUB	APP	DESCRIPTION
0	7.25.95				BASELINE ISSUE PER SBON-DE 306-17.00

DESIGNED BY
G. GONZALEZ
 DRAWN BY
B.H. CHAMBERS
 CHECKED BY
C. YU
 IN CHARGE
E. DER-AVAKIAN
 DATE
25 JULY 95



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

ENGINEERING MANAGEMENT CONSULTANT

Submitted by: *[Signature]*

Approved by: *[Signature]*

ELECTRICAL STANDARD

TYPE AA
 ACCENT LIGHT

CONTRACT NO.	
DRAWING NO.	ES-111
REV.	0
SCALE	NO SCALE
SHEET NO.	

GENERAL DESCRIPTION
 ROUND LINEAR FLUORESCENT UP/DOWN
 LIGHT FOR INDOOR USE.

FIXTURE OPTIONS

BB1

LAMP: (3) 32W. T8, 3500°K
 INITIAL LUMENS: 2850 EACH LAMP
 BALLAST: HPF, ELEC., RAPID START
 INPUT WATTS: 112 PER 4 FOOT SECTION
 DIMENSIONS: APPROX. 8" DIA HOUSING
 EFFICIENCY: 62%

PHOTOMETRIC OPTIONS

1. SYMMETRICAL DOWN
2. SYMMETRICAL UP
3. SYMMETRICAL UP/DOWN

MOUNTING OPTIONS

1. PENDANT MOUNTING HARDWARE
2. WALL MOUNTING HARDWARE

ACCESSORIES OPTIONS

1. LOUVER BOTTOM
2. LENS BOTTOM

FINISH MATERIALS

- ANODIZED ALUMINUM WITH HIGH REFLECTANCE WHITE PAINT

SAFETY LISTING

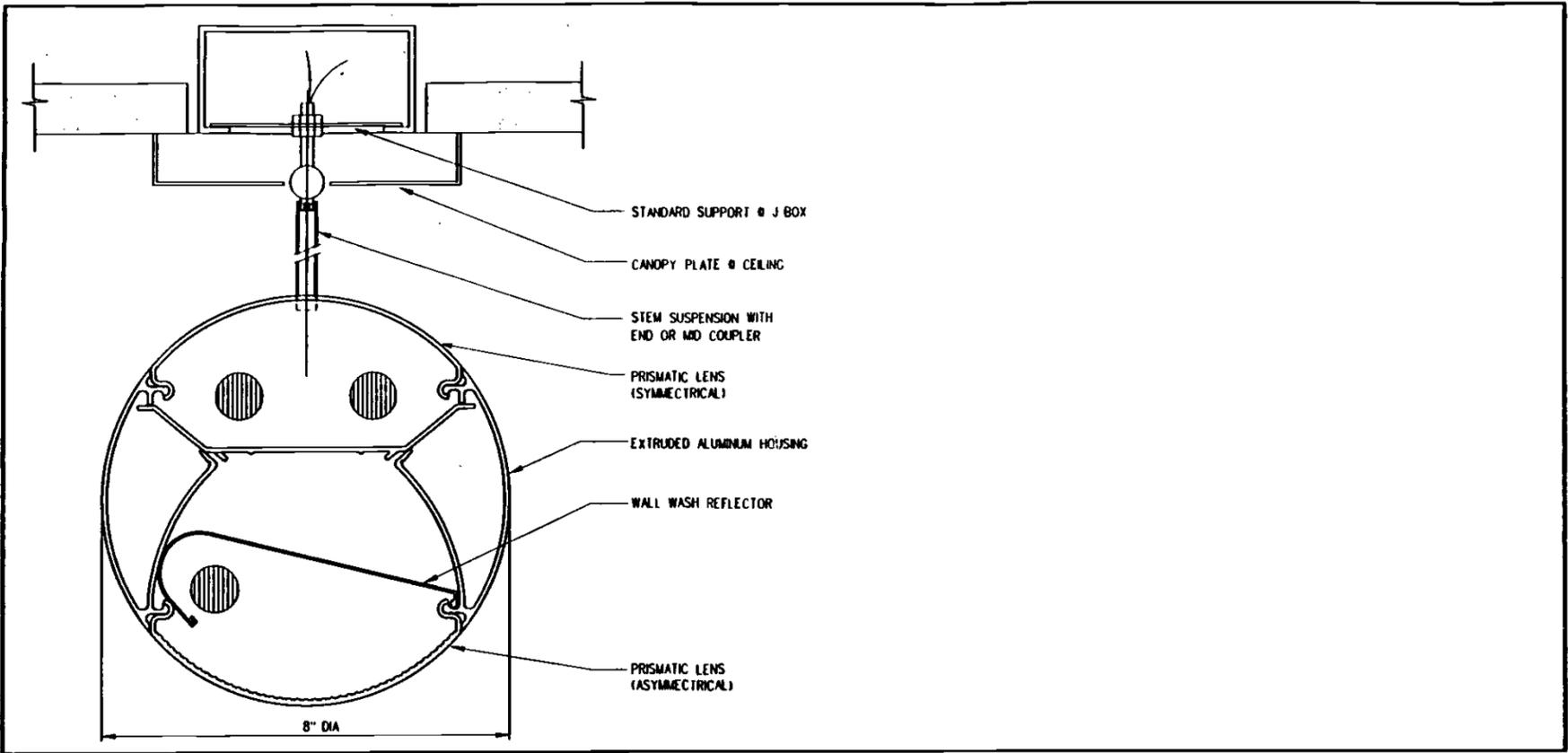
- DAMP

REMARKS

- FIXTURE TO BE MOUNTED NO CLOSER THAN 18" FROM SURFACE TO BE ILLUMINATED

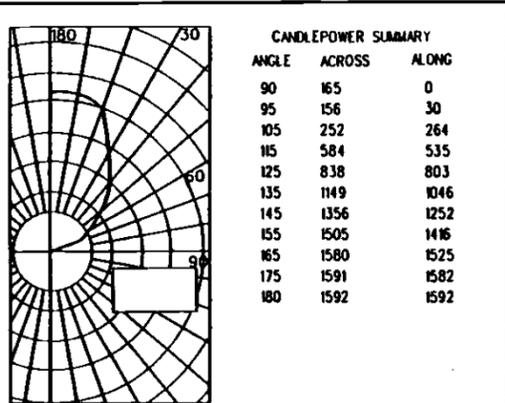
MANUFACTURERS

- STAFF
- PEERLESS LIGHTING
- LINEAR

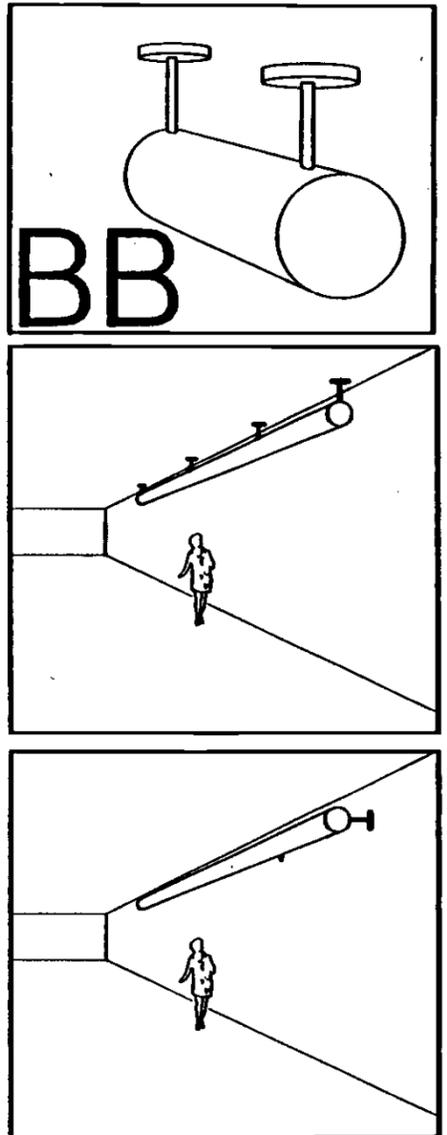


FIXTURE OPTION:

LAMP:



COEFFICIENTS OF UTILIZATION																		
% EFFECTIVE CEILING CAVITY REFLECTANCE																		
PCC	80				70				50				0					
	70	50	30	10	70	50	30	10	50	30	10	50		30	10			
PW	% WALL REFLECTANCE																	
RCR	20% FLOOR CAVITY REFLECTANCE																	
0	68	68	68	68	62	62	62	62	52	52	52	49	49	49	33	33	33	31
1	62	59	57	55	57	55	53	51	46	43	43	39	37	36	31	30	30	26
2	57	52	48	45	52	48	45	42	41	38	36	34	32	31	28	26	23	22
3	52	46	42	33	48	43	39	36	36	33	31	30	29	26	25	23	22	19
4	47	41	36	32	44	38	34	30	32	29	24	27	23	23	22	20	19	17
5	43	36	31	27	40	34	29	26	29	25	23	24	21	19	20	18	16	14
6	40	32	27	28	37	30	25	22	26	22	19	22	19	17	18	16	14	12
7	36	29	24	20	34	27	22	19	23	19	17	19	17	14	16	14	12	11
8	34	26	21	17	31	24	19	16	20	17	14	17	14	12	14	12	11	09
9	31	23	18	15	28	21	17	14	18	15	12	15	12	11	12	11	09	08
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REV	DATE	BY	SUB	APP	DESCRIPTION
0	7/25/95	[Signature]			BASELINE ISSUE PER SBON-DE 306-17.00

DESIGNED BY
G. GONZALEZ

DRAWN BY
B.H. CHAMBERS

CHECKED BY
C. YU

IN CHARGE
E. DER-AVAKIAN

DATE
25 JULY 95



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

ENGINEERING MANAGEMENT CONSULTANT

SUBMITTED: [Signature]

APPROVED: [Signature]

ELECTRICAL STANDARD

TYPE BB

AREA LIGHT

CONTRACT NO.	
DRAWING NO.	ES-112
REV	0
SCALE	NO SCALE
SHEET NO.	

GENERAL DESCRIPTION

CEILING AND WALL MOUNTED METAL HALIDE UPLIGHT FOR INTERIOR OR EXTERIOR USE.

FIXTURE OPTIONS

CCI

LAMP: 175W, M.H., R CLEAR, 4000°K
 INITIAL LUMENS: 12,000
 BALLAST: HPF .20 F STARTING
 INPUT WATTS: 210
 DIMENSIONS: 14" - 16" L, 9"-11" H, 7" D (MAX)
 EFFICIENCY: 60%

PHOTOMETRIC OPTIONS

- HORIZONTAL FLOOD
- VERTICAL FLOOD
- HORIZONTAL SPOT

MOUNTING OPTIONS

- WALL/CEILING CANOPY MOUNTED
- WALL MOUNTED
- WALL ARM MOUNTED

ACCESSORIES OPTIONS

- GLARE HOOD
- GLARE LOUVER
- BARN DOORS

FINISH MATERIALS

- ELECTROSTATICALLY APPLIED DARK BRONZE, BAKED ENAMEL STANDARD
- REFER TO INDIVIDUAL MANUFACTURERS INFORMATION FOR ADDITIONAL INFORMATION.

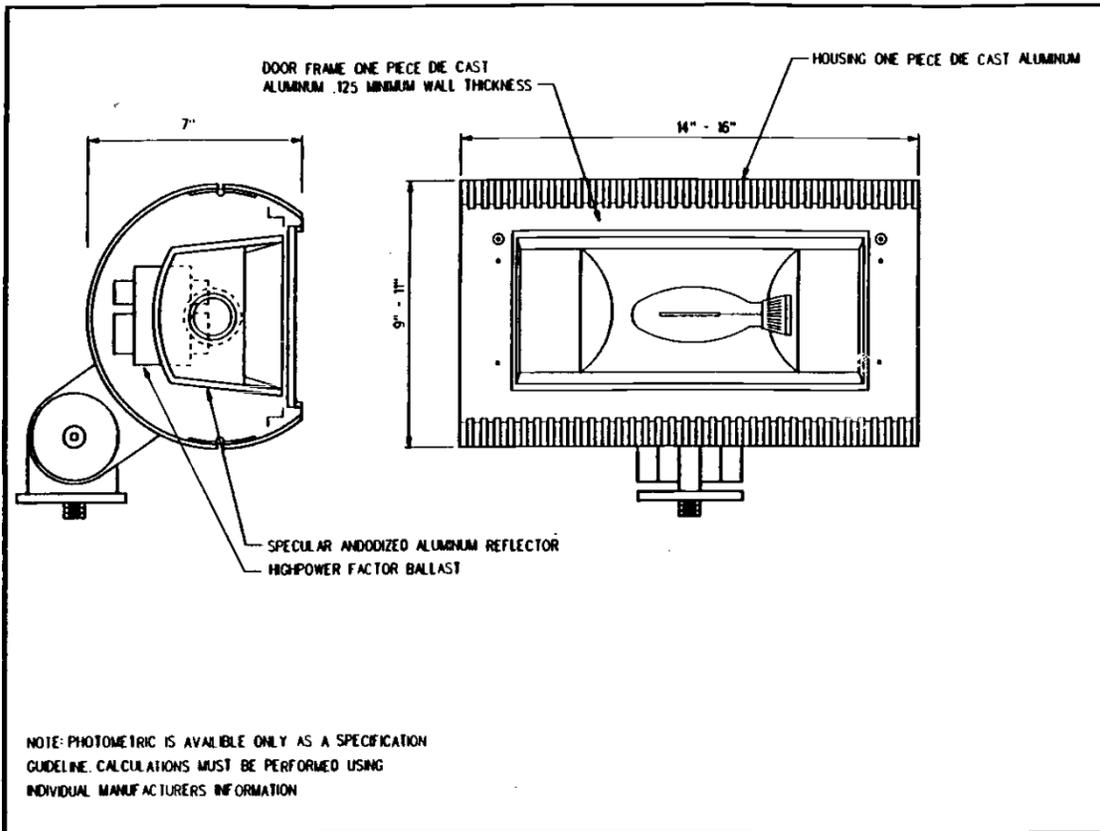
SAFETY LISTING

- DAMP

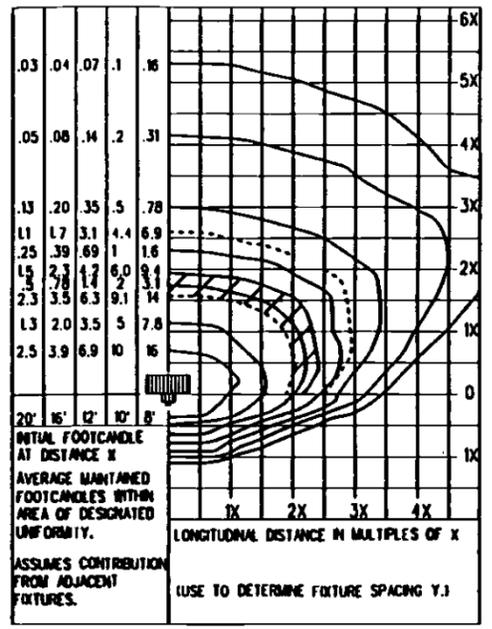
REMARKS

MANUFACTURERS

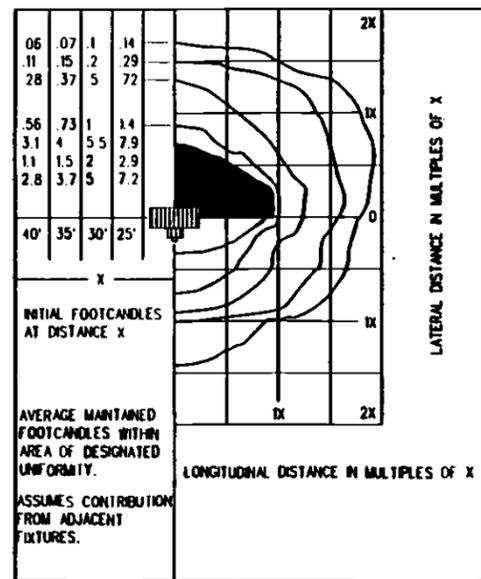
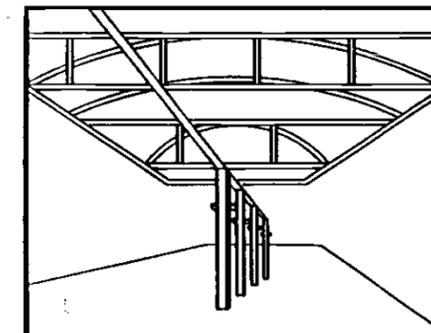
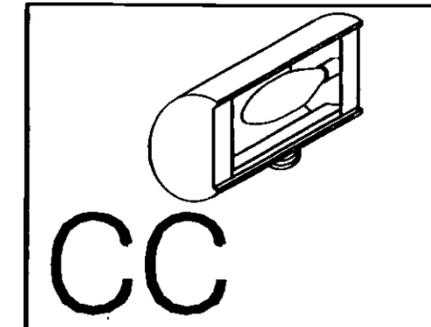
- KIM "AFI"
- GARCO "DF7" SERIES
- STERNER INFRANOR SERIES
- OR APPROVED EQUAL



