

STRUCTURAL GENERAL NOTES:

DESIGN CRITERIA

1. DESIGN LIVE LOADS ARE IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE, 2009 EDITION, WITH THE FOLLOWING MINIMUM CRITERIA:

FLOOR LOADS:	LIVE LOAD:	CONCENTRATED LOAD:
OCCUPANCY OR USE:		
STAIRS.....	100 p.s.f.	300 lbs.(Ø TREAD)
FLOORS (UNLESS NOTED OTHERWISE).....	250 p.s.f.	4000 lbs.
UPPER FLOOR - FUTURE OFFICE SPACE.....	125 p.s.f.	3000 lbs.

SNOW LOADS:

ROOF DESIGN SNOW LOAD, P _f (NON-REDUCIBLE)	30 p.s.f.
EXPOSURE FACTOR, C _e	1.0
IMPORTANCE FACTOR, I _s	1.1
THERMAL FACTOR, C _t	1.0
GROUND SNOW LOAD, P _g	20 p.s.f.
SEE OPERATIONS BUILDING ROOF PLAN FOR DRIFTING LOADS	

SEISMIC LOADS:

IMPORTANCE FACTOR, I_E 1.25

MAPPED SPECTRAL RESPONSE ACCELERATIONS:

S_S..... 0.185

S₁..... 0.059

SITE CLASS D

SPECTRAL RESPONSE COEFFICIENTS:

S_{ps}..... 0.197

S_{p1}..... 0.094

SEISMIC DESIGN CATEGORY B

BASIC SEISMIC-FORCE-RESISTING SYSTEMS: ORDINARY STEEL MOMENT FRAME

DESIGN BASE SHEAR: BY PRE ENGINEERED METAL BUILDING MANUFACTURER

RESPONSE MODIFICATION FACTOR, R: 3.5

ANALYSIS PROCEDURE:EQUIVALENT LATERAL FORCE PROCEDURE

WIND LOADS:

BASIC WIND SPEED (3-SECOND GUST): 100 m.p.h.

WIND EXPOSURE C

IMPORTANCE FACTOR, I_w 1.15

INTERNAL PRESSURE COEFFICIENT, GC_{pi} 0.18±

FLOOD LOADS:

NOT IN FLOOD HAZARD ZONE

2. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE THE LOCATION OF MECHANICAL OPENINGS, FLOOR DRAINS, INSERTS, DEPRESSIONS, BURIED CABLES AND UTILITIES, ETC. WITH ARCHITECTURAL, CIVIL, MECHANICAL AND ELECTRICAL DRAWINGS.
3. VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS, NOTIFY ENGINEER OF DISCREPANCIES. WRITTEN DIMENSIONS TAKE PRECEDENCE OVER SCALED DIMENSIONS.

SOILS AND FOUNDATIONS

1. FOUNDATION DESIGN IS IN ACCORDANCE WITH THE SOIL REPORT BY HEPWORTH-PAWLAK GEOTECHNICAL, INC. NUMBER 308121B, DATED MARCH 4, 2009, AND THE UPDATED LETTER DATED APRIL 17, 2012.

2. DESIGN OF DRILLED PIERS IS BASED ON THE FOLLOWING CRITERIA:
- | | |
|--|---------------|
| MAXIMUM ALLOWABLE END BEARING PRESSURE | 30,000 p.s.f. |
| MINIMUM ALLOWABLE END BEARING PRESSURE | 15,000 p.s.f. |
| MAXIMUM ALLOWABLE SKIN FRICTION | 2,500 p.s.f. |
| MINIMUM PENETRATION INTO BEDROCK | 8.0 feet |
| MINIMUM DRILLED PIER LENGTH | 20.0 feet |

THE MAXIMUM VARIATION OF THE CENTER OF ANY DRILLED PIER AT ITS TOP FROM THE REQUIRED LOCATION SHALL NOT BE MORE THAN 5-1/2% OF ITS DIAMETER AND NO PIER SHALL BE OUT OF PLUMB MORE THAN 1% OF ITS LENGTH.

3. SOIL BENEATH, SLABS ON GRADE SHALL BE NATIVE, SOLID UNDISTURBED MATERIAL FREE OF WATER, FROST OR FOREIGN DEBRIS, OR STRUCTURAL FILL COMPACTED IN ACCORDANCE WITH THE SOILS REPORT AND SPECIFICATIONS WITH MINIMUM DENSITY AS FOLLOWS:

SLABS-ON-GRADE: 95% OF MODIFIED PROCTOR, ASTM D1557.

4. A REPRESENTATIVE OF THE SOILS ENGINEER SHALL INSPECT THE OPEN EXCAVATION TO DETERMINE THAT THE SOIL TYPE AND CONDITIONS ARE CONSISTENT WITH DESIGN CRITERIA OF THE SOILS REPORT. IF THE SOIL PROPERTIES ARE FOUND TO BE DIFFERENT FROM THIS CRITERIA, THEN THE ENGINEER SHALL BE PROMPTLY NOTIFIED SO THAT THE FOUNDATION DESIGN MAY BE REVIEWED.

