GENERAL STRUCTURAL NOTES

1. APPLICABLE CODES:

A. These general notes apply to all structural drawings. This project is designed in accordance with the International Building Code (IBC), 2006 Edition, and the 'Minimum Design Loads for Buildings and Other Structures' (ASCE 7-05).

B. All material and workmanship shall be in accordance with applicable provisions of the codes specified above.

2. LOADS USED IN DESIGN:

A. Roof Live Load: Snow .... 70 psf
 (and/or drift provisions ASCE 7-02, section 7.7)
 Snow Load Importance Factor, I ... 1.0
 Snow Thermal Factor, Ct 1.0
 Snow Exposure Factor, Ce 1.0
 Roof Dead Load: .... 15 psf

B. Wind: Base Wind Speed, V3s .... 100 mph
 Exposure .... 'C'
 Wind Importance Factor, I 1.0
 Building Category:
 II - Other
 Internal Pressure Coefficient, GCpi .... ±0.18 psf

C. Seismic: Use Group:
 I - Other
 Spectral Response Coefficients:
 Ss .... 29.7% g
 S1 .... 7.5% g
 Soil Site Class .... D (Assumed)
 Seismic Design Category .... B
 Design base Shear, V .... 2.15 kips
 Seismic-Force-Resisting System .... Light framed walls sheathed with wood strutural panels rated for shear resistence
 Analysis Procedure: Equivalent Lateral Force Procedure

3. COORDINATION:

A. DO NOT SCALE. The layout shown is based solely on architectural plans and other written documentation by **BHH Partners**, for **Dillon Campus Addition Colorado Mountain College**, last dated **March 25, 2009**. Changes affecting the layout shown must be specific and clearly conveyed to **RMG Engineers Group** in written form as a change for inclusion into these plans. **Contractor and/or client shall verify all dimensions and layout prior to construction.** All dimensions on structural drawings shall be checked against architectural drawings and any discrepancies shall be brought to the attention of the Architect and Engineer immediately. Refer to mechanical, electrical and architectural drawings for openings not shown on structural drawings.

B. Shop drawings shall be prepared by the fabricator. Copying of these construction documents for use as shop drawings will not be permitted.

C. These construction documents were prepared with information about the existing building provided by others. Limited field measurements of the as-built buildings were taken by personnel of RMG Engineers on 3-05-09 and 3-11-09. If the contractor discovers existing conditions which vary from those shown on these documents he shall notify RMG Engineers immediately for guidance on necessary changes to be made.

D. All temporary shoring shall be the responsibility of the contractor.

E. Design is void after two years from original date of issue, unless updated to acceptable codes and practices at that time.

F. A preconstruction meeting with personnel of **RMG Engineers Group**, the architect, contractor and appropriate subcontractors is strongly recommended prior to construction to discuss structural plans.

4. CONCRETE:

A. Concrete has been designed and shall be constructed in accordance with the American Concrete Institute 'Building Code Requirement Reinforced Concrete' and 'Specifications for Structural Concrete for Buildings' (ACI 318 and ACI 301) latest editions. Section 1.3 'Inspection' of ACI 318 is deleted in its entirety, see 'Field Observations' paragraph. All concrete shall be of stone aggregate, unless noted otherwise.

B. Concrete mixes:

See specifications for any additional durability requirements.

Mix 'A' For interior slabs on grade:
4,000 psi minimum compressive strength at age of 28 days.
Type I/II Cement, minimum of 540 pounds per cubic yard.
Fly ash not allowed.
3/4" maximum aggregate size.
3% Maximum air.
4" (8" with superplasticizer) maximum slump.
Water reducing agent:
Use in accordance with manufacturer's recommendations.

Mix 'B' For footings, grade beams, and miscellaneous concrete:
3,000 psi minimum compressive strength at age of 28 days.
Type I/II Cement, minimum of 470 pounds per cubic yard.
3/4" maximum aggregate size.
6%± 1½% Entrained air.
4" (8" with superplasticizer) maximum slump.