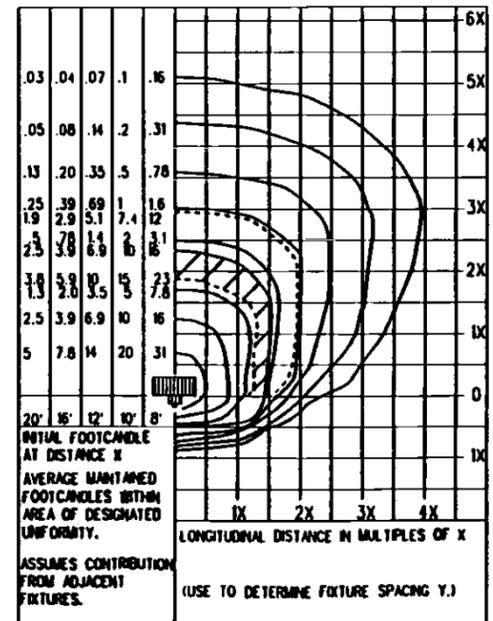
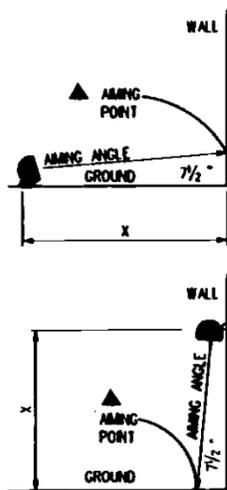
NOTE: PHOTOMETRIC IS AVAILABLE ONLY AS A SPECIFICATION GUIDELINE. CALCULATIONS MUST BE PERFORMED USING INDIVIDUAL MANUFACTURERS INFORMATION



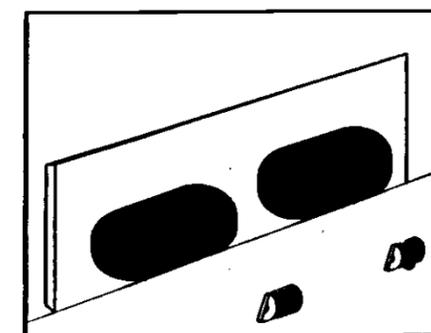
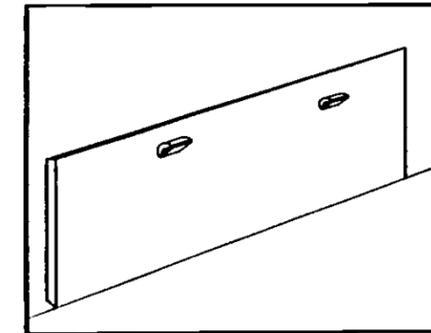
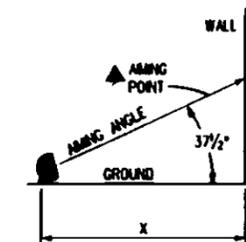
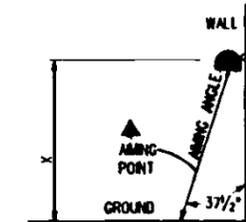
HORIZONTAL FLOOD



HORIZONTAL SPOT



VERTICAL FLOOD



REV	DATE	BY	SIB	APP	DESCRIPTION
0	7 25 95	[Signature]			BASELINE ISSUE PER SBCH-DE 306-17.00

DESIGNED BY
G. GONZALEZ
 DRAWN BY
B.H. CHAMBERS
 CHECKED BY
C. YU
 IN CHARGE
E. DER-AVAKIAN
 DATE
25 JULY 95



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
 ENGINEERING MANAGEMENT CONSULTANT
 SUBMITTED: [Signature]
 APPROVED: [Signature]

ELECTRICAL STANDARD
TYPE CC
METAL HALIDE UPLIGHT

CONTRACT NO.	
DRAWING NO.	ES-113
SCALE	NO SCALE
SHEET NO.	

GENERAL DESCRIPTION

ROUND CYLINDER ARM MOUNTED METAL HALIDE AREA LIGHT WITH GLOW TOP FOR INTERIOR AND EXTERIOR USE.

FIXTURE OPTIONS

DD1

LAMP: 175W, M.H., CL, HORIZ, 4400°K
 INITIAL LUMENS: 15,000
 BALLAST: HPF, -20 F STARTING
 INPUT WALLS: 210
 DIMENSIONS: 17" - 18" HOUSING DIA, 8" - 9 1/2" HIGH
 EFFICIENCY: 70%

PHOTOMETRIC OPTIONS

1. TYPE I DISTRIBUTION
2. TYPE II DISTRIBUTION
3. TYPE III DISTRIBUTION
4. TYPE IV DISTRIBUTION
5. TYPE V DISTRIBUTION

MOUNTING OPTIONS

1. WALL MOUNTING HARDWARE

ACCESSORIES OPTIONS

1. HOUSEHOLD SHIELD
2. PHOTOCELL
2. TAMPER RESISTANT LATCH

FINISH MATERIALS

- HARDCOAT, FADE RESISTANT ELECTROSTATICALLY APPLIED POLYURETHANE PAINT.
- SEE ARCHITECTURAL SPECIFICATIONS FOR COLOR.

SAFETY LISTING

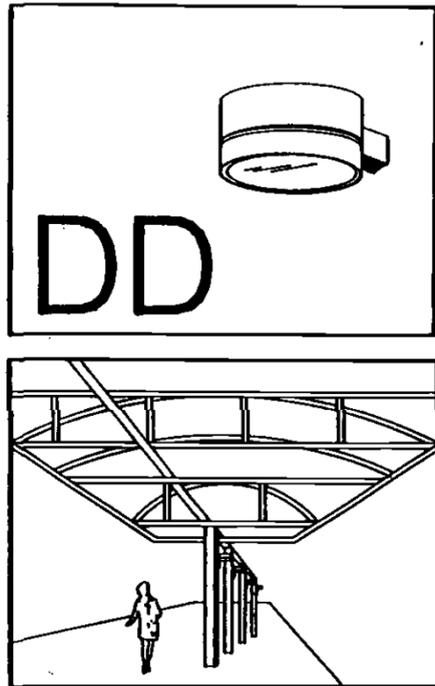
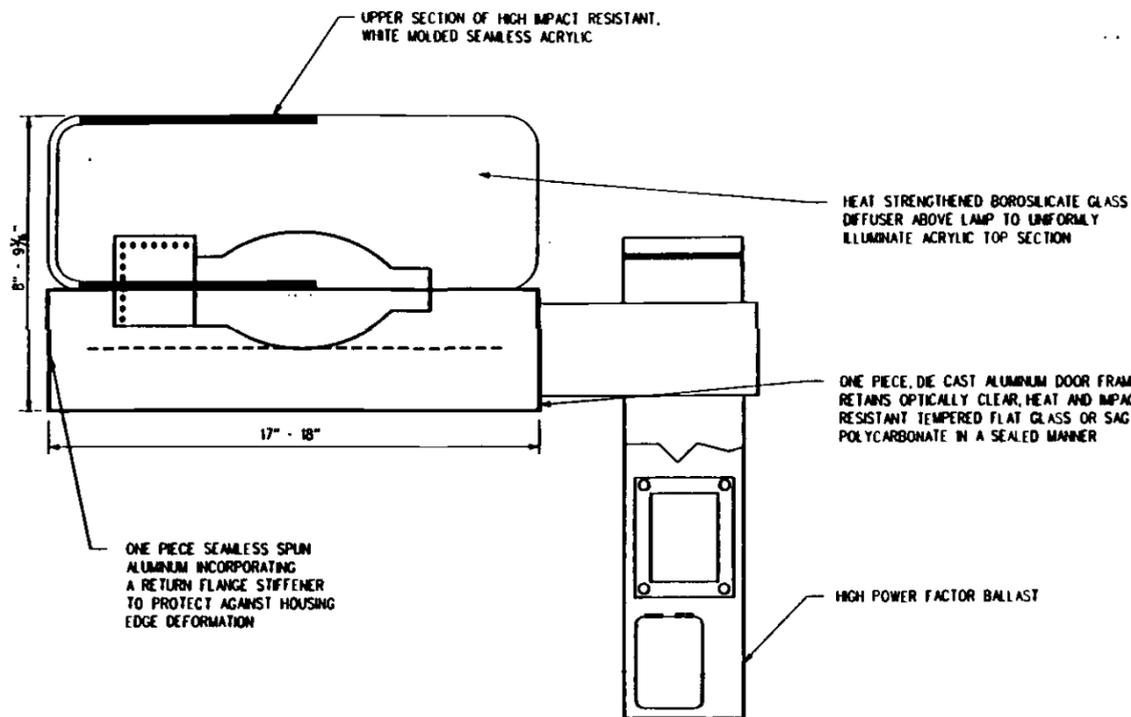
- WET

REMARKS

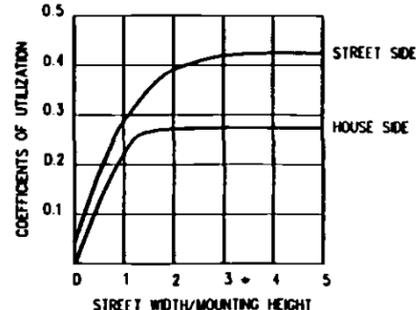
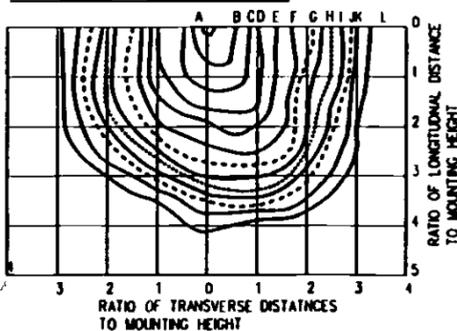
- ALL PHOTOMETRIC TYPES III, IV, AND V TO BE USED. SPECIFICATION SHEET INDICATES ONLY TYPES III AND V. REFER TO MANUFACTURER'S INFORMATION FOR OTHER TYPES.

MANUFACTURERS

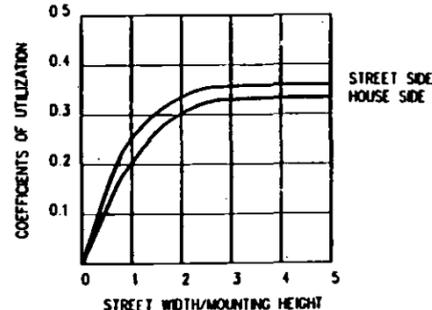
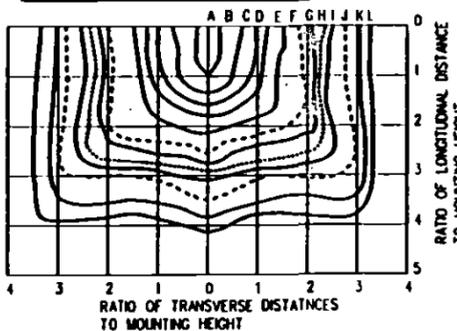
- GARDCO FORM TEN "CAG" OR "CW"
- STERNER "ELEMENTS" SERIES
- OR APPROVED EQUAL



TYPE III PHOTOMETRY



TYPE V PHOTOMETRY



FOOTCANDLE VALUES

MOUNTING HEIGHT 30' 1'		FOOTCANDLES PER 1000 LAMP LUMENS											
		M	N	O	P	Q	R	S	T	U	V	W	X
1	1	.1	.064	.040	.025	.016	.010	.0064	.0052	.0040	.0025	.0016	.0010
2	2	.064	.040	.025	.016	.010	.0064	.0052	.0040	.0025	.0016	.0010	.00064
3	3	.040	.025	.016	.010	.0064	.0052	.0040	.0025	.0016	.0010	.00064	.00040
4	4	.025	.016	.010	.0064	.0052	.0040	.0025	.0016	.0010	.00064	.00040	.00025
5	5	.016	.010	.0064	.0052	.0040	.0025	.0016	.0010	.00064	.00040	.00025	.00016
6	6	.010	.0064	.0052	.0040	.0025	.0016	.0010	.00064	.00040	.00025	.00016	.00010
7	7	.0064	.0052	.0040	.0025	.0016	.0010	.00064	.00040	.00025	.00016	.00010	.000064
8	8	.0052	.0040	.0025	.0016	.0010	.00064	.00040	.00025	.00016	.00010	.000064	.000052
9	9	.0040	.0025	.0016	.0010	.00064	.00040	.00025	.00016	.00010	.000064	.000052	.000040
10	10	.0025	.0016	.0010	.00064	.00040	.00025	.00016	.00010	.000064	.000052	.000040	.000025
11	11	.0016	.0010	.00064	.00040	.00025	.00016	.00010	.000064	.000052	.000040	.000025	.000016
12	12	.0010	.00064	.00040	.00025	.00016	.00010	.000064	.000052	.000040	.000025	.000016	.000010
13	13	.00064	.00040	.00025	.00016	.00010	.000064	.000052	.000040	.000025	.000016	.000010	.0000064
14	14	.00040	.00025	.00016	.00010	.000064	.000052	.000040	.000025	.000016	.000010	.0000064	.0000040
15	15	.00025	.00016	.00010	.000064	.000052	.000040	.000025	.000016	.000010	.0000064	.0000040	.0000025
16	16	.00016	.00010	.000064	.000052	.000040	.000025	.000016	.000010	.0000064	.0000040	.0000025	.0000016
17	17	.00010	.000064	.000052	.000040	.000025	.000016	.000010	.0000064	.0000040	.0000025	.0000016	.0000010
18	18	.000064	.000052	.000040	.000025	.000016	.000010	.0000064	.0000040	.0000025	.0000016	.0000010	.00000064
19	19	.000052	.000040	.000025	.000016	.000010	.0000064	.0000040	.0000025	.0000016	.0000010	.00000064	.00000052
20	20	.000040	.000025	.000016	.000010	.0000064	.0000040	.0000025	.0000016	.0000010	.00000064	.00000052	.00000040
21	21	.000025	.000016	.000010	.0000064	.0000040	.0000025	.0000016	.0000010	.00000064	.00000052	.00000040	.00000025
22	22	.000016	.000010	.0000064	.0000040	.0000025	.0000016	.0000010	.00000064	.00000052	.00000040	.00000025	.00000016
23	23	.000010	.0000064	.0000040	.0000025	.0000016	.0000010	.00000064	.00000052	.00000040	.00000025	.00000016	.00000010
24	24	.0000064	.0000040	.0000025	.0000016	.0000010	.00000064	.00000052	.00000040	.00000025	.00000016	.00000010	.000000064
25	25	.0000040	.0000025	.0000016	.0000010	.00000064	.00000052	.00000040	.00000025	.00000016	.00000010	.000000064	.000000040
26	26	.0000025	.0000016	.0000010	.00000064	.00000052	.00000040	.00000025	.00000016	.00000010	.000000064	.000000040	.000000025
27	27	.0000016	.0000010	.00000064	.00000052	.00000040	.00000025	.00000016	.00000010	.000000064	.000000040	.000000025	.000000016
28	28	.0000010	.00000064	.00000052	.00000040	.00000025	.00000016	.00000010	.000000064	.000000040	.000000025	.000000016	.000000010
29	29	.00000064	.00000052	.00000040	.00000025	.00000016	.00000010	.000000064	.000000040	.000000025	.000000016	.000000010	.0000000064
30	30	.00000052	.00000040	.00000025	.00000016	.00000010	.000000064	.000000040	.000000025	.000000016	.000000010	.0000000064	.0000000052
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38	38	.000000016	.000000010	.0000000064	.0000000052	.0000000040	.0000000025	.0000000016	.0000000010	.00000000064	.00000000040	.00000000025	.00000000016
39	39	.000000010	.0000000064	.0000000052	.0000000040	.0000000025	.0000000016	.0000000010	.00000000064	.00000000040	.00000000025	.00000000016	.00000000010
40	40	.0000000064	.0000000052	.0000000040	.0000000025	.0000000016	.0000000010	.00000000064	.00000000040	.00000000025	.00000000016	.00000000010	.000000000064
41	41	.0000000052	.0000000040	.0000000025	.0000000016	.0000000010	.00000000064	.00000000040	.00000000025	.00000000016	.00000000010	.000000000064	.000000000052
42	42	.0000000040	.0000000025	.0000000016	.0000000010	.00000000064	.00000000040	.00000000025	.00000000016	.00000000010	.000000000064	.000000000052	.000000000040
43	43	.0000000025	.0000000016	.0000000010	.00000000064	.00000000040	.00000000025	.00000000016	.00000000010	.000000000064	.000000000052	.000000000040	.000000000025
44	44	.0000000016	.0000000010	.00000000064	.00000000040	.00000000025	.00000000016	.00000000010	.000000000064	.000000000052	.000000000040	.000000000025	.000000000016
45	45	.0000000010	.00000000064	.00000000040	.00000000025	.00000000016	.00000000010	.000000000064	.000000000052	.000000000040	.000000000025	.000000000016	.000000000010
46	46	.00000000064	.00000000040	.00000000025	.00000000016	.00000000010	.000000000064	.000000000052	.000000000040	.000000000025	.000000000016	.000000000010	.0000000000064
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51	51	.000000000064	.000000000052	.000000000040	.000000000025	.000000000016	.000000000010	.0000000000064	.0000000000040	.0000000000025	.0000000000016	.0000000000010	.00000000000064
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53	53	.000000000040	.000000000025	.000000000016	.000000000010	.							