CONCRETE:

1. ALL CONCRETE DESIGN, MATERIALS AND CONSTRUCTION SHALL CONFORM TO ACI STANDARD 318-08, THE INTERNATIONAL BUILDING CODE, 2009 EDITION, THE CRSI MANUAL OF STANDARD PRACTICE (CURRENT EDITION) AND THE PROJECT SPECIFICATIONS.

2. MATERIAL SPECIFICATIONS:
- | | |
|---------------------------------|-------------------|
| REINFORCING BARS | ASTM A615, GR. 60 |
| WELDED WIRE FABRIC | ASTM A185 |
| REINFORCING BARS (WELDED) | ASTM A706, GR. 60 |

3. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH IN 28 DAYS AS FOLLOWS:

A. GENERAL STRUCTURAL CONCRETE:

GRADE BEAMS & WALLS	4500 p.s.i.	CEMENT TYPE 1/II
FLOOR SLABS	4500 p.s.i.	CEMENT TYPE 1/II
SLABS-ON-GRADE	4500 p.s.i.	CEMENT TYPE 1/II
(WITH 1.5 lbs OF FIBERMESH PER CUBIC YARD)		
EQUIPMENT PEDESTALS	4500 p.s.i.	CEMENT TYPE 1/II
DRILLED PIERS (5"-7" SLUMP)	3750 p.s.i.	CEMENT TYPE 1/II

4. REINFORCEMENT SHALL BE DETAILED IN ACCORDANCE WITH THE ACI DETAILING MANUAL, LATEST EDITION. FORMWORK SHALL BE DESIGNED, ERECTED AND REMOVED IN ACCORDANCE WITH THE SPECIFICATIONS.

5. REINFORCEMENT SHALL BE PLACED SO THAT THE FOLLOWING MINIMUM CONCRETE PROTECTION IS PROVIDED, UNLESS NOTED OTHERWISE.

CONCRETE SURFACES POURED AGAINST GROUND 3" CLEAR

FORMED SURFACES EXPOSED TO GROUND OR WEATHER:

BAR #6 AND LARGER 2" CLEAR

BAR #5 AND SMALLER..... 1-1/2" CLEAR

SLABS-ON-GRADE AT CENTERS

6. REINFORCEMENT SHALL BE SECURELY TIED AND SHALL BE SUPPORTED WITH METAL CHAIRS OR HUNG FROM FORMS.

7. CONTINUOUS HORIZONTAL BARS AND CORNER BARS IN GRADE BEAMS AND SLABS SHALL BE LAPPED AS FOLLOWS AT SPLICES. SPLICE LOCATIONS SHALL BE STAGGERED WHERE POSSIBLE.

CONCRETE COMPRESSIVE STRENGTH	No. 6 BARS & SMALLER	No. 7 BARS & LARGER
4500 p.s.i.	38 db	48 d ^p
	(WHERE db = BAR DIAMETERS)	

SPLICES IN GRADE BEAM REINFORCING, IF REQUIRED, SHALL BE AS FOLLOWS:

BOTTOM BARS AT DRILLED PIERS

TOP BARS MID SPAN BETWEEN DRILLED PIERS

8. ADDITIONAL (2) #6 BARS (ONE EACH FACE) WITH A 3'-0" PROJECTION SHALL BE PLACED DIAGONALLY ACROSS THE CORNERS OF ALL OPENINGS AND VERTICAL STEPS IN WALLS.

9. GRADE BEAMS BELOW GRADE SHALL HAVE BACKFILL PLACED EQUALLY ON BOTH SIDES UNTIL THE REQUIRED LEVELS ARE REACHED.

10. CONSTRUCTION JOINTS IN SLABS ON GRADE SHALL BE SPACED AT INTERVALS ENCLOSING NO MORE THAN 144 SQUARE FEET WITH A MAXIMUM OF 12 FEET IN ANY ONE DIRECTION UNLESS OTHERWISE NOTED ON DRAWINGS. CONSTRUCTION JOINTS SHALL BE FORMED WITH METAL LOAD KEY JOINT SUPPLIED BY JAHN CONCRETE PRODUCTS OR APPROVED EQUAL FOR CONSTRUCTION JOINTS IN SLABS 6" AND THICKER PROVIDE 1 INCH DIAMETER X 24" LONG SMOOTH DOWELS AT 18" ON CENTER OILED ONE END. REFER TO PROJECT MANUAL FOR SEALING OF CONSTRUCTION JOINTS.

11. CONSTRUCTION JOINTS (COLD JOINTS) SHALL BE PROVIDED IN GRADE BEAMS, WHICH ARE

STRUCTURAL STEEL:

1. ALL STRUCTURAL STEEL DESIGN, MATERIALS, FABRICATION AND ERECTION SHALL CONFORM TO THE AISC SPECIFICATION, 13TH EDITION, THE INTERNATIONAL BUILDING CODE, 2009 EDITION AND THE PROJECT SPECIFICATIONS.

