

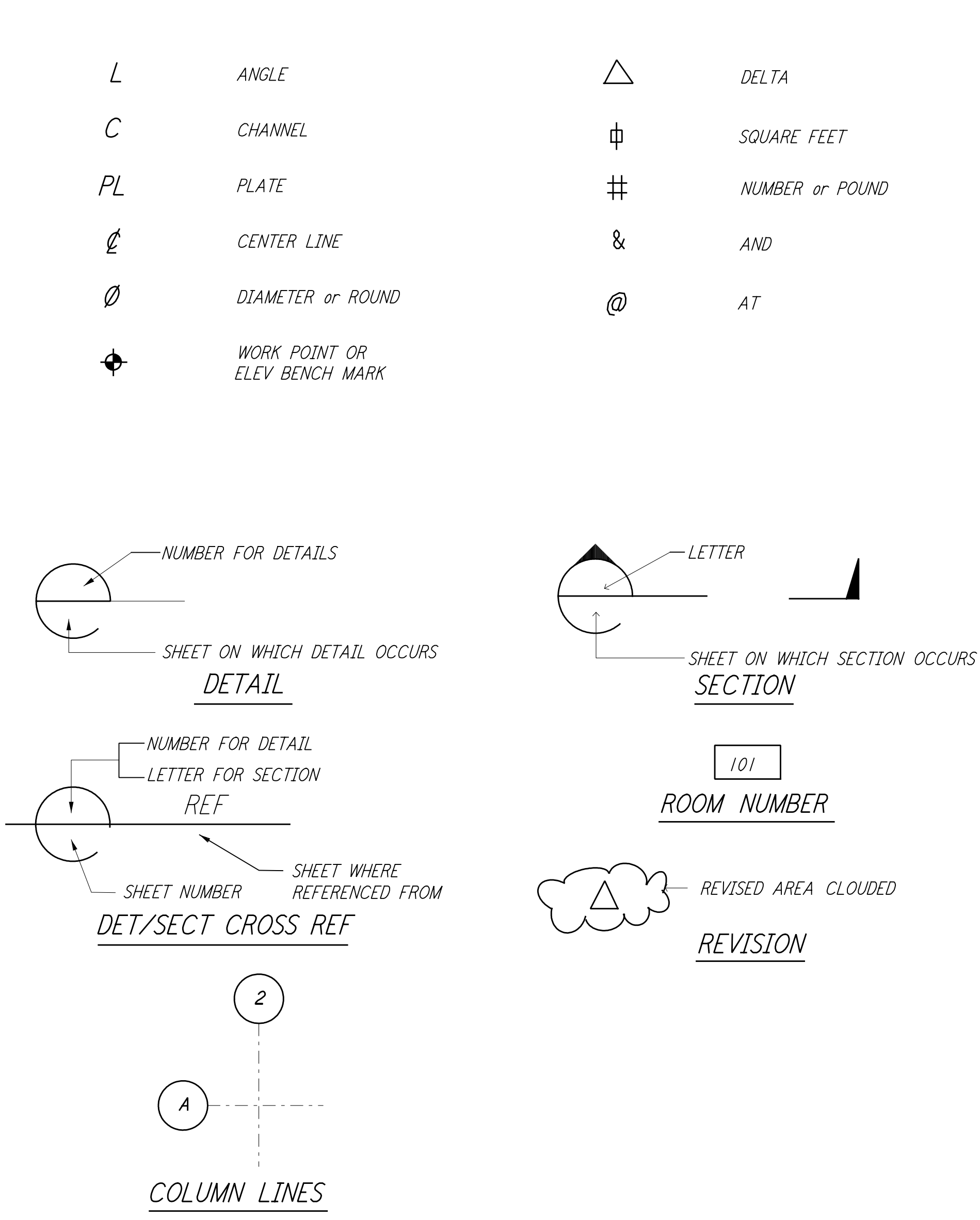
# ABBREVIATIONS

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
		MPSH	MILES PER HOUR
B/B	BACK TO BACK	NS	NEAR SIDE
BYP	BASE PLATE	NTS	NOT TO SCALE
BM	BEAM		
BOF	BOTTOM OF FOOTING	OC	ON CENTER
BOS	BOTTOM OF STEEL	OD	OUTSIDE DIAMETER
BRCG	BRACING	OH	OPPOSITE HAND
		OPNG	OPENING
C	CAMBER	OPP	OPPOSITE
CC OR C/C	CENTER TO CENTER	OSB	OPERATIONS SUPPORT BUILDING
CG	CENTER OF GRAVITY	OTO	OUT TO OUT
CJ	CONSTRUCTION JOINT		
CLG	CEILING	PCF	POUNDS PER CUBIC FOOT
CLR	CLEAR	PL	PLATE
CMU	CONCRETE MASONRY UNIT	PSF	POUNDS PER SQUARE FOOT
COL	COLUMN	PSI	POUNDS PER SQUARE INCH
CONC	CONCRETE	PT	POINT
CONT	CONTINUOUS		
CU	CUBIC		
		R	RADIUS
DET	DETAIL	RD	ROOF DRAIN
DIAG	DIAGONAL	REF	REFERENCE
DIM	DIMENSION	REFIN OR BARS	REINFORCING STEEL
DL	DEAD LOAD	REQD	REQUIRED
DO	DITTO	REV	REVISE OR REVISION
DWG	DRAWING		
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	EQUIPMENT	ST STL	STAINLESS STEEL
EQUIP	EQUIPMENT	STD	STANDARD
ETC	ETCETERA	STIF	STIFFENER
EW	EACH WAY	SYM	SYMMETRICAL
EXIST	EXISTING		
		T&B	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
FOC	FACE OF CONCRETE	TYP	TYPICAL
FRMG	FRAMING		
FS	FAR SIDE	UON	UNLESS OTHERWISE NOTED
FT	FOOT, FEET		
