

|             | B      | 02 FEB 2012 | REVISE DAM LOCATION, ISSUED FOR APPROVAL |                | CIVIL • STRUCTURAL • ENGIN |
|-------------|--------|-------------|--|----------------|----------------------------|
|             |        | 13 DEC 2011 | ISSUED FOR APPROVAL                      |                | RIFLE, CO                  |
| WING NUMBER | NUMBER | DATE        | REVISION DESCRIPTION                     | ENGINEERS SEAL | 970–62                     |

#### <u>DESIGN CRITERIA</u>

APPROXIMATE SITE AMBIENT TEMPERATURE RANGE = 0° F. TO 88°F.. AVERAGE SITE ELEVATION AT BENCH = 7085 FT. ASL SNOW LOAD = 50 PSF (GARFIELD COUNTY.) WIND LOAD = 100 MPH, EXP. C (ASCE-05). SUBSURFACE SOILS & ROCK (SEE HP GEOTECH, INC. REPORTS). NO OVER-PRESSURE DESIGN (BLAST) INCLUDED.

#### REINFORCED CONCRETE NOTES 1. REINFORCED CONCRETE SHALL BE DESIGNED, MIXED AND PLACED IN

ACCORDANCE WITH THE LATEST EDITION OF THE ACI CODE AND APPLICABLE ASTM STANDARDS AS FOLLOWS.

ACI SP-15, ACI SP-19, ACI SP-21, ACI 211, 1, COMMITTEE 121, ACI 214, ACI 301, ACI 302, ACI 304, COMMITTEE 304, ACI 305, ACI 306, ACI 308, ACI 315, ACI 318, & ACI 347.

APPLICABLE ASTM STANDARDS: CEMENT: ASTM C 150. CONCRETE AGGREGATES: ASTM C 33 ADMISTURES: ASTM C 260 & C 494 CURING: ASTM C 171. & C-309 JOINT FILLER: ASTM D 944. & D 1751. REINFORCEMEN: ASTM A-185 & A 615.

DEFORMED BARS, WHICH CONFORM TO ASTM A615.

MIX DESIGN: ASTM C 94. TESTING: ASTM C 31, C 39, C 42, C 138, C 143, C 172, C 173, C 192, & C 231. 2. ALL REINFORCING BARS BEING PLACED BY THE CONTRACTOR, #4 OR LARGER, SHALL BE NEW GRADE 60 DEFORMED BARS. #3 SHALL BE GRADE 40

3. REINFORCING BARS SHALL NOT BE BENT OR STRAIGHTENED IN ANY MANNER WHICH WOULD BE INJURIOUS TO THE STEEL. BARS WITH KINKS OR BENDS NOT SHOWN ON THE BAR BENDING DIAGRAMS SHALL NOT BE PLACED. THE USE OF HEAT TO STRAIGHTEN OR BEND REINFORCING STEEL WILL NOT BE PERMITTED UNLESS SPECIFICALLY APPROVED BY THE ENGINEER.

4. CONCRETE FOR THE PROJECT SHALL BE AS FOLLOWS: TYPE I OR II CEMENT WITH A WATER/CEMENT RATIO (W/C) NOT TO EXCEED 0.45, AND A MINIMUM COMPRESSIVE STRENGTH AS FOLLOWS:

FOUNDATION ELEMENTS = 3,500 PSI ALL CONCRETE SHALL CONTAIN 5.0% (± 1.0%) ENTRAINED AIR AT THE POINT OF PLACEMENT. AIR ENTRAINING AGENT SHALL BE SHOWN IN THE DESIGN MIX. CONCRETE SHALL BE MIXED IN APPROVED TRANSIT MIXERS. MAXIMUM ELAPSED TIME FROM THE TIME THAT WATER IS ADDED TO THE MIX UNTIL THE CONCRETE IS DEPOSITED IN THE WORK SHALL NOT EXCEED 90 MINUTES. ONLY THOSE ADMIXTURES SPECIFIED IN THE CONTRACTORS MIX DESIGN SUBMITTAL SHALL BE USED. CONCRETE SHALL BE MIXED FOR NOT LESS THAN 70 NOR MORE THAN 100 REVOLUTIONS AT MIXING SPEED PRIOR PRIOR TO PLACEMENT. NOM. MAX. SLUMP SHALL NOT EXCEED 4". CONTRACTOR SHALL PROVIDE A MIX DESIGN FOR EACH CLASS OF CONCRETE FOR APPROVAL PRIOR TO BEGINNING WORK.