GENERAL DESCRIPTION

SPHERICAL ARM MOUNTED METAL HALIDE AREA LIGHT WITH GLOWING TOP FOR INTERIOR AND EXTERIOR USE.

FIXTURE OPTIONS

EE1

LAMP: 175W, M.H., CL, HORIZ, 4400°K
 INITIAL LUMENS: 15,000
 BALLAST: HPF, -20 F STARTING
 INPUT WATTS: 210
 DIMENSIONS: 17" - 22" HOUSING DIA., 8" - 11" HIGH
 EFFICIENCY: 70%

PHOTOMETRIC OPTIONS

1. TYPE I DISTRIBUTION
2. TYPE II DISTRIBUTION
3. TYPE III DISTRIBUTION
4. TYPE IV DISTRIBUTION
5. TYPE V DISTRIBUTION

MOUNTING OPTIONS

1. WALL MOUNTING HARDWARE

ACCESSORIES OPTIONS

1. TAMPER RESISTANT LATCH

FINISH MATERIALS

- HARDCOAT, FADE RESISTANT ELECTROSTATICALLY APPLIED POLYURETHANE PAINT.
- SEE ARCHITECTURAL SPECIFICATIONS FOR COLOR.

SAFETY LISTING

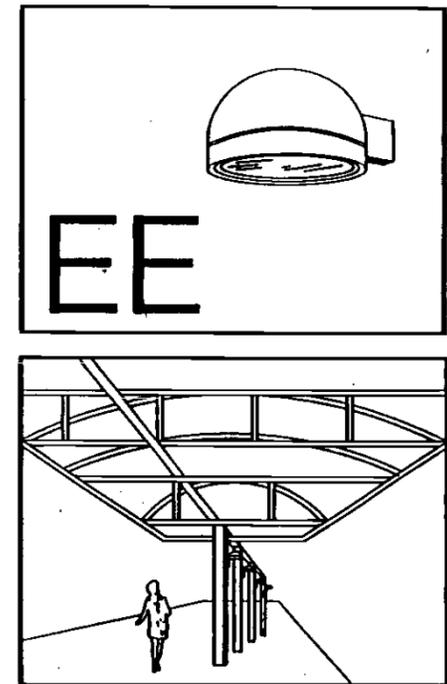
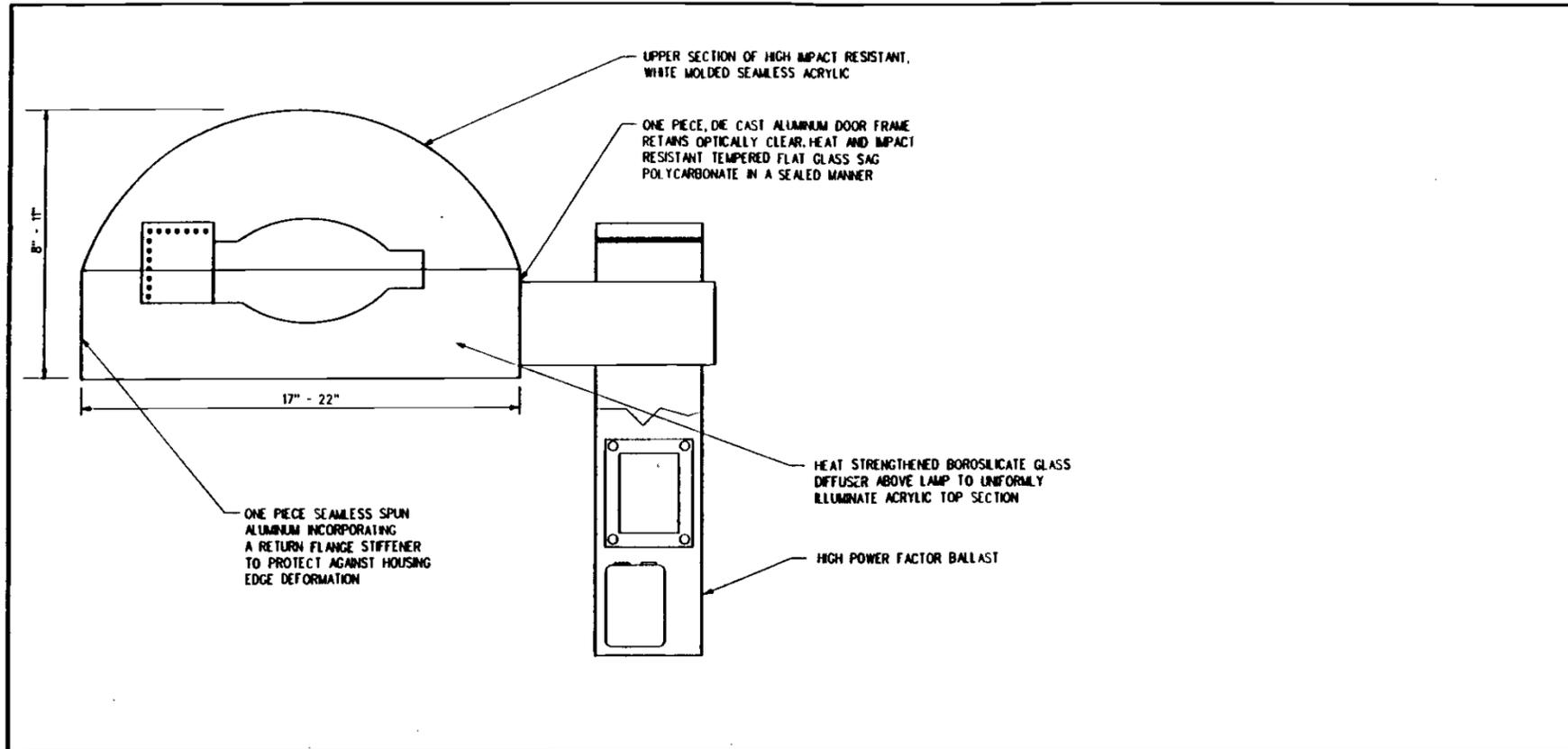
- WET

REMARKS

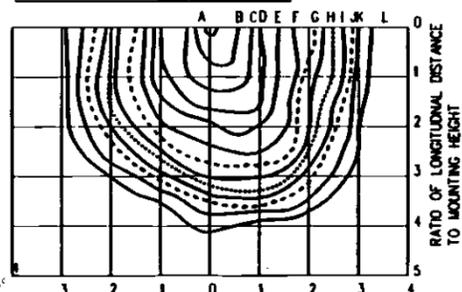
- ALL PHOTOMETRIC TYPES I, II, III, IV, AND V TO BE USED. SPECIFICATION SHEET INDICATES ONLY TYPES III AND V. REFER TO MANUFACTURER'S INFORMATION FOR OTHER TYPES.

MANUFACTURERS

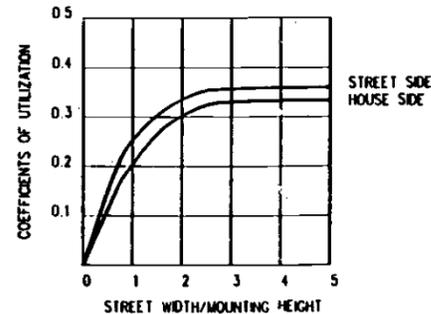
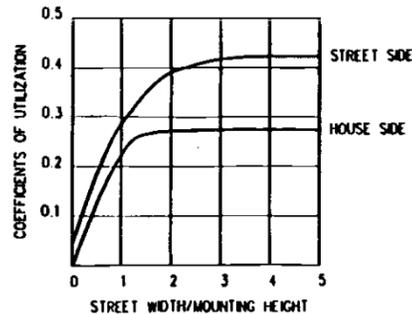
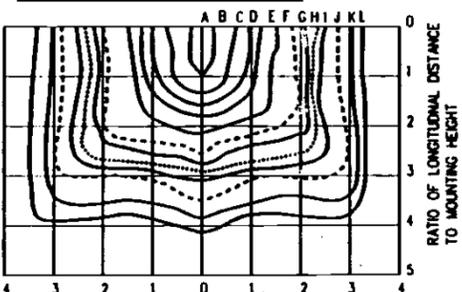
- GARDCO FORM TEN "MW"
- STERNER "ELEMENTS" SERIES
- OR APPROVED EQUAL



TYPE III PHOTOMETRY



TYPE V PHOTOMETRY



FOOTCANDLE VALUES

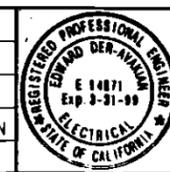
MOUNTING HEIGHT CONFIGURATION	FOOTCANDLES PER 1000 LAMP LUMENS												
	A	B	C	D	E	F	G	H	H/I	I	J	K	L
30' 1	.14	.1	.064	.040	.025	.016	.010	.0064	.0052	.0040	.0025	.0016	.0010

NOTE:

FOOTCANDLE VALUES ABOVE ARE FOR 30' POLE MOUNTING HEIGHT. PHOTOMETRY IS AVAILABLE ONLY AS A SPECIFICATION GUIDELINE. CALCULATIONS MUST BE PERFORMED USING INDIVIDUAL MANUFACTURERS' INFORMATION.

REV	DATE	BY	SLD	APP	DESCRIPTION
0	7 25 95	ED	ED	ED	BASELINE ISSUE PER SBCN-DE 306-17.00

DESIGNED BY: G. GONZALEZ
 DRAWN BY: M. PATEL
 CHECKED BY: C. YU
 IN CHARGE: E. DER-AVAKIAN
 DATE: 25 JULY 95



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

ENGINEERING MANAGEMENT CONSULTANT

SUBMITTED: [Signature]

APPROVED: [Signature]

ELECTRICAL STANDARD

TYPE EE METAL HALIDE AREA LIGHT

CONTRACT NO.	
DRAWING NO.	ES-115
REV.	0
SCALE	NO SCALE
SHEET NO.	

GENERAL DESCRIPTION

BURIAL TYPE METAL HALIDE UPLIGHT FOR INTERIOR AND EXTERIOR USE.

FIXTURE OPTIONS

FF1

LAMP: 70W, M.H., PAR38, 3200°K
 INITIAL LUMENS: 3,200
 BALLAST: HPF, -20°F STARTING
 INPUT WATTS: 95
 DIMENSIONS: APPROX. 18" H, 12" DIA
 EFFICIENCY: 93%

FF2

LAMP: 100W, M.H., PAR38, 3200°K
 INITIAL LUMENS: 5600
 BALLAST: HPF, -20°F STARTING
 INPUT WATTS: 135
 DIMENSIONS: APPROX. 18" H, 12" DIA
 EFFICIENCY: 93%

PHOTOMETRIC OPTIONS

1. SPOT DISTRIBUTION
2. FLOOD DISTRIBUTION
3. VERY WIDE FLOOD DISTRIBUTION

MOUNTING OPTIONS

1. BURIAL MOUNTED

ACCESSORIES OPTIONS

1. ROCK GUARD
2. GLARE SHIELD
2. LOUVER

FINISH MATERIALS

- CAST BRONZE TRIM RING
- ALUMINUM TRIM RING

SAFETY LISTING

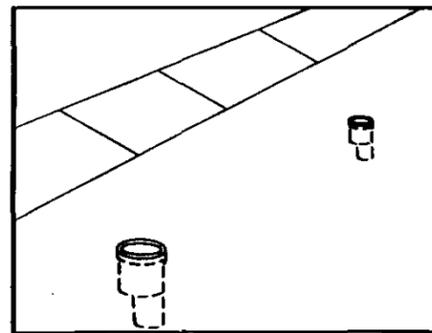
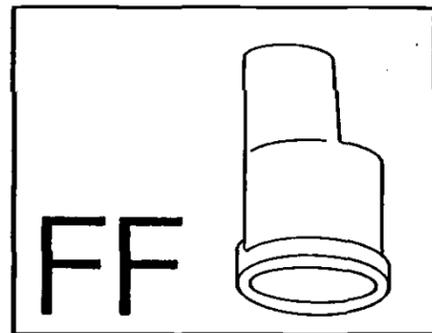
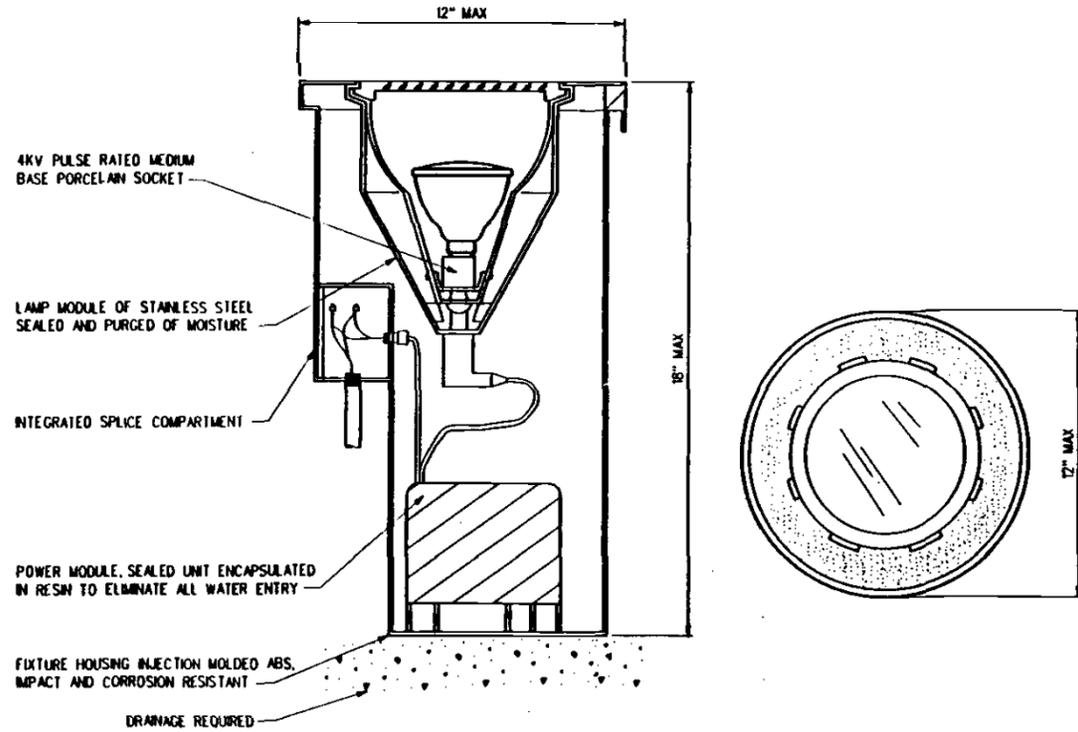
- WET

REMARKS

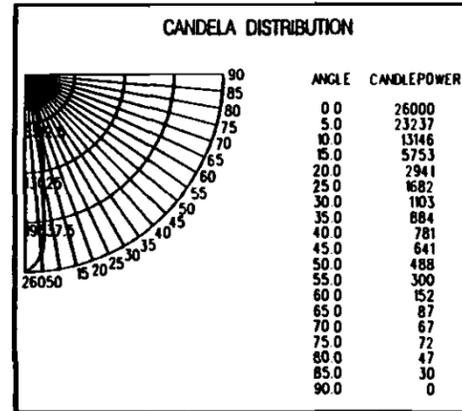
- PROVIDE DRAINAGE ACCORDING TO MANUFACTURERS RECOMMENDATION

MANUFACTURERS

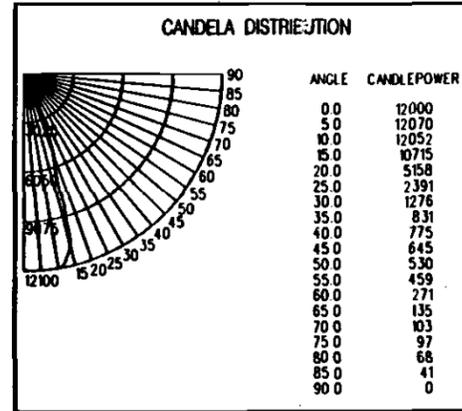
- HYDREL "9100" SERIES
- IMPERIAL BRONZELITE "GMA 6000" OR APPROVED EQUAL



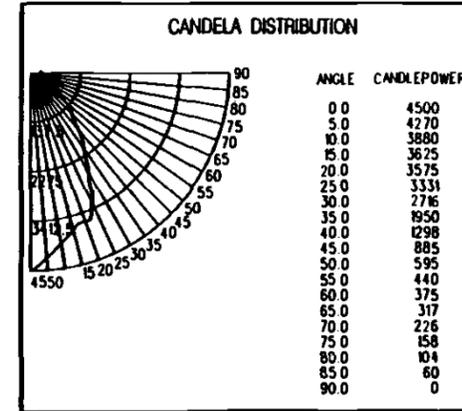
LAMP: 100 PAR38 M.H. SPOT (20°)



LAMP: 100 PAR38 M.H. FLOOD (35°)



LAMP: 100 PAR38 VERY WIDE FLOOD (65°)



REV	DATE	BY	SUB	APP	DESCRIPTION
0	7/25/95				BASELINE ISSUE PER SBCH DE 306-17 DC

DESIGNED BY
G. GONZALEZ

DRAWN BY
B.H. CHAMBERS

CHECKED BY
C. YU

IN CHARGE
E. DER-AVAKIAN

DATE
25 JULY 95



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

ENGINEERING MANAGEMENT CONSULTANT

SUBMITTED: *[Signature]*

APPROVED: *[Signature]*

ELECTRICAL STANDARD

TYPE FF METAL HALIDE UPLIGHT

CONTRACT NO	
DRAWING NO	ES-116
REV	0
SCALE	NO SCALE
SHEET NO	

GENERAL DESCRIPTION

METAL HALIDE DOWNLIGHT WITH REMOTE BALLAST FOR INTERIOR AND EXTERIOR USE.

