STRUCTURAL GENERAL CRITERIA

1

AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS	FND	FOUNDATION	PLUMB	PLUMBING
		FS	FAR SIDE	PR	PAIR
ACI	AMERICAN CONCRETE INSTITUTE	FT	FEET, FOOT	PROJ	PROJECTION
		FTG	FOOTING	PSI	POUNDS PER SQUARE INCH
ADDL	ADDITIONAL			PSF	POUNDS PER SQUARE FOOT
ADJ	ADJACENT	GA	GAUGE		
AISC			GALVANIZED	R	RIGHT, RISER, RADIUS
		GB	GRADE BEAM	RD	ROOF DRAIN
AISI				RE	REFER
			HORIZONTAL	REF	REFERENCE
ANSI		HP	HIGH POINT	REINF	REINFORCE(D), (ING), (MENT)
APPROX.		HR	HOUR	REQD	REQUIRED
AR	ANCHOR ROD	HSS	HOLLOW STRUCTURAL SECTION	REV	REVISION
ARCH				RH	RIGHT HAND
ASCE		ID	INSIDE DIAMETER	RO	ROUGH OPENING
ASTM	AMERICAN SOCIETY OF	IN	INCHES	S	SOUTH, SLAB
AWS	AMERICAN WELDING SOCIETY	JT	JOINT	SCHED	SCHEDULE(D)
				SDI	STEEL DECK INSTITUTE
B, BM	BEAM (MILD REINFORCED)	K	KIPS, JOIST SERIES	SECT	SECTION
BC	"RD	KSI	KIPS PER SQUARE INCH	SF	SQUARE FEET
BLDG	BUILDING			SHT	SHEET
BOD	BOTTOM OF DECK	L	SPAN, LEFT	SIM	SIMILAR
BOT	BOTTOM	Ld	DEVELOPMENT LENGTH	SJI	STEEL JOIST INSTITUTE
BP	BASE PLATE	LG	LENGTH	SL	SLOPE
BRG	BEARING	LGT	LONG, LONGITUDINAL	SPA	SPACE
BS	BOTH SIDES	LH	LEFT HAND	SPEC(S)	SPECIFICATION(S)
		LL	LIVE LOAD	SQ	SQUARE
C	CHANNEL, COMPRESSION	LLBB	LONG LEG BACK TO BACK	STD	STANDARD
CAMB	CAMBER	LLH	LONG LEG HORIZ.	STIF	STIFFENER
CIP	CAST-IN-PLACE	LLV	LONG LEG VERTICAL	STIR	STIRRUP
CL	CENTER LINE	LP	LOW POINT	STL	STEEL
CLR	CLEAR	LW	LONG WAY	STR	STRUCTURAL
COL	COLUMN				
CONC	CONCRETE	MATL	MATERIAL	T	TOP, TENSION
CONT	CONTINUOUS	MAX		T & B	TOP AND BOTTOM
CPL	CAP PLATE	MC	MOMENT CONNECTION, MISC. CHANNEL	T & G	TONGUE AND GROOVE
CS	CARBON STEEL			TEMP	TEMPERATURE
CSJ	CONSTRUCTION JOINT	MECH	MECHANICAL		THICK(NESS)
CTJ	CONTROL JOINT	MFG(S)	MANUFACTURER(S)		TOP OF CONCRETE
		MID			TOP OF FOOTING
D	DEPTH	MILL	MILL FACE		TOP OF LEDGE
DET	DETAIL	MIN			TOP OF PIER, PLINTH
DF	DRILLED FOOTING	MISC	MISCELLANEOUS		TOP OF STEEL
DIA	DIAMETER	ML	MATCH LINE		
DIAG	DIAGONAL	MO	MASONRY OPENING		TOP OF WALL
DIM	DIMENSION	MS	MILD STF		TREAD(S)
DL	DEAD LOAD	MT	STRUCTURAL TEE CUT FROM MISC. STEEL		TOP OF JOIST
DN	DOWN				
DO	DITTO				
DWG	DRAWING	N	NORTH		UNDERWRITERS LABORATORY
DWL	DOWEL	NIC	NOT IN CONTRACT		UNIFORM
		NO.	NUMBER		UNLESS OTHERWISE
E	EAST	NOM	NOMINAL		
EA	EACH	NS	NEAR SIDE		
EF	EACH FACE	NTS	NOT TO SCALE		BEAM END SHEAR
EJ	EXPANSION JOINT				VERTICAL BRACE
EL	ELEVATION	OC	ON CENTER		VERTICAL
ELEC	ELECTRICAL	OD	OUTSIDE DIAMETER		
ELEV	ELEVATOR	OPNG	OPENING		WALL, WEST, WIDTH, WIDE FLANGE
EQ	EQUAL(LY)	OPP	OPPOSITE		
EW	EACH WAY				WIND LOAD, WATER LEVEL, WORKING LINE
EXIST	EXISTING	PL	PLATE		
EXP	EXPANSION	PLF	POUNDS PER LINEAR FOOT	WP	WATERPROOF, WORKING POINT
FD	FLOOR DRAIN				