5. ENGINEER'S PRIOR APPROVAL MUST BE SECURED FOR ALL SUBSTITUTIONS.

6. UNLESS OTHERWISE NOTED, THE MINIMUM CLEAR DISTANCE BETWEEN THE FACE OF CONCRETE AND THE OUTSIDE OF THE REINFORCING BARS SHALL BE 1".

7. CONSTRUCTION JOINTS NOT SHOWN ON THE DRAWINGS SHALL BE LOCATED TO LEAST IMPAIR THE STRENGTH OF THE STRUCTURE AND THE LOCATION MUST BE APPROVED BY THE ENGINEER.

8. BEFORE ANY CONCRETE IS PLACED, APPLICABLE DRAWINGS SHALL BE CHECKED TO DETERMINE THAT ANCHOR BOLTS, EMBEDDED STEEL, PIPING, CONDUITS, GROUNDING WIRES, OPENINGS, ETC. ARE PROPERLY PLACED.

9. LATERAL SUPPORT SHALL BE PROVIDED FOR ALL WALLS DURING BACKFILLING AND CONSTRUCTION OPERATIONS.

10. FOR CATHODIC PROTECTION. ALL UNDERGROUND CONCRETE WITH EMBEDDED PIPING OR INSERTS WHICH ARE A PART OF THE PIPING SHALL HAVE A MINIMUM OF 1-1/2" CLEARANCE BETWEEN REBARS AND SUCH INSERTS. ANCHOR BOLTS SHALL BE SET WITH TEMPLATES.

11. U.N.O.. ANCHOR BOLT MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 OR ASTM A36. MATERIAL FOR ANCHOR BOLTS SHALL BE AS INDICATED ON A PARTICULAR DRAWING. IF NO MATERIAL IS SPECIFIED ASTM A-307 SHALL BE USED. ANCHOR BOLTS AND OTHER PROJECTING EMBEDMENTS SHALL BE SET WITH TEMPLATES OR OTHER APPROVED METHODS TO PREVENT DISPLACEMENT DURING CONCRETE PLACEMENT.

12. WELDING OF REINFORCING. PIPE SLEEVES. ETC. TO ANCHOR BOLTS WILL NOT BE PERMITTED UNLESS OUTLINED ELSEWHERE IN THESE NOTES.

13. ALL EXPOSED UNFORMED CONCRETE SURFACES SHALL BE OF UNIFORM FINISH AND COLOR. ALL FORMED SURFACES SHALL HAVE DEFECTS AND BLEMISHES PATCHED AND REPAIRED IN A WORKMAN LIKE MANNER. ALL EXPOSED EDGES AND CORNERS SHALL BE CHAMFERED 3/4" U.N. 14. WELDED PLAIN WIRE FABRIC FOR CONCRETE REINFORCEMENT SHALL

CONFORM TO ASTM A185. 15. SPLICES IN REINFORCING STEEL SHALL BE IN ACCORDANCE WITH

DETAILS SHOWN ON THE DRAWINGS OR IN ACCORDANCE WITH THE ACI DETAILING MANUAL (LATEST ED.). LOCATION OF SPLICES NOT SHOWN ON THE DRAWING SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER. MINIMUM LAP SPLICE LENGTHS FOR REINFORCING BARS SHALL BE IN ACCORDANCE WITH ACI SP-66 (88), ACI DETAILING MANUAL, TABLE 10 THRU TABLE 15, UNLESS OTHERWISE SHOWN ON THE DESIGN DRAWINGS.

16. BASE PLATES RESTING ON CONCRETE FOUNDATIONS SHALL RECEIVE A MIN. OF 1.5" STRUCTURAL NON-SHRINK GROUT UNLESS OTHERWISE NOTED ON THE DESIGN DRAWINGS. STRUCTURAL GROUT SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 5000 PSI AT 28 DAYS. ALL GROUT SHALL BE MASTER BUILDERS CO. OR APPROVED EQUAL.

17. IF NOTED ON THE DESIGN DRAWINGS, EPOXY FOR DOWELS AND ANCHOR BOLTS SHALL BE SIKADUR 31-HI MOD GEL OR AN APPROVED EQUAL.