FTG	FOOTING	VERT	VERTICAL
GA	GAUGE		
GALV	GALVANIZED	W/	WITH
GR	GRADE	WPF	WATER PROOF
		WP	WORKING POINT
		WS	WELDED STUD
		WT	WEIGHT
		WWF	WELDED WIRE FABRIC
		WWM	WELDED WIRE MESH
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		
LVEA	LASER AND VACUUM EQUIPMENT AREA		
LWC	LIGHT WEIGHT CONCRETE		

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# SYMBOLS



# NOTES

## INSPECTIONS AND APPROVALS

- ### GENERAL
- PROFESSIONAL SOILS ENGINEER REGISTERED IN THE STATE OF WASHINGTON SHALL INSPECT AND APPROVE ALL FOOTING EXCAVATIONS PRIOR TO PLACING CONCRETE ACCORDING TO SECTION 2200 OF THE SPECIFICATION.
  - CONTINUOUS INSPECTION BY AN INSPECTOR, APPROVED BY THE DEPARTMENT OF BUILDING AND SAFETY SHALL BE PROVIDED FOR THE FOLLOWING FIELD WORK:
    - PLACEMENT OF COMPACTED FILL.
    - PLACEMENT OF CONCRETE AND REINFORCING STEEL AND ANCHOR BOLTS.
    - EXPANSION TYPE CONCRETE ANCHORS.
    - FIELD WELDING.
    - INSTALLATION OF HIGH STRENGTH BOLTS.
  - FIELD WELDERS AND WELDING OPERATORS SHALL BE FULLY QUALIFIED IN ACCORDANCE WITH AWS D1.1 AND BE APPROVED BY THE DEPARTMENT OF BUILDING AND SAFETY.
  - THE CONSTRUCTION SHALL COMPLY WITH REQUIREMENTS OF THE BUILDING CODE.