FIXTURE OPTIONS

GG1

LAMP: 100W, M.H., PAR38, 3200°K
 INITIAL LUMENS: 5600
 BALLAST: HPF, -20 F STARTING
 INPUT WATTS: 135
 DIMENSIONS: 11 1/4" HEIGHT, 8 1/4" DIA
 EFFICIENCY: 80%

GG2

LAMP: 150W, M.H., PAR38, 3200°K
 INITIAL LUMENS: 9000
 BALLAST: HPF, -20 F STARTING
 INPUT WATTS: 185
 DIMENSIONS: 11" HEIGHT, 10" DIA
 EFFICIENCY: 80%

PHOTOMETRIC OPTIONS

- REFLECTOR ONLY
- GROOVED BAFFLE

MOUNTING OPTIONS

- RECESSED

ACCESSORIES OPTIONS

- REMOTE BALLAST
- INTEGRAL BALLAST

FINISH MATERIALS

SAFETY LISTING

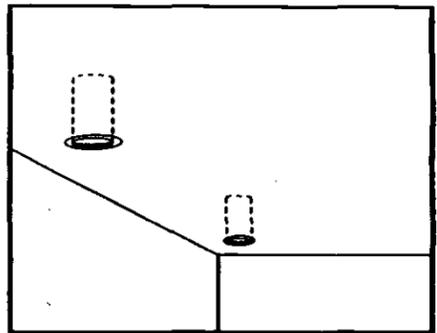
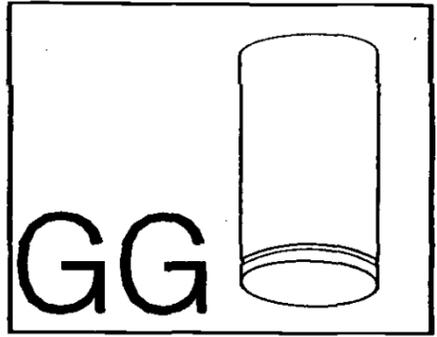
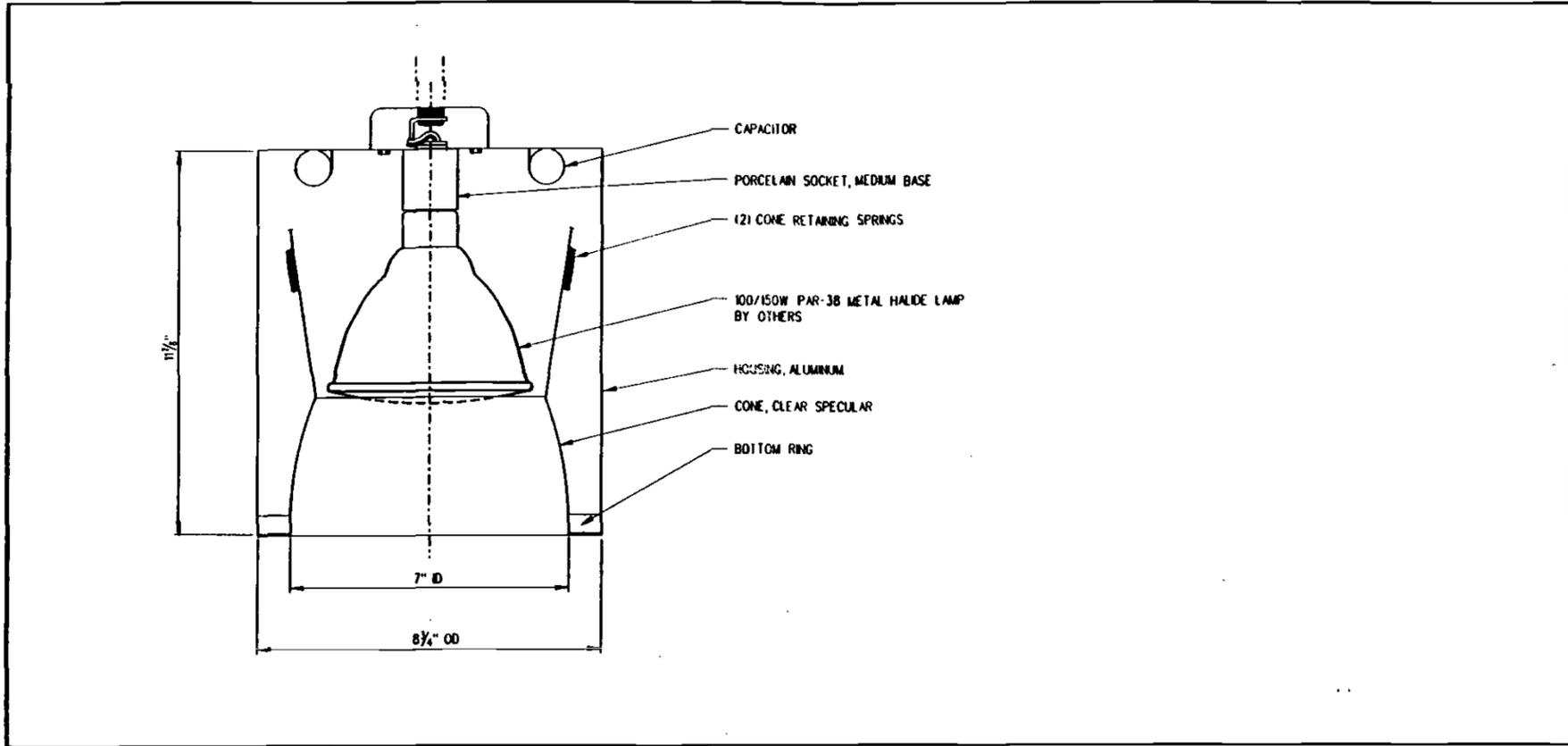
- DAMP/WEI

REMARKS

- MAXIMUM REMOTE BALLAST DISTANCE IS 5'
- BLACK BAFFLE DECREASES EFFICIENCY BY 30%

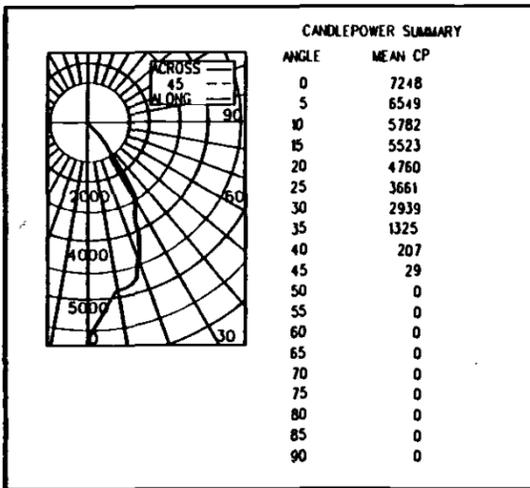
MANUFACTURERS

- STERNER
- KURT VERNON
- MCPHILBEN
- DEVINE E600



FIXTURE OPTION:

LAMP:



CANDLEPOWER NOTES:

- CANDLEPOWER VALUES BASED ON SPECULAR CONE.
- FOR TYPE GG2, MULTIPLY VALUES BY 1.6 TO ADJUST FOR 150W PAR38 LAMP.

COEFFICIENTS OF UTILIZATION

% EFFECTIVE CEILING CAVITY REFLECTANCE

ROOM CAVITY RATIO	% WALL REFLECTANCE																	
	80			70			50			30			10			0		
	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10
1	.98	.96	.94	.96	.94	.93	.92	.91	.90	.89	.88	.87	.86	.85	.85	.83	.82	.80
2	.93	.90	.88	.91	.89	.87	.89	.87	.85	.86	.85	.83	.84	.83	.82	.80	.78	.77
3	.88	.85	.83	.87	.85	.82	.85	.83	.81	.83	.81	.80	.82	.80	.78	.77	.74	.74
4	.85	.81	.78	.84	.81	.78	.82	.79	.77	.80	.78	.76	.79	.77	.75	.74	.72	.71
5	.81	.77	.74	.80	.76	.74	.79	.76	.73	.77	.75	.73	.76	.74	.72	.71	.69	.68
6	.78	.74	.71	.77	.73	.71	.76	.73	.70	.75	.72	.70	.74	.71	.69	.68	.65	.65
7	.74	.70	.67	.74	.70	.67	.73	.69	.67	.72	.69	.66	.71	.68	.66	.65	.62	.62
8	.71	.67	.64	.70	.67	.64	.70	.66	.64	.69	.66	.64	.68	.65	.63	.62	.60	.59
9	.68	.64	.61	.67	.64	.61	.67	.63	.61	.65	.63	.60	.65	.62	.60	.59	.57	.57
10	.65	.61	.58	.65	.61	.58	.64	.60	.58	.63	.60	.58	.63	.60	.58	.57	.55	.55

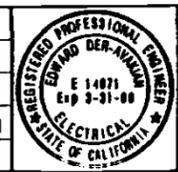
20% FLOOR CAVITY REFLECTANCE

C.U. TABLE NOTES:

- C.U. VALUES BASED ON SPECULAR CLEAR REFLECTOR CONE.
- MULTIPLY VALUES BY .85 TO ADJUST FOR BLACK GROOVED BAFFLE.

REV	DATE	BY	SUB	APP	DESCRIPTION
0	7-25-95	WEL	JBB		BASELINE ISSUE PER SBCN-DE 306-17.00

DESIGNED BY
G. GONZALEZ
 DRAWN BY
B.H. CHAMBERS
 CHECKED BY
C. YU
 IN CHARGE
E. DER-AVAKIAN
 DATE
25 JULY 95



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
 ENGINEERING MANAGEMENT CONSULTANT
 SUBMITTED: *Edward Der-Avakian*
 APPROVED: *[Signature]*

ELECTRICAL STANDARD
TYPE GG
METAL HALIDE DOWNLIGHT

CONTRACT NO	
DRAWING NO	ES-117
SCALE	NO SCALE
SHEET NO	

GENERAL DESCRIPTION

ASYMMETRIC INDIRECT FLUORESCENT COVE LIGHT FOR INTERIOR AND EXTERIOR USE

FIXTURE OPTIONS

HH1

LAMP: (2) 32W. T8, 3500°K
 INITIAL LUMENS: 2850 EACH LAMP
 BALLAST: HPF, ELEC., RAPID START
 INPUT WATTS: 70 PER 4 FOOT SECTION
 DIMENSIONS: APPROX. 9" W, 4" H
 EFFICIENCY: 55%
 REMARKS: FIXTURE IS REFLECTOR ASSEMBLY ONLY TO BE MOUNTED IN ARCHITECTURAL COVE

HH2

LAMP: (4) 32W. T8, IN TANDEM, 3500°K
 INITIAL LUMENS: 2850 EACH LAMP
 BALLAST: HPF, ELEC., INSTANT START
 INPUT WATTS: 140 PER 8 FOOT SECTION
 DIMENSIONS: APPROX. 9" W, 4" H
 EFFICIENCY: 80%
 REMARKS: FIXTURE IS FINISHED UNIT

PHOTOMETRIC OPTIONS

- 1. INDIRECT UPLIGHT

MOUNTING OPTIONS

- 1. WALL MOUNTED

ACCESSORIES OPTIONS

- 0. NO ACCESSORIES

FINISH MATERIALS

- * ANODIZED ALUMINUM WITH HIGH REFLECTANCE WHITE PAINT

SAFETY LISTING

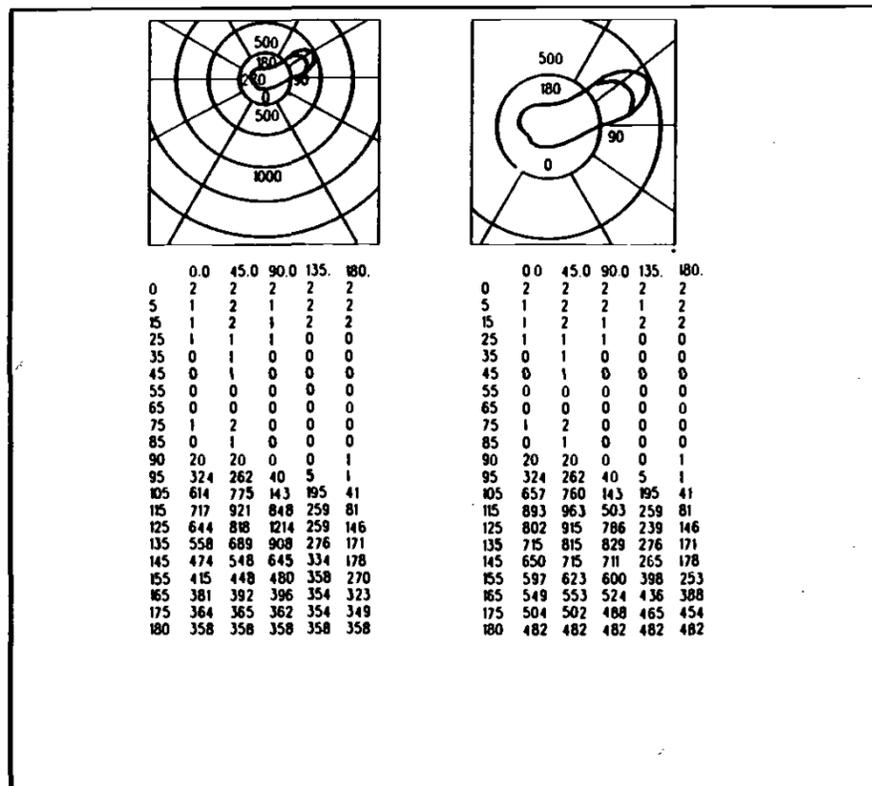
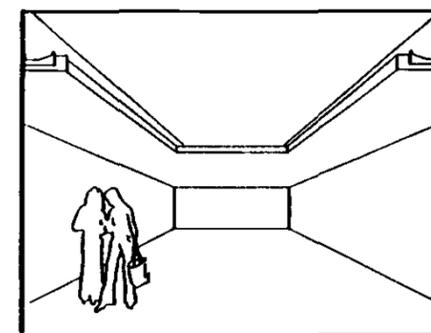
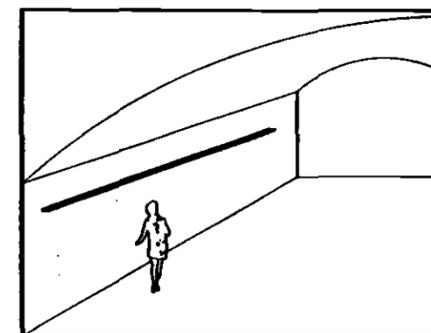
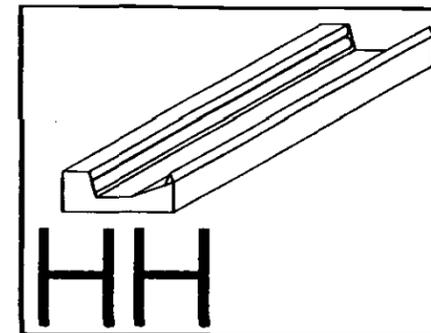
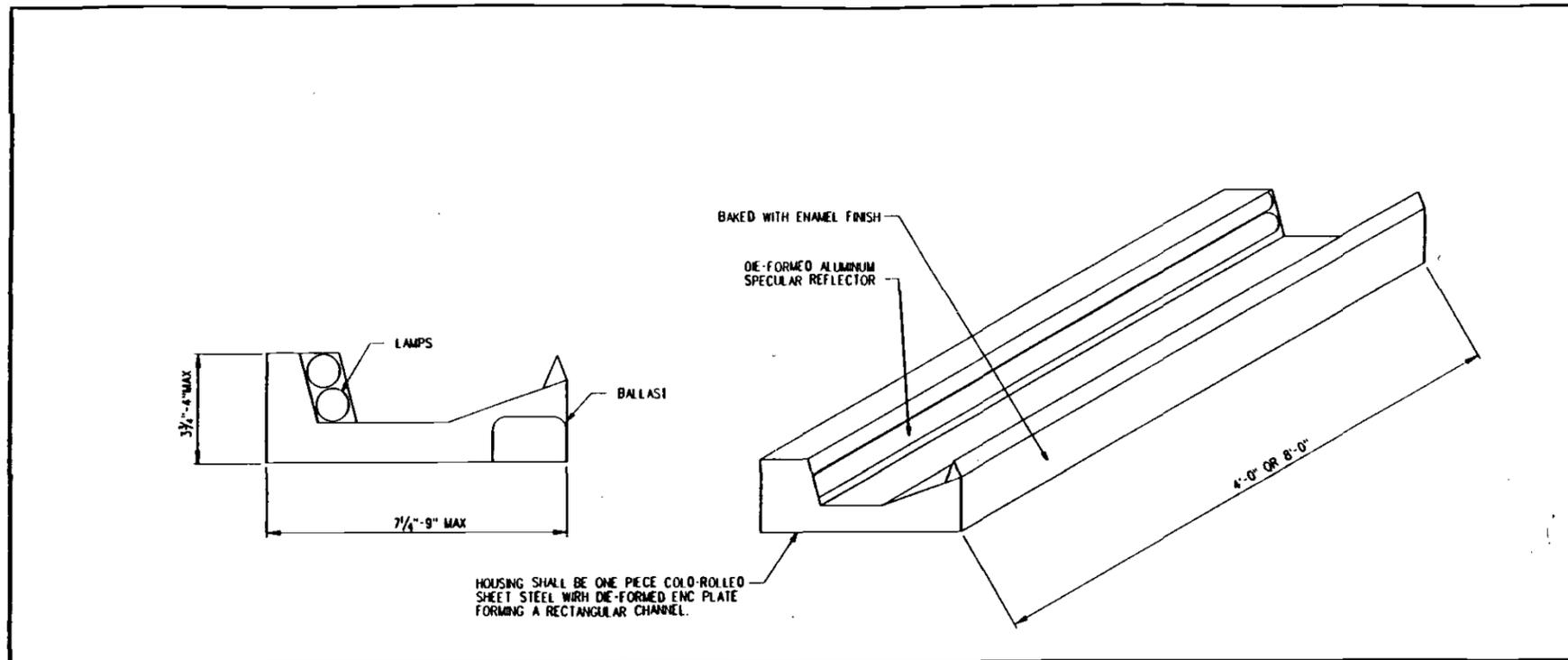
- * OAMP