## STRUCTURAL STEEL

1. DESIGN, FABRICATION, WORKMANSHIP, AND MATERIALS SHALL CONFORM TO THE LATEST EDITION OF THE AISC SPECIFICATION FOR DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS AND THE AISC CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES. ALL BOLTED CONNECTIONS SHALL BR IN ACCORDANCE WITH THE SPECIFICATIONS FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS.

2. ALL MATERIALS USED ON THIS PROJECT SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS UNLESS NOTED OTHERWISE ON THE DWG's.

| STRUCTURAL STEEL SHAPES    |
|----------------------------|
| HOLLOW STRUCTURAL SECTIONS |
| STEEL PLATE                |
| HIGH STRENGTH BOLTS        |
| HEAVY HEX NUTS             |
| HARDENED WASHERS           |
| ANCHOR BOLTS               |
| WELDING ELECTRODES         |
|                            |

ASTM A-992 ASTM A-500 GRD. B ASTM A-36 ASTM A-325 ASTM A-563 ASTM F-436 ASTM A-307 AWS E70XX

3. ALL FIELD CONNECTIONS, INCLUDING BRACING CONNECTIONS SHALL BE MADE WITH 3/4" DIAMETER A325-N HIGH STRENGTH BOLTS, UNLESS OTHERWISE NOTED. BOLT HOLES SHALL BE DRILLED OR PUNCHED, MANUAL FLAME-CUT HOLES ARE PROHIBITED. STANDARD FRAMED CONNECTIONS SHALL BE PROVIDED FOR CONNECTING BEAM TO BEAM AND BEAM TO COLUMN UNLESS NOTED OTHERWISE. FRAMED CONNECTIONS SHALL BE THE MAXIMUM LENGTH AS ALLOWED BY THE AISC SPECIFICATION NOTED. BOLTED CONNECTIONS SHALL BE BEARING TYPE WITH THREADS EXCLUDED FROM THE SHEAR PLANE UNLESS NOTED OTHERWISE. BOLTS FOR STAIR BRACING, HANDRAILS & KICK PLATES SHALL BE 5/8" DIAMETER A307. BOLTS FOR STAIR TREADS SHALL BE 5/8" DIAMETER A307. ALL BOLT HOLES SHALL BE 1/16" LARGER THAN THE BOLT DIAMETER UNLESS OTHERWISE NOTED.

4. GUSSETS AND STIFFENERS SHALL HAVE A MIN. THICKNESS OF 3/8" AND SHALL BE INSTALLED IN PAIRS UNLESS NOTED OTHERWISE.

5. ALL WELDS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF AWS. FLAME-CUT EDGES SHALL BE GROUND SMOOTH. REMOVE ALL BURRS. 6. ALL CONNECTIONS SHALL USE A MINIMUM OF TWO BOLTS OR SUFFICIENT WELD FOR A 10K LOAD U.N.O..

7. THE ENGINEER MUST APPROVE ANY SUBSTITUTIONS IN MATERIAL OR MEMBER SIZE.

8. FILLS SHALL BE INSTALLED AT ALL DOUBLE ANGLES. ANGLES SHALL BE INSTALLED WITH LONG LEG VERTICAL UNLESS NOTED OTHERWISE. 9. STRUCTURAL CONNECTIONS SHALL BE MADE SUCH THAT WORKING LINES OF STRUCTURAL MEMBERS INTERSECT AT LOCATIONS THAT WILL NOT PRODUCE ECCENTRICITY OR BENDING AT THE JOINT UNLESS SPECIFICALLY SHOWN OTHERWISE ON THE DESIGN DRAWINGS.

10. SINGLE LINES SHOWN ON STRUCTURAL DRAWINGS, PARTICULARLY FLOOR PLANS, INDICATE THE NEUTRAL AXIS OF THE DESIGNATED STRUCTURAL SHAPES, OR COMPOUND SECTIONS, OR THE BACKS OF CHANNELS UNLESS DETAILED

11. COATING OF STRUCTURAL STEEL SHALL BE AS FOLLOWS. SURFACE PREPARATION: SSPC-SP 6-63 COMMERCIAL BLAST CLEANING. PRIMER COAT: SHERWIN WILLIAMS MACROPOXY 646 OR EQ.. INTERMEDIATE COAT: N/A TOP COAT: SHERWIN WILLIAMS MACROPOXY 646 OR EQ, COLOR BY OWNER. APPLICATION: 4 MIL MIN., 6 MIL MAX. DFT. IN ACCORDANCE WITH

## <u>LIGHT GAGE\_NOTES.</u>

THE MANUFACTURERS INSTRUCTIONS.