- ### GENERAL
- ALL STRUCTURAL WORK AND MATERIALS SHALL CONFORM TO THE REQUIREMENTS OF THE JOB SPECIFICATIONS AND STANDARDS.
  - ALL SHOP DRAWINGS SHALL BE REVIEWED AND APPROVED BY THE ENGINEER OF RECORD PRIOR TO FABRICATION.
  - NO HOLES OTHER THAN THOSE SPECIFICALLY DETAILED, SHALL BE ALLOWED THROUGH STRUCTURAL STEEL MEMBERS. NO CUTTING OR BURNING OF STEEL SHALL BE PERMITTED WITHOUT APPROVAL OF THE ENGINEER OF RECORD.
  - PAINTING AND SHOP PRIMING WHERE REQUIRE SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.
  - FOR TYPICAL DETAILS SEE DRAWINGS WA-S-002 THROUGH WA-S-009.
  - CONTRACTOR SHALL PROVIDE TEMPORARY BRACING AND SHORING AS REQUIRED TO MAINTAIN THE ALIGNMENT OF BUILDING AND RETAINING WALLS UNTIL ALL CONNECTIONS ARE COMPLETED AND SLAB AND WALLS CONSTRUCTED.
  - PRIOR TO PLACING FOUNDATIONS & SLABS, REFER TO UNDERDRAIN SYSTEM DRAWINGS, ARCHITECTURAL DWGS FOR SLOPES & ELECTRICAL DWGS FOR GROUNDING.
  - FOR BUILDING COLUMN LOCATION COORDINATES SEE CIVIL DWGS.

# NOTES

## FOUNDATIONS

- FOUNDATION AND SOIL REQUIREMENTS ARE BASED ON SOIL REPORT BY DAMES AND MOORE; REPORT NO. 177-004-0016 DATED: FEBRUARY 10, 1993.

## STRUCTURAL STEEL

- THE DESIGN, FABRICATION AND ERECTION OF ALL STRUCTURAL STEEL SHALL CONFORM TO AISC "MANUAL OF STEEL CONSTRUCTION" AND WITH THE SPECIFICATIONS. STRUCTURAL STEEL SHAPES & PLATES SHALL CONFORM TO ASTM A36 UNLESS OTHERWISE NOTED ON PLAN.
- PROVIDE FILLERS AT SPLICES OF PARTS HAVING MORE THAN 1/16" DIFFERENCE IN THICKNESS.
- ALL BEARING STIFFENER PLATES SHALL HAVE A CLOSE BEARING AGAINST THE INNER SURFACES OF BOTH FLANGES.

## CONNECTIONS

- PLATE FOR BOLTED SHEAR PLATE CONNECTIONS SHALL BE THE SAME THICKNESS AS THE BEAM WEB WITH A MINIMUM THICKNESS OF 3/8" UNLESS OTHERWISE NOTED. DIAGONAL GUSSET PLATE CONNECTIONS SHALL HAVE A MINIMUM THICKNESS OF 3/8" (UNLESS OTHERWISE NOTED) AND THE NET AREA THROUGH THE BOLTS HOLES SHALL DEVELOP TOTAL SHEAR CAPACITY OF THE BOLTS. ALL CONNECTIONS SHALL HAVE A MINIMUM OF TWO BOLTS. LOAD INDICATOR WASHERS SHALL BE USED WITH ALL ASTM A325SC BOLTS.
- ALL BOLTS SHALL BE ASTM A325SC, CLASS A, UNLESS OTHERWISE NOTED. 3/8" Ø BOLTS SHALL BE USED FOR MID & END STATION, OSB BUILDING AND MAINTENANCE BUILDING AND 1/2" Ø BOLTS SHALL BE USED FOR CORNER LVEA BUILDING, UNLESS OTHERWISE NOTED.
- ALL STIFFENERS SHALL HAVE A MINIMUM THICKNESS OF 3/8", UNLESS OTHERWISE NOTED.
- GIRT CONNECTIONS SHALL HAVE A MINIMUM OF 2-3/4" Ø ASTM A307 BOLTS.

