FOUNDATION NOTES

1. Design Information and Loads

A. Foundation design in accordance with 2006 International Building Code using the reactions provided by the metal building manufacturer for the following design criteria.
B. Ground Snow Load . . . . . 5 psf
Roof Snow Load . . . . . 20 psf
C. Wind Speed . . . . . 90 mph
Exposure C
D. S_{DS} 0.767
E. SDC . . . . . D
F. Frost Depth . . . . . 2'-0"

2. Earthwork

A. Foundation Design Values (assumed)
i. Allowable Soil Bearing Pressure – 1500 psf
ii. Coefficient of Friction – 0.25
iii. Passive Earth Pressure – 200 psf/ft of depth
B. The building pad area shall be stripped of all frozen soil, debris, vegetation, and topsoil. All fill soils and any remaining loose natural soils shall be excavated to expose suitable natural soils.
C. Proof roll the entire building pad area to locate and remove all soft spots. Replace with compacted structural fill.
D. Place all footings and slabs on undisturbed natural soil or on properly compacted structural fill. Contractor shall verify that soil under footings is suitable to support footings.
E. Structural Fill: Structural fill should consist of well-graded sandy gravels with a maximum particle size of 3 inches and 5 to 15 percent fines (materials passing the No. 200 sieve). The liquid limit of fines should not exceed 35 and the plasticity index should be below 15. All fill soils should be free from topsoils, highly organic material, frozen soil, and other deleterious materials. Structural fill should be placed in maximum 8-inch thick loose lifts at a moisture content within 2 percent of optimum and compacted to at least 95 percent of modified proctor density (ASTM D1557) under the building and 90 percent under concrete flatwork.
F. It is the responsibility of the contractor to ensure that the depth of the bottom of the foundation is far enough below the adjacent grade to ensure adequate frost protection.

