

ABBREVIATIONS

AB	ANCHOR BOLT	MAX	MAXIMUM
ACI	AMERICAN CONCRETE INSTITUTE	MB	MACHINE BOLT
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION	MECH	MECHANICAL
APPROX	APPROXIMATE	MEZZ	MEZZANINE
ARCH	ARCHITECTURAL	MFR	MANUFACTURER
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS	MIN	MINIMUM
AWS	AMERICAN WELDING SOCIETY	MISC	MISCELLANEOUS
		MPH	MILES PER HOUR
B/B	BACK TO BACK	NIC	NOT IN CONTRACT
B/P	BASE PLATE	NS	NEAR SIDE
BM	BEAM	NTS	NOT TO SCALE
BOF	BOTTOM OF FOOTING		
BOS	BOTTOM OF STEEL		
BRCCG	BRACING	OC	ON CENTER
BTE	BEAM TUBE ENCLOSURE	OD	OUTSIDE DIAMETER
		OH	OPPOSITE HAND
C	CAMBER	OPNG	OPENING
CC OR C/C	CENTER TO CENTER	OPP	OPPOSITE
CJ	CENTER OF GRAVITY	OTO	OUT TO OUT
CL	CEILING		
CLG	CLEAR	PCF	POUNDS PER CUBIC FOOT
CLR	CLEAR	PL	PLATE
CMU	CONCRETE MASONRY UNIT	PL	POUNDS PER SQUARE FOOT
COL	COLUMN	PSF	POUNDS PER SQUARE INCH
CONC	CONCRETE	PSI	POUNDS PER SQUARE INCH
CONT	CONTINUOUS	PT	POINT
CU	CUBIC		
		R	RADIUS
DET	DETAIL	RD	ROOF DRAIN
DIAG	DIAGONAL	REF	REFERENCE
DIM	DIMENSION	REF	REINFORCING STEEL
DL	DEAD LOAD	REIN	REINFORCING STEEL
DO	DITTO	REQD.	REQUIRED
DWG	DRAWING	REV	REVISE OR REVISION
DWL	DOWEL		
		SCHED	SCHEDULE
EA	EACH	SECT	SECTION
EF	EACH FACE	SHT	SHEET
EL	ELEVATION	SIM	SIMILAR
ENCL	ENCLOSURE	SLV	SHORT LEG VERTICAL
ENGR	ENGINEER	SPA	SPACED
EQ	EQUAL	ST STL	STAINLESS STEEL
EQUIP	EQUIPMENT	STD	STANDARD
ETC	ETCETERA	STIF	STIFFENER
EW	EACH WAY	SYM	SYMMETRICAL
EXIST	EXISTING		
		TBB	TOP AND BOTTOM
FD	FLOOR DRAIN	THK	THICKNESS
FDN	FOUNDATION	TOC	TOP OF CONCRETE
FIN	FINISH	TOF	TOP OF FOOTING
FLR	FLOOR	TOS	TOP OF STEEL
FLSHG	FLASHING	TOW	TOP OF WALL
FGC	FACE OF CONCRETE	TYP	TYPICAL
FRMG	FRAMING		
FS	FAR SIDE	UN	UNLESS OTHERWISE NOTED
FT	FOOT FEET		
FTG	FOOTING	VE	VACUUM EQUIPMENT
		VERT	VERTICAL
GA	GAUGE	W/	WITH
GALV	GALVANIZED	WP	WATER PROOF
GR	GRADE	WP	WORKING POINT
		WS	WORKING POINT
HORIZ	HORIZONTAL	WT	WEIGHT
HP	HIGH POINT	WTF	WELDED WIRE FABRIC
HR	HANDRAIL	WWM	WELDED WIRE MESH
HSB	HIGH STRENGTH BOLT		
ID	INSIDE DIAMETER		
IN	INCH		
INFO	INFORMATION		
INSUL	INSULATION		
JST	JOIST		
JT	JOINT		

SYMBOLS

L	ANGLE	△	DELTA
C	CHANNEL	⊕	SQUARE FEET
PL	PLATE	#	NUMBER or POUND
⊕	CENTER LINE	&	AND
∅	DIAMETER OF ROUND	@	AT
⊕	WORK POINT OR ELEV BENCH MARK		

	NUMBER FOR DETAILS		LETTER
	SHEET ON WHICH DETAIL OCCURS		SHEET ON WHICH SECTION OCCURS
	DETAIL		SECTION
	NUMBER FOR DETAIL		LETTER FOR SECTION
	REF		ROOM NUMBER
	SHEET NUMBER REFERENCED FROM		REVISION
	DET/SECT CROSS REF		REVISED AREA CLOUDED