C. Reinforcing is to be new billet steel ASTM A615, Grade-60, except ties and bars to be welded shall be Grade-40. Provide not less than (2) #5 around all sides of all openings in concrete and extend 2'-0" past edges of openings. No splices of reinforcement are permitted except as detailed or authorized by structural engineer. Where permitted, use contact lap splices, (36) bar diameters minimum. Welded Wire Fabric (WWF.) shall be in accordance with ASTM A185. Lap (1) full mesh minimum at splices. No welding of reinforcement permitted unless detailed.

D. Placing of Reinforcement: Provide chairs, bolsters, additional reinforcement, and accessories necessary to support reinforcement at position shown on drawings. Support of reinforcement on form ties, wood, brick, brickbat or other unacceptable material, will not be permitted.

E. Grout under base plates and bearing plates shall be non-shrink, non-metallic grout with a minimum compressive strength in 28 days of 7,500 psi.

F. Reinforcement shall be placed so that the following minimum concrete protection is provided, unless noted otherwise:
1) Concrete surfaces poured against ground ... 3" Clear
2) Formed surfaces exposed to ground or weather:
 a) Bars #6 and larger .... 2" Clear
 b) Bars # 5 and smaller .... 1 1/2" Clear
3) Slabs .... at center (u.n.o.)
4) Concrete not exposed to earth or weather .. 3/4"
5) Beams, Columns, Ties, Stirrups or spirals around primary reinforcement, or primary reinforcement with no ties, stirrups or spirals .... 1 1/2"

G. Foundation elements below grade shall have backfill placed equally on both sides until the required levels are reached. Walls shall be appropriately shored when backfill is placed on one side only.

H. Additional (2) #5 bars (one each face) with a 2'-0" projection shall be placed diagonally across the corners of all openings and vertical steps in walls unless otherwise detailed on plans.

I. The contractor is responsible for determining when it is safe to remove forms and/or shoring. Forms and shoring must not be removed until the walls are strong enough to carry their own weight and any anticipated superimposed loads. For foundation walls, this typically requires at least 12 hours of cumulative curing time at a temperature of 50°F or more. Concrete must be adequately covered during cold periods to maintain this surface temperature. Due to varying weather conditions, alternative curing processes, and the use of Type I/II cement, **RMG Engineers Group** suggests forms remain in place a minimum of 3 days to assure this performance specification has been met. When forms are stripped there must be no excessive deflection or distortion or discoloration and no evidence of damage to the concrete. Adequate thermal protection of the concrete shall be continued after stripping for a cumulative period of 48 hours at 50°F, or more, after the initial pour. See applicable notes for specifications on when to backfill foundation walls.

4. CONCRETE CONTINUED:

J. Field quality control:

1) Reference standard: ACI 301 Chapters 16 and 17, latest edition.

2) Slump tests: The general contractor shall provide necessary equipment and shall make test in conformity with ASTM C143. The contractor shall make slump tests on the first truck of each pour and as often as deemed necessary by the contractor to maintain the required slump tests when directed by the Architect or Engineer.

3) Control tests:

a. Control tests of concrete work shall be made on every 50 cubic yards or fraction thereof of concrete placed and, in any case, minimum of once during each day's pour.

b. Each test shall consist of four standard 6" test cylinders cast and cured in accordance with ASTM C31 and ASTM C172.

c. Sample concrete at point of placement.

d. One cylinder shall be broken at end of seven days after placing, two cylinders shall be broken at end of 28 days after placing, and remaining cylinder shall be stored until its disposition is determined by Architect.

e. In general, remaining cylinder will be broken only when previous test reports indicated unsatisfactory results.

f. Tests on remaining cylinder shall be at expense of the contractor.

g. Architect and/or Engineer reserves right to stop future concrete work when seven or 28 day tests indicate unsatisfactory results until, in the opinion of the Architect and/or the Engineer of Record, proper corrective measures have been taken to insure quality concrete in future work and corrections deemed necessary have been made.

h. Tests shall be made at time control tests are taken and so stated in reports to determine slump, air content, unit weight and temperature of concrete.

i. All tests shall be made in accordance with ASTM C138 or ASTM C231.