2 STRUCTURAL LEGEND

EXISTING BUILDING GRID LINES "2" AND "B"	
DIMENSION TO COLUMN GRID, CENTERLINE, FACE OR EDGE	
SHAFT 24/48 BELL — DRILLED PIER MARK	
F1 — SPREAD FOOTING MARK	
CMF1 — CONTINUOUS WALL FOOTING MARK	
P1 — PLINTH MARK	
BW1 — BASEMENT WALL MARK	
RW1 — RETAINING WALL MARK	
BP1 — BASE PLATE MARK	
C1 — STRUCTURAL STEEL COLUMN MARK	
A — STRUCTURAL STEEL COLUMN SPLICE TYPE	
P9 — TILT-UP PANEL MARK	
6" — SLAB DEPRESSION AND AMOUNT	
100'-0" — DATUM ELEVATION	
45°00'00" — ANGLE IN DEGREES, MINUTES AND SECONDS	
W27x84 (+13'-4") — STANDARD AISC ROLLED SHAPE OF W27x84 AT 13'-4" ABOVE DATUM EL.	
W21x55 (c=1") — STANDARD AISC ROLLED SHAPE OF W21x55 W/ 1" UPWARD CAMBER	
W18x35 20k 20k — STANDARD AISC ROLLED SHAPE W18x35 W/ 20 KIPS BEAM END SHEAR	
W14x22 (10) — STANDARD AISC ROLLED SHAPE OF W14x22 WITH 10 HEADED SHEAR CONNECTORS EQUALLY SPACED	
W21x50 (10/6/12) W16 W16 — STANDARD AISC ROLLED SHAPE OF W21x50 WITH 28 HEADED SHEAR CONNECTORS EQUALLY SPACED BETWEEN BEAMS FROM LEFT LEFT TO RIGHT AS 10 CONNECTORS/8 CONNECTORS/12 CONNECTORS	
MC — STANDARD AISC ROLLED SHAPE BEAM CONNECTED TO A ROLLED SHAPE COLUMN W/ A STANDARD WELDED MOMENT CONNECTION	
VB-1 — VERTICAL BRACE MARK	
VCB-1 — VERTICAL CROSS BRACE MARK	
VKB-1 — VERTICAL "K" BRACE MARK	
5 1/2" SLAB DECK TYPE 1 — SPAN DIRECTION OF A COMPOSITE STEEL DECK TYPE 1 HAVING A TOTAL SLAB THICKNESS OF 5 1/2"	
DECK TYPE 2 — SPAN DIRECTION OF A BARE STEEL DECK TYPE 2 NOT HAVING ANY CONCRETE TOPPING	
S1 — SPAN DIRECTION OF A MILD REINFORCED CONCRETE SLAB WITH MAIN REINFORCING MARK S1	
B1 GB1 1B1 — MILD REINFORCED CONCRETE BEAM MARKS	
J1 — MILD REINFORCED CONCRETE JOIST MARK	
L — STEEL ANGLE	
JL — STEEL ANGLES BACK TO BACK	
W — STANDARD ROLLED SHAPE	
C — STANDARD ROLLED CHANNEL	
○ — STANDARD STEEL PIPE, HSS	
□ — HOLLOW STRUCTURAL SECTION	
@ — AT	
& — AND	
x — BY	
℄ — CENTER LINE	
O.C. — ON CENTER	
ø — DIAMETER	
% — PERCENT	
PL — PLATE	
RE: — REFER TO	
# — NUMBER (BAR SIZE)	
◫ — SQUARE	
1 — REVISION MARK	
2/S501 2/S501 — SECTION OR DETAIL REFERENCE (DRAWN AS DETAIL 2 ON SHEET S501)	
49'-0" W12x19 [22'-6"] — FIELD VERIFY EXISTING INFORMATION SHOWN IN *ITALICS* OR [*BRACKETS*]	

3 STRUCTURAL CONCEPTS, STANDARDS & LOADS

A. DESIGN CONCEPT:

1. THE STRUCTURE AS SHOWN HAS BEEN DESIGNED IN ACCORDANCE WITH THE BUILDING CODE REQUIREMENTS AND DESIGN STANDARDS TO SUPPORT THE FINAL BUILDING SERVICE LOADS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ADDITIONAL SUPPORTS FOR THE STRUCTURE IF NECESSITATED BY THE CONSTRUCTION SEQUENCE OR METHODS OF FABRICATION, HANDLING, ERECTION AND OTHER CONSTRUCTION OPERATIONS.

