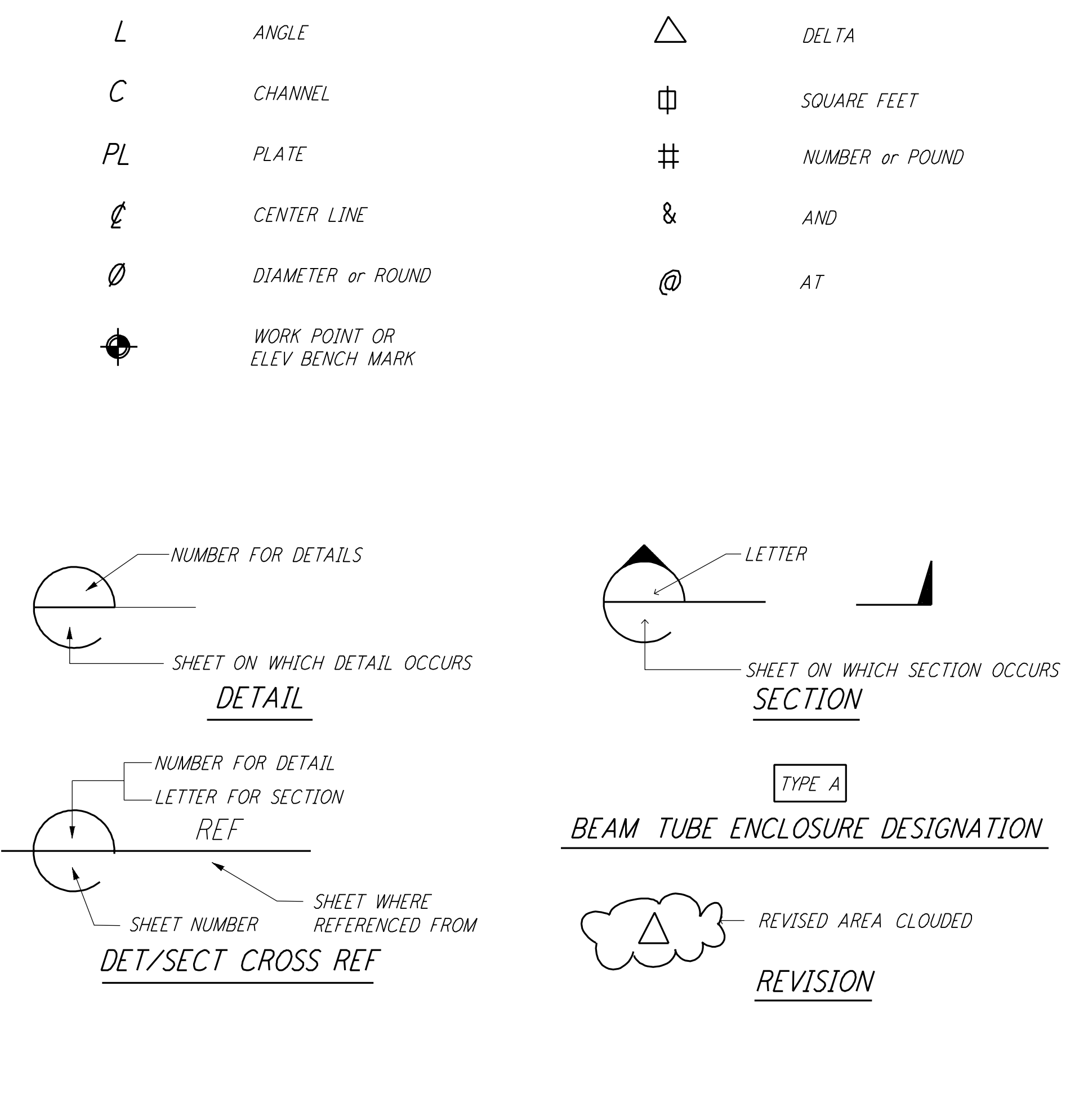


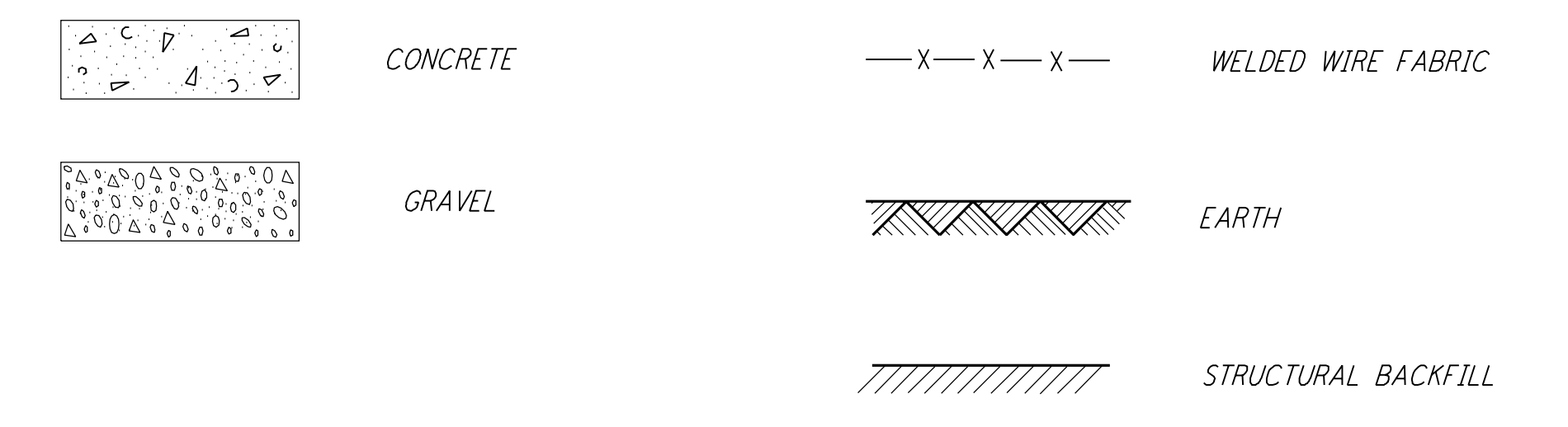
# ABBREVIATIONS

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	OC	ON CENTER
BOS	BOTTOM OF STEEL	OD	OUTSIDE DIAMETER
BRGC	BRACING	OH	OPPOSITE HAND
BTE	BEAM TUBE ENCLOSURE	OPNG	OPENING
		OPP	OPPOSITE
		OTO	OUT TO OUT
C	CAMBER	PCF	POUNDS PER CUBIC FOOT
CC OR C/C	CENTER TO CENTER	PL	PLATE
CG	CENTER OF GRAVITY	PSF	POUNDS PER SQUARE FOOT
CJ	CONSTRUCTION JOINT	PSI	POUNDS PER SQUARE INCH
CLG	CLEAR	PT	POINT
CLR	CLEAR	R	RADIUS
CMU	CONCRETE MASONRY UNIT	RD	ROOF DRAIN
COL	COLUMN	REF	REFERENCE
CONC	CONCRETE	REINF OR BARS	REINFORCING STEEL
CONT	CONTINUOUS	REOD	REQUIRED
CU	CUBIC	REV	REVISE OR REVISION
DET	DETAIL	SCHED	SCHEDULE
DIAG	DIAGONAL	SECT	SECTION
DIM	DIMENSION	SHT	SHEET
DL	DEAD LOAD	SIM	SIMILAR
DO	DITTO	SJV	SHORT LEG VERTICAL
DWG	DRAWING	SPA	SPACED
DWL	DOWEL	ST STL	STAINLESS STEEL
EA	EACH	STD	STANDARD
EF	EACH FACE	STIF	STIFFENER
EL	ELEVATION	SYM	SYMMETRICAL
ENCL	ENCLOSURE	T&B	TOP AND BOTTOM
ENGR	ENGINEER	THK	THICKNESS
EO	EQUAL	TOC	TOP OF CONCRETE
EQUIP	EQUIPMENT	TOF	TOP OF FOOTING
ETC	ETCETERA	TOS	TOP OF STEEL
EW	EACH WAY	TOW	TOP OF WALL