4) Slab tolerance: Maintain surface flatness with maximum variation of 1/8 inch in 20 feet.

5. SPREAD FOOTING FOUNDATIONS:

A. The foundation design has been completed in accordance with pertinent standards, recommended design soil parameters, accepted engineering design procedures, and is based on the best information available at the time of completion. The design is intended to minimize differential movement resulting from the heaving of expansive soil or settling of subsurface soils. It must be recognized that foundation components will undergo movement. It shall be the responsibility of the contractor and/or present owner to inform any subsequent owners of the soil condition and advised to maintain good practices in the future with regard to surface and subsurface drainage, framing of partitions above floor slabs, and finish work above the floor slabs, etc.

B. Foundation Design parameters include an asumed allowable bearing pressure of **1,500** psf with no minimum dead load requirement.

C. A representative of the Geotechnical engineer shall observe the open excavation to determine that the soil type and conditions are consistent with assumed values. If the soil properties are found to be different from this criteria, the foundation engineer shall be promptly notified so that the foundation design may be reviewed.

D. The 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.

E. Mechanically compact all interior and exterior backfill per Geotechnical engineers recommendations. It will also be necessary to adjust and maintain the grade immediately against foundations periodically to avoid the creation of a water trap as the backfill settles over time.

F. Slope backfill away from the building a minimum of 10% for the first 10 feet (2% at paved areas) unless a more stringent requirement is specified by the Geotchnical engineer. Carry roof drains across the backfilled areas. Do not allow water to stand or pond near the building. Do not flood the backfill.

G. Contact Geotechnical engineer for proper preparation of subgrade for placement of floor slabs.

H. Floor slabs have a high probability of moving vertically. Floor slabs shall be separated from all structural portions of building with an expansion joint of minimum 1/2" thick Styrofoam or other approved joint material. A gap in non-bearing partitions, and non-rigid construction of door jambs may be required by the Geotechnical engineer. If required, these items may also require reconstruction over the life of the structure to maintain the independent vertical movement of the floor slabs.

6. STRUCTURAL STEEL:

A. Structural steel, including cast in angles, plates or other sections shall be detailed and erected in accordance with the American Institute of Steel Construction (AISC) Specifications and Code of Standard Practice, latest edition.

B. All wide flange and channel structural steel shall conform to ASTM A992. All other structural shapes and miscellaneous steel shall conform to ASTM A36 unless otherwise noted. Tube steel columns shall conform to ASTM A500, Grade-B. Pipe columns shall conform to ASTM A53.

C. Shop connections shall be welded with E70xx electrodes and ground smooth where exposed. Field connections shall be made with bolts conforming to ASTM A325N unless otherwise noted. Field welds shall be made with E70xx electrodes. All welding shall be in accordance with AWS 'Structural Welding Code', latest edition and performed by certified, licensed welder.

D. All beam connections not detailed on the drawings shall be standard framed beam connections as shown in Table II and III of the AISC 'Manual of Steel Construction', latest edition, designed to carry the full capacity of the uniformly loaded member, unless noted otherwise.

E. Field Quality Control: Inspect in accordance with AISC specifications. Materials engineer shall be AWS certified and shall visually inspect all field welded connections (100%) and visually inspect all bolted connections (100%) to ascertain that all welds, bolts, nuts and required washers have been installed and are of proper type and that all facing surfaces have been brought into snug contact. Materials engineer shall inspect 10% of the bolts (minimum of 2) in each high strength bolted and slip critical (SC) connections. Provide 10% magnetic particle testing of all penetration welds and moment frame connections.