1. WALL GIRTS SHALL BE MBCI C8x2.5 12 GAGE INSTALLED HORIZONTALLY AS SHOWN WITH GIRT CLIPS AT COLUMNS. FINISHED COATING SHALL MATCH WALL PANELS. GIRTS ARE EXPOSED ON THE INSIDE OF THE WALL.

2. WALL PANELS SHALL BE M.B.C.I. 36" PRB 26 GAGE SIGNATURE 200 WALL PANELS , COLOR TO BE SELECTED BY OWNER. PANELS SHALL BE INSTALLED VERTICALLY WITH A SELF-ADHEISIVE MASTIC WEATHER SEAL AT ALL JOINTS BOTH HORIZONTAL AND VERTICAL. FASTENERS SHALL BE COLOR MATCHED AND SPACED TO ACCOMMODATE WIND FORCE FORCE FROM ANY DIRECTION. A CONTINUOUS PRE-MOLDED CLOSURE STRIP SHALL BE INSTALLED AT THE TOP AND BOTTOM OF THE WALL PANELS BETWEEN THE WALL PANELS AND THE SUPPORTS. WALL PANELS ARE EXPOSED ON THE INSIDE OF THE WALL.

3. A 26 GAGE CONTINUOUS CAP FLASHING SHALL BE INSTALLED AT THE TOP OF THE WALL AS SHOWN. COLOR SHALL MATCH SIDING.

### <u>ROLLING STEEL DOOR NOTES:</u>

1. DOORS AT PORTALS SHALL BE ROLLING STEEL SERVICE DOORS AS MANUFACTURED BY OVERHEAD DOOR, SERIES 620, NON-INSULATED OR APPROVED EQUAL WITH THE FOLLOWING FEATURES.

2. DOORS, SLATS, AND ALL COMPONENTS SHALL BE DESIGNED FOR A MINIMUM WIND LOAD OF 20 PSF. DOOR CURTAIN SHALL BE PAINTED STEEL WITH COLOR TO BE SELECTED BY OWNER. HOOD SHALL BE GALVANIZED, MOUNTING SHALL BE TO FACE OF JAMB, OPERATION SHALL BE MANUAL CHAIN CRANK VIA REDUCED GEAR DRIVE, DOORS SHALL BE WEATHER SEALED ON SIDES AND BOTTOM, DOORS SHALL BE EQUIPPED WITH SLIDE BOLT LOCKS AND CHAIN KEEPERS.

3. THE DOOR ASSEMBLY SHALL BE SELF SUPPORTING AND SHALL TRANSFER LATERAL WIND LOADS TO THE STRUCTURAL STEEL COLUMNS ONLY AS SHOWN ON THE DRAWINGS.

4. DOOR SUPPLIER SHALL PROVIDE AND INSTALL THE DOORS IN ACCORDANCE WITH THE MANUFACTURERS DIRECTIONS, AND THESE DRAWINGS, INSTALLER SHALL CERTIFY OPERATION TO OWNER, AND PROVIDE A LIST OF CRITICAL SPARE PARTS.

### <u>AIR LOCK DOOR NOTES:</u>

1. DOORS AT AIR LOCKS SHALL BE INSULATED HOLLOW METAL WITH WEATHER SEALS AND THRESHOLDS. DOORS SHALL BE EQUIPPED WITH (3) PAIR OF HEAVY DUTY BALL BEARING HINGES, AND PANIC HARDWARE OPENING TO THE OUTSIDE OF THE GAS DAM. THE PANIC HARDWARE SHALL BE CAPABLE OF PASSAGE OR LOCKED CONDITIONS AGAINST ENTRANCE FROM THE OUTSIDE, AND INSURE UNOBSTRUCTED EXIT FROM THE INSIDE OF THE GAS DAM.

#### <u>ROCK ANCHORS</u>

1. ROCK ANCHORS FOR FOUNDATIONS SHALL BE INSTALLED AS SHOWN ON THE DRAWINGS, AND IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS.