REMARKS

- * FIXTURE TO BE MOUNTED NO CLOSER THAN 18" FROM SURFACE TO BE ILLUMINATED

MANUFACTURERS

- * LINEAR "TRILIGHT"
- * PEARLESS LIGHTING "ECK 0200 SERIES"
- * PRUDENTIAL "P45 SERIES"



COEFFICIENTS OF UTILIZATION
EFFECTIVE FLOOR CAVITY REFLECTANCE - 20

PCC	80				70				50				30				10			
	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	00		
RCR																				
0	.52	.52	.52	.52	.45	.45	.45	.45	.30	.30	.30	.17	.17	.17	.05	.05	.05	.00		
1	.47	.45	.43	.41	.40	.39	.37	.36	.26	.25	.24	.15	.14	.14	.04	.04	.04	.00		
2	.43	.39	.36	.34	.37	.34	.31	.29	.23	.21	.20	.13	.12	.12	.04	.04	.03	.00		
3	.39	.34	.31	.28	.33	.29	.27	.24	.20	.18	.17	.11	.10	.10	.03	.03	.03	.00		
4	.36	.30	.26	.23	.30	.26	.23	.20	.18	.16	.14	.10	.09	.08	.03	.03	.02	.00		
5	.32	.27	.23	.20	.28	.23	.20	.17	.16	.13	.12	.09	.08	.07	.03	.02	.02	.00		
6	.30	.24	.20	.17	.25	.20	.17	.14	.14	.12	.10	.08	.07	.06	.02	.02	.02	.00		
7	.27	.21	.17	.14	.23	.18	.15	.12	.12	.10	.09	.07	.06	.05	.02	.02	.01	.00		
8	.25	.19	.15	.12	.21	.16	.13	.11	.11	.09	.07	.06	.05	.04	.02	.01	.01	.00		
9	.23	.17	.13	.11	.20	.15	.11	.09	.10	.08	.06	.06	.04	.04	.01	.01	.01	.00		
10	.22	.16	.12	.09	.18	.13	.10	.08	.09	.07	.06	.05	.04	.03	.01	.01	.01	.00		

REV	DATE	BY	CHKD	APP	DESCRIPTION
0	7 25 95				BASELINE ISSUE PER SBCH-DE 306-17.00

DESIGNED BY
G. GONZALEZ

DRAWN BY
B. H. CHAMBERS

CHECKED BY
C. YU

IN CHARGE
E. DER-AVAKIAN

DATE
25 JULY 95



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

ENGINEERING MANAGEMENT CONSULTANT

SUBMITTED: *[Signature]*

APPROVED: *[Signature]*

ELECTRICAL STANDARD

TYPE HH

FLUORESCENT COVE LIGHT

CONTRACT NO.	
DRAWING NO.	ES-118
REV.	0
SCALE	NO SCALE
SHEET NO.	

GENERAL DESCRIPTION

CONTINUOUS LINEAR FLUORESCENT "SIGN LIGHT" FOR INTERIOR AND EXTERIOR USE.

FIXTURE OPTIONS

W:
LAMP: (1) 32W, T8 3500°K
INITIAL LUMENS: 2850
BALLAST: HPF, ELEC., RAPID START
INPUT WATTS: 38
DIMENSIONS: APPROX. 6"-8" W. 4"-6" D. 48" LENGTH
EFFICIENCY: 65%

PHOTOMETRIC OPTIONS

1. ASYMMETRIC

MOUNTING OPTIONS

1. WALL BRACKET MOUNTING HARDWARE
 2. CEILING PENDANT MOUNTING HARDWARE

ACCESSORIES OPTIONS

0 NO ACCESSORIES

FINISH MATERIALS

• ALUMINUM HOUSING, SEMISPECULAR ALUMINUM REFLECTOR

SAFETY LISTING

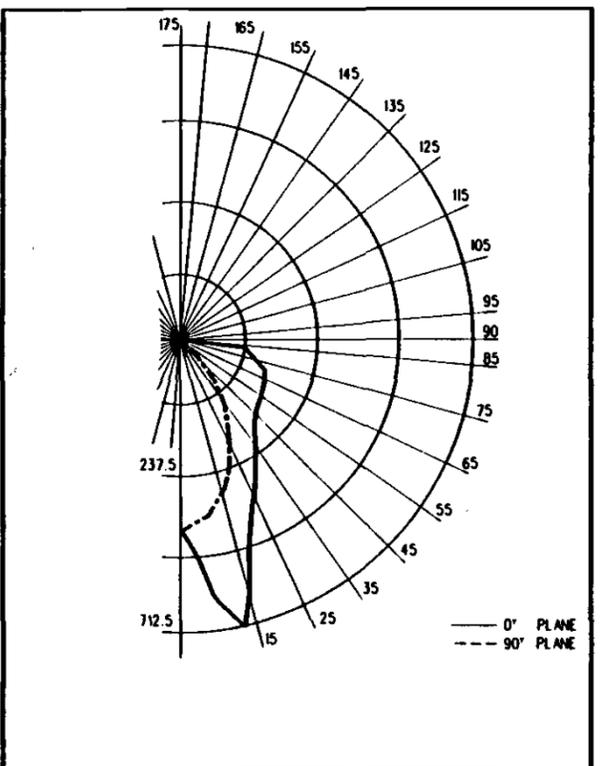
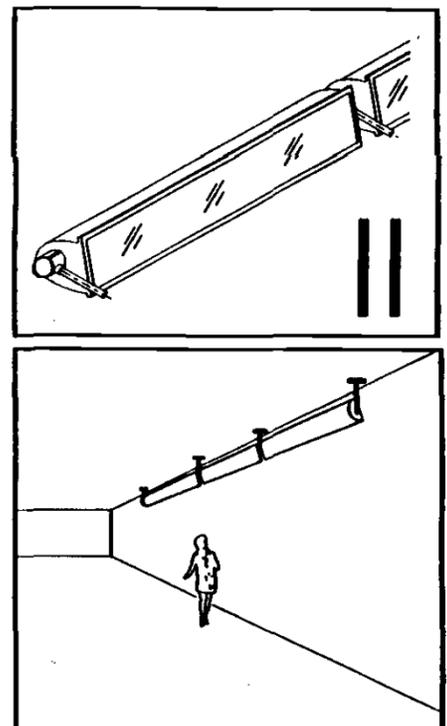
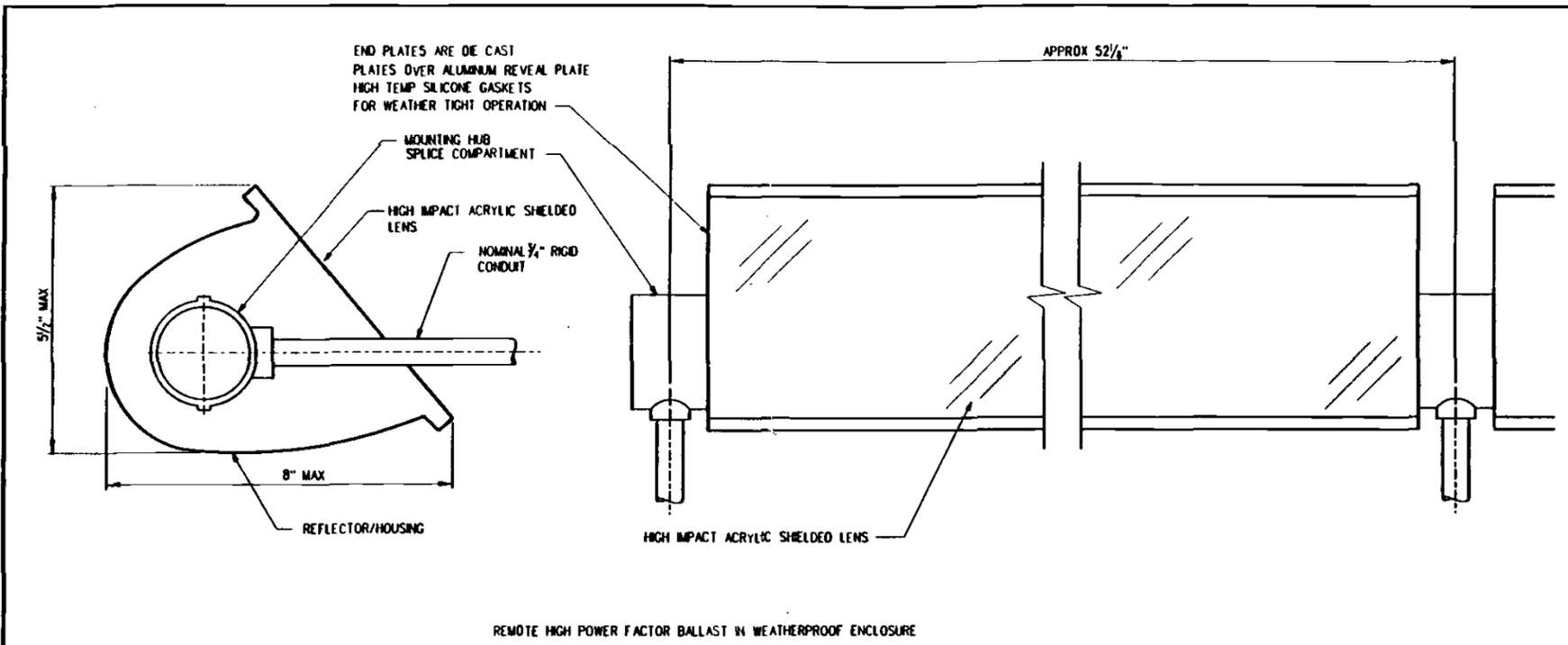
• WET OR DAMP

REMARKS

• MAXIMUM REMOTE BALLAST DISTANCE IS 15' FROM SOCKET

MANUFACTURERS

• COLUMBIA "SOD-M5"
 • ELLIPTIPAR "OUTDOOR LARGE FLUORESCENT" OR APPROVED EQUAL



FIXTURE HEAD SHOWN ORIENTED CORRESPONDING TO PHOTOMETRIC DISTRIBUTION

CANDELA DISTRIBUTION		
0.0	0.0	90.0
0.0	614.0	614.0
5.0	746.0	614.0
15.0	923.0	590.0
25.0	771.0	537.0
35.0	603.0	456.0
45.0	500.0	352.0
55.0	409.0	236.0
65.0	383.0	115.0
75.0	389.0	35.0
85.0	318.0	4.0
90.0	232.0	1.0
95.0	143.0	1.0
105.0	33.0	0.0
115.0	3.0	0.0
125.0	0.0	0.0
135.0	0.0	0.0
145.0	0.0	0.0
155.0	0.0	0.0
165.0	0.0	0.0
175.0	0.0	0.0
180.0	0.0	0.0

MOUNTING DISTANCE FROM SIGN SURFACE	A				B				C				D			
	A	B	C	D	E	F	G	H	I	J	K	L	M	N		
12"	28	25	28	47	100	125	100	47	12	23	26	23	12			
18"	14	16	14	44	98	110	98	44	18	33	38	33	18			
24"	25	30	25	46	95	110	95	46	24	43	43	43	24			
48"	10	11	10	18	30	33	30	18	10	29	33	29	10			
60"	13	16	13	17	26	30	26	17	17	26	30	26	17			

FOOTCANDLE VALUES ARE FOR HIGH OUTPUT LAMP MULTIPLY VALUES BY .70 TO ADJUST FOR T8 LAMP

REV	DATE	BY	CHK	APP	DESCRIPTION
0	7 25 95				BASELINE ISSUE PER SBON-DE 306-17-00

DESIGNED BY
G. GONZALEZ
 DRAWN BY
B.H. CHAMBERS
 CHECKED BY
C. YU
 IN CHARGE
E. DER-AVAKIAN
 DATE
25 JULY 95



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
 ENGINEERING MANAGEMENT CONSULTANT
 SUBMITTED: [Signature]
 APPROVED: [Signature]

ELECTRICAL STANDARD
 TYPE #
 FLUORESCENT SIGN LIGHT

CONTRACT NO.	
DRAWING NO.	ES-119
REV	0
SCALE	NO SCALE
SHEET NO.	