GENERAL NOTES

GENERAL

1. ALL WORKMANSHIP AND MATERIALS SHALL CONFORM TO THE PROJECT SPECIFICATIONS.
2. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS AFFECTING THE WORK AND SHALL NOTIFY THE CONSTRUCTION MANAGER OF ANY DISCREPANCY WITH THE INFORMATION SHOWN ON THE DRAWINGS PRIOR TO PROCEEDING WITH THE WORK.
3. FOR TOP OF CONCRETE SLAB FOR BEAM TUBE ENCLOSURE SEE CIVIL DRAWINGS.

STEEL REINFORCEMENT FOR CONCRETE

1. STEEL REINFORCEMENT SHALL BE DEFORMED BARS CONFORMING TO ASTM A615, GRADE 60.
2. STEEL REINFORCEMENT SHALL HAVE THE FOLLOWING MINIMUM CONCRETE COVER UNLESS OTHERWISE NOTED:
 CONCRETE CAST AGAINST EARTH ----- 3"
 CONCRETE EXPOSED TO EARTH OR WEATHER: #6 BARS & LARGER ----- 2"
 (INCLUDING VAPOR BARRIER) #5 BARS & SMALLER ----- 1 1/2"
 CONCRETE NOT EXPOSED TO EARTH OR WEATHER: SLABS & WALLS ----- 1/2"
3. ALL CONCRETE STEEL REINFORCEMENT SHALL BE DETAILED, FABRICATED AND PLACED IN ACCORDANCE WITH ACI 318-89 AND ACI 315-80.
4. MINIMUM SPLICE LENGTH SHALL BE 2'-0".

FOUNDATIONS AND SOILS

1. ALLOWABLE SOIL BEARING PRESSURE IS 2000 PSF ON FOOTINGS WITH A MINIMUM OF 2'-0" DEPTH. 1/3 INCREASE IN ALLOWABLE BEARING VALUES ARE PERMITTED FOR SHORT DURATION LOADINGS RESULTING FROM WIND OR SEISMIC.
2. FOUNDATION AND SOIL REQUIREMENTS ARE BASED ON SOIL REPORT BY WOODWARD CLYDE; REPORT NO. 93B107C DATED: JANUARY, 1995.
3. REFER TO CIVIL DRAWINGS FOR BASE COURSE FOR SLABS AND FOUNDATIONS.

STRUCTURAL AND MISC METAL WORKS

1. STRUCTURAL AND MISCELLANEOUS STEEL SHALL CONFORM TO ASTM A36.
2. ALL WELDING AND ELECTRODES SHALL CONFORM TO THE REQUIREMENTS OF AWS D1.1 STRUCTURAL WELDING CODE.
3. FIELD WELDING SHALL BE PERFORMED BY CERTIFIED WELDERS AND CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER PRIOR TO WELDING.
4. ALL STRUCTURAL STEEL SHALL BE FABRICATED BY AN APPROVED FABRICATION SHOP.
5. CONTRACTOR SHALL SUBMIT STRUCTURAL AND MISCELLANEOUS METAL WORK SHOP DRAWINGS TO THE CONSTRUCTION MANAGER FOR REVIEW AND APPROVAL PRIOR TO START OF FABRICATION.
6. HEADED ANCHORS SHALL BE "NELSON" TYPE H4L OR S3L, FLUX FILLED, MADE FROM COLD DRAWN STEEL GRADES C-1010 THROUGH C-1020 PER ASTM A108 OR APPROVED EQUAL. ANCHORS SHALL BE WELDED PER THE MANUFACTURER'S SPECIFICATIONS.