## WELDING

- ALL WELDING SHALL CONFORM TO THE REQUIREMENTS OF AWS D1.1-90 STRUCTURAL WELDING CODE AND THE SPECIFICATION.
- ALL WELDING PROCEDURE SPECIFICATIONS AND WELDING PROCEDURE QUALIFICATIONS, WELDERS, AND WELDING OPERATORS SHALL BE FULLY QUALIFIED IN ACCORDANCE WITH AWS D1.1-90.
- LENGTHS OF WELDS SHOWN ARE EFFECTIVE LENGTHS AS SPECIFIED IN AISC SPECIFICATIONS. WHERE LENGTH OF WELD IS NOT SHOWN, IT SHALL BE FULL LENGTH OF JOINT. ALL BUTT WELDS SHALL BE FULL PENETRATION WELDS, UNLESS OTHERWISE NOTED.
- ALL WELDING ELECTRODES SHALL BE E70XX.
- WITH REFERENCE TO MINIMUM SIZE OF FILLET WELD REQUIREMENTS IN SECTION 1.17 OF AISC SPECIFICATIONS, MINIMUM SIZE OF FILLET WELDS WHEN NOT SPECIFIED ON WELD SYMBOLS SHALL BE AS FOLLOWS:
  - 3/8" WELD FOR MATERIAL THICKNESS UP TO AND INCLUDING 3/4"
  - 5/8" WELD FOR MATERIAL THICKNESS OVER 3/4" TO 1 1/2"
- WELDING PROCEDURES AND SEQUENCES SHALL BE PLANNED TO MINIMIZE WELD SHRINKAGE THAT COULD RESULT IN LAMELLAR TEARING, AND APPROVED BY OWNER'S REPRESENTATIVE.
- GRIND SMOOTH WELDED JOINTS WHERE FLUSH SURFACE IS REQUIRED.

## METAL DECK

- ALL METAL DECKING SHALL BE IN ACCORDANCE WITH SECTION 5312 OF THE SPECIFICATIONS.
- ROOF DECK SHALL HAVE SINGLE RIBS 3" DEEP AND MADE OUT OF 20 GAGE STEEL WITH MINIMUM I=0.873 IN<sup>4</sup>/FOOT OF WIDTH AND MINIMUM S(+)=0.508 IN 3/FOOT WIDTH AND S(-)=0.562 IN 3/FOOT WIDTH. ATTACHMENT OF ROOF DECK TO SUPPORTS SHALL BE PER MANUFACTURER'S RECOMMENDATIONS. THE ATTACHMENT SHALL BE CAPABLE OF RESISTING 80 PSF NET UPLIFT AND 300 POUNDS PER LINEAR FOOT OF SHEAR.
- ACOUSTICAL ROOF DECK OF SAME SECTION PROPERTIES AS INDICATED IN ITEM 2 ABOVE SHALL BE USED FOR THE ROOF OVER MULTIPURPOSE ROOM OF THE OSB BLDG AS INDICATED ON THE DWG.
- ROOF DECK SHALL HAVE A MINIMUM OF TWO (2) SPANS UNLESS OTHERWISE NOTED.