GENERAL DESCRIPTION

WALL BRACKET MOUNTED METAL HALIDE DOWNLIGHT FOR INTERIOR AND EXTERIOR USE

FIXTURE OPTIONS

JJ1

LAMP: 175W, MH, CLEAR, HORIZ, 4400*L
 INITIAL LUMENS: 15,000
 BALLAST: HPF, -20* F STARTING
 INPUT WATTS: 210
 DIMENSIONS: 8" DIA, 19" LONG
 EFFICIENCY: 70%

PHOTOMETRIC OPTIONS

1 DOWNLIGHT

MOUNTING OPTIONS

1 WALL MOUNTED

ACCESSORIES OPTIONS

0 NO ACCESSORIES

FINISH MATERIALS

* EXTRUDED ALUMINUM WITH THERMOSET POLYESTER POWDERCOAT

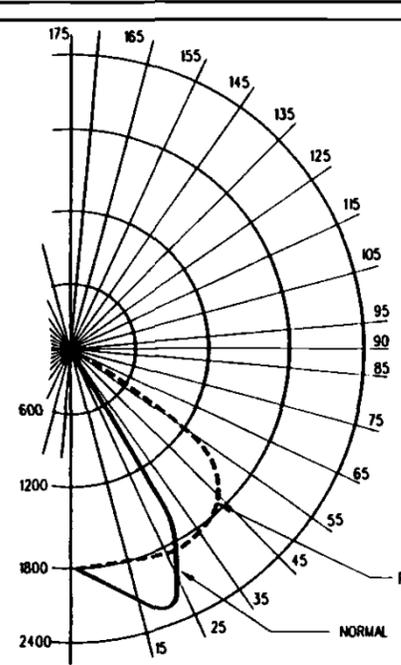
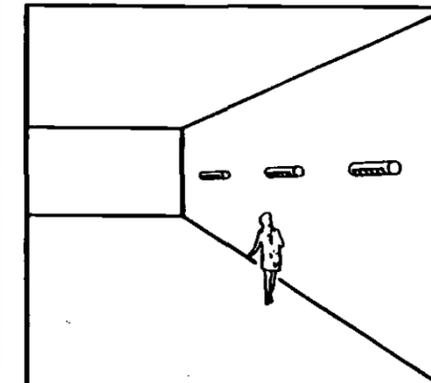
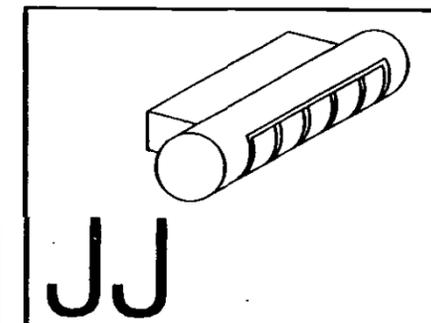
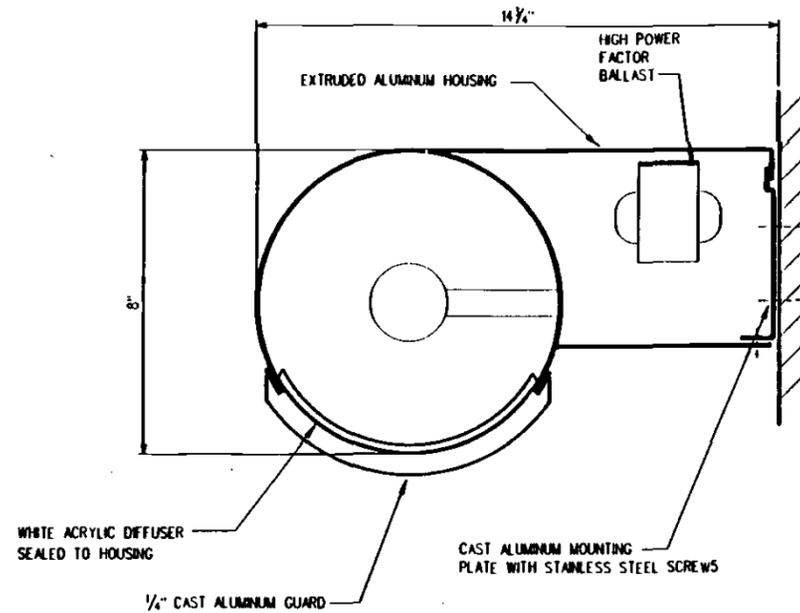
SAFETY LISTING

* WET

REMARKS

MANUFACTURERS

* ARCHITECTURAL AREA LIGHTING "ALR" SERIES
 * COLE EQUAL
 * OR APPROVED EQUAL



COEFFICIENTS OF UTILIZATION

CEILING REFLECTANCE	70				50				10				0																																																																			
WALL REFLECTANCE	50		30		50		30		50		30		50		30		0																																																															
ROOM CAVITY RATIO	1	36	34	34	33	31	31	29	2	31	29	30	28	28	27	25	3	28	25	27	25	25	23	21	4	25	22	24	21	22	20	18	5	22	19	21	19	20	18	16	6	20	17	19	17	18	16	14	7	18	15	17	15	16	14	12	8	16	14	16	13	15	13	11	9	15	12	15	12	14	12	10	10	14	11	13	11	13	11	9

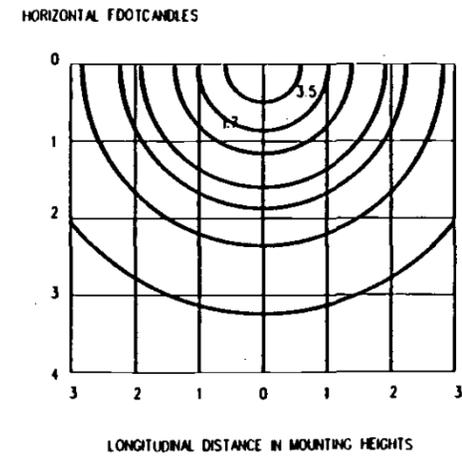
BASED ON A 20% FLOOR CAVITY REFLECTANCE

CANDLEPOWER DISTRIBUTION

ANGLE	CANDLEPOWER	
	NORMAL	PAR

CONVERSION FACTORS

LAMP TYPE	LUMENS	MOUNTING HEIGHT						
		8'	10'	12'	14'	16'	18'	
175 W MH, CLEAR	175 W MH, CLEAR	1400	197	1.26	.88	.64	.49	.39



REV	DATE	BY	APP	DESCRIPTION
0	7/25/95	[Signature]	[Signature]	BASELINE ISSUE PER SBCH-DE 306-17.00

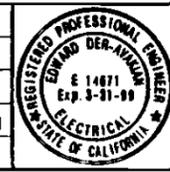
DESIGNED BY
G. GONZALEZ

DRAWN BY
B.H. CHAMBERS

CHECKED BY
C. YU

IN CHARGE
E. DER-ARAVAKIAN

DATE
25 JULY 95



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

ENGINEERING MANAGEMENT CONSULTANT

FORWARD: [Signature]

APPROVED: [Signature]

ELECTRICAL STANDARD

TYPE JJ

METAL HALIDE DOWNLIGHT

CONTRACT NO.	
DRAWING NO.	ES-120
SCALE	NO SCALE
SHEET NO.	0



BASELINE STATUS REPORT: DIRECTIVE/STANDARD DRAWINGS

DRAWING NO.	REV.	DATE MODIFIED	DRAWING TITLE / Change Title	REMARKS
<u>R92-DE306-07</u>			STANDARD DRAWINGS: CIVIL	
CS-000	0	03/03/94	CIVIL STANDARDS INDEX OF DRAWINGS Base line issue	
CS-001	0	03/03/94	CIVIL STANDARD ABBREVIATIONS & SYMBOLS SHEET 1 OF 4 Base line issue	
CS-002	0 1	03/03/94 12/22/95	CIVIL STANDARD ABBREVIATIONS & SYMBOLS SHEET 2 OF 4 Base line issue DE306-sbcn-2200	
CS-003	0	03/03/94	CIVIL STANDARD ABBREVIATIONS & SYMBOLS SHEET 3 OF 4 Base line issue	
CS-004	0	03/03/94	CIVIL STANDARD ABBREVIATIONS & SYMBOLS SHEET 4 OF 4 Base line issue	

VOLUME VI
STANDARD DRAWINGS
CIVIL

MTA BASELINE DOCUMENT
NO. R92-DE306.07

ABBREVIATIONS

REV NO	SHEET NO	DWG NO	DRAWING TITLE
0		CS001	ABBREVIATIONS & SYMBOLS - 1
0		CS002	ABBREVIATIONS & SYMBOLS - 2
0		CS003	ABBREVIATIONS & SYMBOLS - 3
0		CS004	ABBREVIATIONS & SYMBOLS - 4

DESIGNED BY P. CHIN			 LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY	CIVIL STANDARDS INDEX OF DRAWINGS	DRAWING NO CS000
DRAWN BY C. SHORE					REV 0
CHECKED BY N. PECKOVICH					SCALE NO SCALE
IN CHARGE D. L. WAHL					DATE 3 MAR 94
DATE 3 MAR 94		DESCRIPTION BASE LINE ISSUE	SUBMITTED <i>Dennis L. Wahl</i>	APPROVED <i>[Signature]</i>	SHEET NO 0

ABBREVIATIONS

DWG	DRAWING	GA	GAUGE (GAGE)	LT	LEFT	PF	POINT OF FROG
DWL	DOWEL	GALY	GALVANIZE OR GALVANIZED	LTG	LIGHTING	PGL	PROFILE GRADE LINE
DWLG	DOWELLING	GAL(S)	GALLON(S)			PITO	POINT OF INTERSECTION OF TURNOUT
DWY	DRIVEWAY	GASD	GASOLINE			PIV	POST INDICATOR VALVE
		GB	GRADE BREAK	M	MAIN	PL OR R	PLATE
E	EAST, ELECTRIC	GM	GAS METER	MACH	MACHINE OR MACHINERY	R	PROPERTY LINE
EA	EACH	GND	GROUND	MAG	MAGNESIUM OR MAGNETIC	PLD	PLASTIC DUCT
EB	EASTBOUND	GP	GENERAL PACKAGE, GAUGE PLATE OR GRADING PLAN	MAINT	MAINTENANCE	PLT	PLASTIC TILE
EC	END CURVE	GR	GRADE, GROUND OR GUARD RAIL PLATE	MAX	MAXIMUM	PM	PARKING METER
ECR	END CURB RETURN	GRS	GALVANIZED RIGID STEEL	MBL	METRO BLUE LINE	PO	PUSH-ON JOINT
E/E	EAST OF EAST RIGHT-OF-WAY LINE	GSC	GALVANIZED STEEL CONDUIT	MCD	MULTIPLE CONCRETE DUCT	POC	POINT OF CONNECTION
EF	EACH FACE	GV	GATE VALVE	MCWD	MULTIPLE CREOSOTED WOOD DUCTS	POL	POLICE
EH	ELECTRICAL HANDHOLE	GW	GUY WIRE	MECH	MECHANICAL	PP	POWER POLE OR PAPER PIPE
EL	ELEVATION			MGL	METRO GREEN LINE	PPD	PAPER PIPE DUCT
ELEC	ELECTRIC OR ELECTRICAL			MH	MANHOLE	PROD	PRODUCT
ELECT	ELECTRIC (REF)	H	HEIGHT	MIN	MINIMUM, MINUTES	PROP	PROPERTY OR PROPOSED
ELEV	ELEVATOR OR ELEVATION	HAP	HORIZONTAL ANGLE POINT	MISC	MISCELLANEOUS	PS	POINT OF SWITCH
EMB	EMBANKMENT	HB	HOSE BIB	MJ	MECHANICAL JOINT	PSF	POUNDS PER SQUARE FOOT
EMH	ELECTRICAL MANHOLE	HC	SANITARY SEWER HOUSE CONNECTION	ML	MORTAR LINED	PSI	POUNDS PER SQUARE INCH
E/O	EAST OF	HF	HEEL OF FROG	ML & C	MORTAR LINED & COATED	PSP	PAINT SHOP
EOR	END OF ROAD	HH	HANDHOLE	MON	MONUMENT	PT(S)	POINT(S)
EP	EDGE OF PAYEMENT OR END PLATFORM	HL	HEEL LENGTH	MP	MEDIUM PRESSURE	PUE	PUBLIC UTILITY EASEMENT
ED	EQUAL, EQUATION OR EQUALITY	HMPE	HIGH MOLECULAR WEIGHT POLYETHYLENE	MPH	MILES PER HOUR	PV	PLUG VALVE
ES	EXTRA STRENGTH	HORIZ	HORIZONTAL	MRL	METRO RED LINE	PVC	POLYVINYL CHLORIDE
ET	END TRACK	HOV	HIGH OCCUPANCY VEHICLE	MTC	MULTI-TILE CONDUIT	PVCC	POLYVINYL CHLORIDE CONDUIT
ETC	ET CETERA	HP	HIGH PRESSURE, HORSE POWER, HEEL PLATE OR HIGH POINT	MTD	MULTI-TILE DUCT	PVCP	POLYVINYL CHLORIDE PIPE
ETS	EMERGENCY TRIP STATION	Hd	HORSEPOWER			PVMT	PAVEMENT
EW	EACH WAY	HR	HEADROOM OR HOUR			PWR	POWER
E/W	EAST OF WEST RIGHT-OF-WAY LINE	HS	HIGH STRENGTH STEEL ASTM 432	N	NORTH		
EX OR EXIST	EXISTING	HWY	HIGHWAY	N/A	NOT APPLICABLE	QTY	QUANTITY
EXP	EXPANSION			NB	NORTHBOUND	QUAD	QUADRANT
EXT	EXTERIOR			NF	NEAR FACE		
		ID	INSIDE DIAMETER	NIC	NOT IN CONTRACT		
F	FIBER	IJ	INSULATED JOINT	N/N	NORTH OF NORTH RIGHT-OF-WAY LINE	R	RADIUS
FA	FIRE ALARM	IN	INCH OR INCHES	N/O	NORTH OF	RBM	RAILBOUND MANGANESE
FAC	FIRE ALARM CONDUIT	INV	INVERT	ND, OR #	NUMBER	RCB	REINFORCED CONCRETE BOX (CULVERT)
FAI	FRESH AIR INTAKE	IP	IRON PIPE	NRC	NON-REVENUE CONNECTOR	RCP	REINFORCED CONCRETE PIPE
FB	FIRE ALARM BOX			NRCP	NON-REINFORCED CONCRETE PIPE	RD	ROAD
FBM	FOOT BOARD MEASUREMENT			NS	NEAR SIDE	RECT	RECTANGLE OR RECTIFIER
FBP	FUTURE BEGIN PLATFORM	JS	JUNCTION STRUCTURE	N/S	NORTH OF SOUTH RIGHT-OF-WAY LINE	REF	REFERENCE
FC	FIBER CONDUIT OR FIRE CONNECTION	JT	JOINT	NTS	NOT TO SCALE	REINF	REINFORCE, REINFORCED, OR REINFORCEMENT
FD	FIBER DUCT, FLOOR DRAIN OR FIRE DEPARTMENT					REQD	REQUIRED OR REQUIRE
FDM	FOUNDATION	K	KIP OR KIPS	OC	ON CENTER(S) OR OVERCROSSING	RET	RETAINING
FE	FLANGED END	KF	KIP-FOOT	OCS	OVERHEAD CONTACT SYSTEM	RET W	RETAINING WALL
FEP	FUTURE END PLATFORM	KLF	KIPS PER LINEAR FOOT	OD	OUTSIDE DIAMETER	REV	REVISE, REVISED, OR REVISION
FF	FINISHED FLOOR OR FAR FACE	KSF	KIPS PER SQUARE FOOT	OFC	ORANGEBURG FIBER CONDUIT	RGS	RIGID GALVANIZED STEEL
FFE	FINISH FLOOR ELEVATION	KV	KILOVOLT	OG	ORIGINAL GROUND	RH	RIGHT HAND
FG	FROG GAUGE PLATE OR FINISH GRADE			OH	OVERHEAD	ROW	RIGHT OF WAY
FH	FIRE HYDRANT			OPP	OPPOSITE	RR	RAILROAD
FIN	FINISH	L	LINE, LINING, OR LENGTH	ORL	ORNAMENTAL LIGHTING	RT	RIGHT
FL	FLOW LINE, FUEL	LAT	LATERAL	OTM	OTHER TRACK MATERIAL	RTP	RAIL TRANSIT PROJECT
FLG	FLANGE	LBS OR #	POUND(S)			RY	RAILWAY
FLP	FLOW LINE PIPE	LB-LA RTP	LONG BEACH-LOS ANGELES RAPID TRANSIT PROJECT (METRO BLUE LINE)			R/W	RIGHT-OF-WAY
FLR	FLOOR			P	PIPE	S	SOUTH, SLOPE, OR SIGN
FP	FIRE PROTECTION	LD	LEAD	PA	POLICE ALARM OR PUBLIC ADDRESS	SA	SERVICE AISLE
FPS	FEET PER SECOND	LF	LINEAR FOOT (FEET)	PB	PULL BOX	SB	SOUTHBOUND OR SPLICE BOX
FR	FRAME	LG	LONG OR LENGTH	PCC	PORTLAND CEMENT CONCRETE OR POINT OF COMPOUND CURVATURE	SCC	STEEL CYLINDER CONCRETE (PIPE)
FS	FIRE SERVICE, FINISHED SURFACE, OR FAR SIDE	LGT	LIGHT (REF)			SCL	SECONDARY CONTROL LINE
FT	FOOT OR FEET	LH	LEFT HAND	PCCP	PRE-STRESSED CONCRETE CYLINDER PIPE	SCWD	SINGLE CREOSOTED WOOD DUCT
F TO F	FACE TO FACE	LIN FT	LINEAR FEET	PCL	PRIMARY CONTROL LINE	SD	STORM DRAIN
FWL	FIRE WATER LINE	LJ	LEADED JOINT	PCS	PIECES	SDMH	STORM DRAIN MANHOLE
FWY	FREEWAY	LOC	LOCATE, LOCATED, OR LOCATION	PD	PAPER DUCT	SEC	SECONDS
		LP	LOW PRESSURE OR LOW POINT	PE	POLYETHYLENE OR PLAIN END	SECT	SECTION
		LPT	LOW POINT	PEB	PEDESTRIAN	SFP	SITE FINISH PLAN
		LRT	LIGHT RAIL TRANSIT	PEM	POLYETHYLENE MAIN	SG	SUB GRADE
						SHT	SHEET

REV	DATE	BY	SUB	APP	DESCRIPTION
0	3/3/94				BASE LINE ISSUE

DESIGNED BY
N. PECKOVICH

DRAWN BY
C. SHORE

CHECKED BY
D. L. WAHL

IN CHARGE
D. L. WAHL

DATE
3 MAR 94

A SIGNED & SEALED ORIGINAL OF REV 0 OF THIS DRAWING IS MAINTAINED BY MTA

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY

ENGINEERING MANAGEMENT CONSULTANT

SUBMITTED **D. L. WAHL**

APPROVED **K.N. MURTHY**

CIVIL STANDARD

ABBREVIATIONS & SYMBOLS

SHEET 2 OF 4

CONTRACT NO.	
DRAWING NO.	CS002
SCALE	NO SCALE
SHEET NO.	