EXIST	EXISTING	TYP	TYPICAL
FD	FLOOR DRAIN	UN	UNLESS OTHERWISE NOTED
FDN	FOUNDATION	VE	VACUUM EQUIPMENT
FIN	FINISH	VERT	VERTICAL
FLR	FLOOR	W/	WITH
FLASH	FLASHING	WP	WATER PROOF
FOC	FACE OF CONCRETE	WP	WORKING POINT
FRMG	FRAMING	WS	WELDED STUD
FS	FAR SIDE	WT	WEIGHT
FT	FOOT, FEET	WWF	WELDED WIRE FABRIC
FTG	FOOTING	WWM	WELDED WIRE MESH
GA	GAUGE		
GALV	GALVANIZED		
GR	GRADE		
HORIZ	HORIZONTAL		
HP	HIGH POINT		
HR	HANDRAIL		
HSB	HIGH STRENGTH BOLT		
ID	INSIDE DIAMETER		
IN	INCH		
INFO	INFORMATION		
INSUL	INSULATION		
JST	JOIST		
JT	JOINT		
LB	POUND		
LG	LENGTH		
LL	LIVE LOAD		
LLH	LONG LEG HORIZONTAL		
LLV	LONG LEG VERTICAL		
LWC	LIGHT WEIGHT CONCRETE		

# SYMBOLS



# MATERIALS LEGEND



# GENERAL NOTES

## GENERAL

- ALL WORKMANSHIP AND MATERIALS SHALL CONFORM TO THE PROJECT SPECIFICATIONS.
- 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.
- FOR TOP OF CONCRETE SLAB FOR BEAM TUBE ENCLOSURE SEE CIVIL DRAWINGS.
- INSTALLATION AND SEALING OF BEAM TUBE ENCLOSURE SEGMENTS ARE NOT INCLUDED IN THIS CONTRACT (NIC).
- INSTALLATION OF DOORS ARE NOT INCLUDED IN THIS CONTRACT (NIC).