## CONCRETE

- ALL CONCRETE MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE REQUIREMENTS OF DIVISION 3 (CONCRETE) OF THE SPECIFICATIONS. (REGULAR WEIGHT AND LIGHT WEIGHT)
- STRUCTURAL CONCRETE SHALL HAVE AN ULTIMATE COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS UNLESS OTHERWISE NOTED. ALL CONCRETE SHALL BE REGULAR WEIGHT CONCRETE UNLESS OTHERWISE NOTED.
- ALL REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO ASTM A615 GRADE 60 (UNLESS OTHERWISE NOTED). SPLICES AND HOOKS SHALL CONFORM TO ACI 318-89. SPLICES SHALL BE CLASS B UNLESS OTHERWISE NOTED. MINIMUM LAP SHALL BE 30 DIAMETERS. STIRRUP AND TIE HOOKS SHALL HAVE 135-DEGREE BENDS.
- LOCATION OF ALL CONSTRUCTION JOINTS OR OTHER TYPES OF JOINTS, OTHER THAN SPECIFIED, SHALL BE APPROVED BY THE CONSTRUCTION MANAGER BEFORE PLACING.
- MINIMUM CONCRETE COVER PROVIDED FOR REINFORCEMENT SHALL BE IN ACCORDANCE WITH THE SPECIFICATION.
- ALL REINFORCING STEEL, ANCHOR BOLTS, DOWELS AND OTHER INSERTS SHALL BE WELL SECURED IN POSITION AND INSPECTED BY QUALIFIED INSPECTOR PRIOR TO PLACING CONCRETE.
- EXISTING PAVEMENT SHALL BE SAW CUT AND BROKEN OUT TO CLEAN, STRAIGHT EDGES OF DEMOLITION AREAS.
- EXPOSED EDGES OF CONCRETE SHALL HAVE A 3/4" CHAMFER UNLESS OTHERWISE NOTED ON DRAWINGS.
- EXCAVATING AND BACKFILLING SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.
- CONSTRUCTION JOINTS SHALL BE CLEANED AND ROUGHENED TO 1/4" AMPLITUDE AS PER DETAIL (11) WA-S-002