3. Concrete and Reinforcement

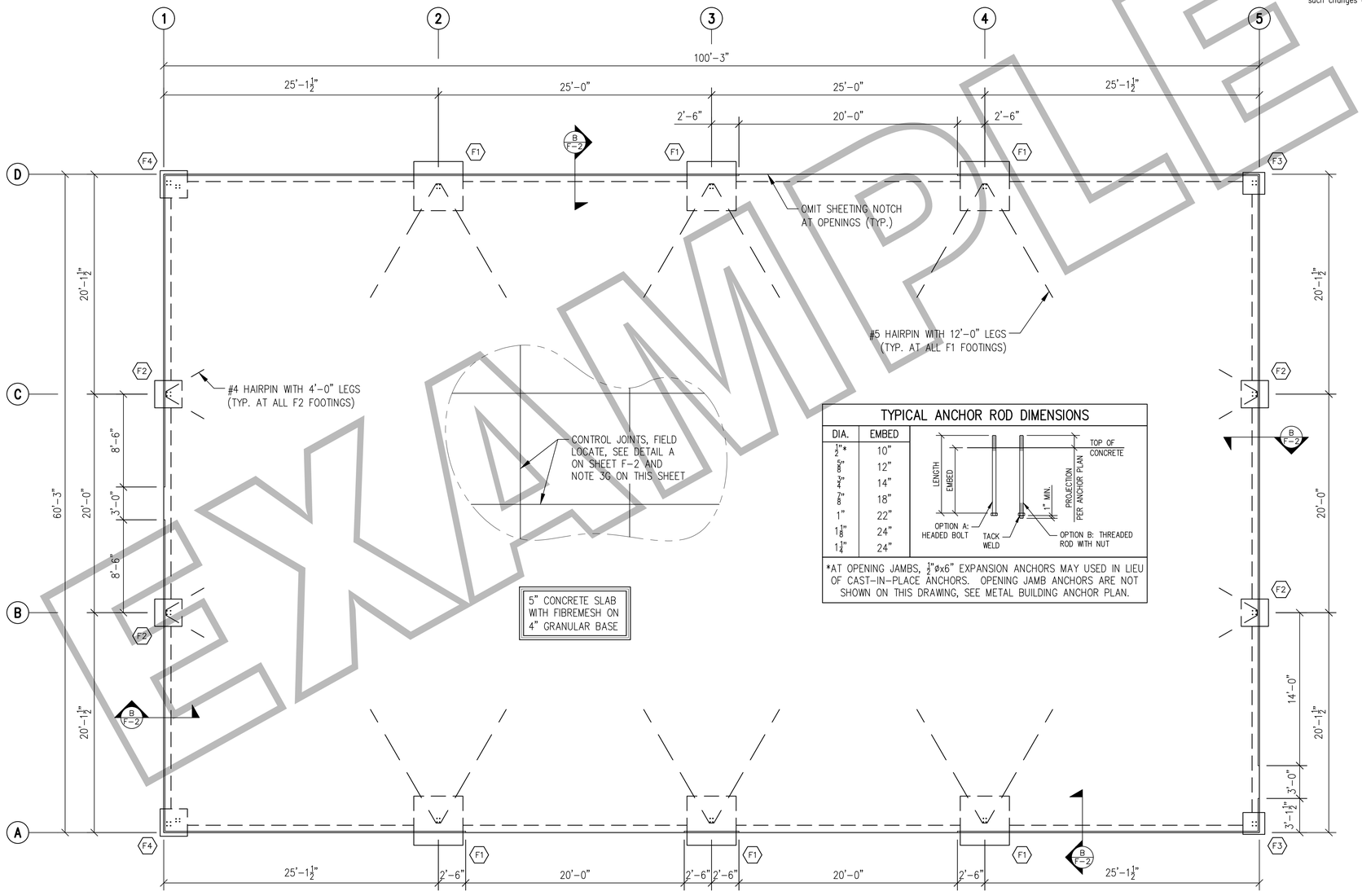
A. Material Standards
i. Concrete
a. Footings and foundation walls – f'c = 3000** p.s.i.
b. Slabs on grade – f'c = 3500 p.s.i.
** Concrete has been designed using f'c = 2500 p.s.i. Special Inspection not required unless noted otherwise, see Special Inspection Notes.
c. Normal weight aggregates – ASTM C33
ii. Cement
a. Use Type I/II cement as per ASTM C150
b. Air-entraining admixtures (where required) – ASTM C260
c. Calcium chloride shall not be used.
iii. Reinforcing
a. Rebar – ASTM A615 Grade 60 (Fy = 60 ksi)
b. Welded wire – ASTM A1064
c. Epoxy – Simpson SET-XP (ICC-ES ESR-2508) or Hilti HIT-RE 500-SD (ICC-ES ESR-2322)
iv. Anchor Rods/Bolts
a. Steel column anchor rods/bolts – ASTM F1554 Grade 36 with ASTM A563 heavy hex nuts and hardened washers
b. Adhesive (epoxy) anchors – Simpson SET-XP (ICC-ES ESR-2508) or Hilti HIT-RE 500-SD (ICC-ES ESR-2322)
c. Expansion anchors – Simpson Strong-Bolt (ICC-ES ESR-1771) or Hilti Kwik Bolt TZ (ICC-ES ESR-1917)
d. Use of hooked anchor rods/bolts is limited under the ACI and the IBC. Headed anchor rods/bolts must be used where indicated in the details.
e. The symbols ℄ A.R./℄ A.B. as shown in the drawings indicate the center line of the anchor rod/bolt pattern, not the center line of any individual anchor rod/bolt.
B. Detail reinforcing to comply with ACI 315 "Manual of Standard Practice for Detailing Reinforcing Concrete Structures" and the Concrete Reinforcing Steel Institute (CRSI) recommendations.
i. Minimum clear concrete cover for reinforcement shall be as follows unless noted otherwise:
a. Concrete cast directly against and permanently exposed to earth – 3"
b. Concrete exposed to weather or earth:
1. #5 bars or smaller – 1½"
2. #6 bars or larger – 2"
c. Concrete not exposed to weather or in contact with the ground – ¾"
d. Slabs on grade – as shown in details, ¼" min. from top of slabs not exposed to weather
ii. Lap Splice Lengths (unless noted otherwise)
a. f'c = 2500-3500 p.s.i.
1. #6 and smaller – 36 bar diameters
2. #7 and larger – 45 bar diameters
b. f'c = 4000 p.s.i. or greater
1. #6 and smaller – 29 bar diameters
2. #7 and larger – 36 bar diameters
c. Lap splice lengths may be decreased by 25% for slabs on grade and horizontal wall reinforcing.
d. Increase lap splice lengths by 50% where epoxy coated bars are used.
iii. Stagger splices in walls so that no two adjacent bars are spliced in the same location, unless shown otherwise.
iv. Make all bars continuous around corners or provide corner bars of equal size and spacing.
v. Vertical bars in walls, grade beams, and piers to terminate in footings with ACI standard hooks (12 bar diameters) to within 4" of the bottom of the footing unless noted otherwise.
vi. Horizontal wall reinforcing shall terminate at the ends of walls with a 90 degree hook plus a 6 bar diameter extension, unless shown otherwise.
vii. Horizontal wall reinforcing shall be continuous through construction and control joints.
viii. Splices in horizontal reinforcement shall be staggered. Splices in two curtains (where used) shall not occur in the same location.
ix. Use chairs or other support devices as required for proper clearance.
x. Rebar hairpins shall be centered in slabs and shall be wire tied to the slab reinforcing (if any). Rebar hairpins shall be continuous through walls and piers; lap splices in hairpins may only occur in the floor slab unless noted otherwise.
C. Control joints in slabs on grade are recommended to control cracking. See plans for control joint spacing and details.
D. Slabs and grade beams shall not have joints in a horizontal plane. All reinforcement shall be continuous through all construction joints.
E. Floor slab thickness and reinforcing shown in these drawings are adequate to support typical uniform loads only. Mountain View Engineering has not designed the slab for any specific concentrated forces such as those from vehicles, storage racks, or heavy equipment (unless noted otherwise).
F. Welding of rebar is not allowed unless specifically indicated in the drawings. All embedments, reinforcing, and dowels shall be securely tied to framework or to adjacent reinforcing prior to placement of the concrete. Tack welding of rebar joints in grade beams, walls, or cages is not allowed. Where welding of rebar is shown in the drawings, all rebar to be welded shall be ASTM A706 Grade 60.