B. BUILDING CODES AND DESIGN STANDARDS:

1. AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE); MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES, ASCE 7.
2. AMERICAN CONCRETE INSTITUTE (ACI), BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE, ACI 318.
3. AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), MANUAL OF STEEL CONSTRUCTION, 1989, AS AMENDED.
4. INTERNATIONAL BUILDING CODE, 2003 EDITION.
5. STEEL DECK INSTITUTE (SDI), DESIGN MANUAL FOR COMPOSITE DECKS, FORM DECKS, ROOF DECKS AND CELLULAR METAL FLOOR DECK WITH ELECTRICAL DISTRIBUTION.

C. GRAVITY LOADS:

1. SUPERIMPOSED LOADS ARE GIVEN IN POUNDS PER SQUARE FOOT (PSF).

BUILDING AREA	DEAD LOAD (PSF)	LIVE LOAD (PSF)
1. SECOND FLOOR	40	70
2. STAIRS AND EXITS	25	100
3. ROOF	23	20

D. LATERAL DESIGN LOADS:

1. WIND LOADS FOR A BASIC WIND SPEED OF 90 MPH (3-SECOND GUST WIND SPEED OF 110 MPH), WITH EXPOSURE B AND AN IMPORTANCE FACTOR 1.0.

E. SPECIAL LOADS:

1. PIPE LOADS WITH WATER

SIZE	WEIGHT MAX.	SPACING OF HANGERS
4" DIA.	17 PLF	10'-0"
6" DIA.	32 PLF	10'-0"
8" DIA.	50 PLF	10'-0"
10" DIA.	75 PLF	10'-0"
12" DIA.	100 PLF	5'-0"

2. ARCHITECTURAL BARRIER ACT LOADS:

ITEM	REQUIRED CAPACITY
GRAB BAR	250 POUNDS ANY DIRECTION
TUB OR SHOWER SEAT	250 POUNDS ANY DIRECTION
FASTENERS & MOUNTING DEVICES	250 POUNDS ANY DIRECTION

3. STAIR TREADS, RAILING AND GUARD RAILS:

ITEM	REQUIRED CAPACITY
TREADS	300 POUNDS AT CENTER
TOP RAILS	50 PLF HORIZONTALLY
OTHER RAILS, FILLERS & CONNECTIONS	25 PSF HORIZONTALLY
HAND RAILS	200 POUNDS ANY DIRECTION

4 GENERAL NOTES FOR CONSTRUCTION

A. CONSTRUCTION METHODS, PROCEDURES AND SEQUENCES ARE THE RESPONSIBILITY OF THE CONTRACTOR AND THE CONTRACTOR SHALL TAKE ALL THE NECESSARY MEANS TO MAINTAIN AND PROTECT THE STRUCTURAL INTEGRITY OF ALL CONSTRUCTION AT ALL STAGES.

B. ANY PROPOSED SUBSTITUTION MUST BE EQUAL OR BETTER AND SHALL BE REVIEWED BY THE ARCHITECT/ENGINEER PRIOR TO ANY PERTINENT WORK AND PRIOR TO THE AWARD OF THE CONTRACT.

C. NOT ALL OPENINGS AND OTHER COMPONENTS THAT ARE REQUIRED HAVE BEEN SHOWN IN THE STRUCTURAL DRAWINGS. COORDINATE WITH THE ARCHITECTURAL, MECHANICAL, PLUMBING AND ELECTRICAL DRAWINGS AND VERIFY THE LOCATIONS AND SIZES OF ALL CHASES, INSERTS, OPENINGS, SLEEVES, FINISHES, DEPRESSIONS, PADS AND OTHER PROJECT REQUIREMENTS.

D. THE CONTRACTOR IS RESPONSIBLE FOR REVIEWING THE MECHANICAL, ELECTRICAL, PLUMBING AND ARCHITECTURAL DRAWINGS TO DETERMINE WHERE OPENINGS ARE REQUIRED IN REINFORCED CONCRETE BEAMS AND SLABS.

E. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS, DETAILING ALL THE OPENINGS, INCLUDING ADDED REINFORCEMENT AS SHOWN ON THE TYPICAL WALL, SLAB AND BEAM OPENING DETAILS FOR REVIEW.