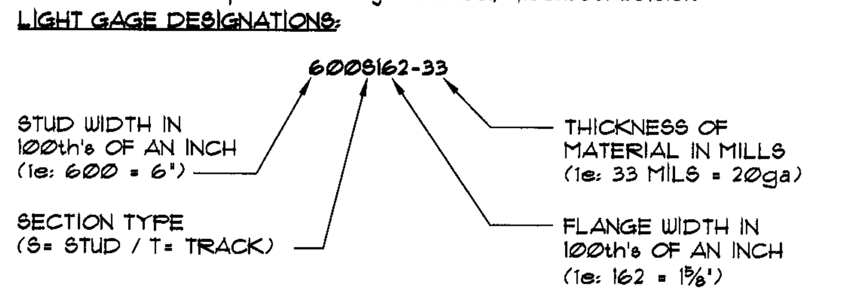
7. LIGHT GAGE STEEL:

A. Fabrication and erection shall be in accordance with the 'Light Gage Cold Formed Steel Design Manual', latest edition.

B. Light gage framing shall be 600 S 162-43 studs and joists, unless noted otherwise, formed from steel that corresponds to the requirements of ASTM A611, Grade-C minimum yield of 33,000 psi. Provide lateral stud bridging per manufacturer's recommendations.

C. All welding shall be in accordance with AWS 'Structural Welding Code', latest edition and performed by certified, licensed welder.

LIGHT GAGE DESIGNATIONS:



8. STEEL DECK:

A. Steel deck shall be erected in accordance with manufacturer's suggested specifications.

B. Deck panels are to be 36" wide and have a minimum length of (3) spans.

C. Weld deck to all supports as indicated on the structural drawings.

D. Form deck with nested side laps allowing self tapping screw connections.

E. Provide angle framing around openings larger than 10" per typical detail.

9. FIELD OBSERVATIONS:

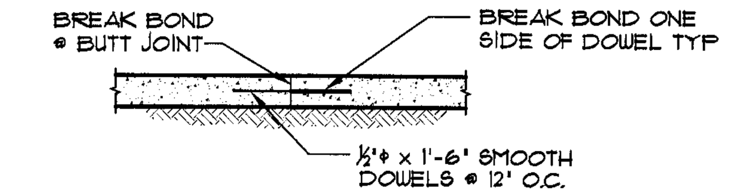
A. The Contractor shall inform the Engineer of Record at least 24 hours prior to casting any concrete so as to allow the Engineer of Record the opportunity to review the placement of reinforcing and/or embedded items. Contact **RMG Engineers Group**: (719) 548-0600.

FOUNDATION LEGEND

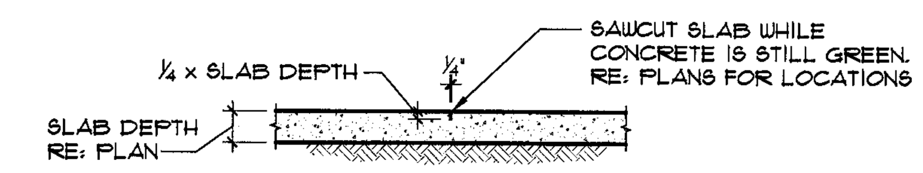
(symbol)	FOUNDATION WALL
(symbol)	CAST IN PLACE CONCRETE FOUNDATION WALL W/ SPREAD FOOTING
X / SX	DETAIL No. OR LETTER / SHEET DETAIL IS ON
(symbol)	NEW COLUMN PAD FOOTING
(A)	PAD DESIGNATION
CJ	CONTROL JOINT
Φ	DIAMETER
℄	CENTER LINE
PL	PLATE
A.B.	ANCHOR BOLT
CANT.	CANTILEVER
CONT.	CONTINUOUS
FDN.	FOUNDATION
F.F.	FINISH FLOOR
FTG.	FOOTING
HSS	HOLLOW STRUCTURAL SECTION
L.L.H.	LONG LEG HORIZONTAL
L.L.V.	LONG LEG VERTICAL
SIM.	SIMILAR
T.O.SLAB	TOP OF SLAB
(TYP)	TYPICAL
P/C	PRECAST / PRE STRESSED CONCRETE
T.O.C.	TOP OF CONCRETE
T.O. P/C	TOP OF PRECAST
T.O.F.	TOP OF FOOTING
U.N.O.	UNLESS NOTED OTHERWISE