## FOUNDATIONS AND SOILS

- 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.
- FOUNDATION AND SOIL REQUIREMENTS ARE BASED ON SOIL REPORT BY DAMES AND MOORE; REPORT NO. 177-004-0016 DATED: FEBRUARY 10, 1993.
- REFER TO CIVIL DRAWINGS FOR BASE COURSE FOR SLABS AND FOUNDATIONS.

## CONCRETE

- PORTLAND CEMENT SHALL BE TYPE I OR II CONFORMING TO ASTM C150.
- CONCRETE SHALL BE NORMAL WEIGHT AND SHALL HAVE A COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS.
- ALL STEEL REINFORCEMENT, ANCHOR BOLTS AND OTHER EMBEDDED ITEMS SHALL BE SECURED IN PLACE. CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER PRIOR TO CONCRETE PLACEMENT.
- ALL CONCRETE MIX DESIGNS SHALL BE SUBMITTED TO THE CONSTRUCTION MANAGER FOR REVIEW 3 WEEKS PRIOR TO SCHEDULED CONCRETE PLACEMENT.
- ALL EXPOSED EDGES SHALL BE CHAMFERED TO 3/4" UNLESS OTHERWISE NOTED ON THE DESIGN DRAWINGS.
- CONTACT SURFACE AT CONSTRUCTION JOINTS WITHOUT A SHEAR KEY SHALL BE ROUGHENED TO A FULL AMPLITUDE OF 3/4" THROUGHOUT.
- NO SAWCUTTING OF CONCRETE WALLS OR SLABS SHALL BE PERFORMED WITHOUT PRIOR WRITTEN APPROVAL FROM THE CONSTRUCTION MANAGER.
- 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".