4. Special Inspections

A. Concrete
i. Spot Footings – Not required (IBC 1704.4 Exception 1)
ii. Continuous Ftgs. – Not required (IBC 1704.4 Exception 2.3)
iii. Slabs – Not required (IBC 1704.4 Exception 3)
iv. Grade Beams – Not required (IBC 1704.4 Exception 4)
v. Walls – Not required (IBC 1704.4 Exception 4)
vi. Anchor rods/bolts – Required (IBC Table 1704.4) Special inspection may be waived subject to the approval of the building official.
B. Steel Reinforcement
i. Placement – Third party special inspection of reinforcing placement need only be performed where specifically required by the building official.
ii. Welding – Special inspection of rebar welding is required (if any is used).

5. Miscellaneous

A. The contractor shall notify engineer of any variations in dimensions.
B. The engineer is not responsible for any deviations from these plans unless such changes are authorized in writing by the engineer.



TYPICAL ANCHOR ROD DIMENSIONS

DIA.	EMBED
½"*	10"
⅝" & ¾" DIAS.	12"
	14"
	18"
1"	22"
1⅛"	24"
1¼"	24"

*AT OPENING JAMBS, ½"ø x 6" EXPANSION ANCHORS MAY USED IN LIEU OF CAST-IN-PLACE ANCHORS. OPENING JAMB ANCHORS ARE NOT SHOWN ON THIS DRAWING, SEE METAL BUILDING ANCHOR PLAN.

NOTE: COORDINATE THIS DRAWING WITH THE R & M STEEL ANCHOR BOLT PLAN.

F1 INDICATES APPLICABLE FOOTING DETAIL.

FOUNDATION PLAN

SCALE: 3/16"=1'-0"

EXAMPLE FOUNDATION PLAN

EXAMPLE

MOUNTAIN VIEW ENGINEERING, INC.
Structural Engineering Consulting Design
345 North Main Street Ste. A, Brigham City, Utah 84302 (435) 734-9700 Fax (435) 734-9519

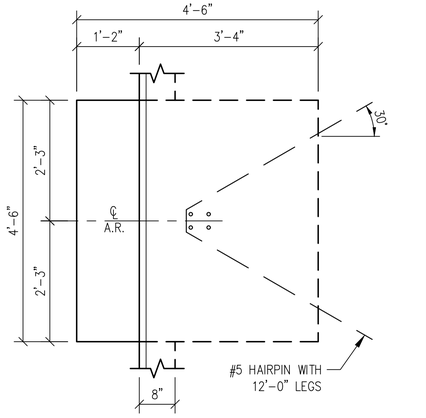
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JOB NAME: 60' x 100' x 16'
LOCATION:
CONTRACTOR:

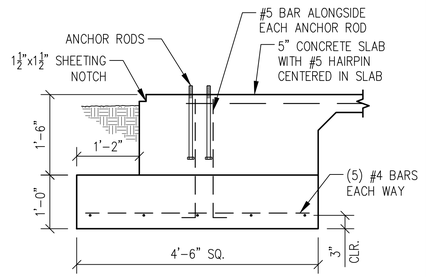
PLAN ISSUE DATES

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2			
3			
4			
5			

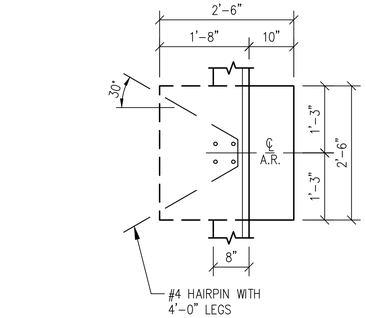
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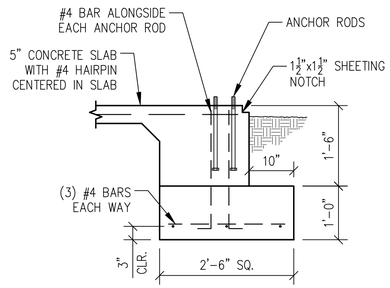
DRAWN BY:	
ENGINEER:	
MVE JOB NUMBER:	120000