STRUCTURAL LEGEND

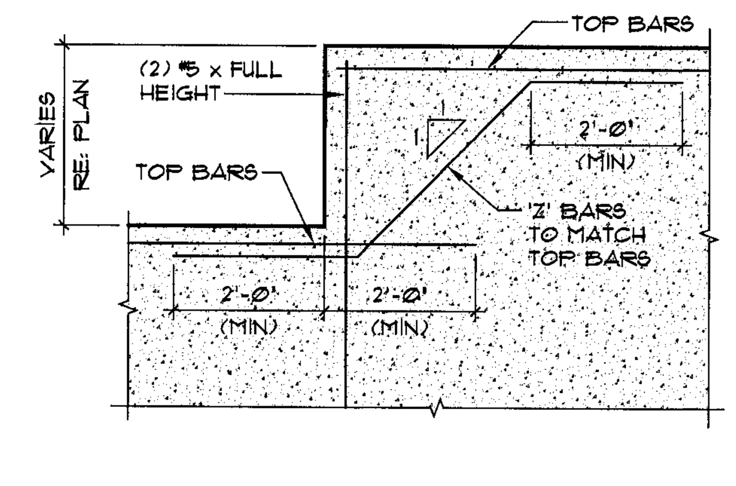
- / S-	DETAIL # OR LETTER / SHEET DETAIL IS ON
(1)	RE: PLAN NOTES
B1	BEAM/HDR SCHEDULE
S1	SHEAR WALL SCHEDULE
C1	COL/POST SCHEDULE
LA ■	SOLID BOX INDICATES LOAD FROM ABOVE (CONTINUE POST DOWN TO FOUNDATION BELOW)
LA □	OPEN BOX INDICATES LOAD FROM ABOVE (CARRIED BY BEAM OR HEADER BELOW)
(symbol)	JOIST/RAFTER SPAN
CANT	CANTILEVER JOIST
(symbol)	HANGER (RE: PLAN)
(symbol)	HEADER / BEAM
(symbol)	SHEAR WALL
(symbol)	BEARING WALL (INTERIOR)
(symbol)	JOIST/RAFTER SPAN (BEAR ON BEAM)
(symbol)	JOIST/RAFTER SPAN (FLUSH FRAME TO BEAM)