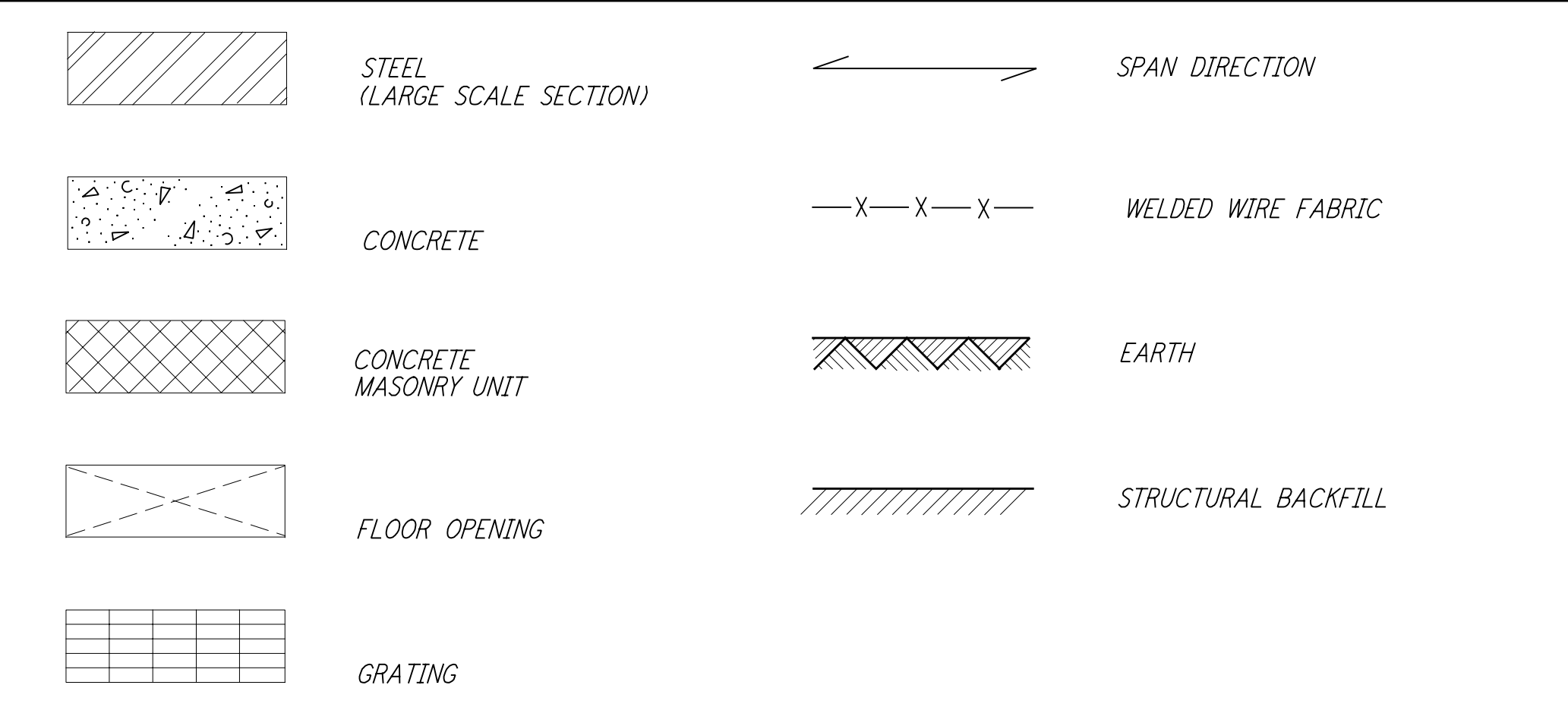
## ANCHOR BOLTS

- FOR ANCHOR BOLT DETAILS SEE DRAWING WA-S-003

## MASONRY

- WALLS SHALL BE LOAD BEARING REGULAR WEIGHT LIGHT CONCRETE MASONRY UNITS WITH ALL CELLS GROUTED SOLID (UON), ACCORDING TO THE SPECIFICATIONS.
- THE MORTAR SHALL BE CEMENT-LIME TYPE 'S' WITH A COMPRESSIVE STRENGTH OF 1800 PSI AT 28 DAYS, CONSISTING OF ONE PART OF CEMENT 1/2 TO 3/4 PART OF HYDRATED LIME OR LIME PUTTY AND DAMP LOOSE AGGREGATE 2 1/4 TO 3 TIMES THE SUM OF VOLUMES OF CEMENT AND LIME. THE GROUT SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI AT 28 DAYS.
- THE MINIMUM CLEAR DISTANCE BETWEEN PARALLEL BARS SHALL BE THE BARS DIAMETER, BUT NOT LESS THAN 1".
- MINIMUM LAP OF REINFORCING STEEL SHALL BE 40 DIAMETERS, BUT NOT LESS THAN 2'-0".
- IF WORK STOPPED FOR ONE HOUR OR MORE, PROVIDE A HORIZONTAL CONSTRUCTION JOINT BY STOPPING THE GROUT 1/2" MINIMUM BELOW THE TOP OF MORTAR OR MASONRY.

# MATERIALS LEGEND



DRAWING NO.	DESCRIPTION	NO.	DATE	BY	CHKD	ENGR	PROJ	DESCRIPTION
		1	6-15-98	CKT				ISSUED FOR AS-BUILT

ISSUED FOR CONSTRUCTION		
DRAWN	MCS	6-24-96
CHECKED	DDM	7-2-96
ENGINEER	BP	6-28-96
PROJ	MDW	7-9-96
AS-BUILT DRAWINGS		

100 WEST WALNUT STREET  
PASADENA, CALIFORNIA

CALIFORNIA INSTITUTE OF TECHNOLOGY  
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

LASER INTERFEROMETER  
GRAVITATIONAL-WAVE OBSERVATORY  
SITE NO. 1 - HANFORD, WASHINGTON

TITLE	SCALE	DATE	PROJECT NUMBER
STRUCTURAL GENERAL NOTES, ABBREVIATIONS & LEGEND	NONE	PP150969	8094
SHEET NUMBER	WA-S-001		REVISIONS