2. MATERIAL SPECIFICATIONS:

WIDE FLANGE (W) STRUCTURAL STEEL SHAPES	ASTM A992
S SHAPES, CHANNELS (C AND MC), ANGLES (L), BARS AND PLATES	ASTM A36
HOLLOW STRUCTURAL STEEL (HSS)	ASTM A500, GRADE B
ANCHOR BOLTS	ASTM F1554, GRADE 36
HIGH STRENGTH BOLTS	ASTM A325

3. SHOP CONNECTIONS SHALL BE WELDED WITH E70XX ELECTRODES. FIELD WELDS SHALL BE MADE WITH E70XX ELECTRODES. ALL WELDING SHALL BE DONE BY WELDERS CERTIFIED FOR WELD TYPES AND POSITIONS REQUIRED ACCORDING TO AWS D1.1 WELDING CODE CURRENT EDITION.

4. ALL STRUCTURAL STEEL SHALL BE PAINTED WITH ONE SHOP COAT OF RED OXIDE PRIMER.

WOOD:

1. ALL LUMBER DESIGN, MATERIALS, FABRICATION AND CONSTRUCTION SHALL CONFORM TO THE INTERNATIONAL BUILDING CODE, 2009 EDITION, THE NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION 2005 EDITION, ALONG WITH ITS SUPPLEMENT OF WOOD DESIGN VALUES, AND THE PROJECT SPECIFICATIONS.

2. ALL DIMENSION LUMBER (2" TO 4" THICK) SHALL BE HEM-FIR #2 OR BETTER WITH THE FOLLOWING MINIMUM ALLOWABLE STRESSES (NORMAL LOADING CONDITIONS AND SINGLE MEMBER USES):

EXTREME FIBER IN BENDING, F _b	850 p.s.i.
HORIZONTAL SHEAR, F _v	75 p.s.i.
COMPRESSION PERPENDICULAR TO GRAIN, F _{c⊥}	405 p.s.i.
COMPRESSION PARALLEL TO GRAIN, F _c	1,300 p.s.i.
MODULUS OF ELASTICITY, E	1,300,000 p.s.i.

3. ALL PLYWOOD SHEATHING SHALL BEAR THE STAMP OF THE AMERICAN PLYWOOD ASSOCIATION (APA). PLYWOOD SHALL HAVE THE FOLLOWING SPAN RATINGS:

FLOOR	SPAN RATING
3/4" EXPOSURE 1 PLYWOOD	48/24

4. DESIGN VALUES USED FOR TRUSSES AND FABRICATED ITEMS SHALL BE SUBMITTED WITH SHOP DRAWINGS.

5. MISCELLANEOUS FRAMING CLIPS, ANCHORS AND HANGERS SHALL BE PROVIDED AS NECESSARY TO ERECT A RIGID STRUCTURAL FRAMEWORK.

6. ALL PLYWOOD SHEATHING SHALL BE NAILED IN ACCORDANCE WITH THE FOLLOWING SCHEDULE, UNLESS NOTED OTHERWISE.

	PANEL EDGES	INTERMEDIATE SUPPORTS
3/4" PLYWOOD	10d AT 10" O.C.	10d AT 10" O.C.

7. BRIDGING AND NAILING SHALL BE PROVIDED IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE, 2009 EDITION.

8. ALL RED BUILT (OR EQUIVALENT) MEMBERS SHALL MEET ICC PRODUCT ACCEPTANCE NATIONAL EVALUATION REPORT.

9. ALL BUILT-UP MEMBERS OF 2 PIECES SHALL BE NAILED TOGETHER WITH A MINIMUM OF 4 10d COM. NAILS PER FOOT. ALL BUILT-UP MEMBERS OF MORE THAN 2 PIECES SHALL BE BOLTED TOGETHER WITH 1/2" DIAMETER BOLTS AT 24" O.C. (COUNTERSINK AS NECESSARY) WITH A MINIMUM OF THREE BOLTS PER MEMBER.

REVISIONS		
NO.	DATE	DESCRIPTION
1	06/29/2012	ISSUED FOR BUILDING PERMIT SUBMITTAL TO PPRBD (OPERATIONS BUILDING)
2	08/15/2012	ISSUED FOR CONSTRUCTION PER PPRBD BUILDING PERMIT #35220 (OPERATIONS BLDG)

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STRUCTURAL GENERAL NOTES	
OPERATIONS BUILDING	
HAROLD D. THOMPSON REGIONAL WATER RECLAMATION FACILITY	
LOWER FOUNTAIN METROPOLITAN SEWAGE DISPOSAL DISTRICT	
DRAWN _____ SKC	GMS, INC. CONSULTING ENGINEERS 611 N. WEBER, SUITE 300 COLORADO SPRINGS, COLORADO 80903
DESIGNED _____ MC	
CHECKED _____ RJS	SHEET 1-22 OF -
DATE _____ JUNE 2012	
PROJECT NO. _____ 20166.410	
GMS FILE NO. _____ 2599	

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