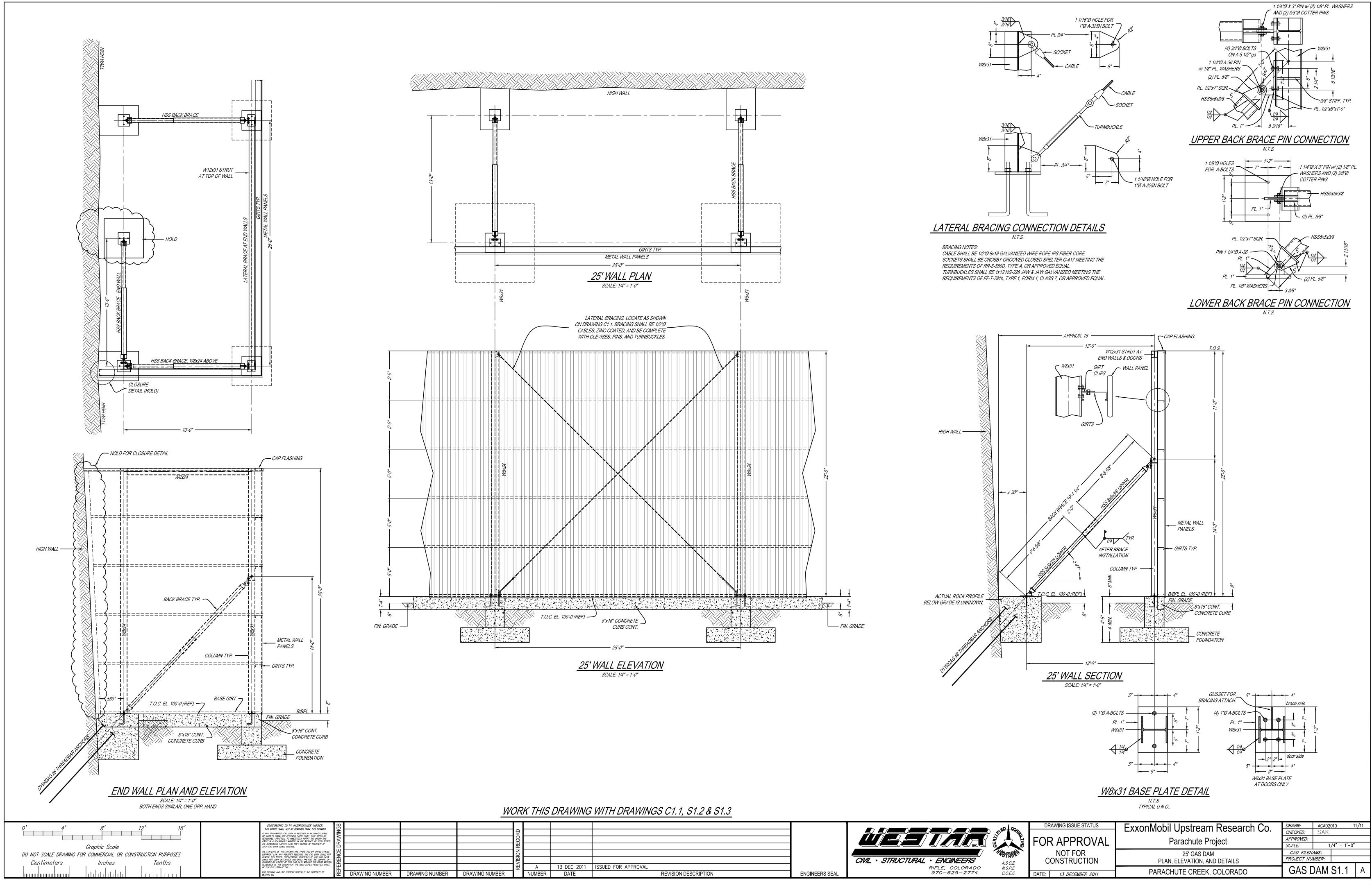
2. ROCK ANCHORS SHALL BE DYWIDAG THREADBAR #8, ASTM A-615 GRADE 75 RESIN BOLTS EQUIPPED WITH A BEARING PLATE, BEVELED WASHERS, AND HEX NUT, ALL AS MANUFACTURED BY DYWIDAG OR APPROVED EQUAL.

3. ROCK ANCHORS SHALL BE FULLY GROUTED TO THE SURFACE OF THE ROCK FORMATION, AND SHALL HAVE A MINIMUM EMBEDMENT OF AT LEAST 8'-0".