## STEEL REINFORCEMENT FOR CONCRETE

- STEEL REINFORCEMENT SHALL BE DEFORMED BARS CONFORMING TO ASTM A615, GRADE 60.
- 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 ----- 3/4"
- ALL CONCRETE STEEL REINFORCEMENT SHALL BE DETAILED, FABRICATED AND PLACED IN ACCORDANCE WITH ACI 318-89 AND ACI 315-80.
- MINIMUM SPLICE LENGTH SHALL BE 2'-0".

## STRUCTURAL AND MISC METAL WORKS

- STRUCTURAL AND MISCELLANEOUS STEEL SHALL CONFORM TO ASTM A36.
- ALL WELDING AND ELECTRODES SHALL CONFORM TO THE REQUIREMENTS OF AWS D1.1 STRUCTURAL WELDING CODE.
- FIELD WELDING SHALL BE PERFORMED BY CERTIFIED WELDERS AND CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER PRIOR TO WELDING.
- ALL STRUCTURAL STEEL SHALL BE FABRICATED BY AN APPROVED FABRICATION SHOP.
- CONTRACTOR SHALL SUBMIT STRUCTURAL AND MISCELLANEOUS METAL WORK SHOP DRAWINGS TO THE CONSTRUCTION MANAGER FOR REVIEW AND APPROVAL PRIOR TO START OF FABRICATION.
- 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.

## DESIGN LOADS - FOR THE BEAM TUBE ENCLOSURE

- DEAD LOADS: ACTUAL LOAD
- LIVE LOADS: SNOW LOADS --- 20 PSF
- LATERAL LOADS: PER UBC 1994
  - SEISMIC LOADS: ZONE 2B  
IMPORTANCE FACTOR 1.0  
COEFFICIENT R<sub>w</sub> = 4.0
  - WIND LOADS: BASIC WIND VELOCITY = 70 MPH  
WIND EXPOSURE C  
IMPORTANCE FACTOR 1.0
- CONSTRUCTION LOADS:
  - HANDLING AND TRANSPORTATION LOADS INCLUDING IMPACT.
  - LOADS DUE TO FOUNDATION SLAB ALLOWABLE TOLERANCES - 1/2" INCH OF VERTICAL DISPLACEMENT BETWEEN OPPOSITE DIAGONAL ENDS OF SEGMENT BASE.
- BEAM TUBE ENCLOSURE AND ACCESS DOORS SHALL BE CAPABLE OF STOPPING THE PENETRATION OF A STRAY BULLET WITH THE FOLLOWING PROPERTIES:
  - CALIBER ----- 308
  - WEIGHT ----- 180 GRAINS
  - VELOCITY AT IMPACT --- 2900 FEET PER SECOND
  - ENERGY AT IMPACT ----- 2800 FEET-POUNDS
  - MATERIAL ----- LEAD CORE, FULLY JACKETED WITH COOPER

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NO.	DATE	BY	CHKD	ENGR	PROJ	DESCRIPTION

ISSUED FOR CONSTRUCTION		
DRAWN	MCS	1-19-96
CHECKED	RM	1-19-96
ENGINEER	FD	1-19-96
PROJ	MW	1-19-96


100 WEST WALNUT STREET  
PASADENA, CALIFORNIA

CALIFORNIA INSTITUTE OF TECHNOLOGY  
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

LASER INTERFEROMETER  
GRAVITATIONAL-WAVE OBSERVATORY  
BTE SITEWORK & FABRICATION - HANFORD, WA

TITLE	NONE	CONTRACT NUMBER PP150969	PROJECT NUMBER 8094
SHEET NUMBER BT-S-001			REVISIONS

LIGO-D960186-00-0