CONCRETE

1. PORTLAND CEMENT SHALL BE TYPE I OR II CONFORMING TO ASTM C150.
2. CONCRETE SHALL BE NORMAL WEIGHT AND SHALL HAVE A COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS.
3. ALL STEEL REINFORCEMENT, ANCHOR BOLTS AND OTHER EMBEDDED ITEMS SHALL BE SECURED IN PLACE. CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER PRIOR TO CONCRETE PLACEMENT.
4. ALL CONCRETE MIX DESIGNS SHALL BE SUBMITTED TO THE CONSTRUCTION MANAGER FOR REVIEW 3 WEEKS PRIOR TO SCHEDULED CONCRETE PLACEMENT.
5. ALL EXPOSED EDGES SHALL BE CHAMFERED TO 1/4" UNLESS OTHERWISE NOTED ON THE DESIGN DRAWINGS.
6. CONTACT SURFACE AT CONSTRUCTION JOINTS WITHOUT A SHEAR KEY SHALL BE ROUGHENED TO A FULL AMPLITUDE OF 1/4" THROUGHOUT.
7. NO SAWCUTTING OF CONCRETE WALLS OR SLABS SHALL BE PERFORMED WITHOUT PRIOR WRITTEN APPROVAL FROM THE CONSTRUCTION MANAGER.
8. ANCHOR FOUNDATIONS AT VACUUM EQUIPMENT INTERFACES AT CORNER, MID AND END STATIONS SHALL BE CURED WITH MOISTURE CURING METHOD. SEE SPECIFICATION SECTION 03300, "CAST-IN PLACE CONCRETE".
9. SEE SPECIFICATION SECTION 7110 FOR UNDERSLAB WATERPROOFING OCCURRING AT BEAM TUBE TERMINATION SLABS.

DESIGN LOADS - FOR THE BEAM TUBE ENCLOSURE

1. DEAD LOADS: ACTUAL LOAD
2. LIVE LOADS: SNOW LOADS --- 20 PSF
3. LATERAL LOADS: PER UBC 1994
 - A) SEISMIC LOADS: ZONE 2B
 IMPORTANCE FACTOR 1.0
 COEFFICIENT Fw - 4.0
 - B) WIND LOADS: BASIC WIND VELOCITY - 100 MPH
 WIND EXPOSURE C
 IMPORTANCE FACTOR 1.0
4. CONSTRUCTION LOADS:
 - A) HANDLING AND TRANSPORTATION LOADS INCLUDING IMPACT.
 - B) LOADS DUE TO FOUNDATION SLAB ALLOWABLE TOLERANCES - 1/2" INCH OF VERTICAL DISPLACEMENT BETWEEN OPPOSITE DIAGONAL ENDS OF SEGMENT BASE.
5. BEAM TUBE ENCLOSURE AND ACCESS DOORS SHALL BE CAPABLE OF STOPPING THE PENETRATION OF A STRAY BULLET WITH THE FOLLOWING PROPERTIES:
 - A) CALIBER ----- 308
 - B) WEIGHT ----- 180 GRAINS
 - C) VELOCITY AT IMPACT --- 2900 FEET PER SECOND
 - D) ENERGY AT IMPACT --- 2800 FEET-POUNDS
 - E) MATERIAL ----- LEAD CORE, FULLY JACKETED WITH COOPER

DRAWING INDEX

LA-S-501	GENERAL NOTES, ABBREVIATIONS & LEGEND
LA-S-502	KEY PLAN OF BEAM TUBE ENCLOSURE & PARTIAL ENLARGED PLAN
LA-S-502A	SOUTHEAST ARM BEAM TUBE ENCLOSURE PARTIAL ENLARGED PLAN
LA-S-503	BEAM TUBE ENCLOSURE PLANS, SECTIONS & DETAILS
LA-S-504	KEY PLAN OF BEAM TUBE ENCLOSURE FOUNDATION & PARTIAL ENLARGED PLANS
LA-S-505	BEAM TUBE ENCLOSURE SECTIONS & DETAILS SHEET 1
LA-S-506	BEAM TUBE ENCLOSURE SECTIONS & DETAILS SHEET 2
LA-S-507	BEAM TUBE ENCLOSURE - MID STATIONS "A" & "B" - FOUNDATION PLANS
LA-S-508	BEAM TUBE ENCLOSURE - CONCRETE SLAB & JOINT DETAILS

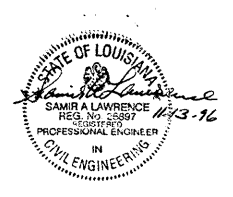
MATERIALS LEGEND

	CONCRETE		WELDED WIRE FABRIC
	GRAVEL		EARTH
	STRUCTURAL BACKFILL		

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ISSUED FOR CONSTRUCTION	
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PARSONS
 100 WEST WALNUT STREET
 PASADENA, CALIFORNIA

LIGO
 CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

LASER INTERFEROMETER
 GRAVITATIONAL-WAVE OBSERVATORY
 BEAM TUBE ENCLOSURE - LIVINGSTON, LA

TITLE	STRUCTURAL BEAM TUBE ENCLOSURE GENERAL NOTES, ABBREVIATIONS & LEGEND	SOURCE	NONE	CONTRACT NUMBER	PP150969	PROJECT NUMBER	8094
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