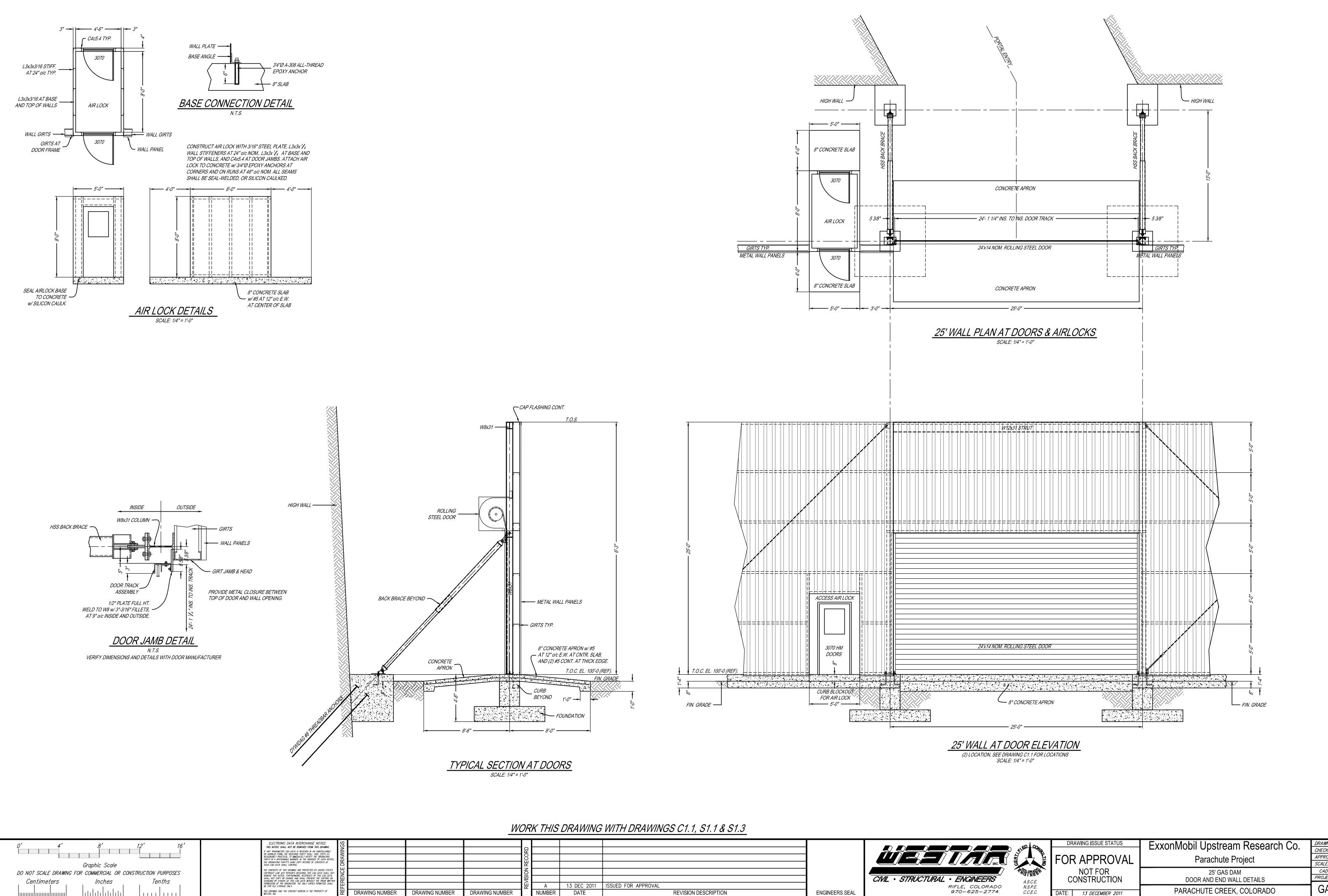
## WORK THIS DRAWING WITH DRAWINGS S1.1, S1.2 AND S1.3



DRAWING ISSUE STATUS ExxonMobil Upstream Research Co. RAWN: ACAD2010 CHECKED: SAK FOR APPROVAL APPROVED: Parachute Project CALE: 1" = 20' NOT FOR CAD FILENAME: GAS DAM CONSTRUCTION PROJECT NUMBER: SITE PLAN AND DETAILS GAS DAM C1.1 PARACHUTE CREEK, COLORADO C.C.E.C. DATE: 02 FEBRUARY 2012