PLOTTED BY: approved

ABBREVIATIONS

SIG	SIGNAL	TSPB	TRAFFIC SIGNAL PULLBOX
SIM	SIMILAR	TV	TELEVISION
SIP	SUPPORT IN PLACE	TVCC	TRANSPORTED VITRIFIED CLAY CONDUIT
SL	STREET LIGHT	TVM	TICKET VENDING MACHINE
SLC	STREET LIGHT CONDUIT	T/W	TOP OF WALL
SLPB	STREET LIGHT PULL BOX	TYP	TYPICAL
SMH	SEWER MANHOLE		
S/N	SOUTH OF NORTH RIGHT-OF-WAY LINE	UC	UNDERCROSSING OR UNDER CONSTRUCTION
SP	SPACE, SPACING, OR SITE PLAN	UD	UNDERDRAIN
SPEC	SPECIFICATION(S) (REF)	UG	UNDERGROUND
SPR	SPRINKLER	UNK	UNKNOWN
SO	SQUARE	UP	UNDERPASS OR COMBINATION POWER/TELEPHONE POLE
S/S	SOUTH OF SOUTH RIGHT-OF-WAY LINE	UPE	UNDER PLATFORM EXHAUST
SS	SANITARY SEWER OR STOP SIGN	UNO	UNLESS NOTED OTHERWISE
SSD	SANDSTONE CEMENT DUCT		
SSMH	SANITARY SEWER MANHOLE		
ST	STREET		
STA	STATION	V	VALVE, RATE OF SPEED, OR DESIGN SPEED
STD	STANDARD OR SEWER TILED DUCT	VAC	VACUUM
STL	STEEL	VAP	VERTICAL ANGLE POINT
STM	STEAM	VAR	VARIES OR VARIABLE
STOR	STORAGE	VCC	VITRIFIED CLAY CONDUIT
STP	STEEL PIPE	VCD	VITRIFIED CLAY DUCT
STR	STRAIGHT	VCP	VITRIFIED CLAY PIPE
STRUCT	STRUCTURE	VCP(ES)	VITRIFIED CLAY PIPE (EXTRA STRENGTH)
STY	STYRENE	VCT	VITRIFIED CLAY TILE
SUB	SUBMITTED	VERT	VERTICAL
SUPV	SUPERVISE OR SUPERVISOR	VLT	VAULT
SURF	SURFACE		
SW	SWITCH	W	WEST OR WATER
SWK	SIDEWALK	W/	WITH
SYM	SYMMETRICAL	WB	WESTBOUND
		WD	WATER DETECTOR
		W/E	WEST OF EAST RIGHT-OF-WAY LINE
		WG	WHITE GAS
		WHH	WATER HANDHOLE
		WHSE	WAREHOUSE
		WI	WROUGHT IRON
		WD	WIDTH
		WIP	WROUGHT IRON PIPE
		WL	WATER LEVEL
		WLN	WATER LINE
		WM	WATER METER
		WMH	WATER MANHOLE
		W/O	WITHOUT
		WP	WORKING POINT OR WORK POINT
		WSP	WELDED STEEL PIPE
		WSP(L)	WELDED STEEL PIPE (CEMENT LINED)
		WTR	WATER
		WTW	WALL TO WALL
		WV	WATER VALVE
		WW	WASTEWATER
		W/W	WEST TO WEST RIGHT-OF-WAY LINE
		X-DRAIN	CROSS DRAIN
		X-ING	CROSSING
		X-MITER	TRANSMITTER
		X-OVER	CROSS OVER
		X-SECT	CROSS SECTION
TAN	TANGENT		
T & B	TOP AND BOTTOM		
TC	TILE CONDUIT, TOP OF CURB, TRACK CENTER, OR TRAIN CONTROL		
TCC	TRAIN CONTROL/COMMUNICATIONS		
TCCB	TRAIN CONTROL/COMMUNICATIONS BUILDING		
TCCR	TRAIN CONTROL/COMMUNICATIONS ROOM		
TD	TILE DUCT OR TILE DRAIN		
TEL, T	TELEPHONE		
TELE	TELESCOPING		
TEMP	TEMPERATURE OR TEMPORARY		
TERM	TERMINAL		
TF	TOP OF FACE		
TG	TOP OF GRADE, TOP OF GRATE, OR TELEGRAPH		
THEO	THEORETICAL		
THK	THICK OR THICKNESS		
TL	TRAFFIC LIGHT OR TOE LENGTH		
TMH	TELEPHONE MANHOLE		
TO	TURNOUT		
TOC	TOP OF CURB		
TOP	TOP OF PIPE		
TOS	TOP OF SLOPE		
TP	POLICE TELEPHONE OR TRACTION POWER		
TPS	TRACTION POWER SUBSTATION		
TPSS	TRACTION POWER SUPPLY SYSTEM		
T/LR	TOP OF LOW RAIL		
T/R	TOP OF RAIL		
TRD	TRANSIT DUCT		
TRK	TRACK		
TRPB	TRANSIT SHELTER PULLBOX		
TS	TRAFFIC SIGNAL		
TSC	TRAFFIC SIGNAL CONDUIT		
TSCB	TRAFFIC SIGNAL CONTROL BOX		

SYMBOLS

AERIAL EASEMENT		CONCRETE CHANNEL	
ASPHALT CONCRETE PAVEMENT		CONSTRUCTION EASEMENT (TEMPORARY)	
AUTOMATIC GATE INTO PARKING AREA		CONTINUOUS WELDED RAIL	
BALLAST		CONTOUR LINES	
BARRICADE POSTS, BOLLARDS		CONTROL POINT OR STREET INTERSECTION POINT	
BASE COURSE		COORDINATE GRID CROSSHAIR	
BEGIN OR END PLATFORM		CURB	
BENCH MARK		CURB AND GUTTER	
BILLBOARD		CURVE NUMBER	
BLOCK WALL		CURVE POINT	
BORING & NUMBER		DEPRESSION	
BOX		DOUBLE CROSSOVER	
BREAK LINE		DRAINAGE DITCH OR SWALE	
BRIDGE		DRAINAGE INLET	
BUILDING		DRIVEWAY	
BUMPING POST		EDGE OF PAVEMENT	
BUMPING POST NUMBER		EARTH	
CANOPY		ELASTOMER	
CATCH BASIN		ELEVATION (EXISTING)	
CENTERLINE		EMBANKMENT OR SLOPE	
CLEANOUT		EXISTING GROUND LINE	
COLUMN, BENT		FENCE-CHAIN LINK OR OTHER	
CONCRETE		FIRE HYDRANT	
CONCRETE BARRIER		FLAGPOLE	

DESIGNED BY N. PECKOVIC			LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY		CIVIL STANDARD ABBREVIATIONS & SYMBOLS SHEET 3 OF 4	DRAWING NO. CS003	SCALE NO SCALE
DRAWN BY C. SHORE			ENGINEERING MANAGEMENT CONSULTANT an affiliate of Parsons Brinckerhoff Quade & Douglas, Inc. Daniel Mann Johnson & Mendenhall CP Kaiser Engineers - Civil Corps Excelsior-Fishery Associates Jackson Gable McLean, Inc. The National Group, Inc.				
CHECKED BY D. L. WAHL			SUBMITTED <i>Dennis F. Wahl</i>				
DATE 3 MAR 94			APPROVED 				

SYMBOLS

FOUNDATION OR RUIN		PERFORATED SUBDRAIN		STEEL	
GATE		PICTURE CENTER		SUBBALLAST	
GUARD RAIL		PI		SUBGRADE EARTH	
GRAVEL		PVI		TANK	
GRAVEL OR DIRT ROAD		PITO OR PI NUMBER		TIMBER	
GROUND ROD		PLANTER		TRACK CENTER LINE	
GROUND ROD IN WELL		POINT OF INTERSECTION OF TURNOUT (PITO)		TRACTION POWER MANHOLE	
GUY WIRE		POINT OF SWITCH (OR SWITCH MACHINE)		TRACTION POWER SUBSTATION	
HANDICAPPED PARKING		POINT OF SWITCH NUMBER		TRAFFIC LIGHT, TRAFFIC SIGNAL	
HEADSPAN		POOL		TRANSIT SIGNAL	
HIGH VOLTAGE VAULT		POST WITH LIGHT & TRAFFIC LIGHT		TREE	
HOSE BIB		RAILROAD SWITCH		TURNOUT WITH NUMBER INDICATED	
LANE LINES		RAILROAD TRACK		UNDERDRAIN	
LRT TCC SYSTEM HANDHOLE		RIDGE		UTILITY BOX	
LRT TCC SYSTEM MANHOLE		RIGHT-OF-WAY		UTILITY POLE	
MANHOLE		SAND/CONC SURFACE		VALVE, VENT	
MATCH LINE		SEWER, WATER OR GAS ENCASEMENT		VALVE COVER	
METER BOX		SIDEWALK, CONCRETE		VINEYARD	
DIL WELL		SINGLE CROSSOVER		WALL OR RETAINING WALL	
ORCHARD		SHRUBBERY		WELL	
OVERHEAD SIGN		SPA		WOOD	
OVERHEAD WIRES AND CABLES		SPOT ELEVATION		WORK POINT	
PALM TREE		STANDPIPE			
PARKING SPACES		STATION EQUATION			

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY
N. PECKOVIC
DRAWN BY
C. SHORE
CHECKED BY
D. L. WAHL
IN CHARGE
D. L. WAHL
DATE
3 MAR 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
ENGINEERING MANAGEMENT CONSULTANT
SUBMITTED *Dennis F. Wahl*
APPROVED *[Signature]*

CIVIL STANDARD
ABBREVIATIONS & SYMBOLS
SHEET 4 OF 4

PROJECT NO.	CS004	SHEET NO.	0
SCALE	NO SCALE		

BASELINE STATUS REPORT: DIRECTIVE/STANDARD DRAWINGS

DRAWING NO.	REV.	DATE MODIFIED	DRAWING TITLE / Change Title	REMARKS
<u>R92-DE306-07</u> STANDARD DRAWINGS: CIVIL				
CS-000	0	03/03/94	CIVIL STANDARDS INDEX OF DRAWINGS Base line issue	
CS-001	0	03/03/94	CIVIL STANDARD ABBREVIATIONS & SYMBOLS SHEET 1 OF 4 Base line issue	
CS-002	0	03/03/94	CIVIL STANDARD ABBREVIATIONS & SYMBOLS SHEET 2 OF 4 Base line issue	
CS-003	0	03/03/94	CIVIL STANDARD ABBREVIATIONS & SYMBOLS SHEET 3 OF 4 Base line issue	
CS-004	0	03/03/94	CIVIL STANDARD ABBREVIATIONS & SYMBOLS SHEET 4 OF 4 Base line issue	



VOLUME VI

STANDARD DRAWINGS

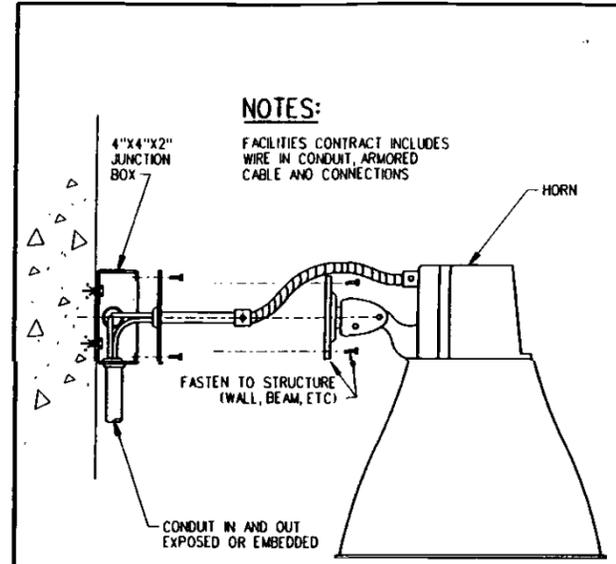
COMMUNICATIONS

**MTA BASELINE DOCUMENT
NO. R92-DE306.09**

JOAN VERTREES/RMC REFERENCE
MTA Construction
NO. 2310

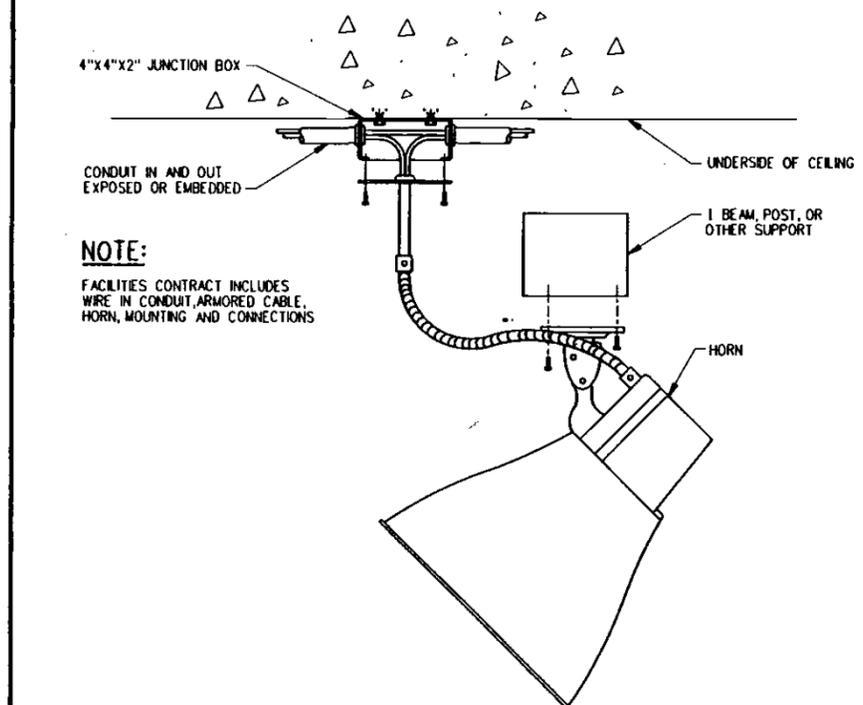
BASELINE STATUS REPORT: DIRECTIVE/STANDARD DRAWINGS

DRAWING NO.	REV.	DATE MODIFIED	DRAWING TITLE / Change Title	REMARKS
R92-DE306-09			STANDARD DRAWINGS: COMMUNICATIONS	
NS-000	0	11/07/94	COMMUNICATIONS STANDARD INDEX OF DRAWINGS Baseline issue	
NS-106	0	11/07/94	COMMUNICATIONS STANDARD CLOSED CIRCUIT TELEVISION MOUNTING DETAIL Baseline issue	
NS-108	0	11/07/94	COMMUNICATIONS STANDARD PUBLIC ADDRESS SPEAKER MOUNTING DETAIL Baseline issue	
NS-109	0	11/07/94	COMMUNICATIONS STANDARD PUBLIC ADDRESS SPEAKER BACK BOX AND BAFFLE Baseline issue	
NS-110	0	11/07/94	COMMUNICATIONS STANDARD PUBLIC ADDRESS SPEAKER CONNECTIONS Baseline issue	