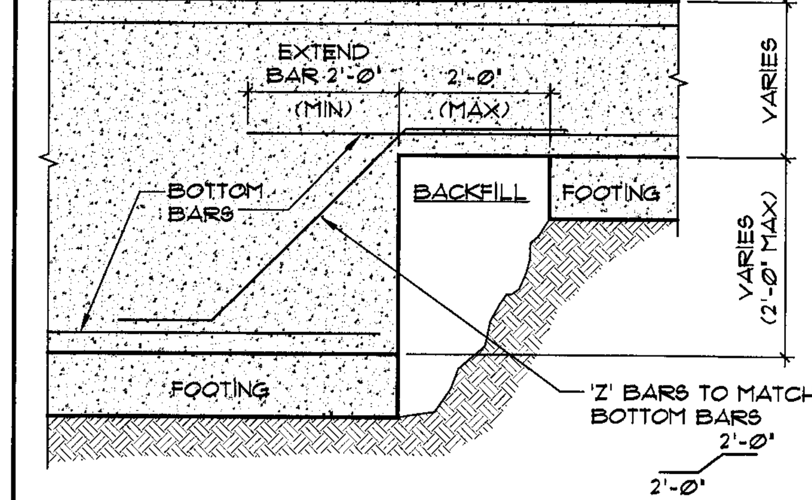
OPTIONAL SLAB CONSTRUCTION JOINT DETAIL



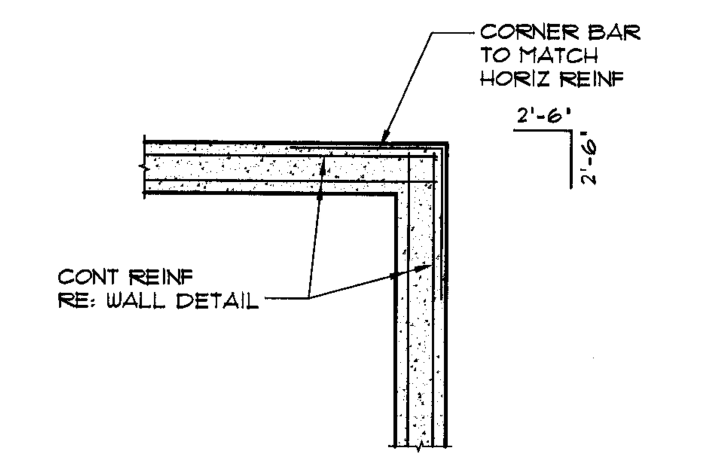
1/S2 TYPICAL SLAB CONSTRUCTION JOINT DETAIL
SCALE: 1/2" = 1'-0"



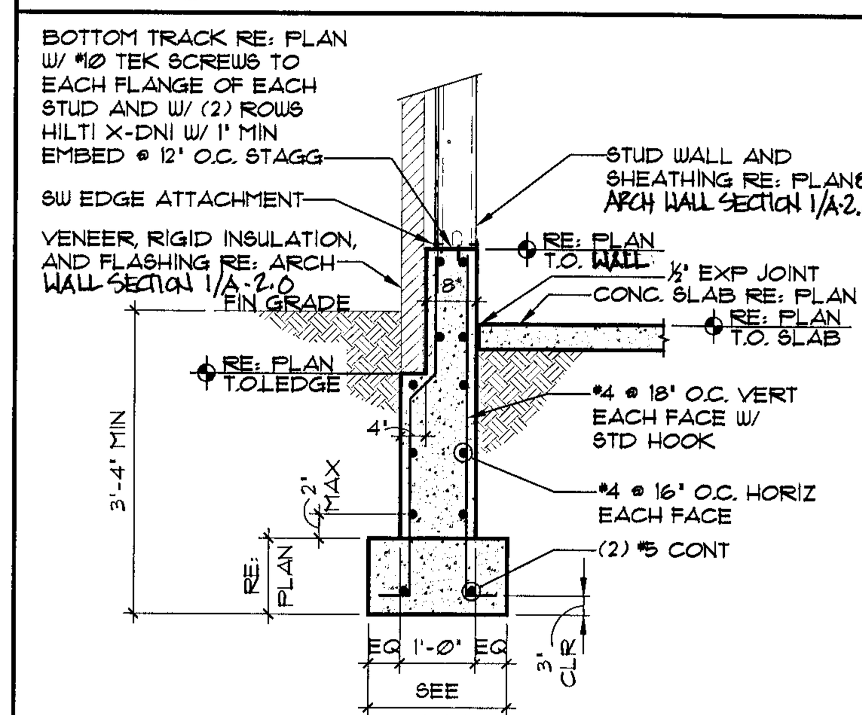
2/S2 TYPICAL TOP OF WALL STEP
SCALE: 1/2" = 1'-0"



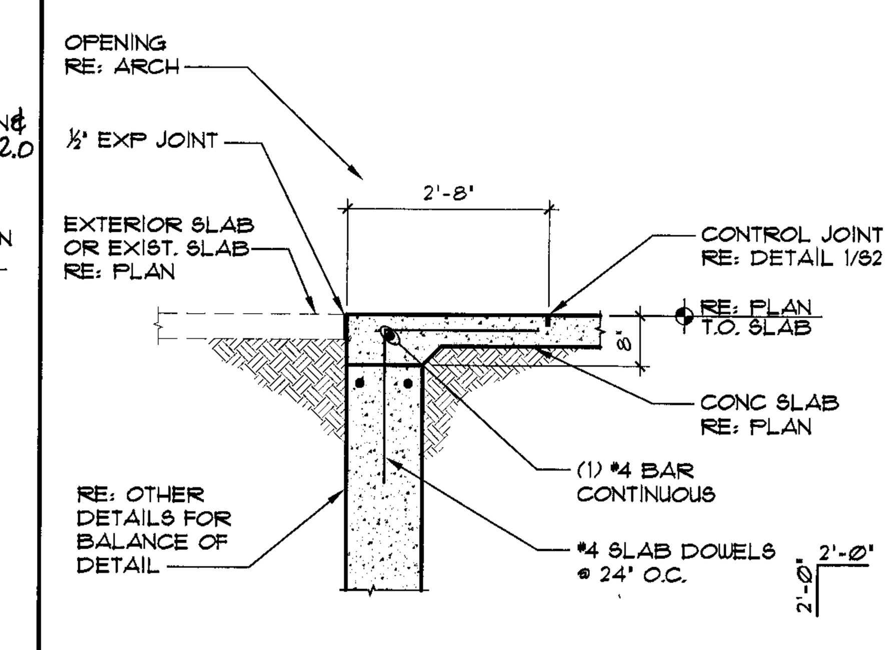
3/S2 TYPICAL BOTTOM OF WALL STEP
SCALE: 1/2" = 1'-0"