F. ADDITIONAL REINFORCEMENT ABOVE THAT SHOWN IN THE TYPICAL SLAB AND BEAM OPENING DETAILS MAY BE REQUIRED AND WILL BE REVIEWED ON THE SHOP DRAWINGS.

G. USE THE MANUFACTURER'S CERTIFIED DRAWINGS AND SPECIFICATIONS FOR THE EQUIPMENT ANCHORAGE AND DETAILS.

H. ALL CONSTRUCTION JOINTS SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE INCORPORATED INTO THE STRUCTURE. ADDITIONAL CONSTRUCTION JOINTS TO FACILITATE CONSTRUCTION SHALL BE LOCATED AND DETAILED ON THE SHOP DRAWINGS FOR REVIEW.

I. HORIZONTAL CONSTRUCTION JOINTS SHALL NOT BE PERMITTED IN BEAMS UNLESS SHOWN ON THE STRUCTURAL DRAWINGS.

J. ALL CONSTRUCTION AND CONTROL JOINTS FOR BEAMS WHICH ARE EXPOSED TO VIEW ARE TO BE LOCATED TO COINCIDE WITH THE ARCHITECTURAL RUSTICATION JOINTS AS SHOWN ON THE BUILDING ELEVATION SHEETS OR AS REVIEWED IN WRITING.

K. ALL WELDING SHALL CONFORM TO AWS STANDARDS. THE THICKNESS AND THE LENGTHS OF THE WELDS ARE AS SHOWN, SPECIFIED OR AS REQUIRED.

L. SHOP DRAWINGS:

1. THE TERM "SHOP DRAWINGS" INCLUDES FABRICATION, MANUFACTURING, ERECTION AND SETTING DRAWINGS, BROCHURES, CERTIFICATES, AND PRODUCT DATA DESCRIBING MATERIALS AND EQUIPMENT. SHOP DRAWINGS SHALL INCLUDE ALL PERTINENT INFORMATION REQUIRED FOR THE ENGINEER TO FULLY EVALUATE THE MATERIALS BEING REPRESENTED BY THE SUBMITTAL INCLUDING THE PHYSICAL PROPERTIES, DIMENSIONS LOCATIONS AND METHOD OF INSTALLATION.
2. SHOP DRAWINGS WILL BEAR THE REVIEW STAMP OF THE CONTRACTOR INDICATING THAT HE HAS REVIEWED THE DRAWINGS FOR CONFORMANCE WITH THE CONTRACT DOCUMENTS; COORDINATED ITEMS INCLUDED IN THE SUBMITTAL WITH RELATED ITEMS; AND VERIFIED AND COORDINATED DIMENSIONS.
3. REPRODUCTIONS OF THE ENGINEERING DRAWINGS WILL NOT BE ACCEPTABLE AS SHOP DRAWINGS.
4. ANY SHOP DRAWING THAT DOES NOT CONFORM TO THESE REQUIREMENTS WILL BE CAUSE FOR REJECTION AND WILL BE RETURNED WITHOUT ANY FURTHER ACTION.

5 EXCAVATION, BACKFILLING AND FOUNDATIONS

A. A GEOTECHNICAL REPORT IS NOT AVAILABLE FOR REVIEW.

B. FOUNDATIONS HAVE BEEN DESIGNED WITH AN ALLOWABLE BEARING CAPACITY OF 6000 PSF FOR TOTAL LOAD AND 4000 PSF FOR DEAD PLUS SUSTAINED LIVE LOAD BASED UPON THE INFORMATION SHOWN ON THE ORIGINAL DESIGN DOCUMENTS.

6 CONCRETE AND REINFORCING STEEL

A. CONCRETE SCHEDULE:

BUILDING COMPONENT	f'c, 28-DAY CYLINDER COMPRESSIVE STRENGTH POUNDS PER SQUARE INCH (PSI)				
	NORMAL WEIGHT			MAXIMUM AGGREGATE SIZE (IN)	MAXIMUM SLUMP (IN)
	3000	4000	5000		
1. DRILLED PIERS	•			1 1/2	4
2. GRADE BEAMS AND PLINTHS		•		1 1/2	4
3. SLAB-ON-GRADE		•		1 1/2	4
4. SLAB-ON-DECK	•			3/4	4
5. ALL OTHER CONCRETE	•			1 1/2	4

B. PROVIDE DEFORMED NEW BILLET STEEL BARS CONFORMING TO ASTM DESIGNATION A615, GRADE 60. ALL REINFORCING STEEL SHALL BE SECURELY HELD IN PLACE; PROVIDE ADDITIONAL BARS OR STIRRUPS FOR SUPPORT AS REQUIRED.