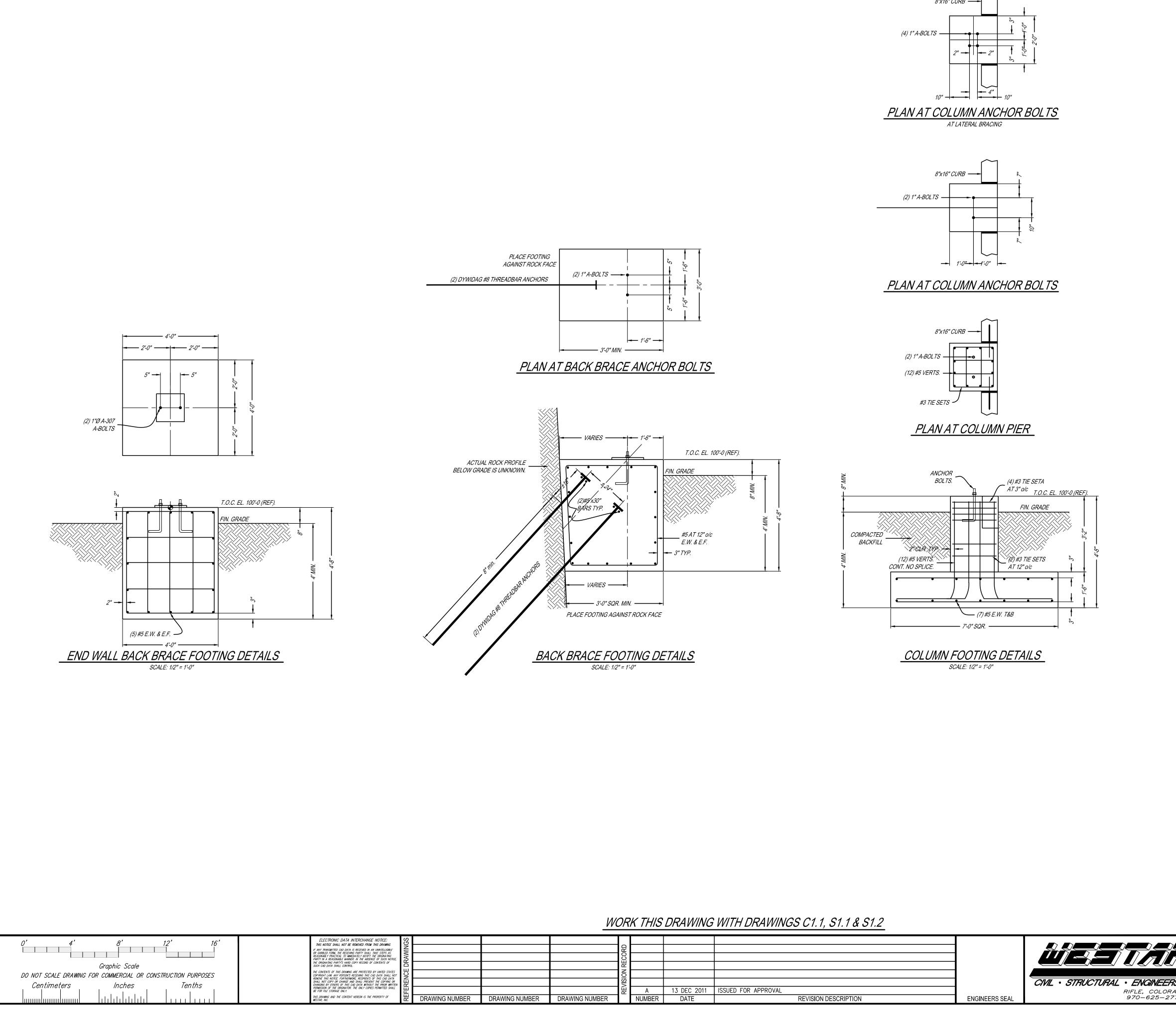


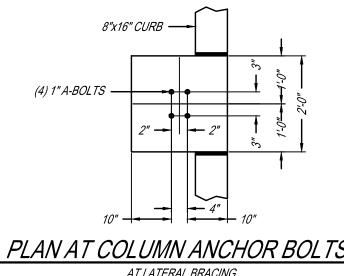
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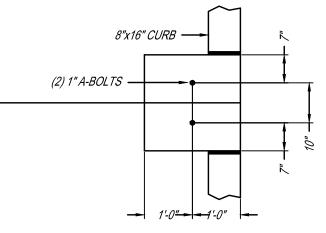