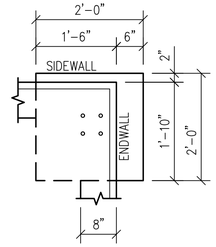


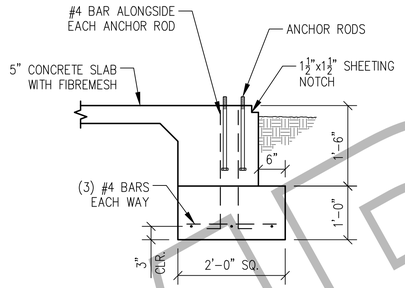
F1 SIDEWALL FOOTING DETAIL
3/4"=1'-0"



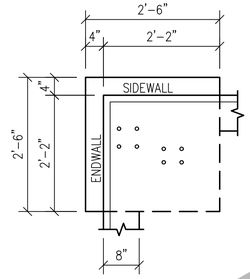


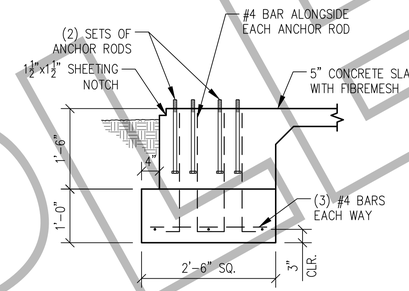
F2 ENDWALL FOOTING DETAIL
3/4"=1'-0"





F3 CORNER FOOTING DETAIL
3/4"=1'-0"



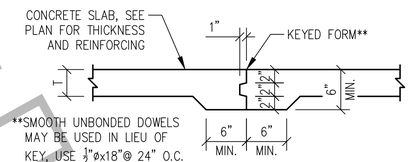


F4 CORNER FOOTING DETAIL
3/4"=1'-0"

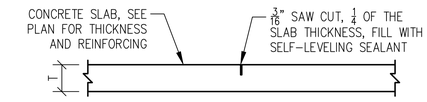
CONTROL JOINT NOTES:
1. Control joints shall be field located by the contractor.
2. Control joints shall be located to limit the frequency and width of random cracks in the concrete slab.
3. Locate and install control joints in accordance with ACI 360R "Design of Slabs on Ground" and the details shown.
4. Maximum spacing of joints shall be per the table below.
5. Saw cuts should be made as soon as possible after hardening.
6. Keyed form to be removed before adjacent slab is poured.

MAXIMUM SPACING OF CONTROL JOINTS

Slab thickness (T), in.	Slump 4 in. to 6 in.		Slump less than 4 in.
	Maximum-size aggregate less than 3/4 in.	Maximum-size aggregate 3/4 in. and larger	
4	8 ft.	10 ft.	12 ft.
5	10 ft.	13 ft.	15 ft.
6	12 ft.	15 ft.	18 ft.
7	14 ft.	18 ft.	21 ft.
8	16 ft.	20 ft.	24 ft.

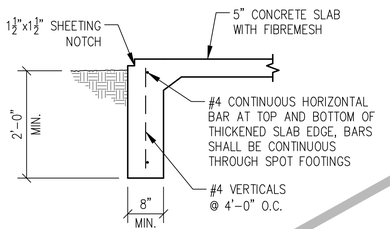


CONSTRUCTION JOINT



CONTROL JOINT

A CONTROL JOINTS
N.T.S.



B THICKENED SLAB EDGE DETAIL
3/4"=1'-0"

EXAMPLE FOUNDATION DETAILS, WILL VERY BASED ON LOCAL SNOW, WIND, & SEISMIC LOADS

EXAMPLE

MOUNTAIN VIEW ENGINEERING, INC.
Structural Engineering Consulting Design
345 North Main Street Ste. A, Brigham City, Utah 84302 (435) 734-9700 Fax (435) 734-9519

SHEET TITLE: FOUNDATION DETAILS
JOB NAME: 60' x 100' x 16'
LOCATION:
CONTRACTOR:

PLAN ISSUE DATES

	DATE:	BY:	DESCRIPTION:
1			

SHEET NUMBER: F-2

DRAWN BY:	
ENGINEER:	
MVE JOB NUMBER:	120000