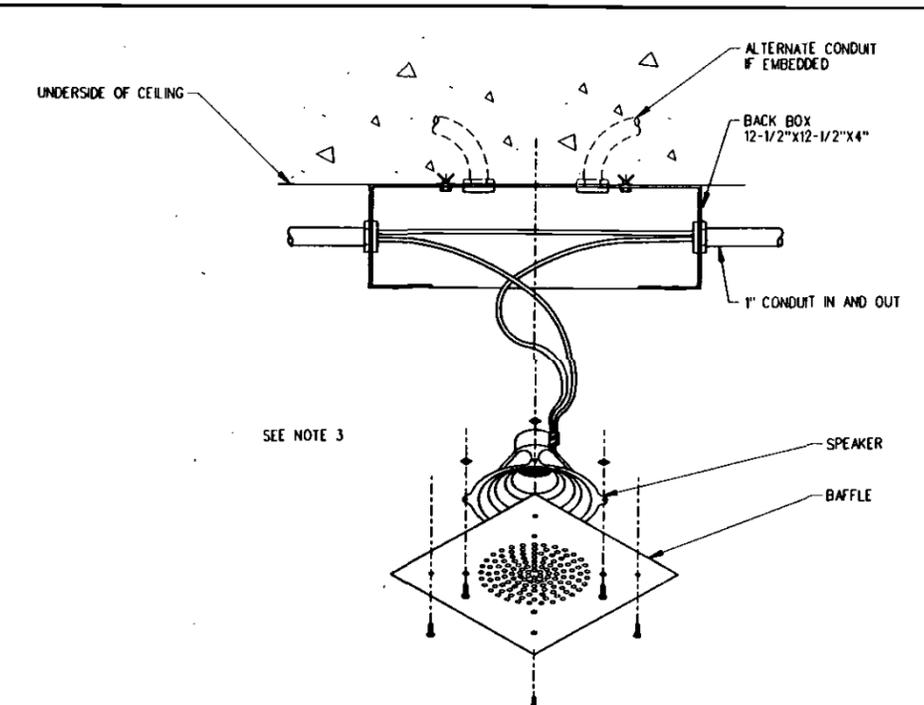
NOTES:
 FACILITIES CONTRACT INCLUDES WIRE IN CONDUIT, ARMORED CABLE AND CONNECTIONS

**FIGURE 1
 HORN MOUNT**



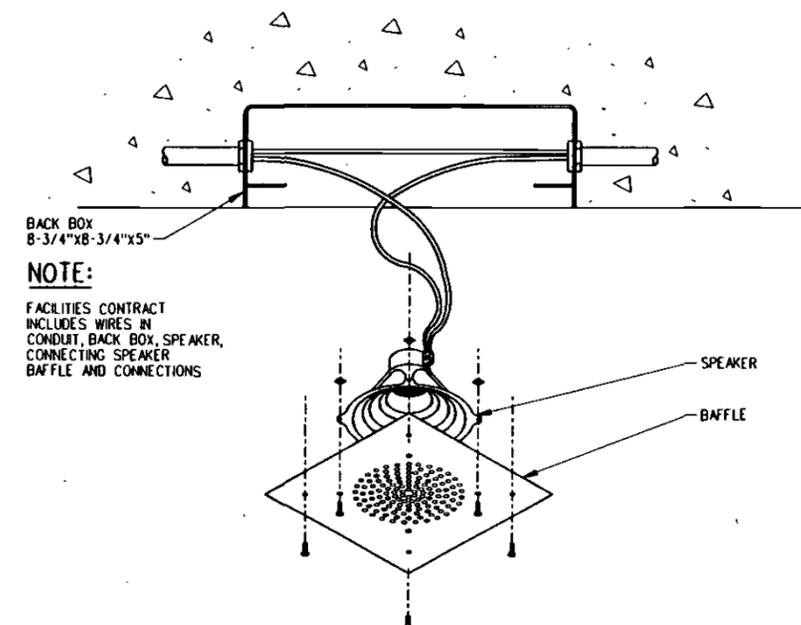
NOTE:
 FACILITIES CONTRACT INCLUDES WIRE IN CONDUIT, ARMORED CABLE, HORN, MOUNTING AND CONNECTIONS

**FIGURE 2
 ALTERNATE HORN MOUNT**



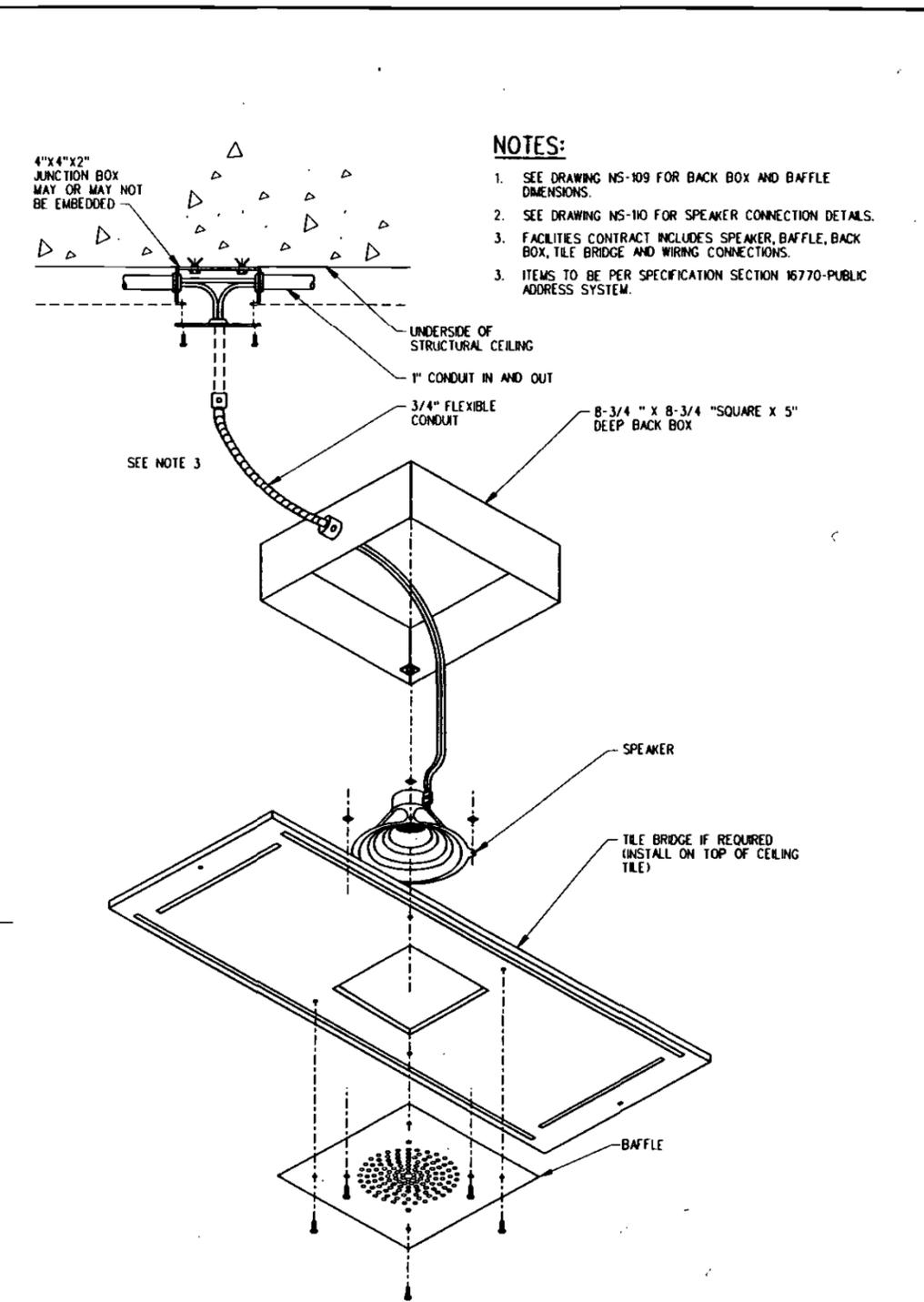
SEE NOTE 3

**FIGURE 3
 SURFACE MOUNT**



NOTE:
 FACILITIES CONTRACT INCLUDES WIRES IN CONDUIT, BACK BOX, SPEAKER, CONNECTING SPEAKER BAFFLE AND CONNECTIONS

**FIGURE 4
 RECESSED MOUNT**



NOTES:
 1. SEE DRAWING NS-109 FOR BACK BOX AND BAFFLE DIMENSIONS.
 2. SEE DRAWING NS-110 FOR SPEAKER CONNECTION DETAILS.
 3. FACILITIES CONTRACT INCLUDES SPEAKER, BAFFLE, BACK BOX, TILE BRIDGE AND WIRING CONNECTIONS.
 3. ITEMS TO BE PER SPECIFICATION SECTION 16770-PUBLIC ADDRESS SYSTEM.

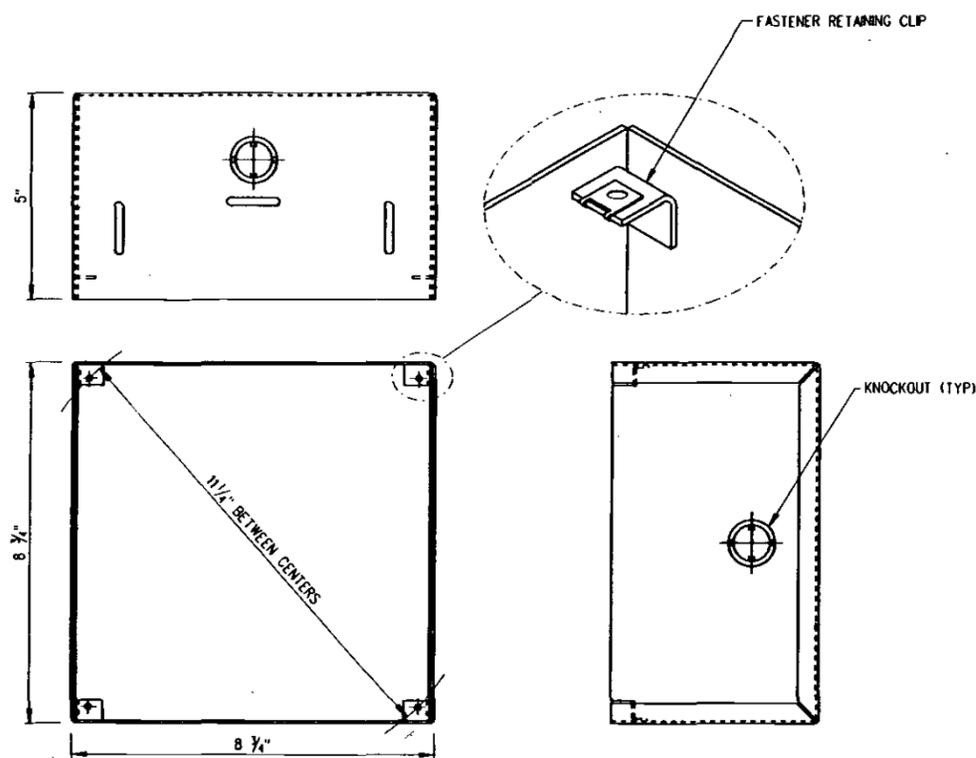
**FIGURE 5
 SUSPENDED CEILING MOUNT**

										DESIGNED BY P KARLEN					LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY COMMUNICATIONS STANDARD PUBLIC ADDRESS SPEAKER MOUNTING DETAIL		CONTRACT NO.
										DRAWN BY J E HARRIS							DRAWING NO NS-108
										CHECKED BY J BERUKOFF							SHEET NO
										IN CHARGE A EDELSON							
										DATE 07 Nov 94							
REV	DATE	BY	SUB	APP	DESCRIPTION	REV	DATE	BY	SUB	APP	DESCRIPTION						
						0	11-7-94				BASELINE ISSUE						

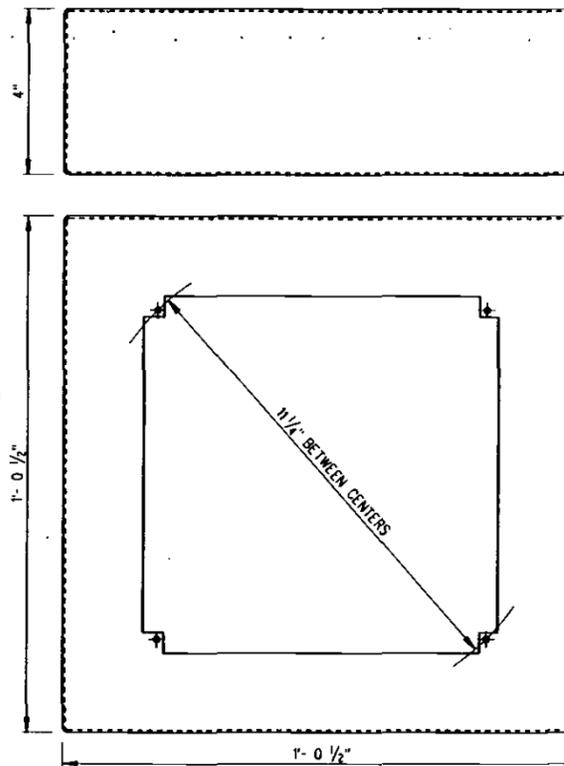
U.C.C.C. 7894 10 24 / 11/10/11/12/13/14/15/16/17/18/19/20/21/22/23/24

NOTES:

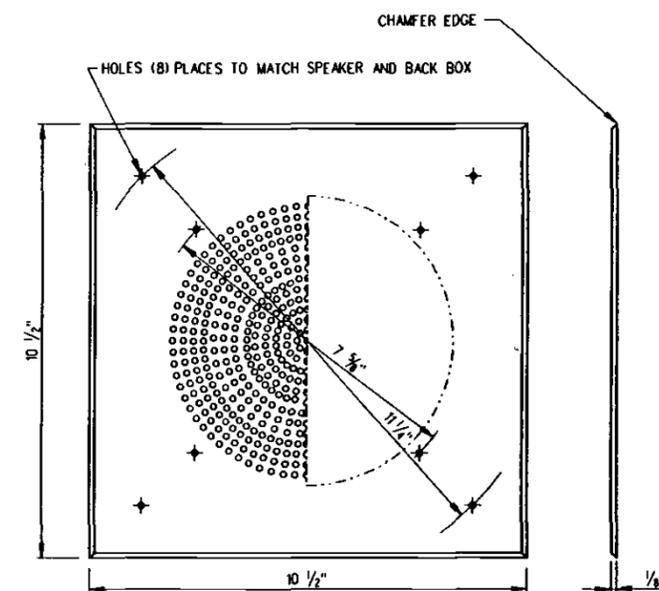
- 1. SEE DRAWING NS-108 FOR SPEAKER MOUNTING.
- a. SEE FIGURES 4 AND 5
- b. SEE FIGURE 3
- c. SEE FIGURES 3, 4, AND 5



BACK BOX - SUSPENDED CEILING OR RECESSED MOUNT
SEE NOTE 1a



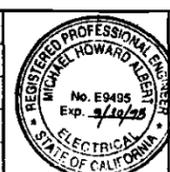
BACK BOX - SURFACE MOUNT
SEE NOTE 1b



BAFFLE
SEE NOTE 1c

REV	DATE	BY	SUB	APP	DESCRIPTION
0	11-7-94				BASLINE ISSUE

DESIGNED BY
P KARLEN
DRAWN BY
J E HARRIS
CHECKED BY
J BERUKOFF
IN CHARGE
A EDELSON
DATE
07 Nov 94



LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
ENGINEERING MANAGEMENT CONSULTANT
Submitted by: *Michael H. Albert*
Approved by: *[Signature]*

COMMUNICATIONS STANDARD
PUBLIC ADDRESS
SPEAKER BACK BOX AND BAFFLE

CONTRACT NO	
DRAWING NO	NS-109
REV	0
SCALE	1/2" = 1"
SHEET NO	

11/10/94 10:25 / 11/10/94 10:25 / 11/10/94 10:25 / 11/10/94 10:25



TRANSMITTAL

Vol VI - Standard Drawings - Mechanical (MS-010 Symbols & Abbreviations)
R92-DE306.04 - Approved as of 07/16/97
SECN NO. 29.00

DATE: 07/29/97

TO: JUDITH BUTLER/RMC REFERENCE ASSIGNED NO.: 2310
METRO Construction
MAIL STOP: 99-P5-20L

FROM: CLAUDIA ELLIOTT
DEPUTY PROEJCT MANAGER

SUBJECT: DISTRIBUTION OF CONTROLLED COPY DOCUMENT
Vol VI - Standard Drawings - Mechanical (MS-010 Symbols & Abbreviations)

The above controlled baseline document No. 2310 has been assigned to you. This transmittal consists of revised OR new baseline drawings to the Rail Transit Design Criteria & Standards, Vol VI - Standard Drawings - Mechanical (MS-010 Symbols & Abbreviations). The changes to this document shall be made by replacing existing pages with the attached drawings, or inserting new pages. Any subsequent revisions which have been approved by the Metro Programwide Change Control Board will be transmitted to you.

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Section Designers should contact the Engineering Management Consultant (EMC) Project Unit Manager prior to proceeding with any change that may affect their contract scope of work.

If you have any questions please contact Claudia Elliott at (213) 892-0124 x 10 or Mary Heitmeyer of MTA Configuration Management at (213) 922-7350.

CE/re

Attachment:
R92DE30604 Vol VI - Standard Drawings - Mechanical (MS-010 Symbols & Abbreviations) Approved as of 07/16/97
cc: RMC\R92DE30604