C. ALL WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185, WITH A MINIMUM YIELD STRENGTH OF 65 KSI. WWF SHALL CONSIST OF FLAT SHEETS.

D. PROVIDE FULL EMBEDMENT WITH STANDARD 90 DEGREE HOOKS FOR ALL DOWELS. IF NOT OTHERWISE SPECIFIED, THE DOWEL SIZE AND SPACING SHALL BE THE SAME AS THE MAIN REINFORCING.

E. WHEN REINFORCING STEEL IN GRADE BEAMS, WALLS, SLABS AND BEAMS IS NOTED AS CONTINUOUS, SPLICE REINFORCING STEEL ONLY WHEN UNAVOIDABLE DUE TO STOCK LENGTHS. STAGGER ALL SPLICES A MINIMUM OF 4'-0". ADJACENT BAR SPLICES ARE NOT ACCEPTABLE. LOCATE THE TOP BAR SPLICES WITHIN THE MIDDLE HALF OF THE SPAN AND LOCATE THE BOTTOM BAR SPLICES AT SUPPORTS OR BETWEEN SUPPORTS AND 1/3 SPAN POINT, UNLESS OTHERWISE NOTED ON PLANS, DETAILS OR SCHEDULES.

F. PROVIDE INTERIOR AND EXTERIOR HORIZONTAL LAPPED CORNER BARS AT ALL CORNERS TO MATCH THE SIZE, TYPE AND SPACING OF THE WALL AND GRADE BEAM HORIZONTAL REINFORCING.

G. UNLESS SPECIFICALLY NOTED, SCHEDULED OR DETAILED OTHERWISE, PROVIDE DEVELOPMENT LENGTH FOR REINFORCING IN CONCRETE COMPONENTS IN ACCORDANCE WITH THE SCHEDULE IN NOTE NO. H BELOW. THIS SCHEDULE SHALL APPLY TO ALL DEVELOPMENT LENGTHS NOT OTHERWISE NOTED, DETAILED OR SCHEDULED IN THE DRAWINGS OR SPECIFICATIONS.

H. REINFORCING BAR DEVELOPMENT LENGTHS (Ld)

BAR SIZE GRADE 60	Ld FOR TOP BARS *				Ld FOR BOTTOM BARS *			
	28-DAY CYLINDER CONCRETE STRENGTH (PSI)				28-DAY CYLINDER CONCRETE STRENGTH (PSI)			
	3000	4000	5000	6000	3000	4000	5000	6000
#3	22	19	17	16	17	15	13	12
#4	29	25	23	21	22	19	17	16
#5	36	31	28	26	28	24	22	20
#6	43	37	34	31	33	29	26	24
#7	63	54	49	45	48	42	38	34
#8	72	62	56	51	55	48	43	39
#9	81	70	62	57	62	54	48	44
#10	89	78	69	63	69	60	53	49
#11	98	85	76	70	76	66	59	54

* TOP BARS ARE DEFINED AS HORIZONTAL REINFORCING SO PLACED IN A MEMBER THAT MORE THAN 12 INCHES OF CONCRETE IS CAST BELOW THE BAR. ALL OTHER CONDITIONS ARE CONSIDERED BOTTOM BARS FOR DEVELOPMENT AND SPLICE LENGTH PURPOSES.

I. PROVIDE LAP SPLICE LENGTHS FOR REINFORCING BARS 1.3 TIMES THE Ld NOTED IN NOTE H ABOVE.

1. WHEN TWO BARS OF DIFFERENT SIZES ARE LAPPED, THE SMALLER SIZE SHALL GOVERN THE LAP LENGTH UNLESS SPECIFICALLY NOTED OTHERWISE.
2. WELDED OR MECHANICAL SPLICES CAPABLE OF DEVELOPING 125% OF THE BAR YIELD STRENGTH MAY BE USED IN LIEU OF THE LAPS. SUCH SPLICES MAY BE EITHER FULL BUTT WELDS OR SERIES "C" CADWELDS OR EQUAL.

J. THE GENERAL NOTES, LAP LENGTHS OR DETAILS PERTAINING TO REINFORCING STEEL AS SHOWN ON THE DETAIL SHEETS OR OTHER SCHEDULES SHALL SUPERSEDE THE NOTES SHOWN ON THIS SHEET.