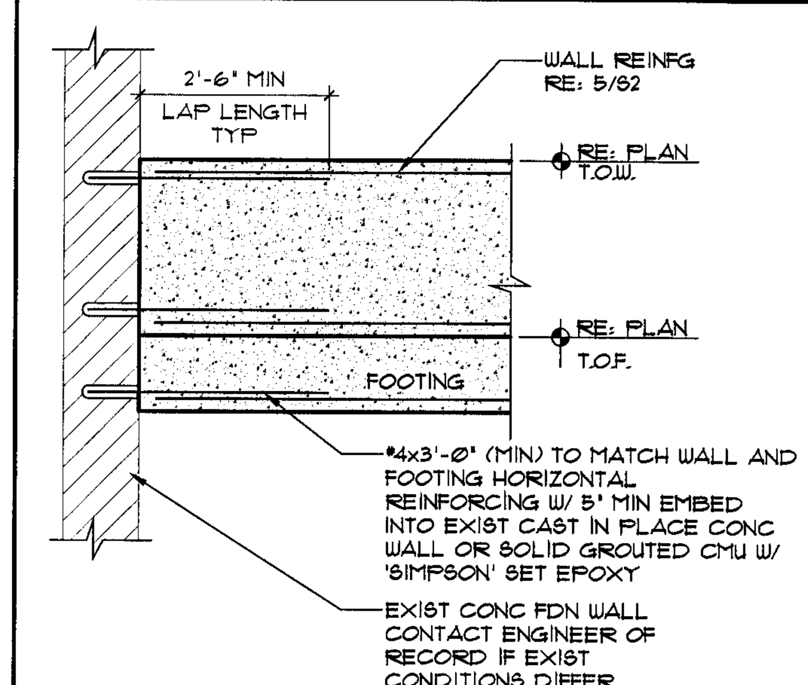
4/S2 TYPICAL CORNER WALL REINF'G DETAIL
SCALE: 1/2" = 1'-0"



5/S2 FOUNDATION DETAIL
SCALE: 1/2" = 1'-0"



6/S2 FOUNDATION DETAIL
SCALE: 1/2" = 1'-0"



7/S2 FOUNDATION DETAIL
SCALE: 1/2" = 1'-0"

Structural • Geotechnical
RMG ENGINEERS

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Summit County:
202 Main Street #22
Post Office Box 4038
Frisco, Colorado 80443
(970) 668-4530 Fx (970) 668-4589

ISSUED FOR CONSTRUCTION 10/9/09

DILLON CAMPUS ADDITION
333 FIEDLER AVE
DILLON, COLORADO
COLORADO MOUNTAIN COLLEGE

ENGINEER:	EJ
DRAWN BY:	CL/AR
CHECKED BY:	MW
PRINTING:	DATE:
CD	10-1-09
REVISION:	DATE:

GENERAL NOTES AND FOUNDATION DETAILS

SHEET No. S2 OF 3

JOB No. 122674

Site Spec/09/COLORADO MOUNTAIN COLLEGE