PROVIDE THE FOLLOWING CONCRETE COVER TO REINFORCING STEEL IN CAST-IN-PLACE CONCRETE:

UNFORMED SURFACES IN CONTACT WITH EARTH.....3 INCHES

UNFORMED SURFACES OVER MOISTURE BARRIER.....2 INCHES

FORMED SURFACES EXPOSED TO EARTH OR WEATHER:
#6 AND LARGER.....2 INCHES #5 AND SMALLER.....1 1/2 INCHES

FORMED SURFACES NOT EXPOSED TO EARTH OR WEATHER:
SLABS AND WALLS.....3/4 INCHES BEAMS AND COLUMNS.....1 1/2 INCHES

K. THE GENERAL NOTES, LAP LENGTHS OR DETAILS PERTAINING TO REINFORCING STEEL AS SHOWN ON THE DETAILS SHEETS OR OTHER SCHEDULES SHALL SUPERSEDE THE NOTES SHOWN ON THIS SHEET.

7 STRUCTURAL STEEL

A. ROLLED SHAPES:

1. PROVIDE STRUCTURAL STEEL FOR W-SHAPE MEMBERS CONFORMING TO AMERICAN SOCIETY FOR TESTING MATERIALS ASTM A992, GRADE 50, UNLESS OTHERWISE NOTED.
2. PROVIDE STRUCTURAL STEEL FOR ALL OTHER SHAPES, PLATES AND BARS CONFORMING TO ASTM A36, UNLESS OTHERWISE NOTED.
3. PROVIDE STRUCTURAL STEEL FOR HOLLOW STRUCTURAL SECTIONS CONFORMING TO ASTM A500, GRADE B, OR A501, UNLESS OTHERWISE NOTED.
4. PROVIDE STRUCTURAL STEEL FOR PIPE CONFORMING TO ASTM A53, TYPE E OR S, GRADE B, UNLESS OTHERWISE NOTED.

B. CONNECTIONS:

1. ALL BOLTED CONNECTIONS SHALL BE STANDARD AMERICAN INSTITUTE OF STEEL CONSTRUCTION BOLTED CONNECTIONS, USING AMERICAN SOCIETY FOR TESTING MATERIALS A325 BOLTS.
2. ALL WELDED CONNECTIONS SHALL CONFORM TO AMERICAN WELDING SOCIETY UNLESS OTHERWISE NOTED.
3. SURVEY ALL PLANS, DETAILS, SECTIONS, SCHEDULES AND SPECIFICATIONS FOR SPECIAL CONNECTIONS.
4. UNLESS OTHERWISE NOTED AND/OR SPECIFIED, ALL BEAM CONNECTIONS SHALL BE DESIGNED TO SUPPORT 1/2 OF THE TOTAL UNIFORM LOAD FOR THE APPLICABLE MEMBER SIZE AND SPAN AS DETERMINED BY THE TABLES FOR ALLOWABLE UNIFORM LOADS ON BEAMS IN THE 9TH EDITION OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION MANUAL OF STEEL CONSTRUCTION (ASD).
5. WHERE BEAMS ARE TO RECEIVE HEADED SHEAR CONNECTORS, DESIGN THOSE BEAM CONNECTIONS FOR THE REACTIONS SHOWN. IF REACTIONS ARE NOT SHOWN, DESIGN THE CONNECTION TO SUPPORT 40 PERCENT OF THE MAXIMUM WEB SHEAR, V, FOR THE APPLICABLE MEMBER SIZE AS DETERMINED FOR THE VALUES TABULATED FOR ALLOWABLE UNIFORM LOADS ON BEAMS IN THE 9TH EDITION OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION MANUAL OF STEEL CONSTRUCTION (ASD).
6. MOMENT CONNECTIONS SHOWN SHALL BE DESIGNED TO FULLY DEVELOP THE SECTION IN FLEXURE AND TO SUPPORT 1/2 THE TOTAL UNIFORM LOAD FOR SHEAR AS DESCRIBED IN NOTE 4 ABOVE.

C. STEEL DECK:

TYPE 1: STEEL FORM DECK

1. PROVIDE 0.6 INCHES DEEP DECK FORMED FROM 24 GAUGE STEEL SHEETS CONFORMING TO ASTM A653, STRUCTURAL STEEL (SS), GRADE 33, WITH G60 ZINC COATING.
2. PROVIDE FORM DECK WITH THE FOLLOWING MINIMUM SECTION PROPERTIES:
   a. MOMENT OF INERTIA I=0.019 INCHES ^{4}/FOOT WIDTH
   b. SECTION MODULUS Sp=0.057 INCHES ^{3}/FOOT WIDTH
   c. SECTION MODULUS Sn=0.057 INCHES ^{3}/FOOT WIDTH
3. ATTACH FORM DECK TO STEEL SUPPORTS WITH 1/2" DIA. PUDDLE WELDS WITH WELDING WASHERS @ 12" O.C.

8 MASONRY

A. CONSTRUCT REINFORCED MASONRY IN ACCORDANCE WITH "SPECIFICATION FOR MASONRY STRUCTURES", ACI 530.1/ASCM. MASONRY ALLOWABLE DESIGN STRESSES ARE BASED UPON REQUIRING NO SPECIAL INSPECTION.

B. ALL CONCRETE MASONRY UNITS SHALL CONFORM TO ASTM C90, GRADE N, TYPE 1 MINIMUM FACE THICKNESS SHALL BE 1.25". ALL WALLS ARE LIGHT WEIGHT BLOCKS (105 PCF OR LESS).

C. REINFORCING STEEL SHALL BE ASTM A615, GRADE 60. ALL BOLTS USED FOR ANCHORAGE SHALL BE ASTM A307 HEADED BOLTS.

D. MASONRY STRENGTH (F'M) AT 28 DAYS SHALL BE A MINIMUM OF 2,000 PSI. USE TYPE M OR S MORTAR. MASONRY UNITS SHALL HAVE A MINIMUM NET AREA COMPRESSIVE STRENGTH OF 2800 PSI. GROUT SHALL CONFORM TO ASTM C476. GROUT STRENGTH SHALL BE AT LEAST 2800 PSI.

E. PROVIDE MORTAR BED OR WEB BETWEEN GROUTED BED AND HOLLOW CELL. USE FULL HEAD AND BED JOINTS.

F. UNLESS SHOWN ON DETAILS, PROVIDE #9 LADDER OR TRUSS HORIZONTAL JOINT REINFORCEMENT AT 16" O.C. PROVIDE 2-#5 AT ALL JAMBS AND ENDS OF WALLS.

G. GROUT SOLID THE FIRST CELL ON EITHER SIDE OF DOOR OPENINGS, UNLESS OTHERWISE NOTED. PROVIDE 8" U-BLOCK CMU LINTEL WITH 8" BEARING EACH END; REINFORCE WITH (2) #4 BOTTOM.

H. EMBED ALL BOLTS IN FULL GROUTED CELL. PLACE BOLTS IN SAME VERTICAL CELL AS REINFORCING IF POSSIBLE. MINIMUM EMBEDDED LENGTH IS ONE-HALF WIDTH OF CELL.

I. CONCRETE MASONRY UNIT (CMU) LINTEL SCHEDULE:

MASONRY OPENING	U-BLOCK	REINFORCING
LESS THAN 4'-8"	8" x 8"	(2) #4
4'-8" BUT LESS THAN 5'-8"	8" x 8"	(2) #5
5'-8" BUT LESS THAN 6'-8"	8" x 8"	(2) #6
GREATER THAN 6'-8"	–	RE: PLAN FOR DETAILS

1. PROVIDE 8" MINIMUM BEARING EACH END FOR CMU LINTELS. SEE ARCHITECTURAL DRAWINGS FOR LOCATIONS.

J. LOOSE ANGLE MASONRY LINTEL SCHEDULE:

MASONRY OPENING	SIZE	DETAIL
LESS THAN 4'-0"	L 3 1/2 x 3 1/2 x 1/4	L
4'-0" BUT LESS THAN 5'-0"	L 4 x 4 x 1/4	L
5'-0" BUT LESS THAN 6'-0"	L 5 x 3 1/2 x 1/4 LLV	L
6'-0" BUT LESS THAN 7'-0"	L 6 x 3 1/2 x 5/16 LLV	L
7'-0" BUT LESS THAN 8'-0"	L 6 x 4 x 5/16 LLV	L

NOTE:
PROVIDE 8" MINIMUM BEARING EACH END FOR STEEL LOOSE LINTELS. ONE ANGLE SHALL BE PROVIDED FOR EACH WYTHE OF BRICK. SEE ARCHITECTURAL DRAWINGS FOR LOCATIONS. HOT DIP GALVANIZE ALL LINTELS AFTER FABRICATION.

9 INDEPENDENT TESTING LABORATORY

A. THE OWNER WILL EMPLOY THE SERVICES OF AN INDEPENDENT TESTING LABORATORY TO PERFORM SPECIFIED INSPECTIONS AND TESTING.

B. EMPLOYMENT OF A TESTING LABORATORY IN NO WAY RELIEVES THE CONTRACTOR OF ANY OBLIGATION TO PERFORM WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

C. CONTRACTOR RESPONSIBILITIES:

1. DELIVER TO LABORATORY AT DESIGNATED LOCATION ADEQUATE SAMPLES OF MATERIALS PROPOSED TO BE USED WHICH REQUIRE TESTING, TOGETHER WITH PROPOSED MIX DESIGNS.
2. COOPERATE WITH LABORATORY PERSONNEL AND PROVIDE ACCESS TO WORK AND TO MANUFACTURER'S FACILITIES.
3. PROVIDE INCIDENTAL LABOR AND FACILITIES TO PROVIDE ACCESS TO WORK TO BE TESTED, TO OBTAIN AND HANDLE SAMPLES AT THE SITE OR AT SOURCE OF PRODUCTS TO BE TESTED, TO FACILITATE TEST AND INSPECTIONS AND FOR STORAGE AND CURING OF TEST SAMPLES.
4. NOTIFY LABORATORY OF MATERIAL SOURCES AND FURNISH NECESSARY QUANTITIES OF REPRESENTATIVE SAMPLES OF MATERIALS PROPPOSED FOR USE WHICH ARE REQUIRED TO BE TESTED.
5. NOTIFY ARCHITECT AND LABORATORY 24 HOURS PRIOR TO EXPECTED TIME FOR OPERATIONS REQUIRING INSPECTION AND TESTING SERVICES.
6. ADVISE LABORATORY IN A TIMELY FASHION TO COMPLETE REQUIRED INSPECTION AND TESTING PRIOR TO SUBSEQUENT WORK BEING PERFORMED.
7. PAY FOR ALL SUBSEQUENT RE-TESTING OF PRODUCTS OR SYSTEMS FOUND TO BE DEFECTIVE OR OTHERWISE NOT IN ACCORDANCE WITH SPECIFICATION REQUIREMENTS. REMOVE REJECTED PRODUCTS AND REPLACE WITH PRODUCTS OF SPECIFIED QUALITY.
8. CORRECT DEFICIENCIES IN WORK THAT TEST REPORTS AND INSPECTIONS INDICATE DO NOT COMPLY WITH THE CONTRACT DOCUMENTS.

D. INDIVIDUAL TEST AND INSPECTIONS REQUIRED:

1. SOIL COMPACTION TESTS
2. DRILLED PIER BEARING STRATA CONFIRMATION, INSPECTION AND TESTS
3. CONCRETE COMPRESSIVE STRENGTH
4. CONCRETE SLUMP TESTS
5. CONCRETE AIR CONTENT TESTS
6. STRUCTURAL STEEL FIELD WELD INSPECTION AND TESTS. INSPECT AND TEST 100% OF FULL PENETRATION WELDS.
7. STRUCTURAL STEEL BOLTED CONNECTION INSPECTION AND TESTS
8. STEEL DECK FIELD WELD AND ATTACHMENT INSPECTION

E. ADDITIONAL TESTS AT THE CONTRACTOR'S EXPENSE WILL BE PERFORMED TO DETERMINE COMPLIANCE OF REPLACED OR ADDITIONAL WORK WITH SPECIFIED REQUIREMENTS.

ISSUE LOG

NO.	DATE	DESCRIPTION
1	04/07/09	ISSUE FOR BID
2	04/07/09	ISSUE FOR PERMIT
3		
4		
5		
6		

CONSULTANT(S) :

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2500 WILCREST, SUITE 300
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1155 Dairy Ashford, Suite 111
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TEL. NO. (281) 531-4401
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STATE OF TEXAS
SAADUDDIN AHMED
04/07/09

PROJECT NAME :

FIRE STATION 20 RENOVATIONS

HOUSTON, TEXAS

CITY OF HOUSTON
GENERAL SERVICES DEPARTMENT

REVIEWED :

PROGRAM MANAGER — SPONSORING DEPARTMENT

PROJECT MANAGER

OTHER APPROVALS :

WATER ENGINEERING — TRAFFIC AND TRANSPORTATION

WASTEWATER ENGINEERING — STREET, BRIDGE & ROW ENGINEERING

STORMWATER ENGINEERING — PLANNING & DEVELOPMENT

CITY ENGINEER — DATE

DIRECTOR, DEPT. OF PUBLIC WORKS & ENGINEERING — DATE

DATE : 04/07/09
W.B.S. No : D-000000-0000-0
SCALE : AS SHOWN
DRAWN BY : DL
CHECKED BY : JL

SHEET TITLE :
STRUCTURAL GENERAL CRITERIA

SHEET NO. : **S101**
3 OF SHEETS

CITY DWG. NO. :

DESIGN FILE:

CAD FILE :