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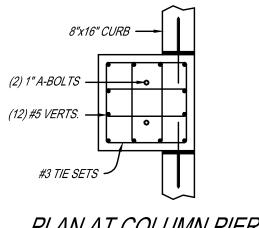
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| 774 <i>C.C.E.C.</i> |                                       | DATE: 13 DECEMBER 2011 | PARACHUTE CREEK, COLORADO                | GAS DAM S1.2  |            | A     |
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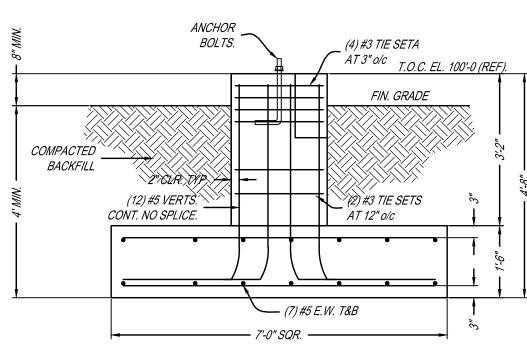


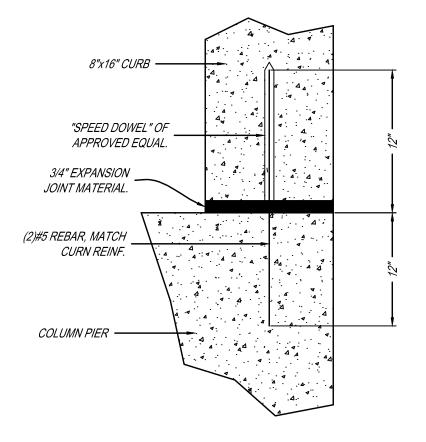




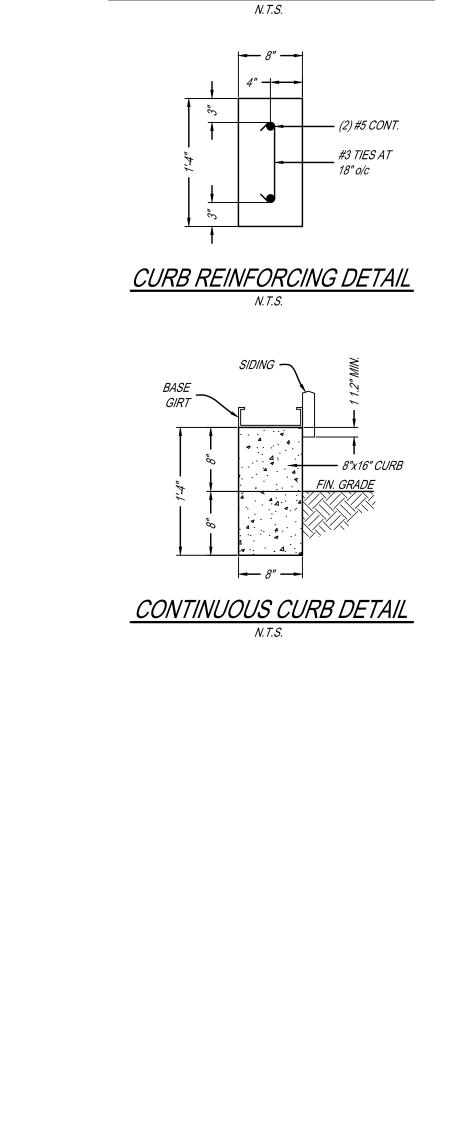


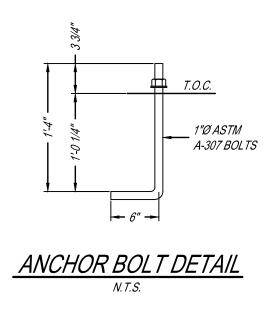






CURB EXPANSION JOINT DETAIL





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|    | C.E.C.              | DATE:                | PARACHUTE CREEK, COLORADO         | GAS L         | DAM S1.3     | A     |

ExxonMobil Global Services Company Colony Shale Oil Project P.O. Box 2567 Houston, Texas 77252-2567

# **E**xonMobil

May 2, 2012

Colorado Division of Reclamation Mining & Safety Grand Junction Office 101 South 3<sup>rd</sup> Street, Suite 301 Grand Junction, Colorado 81501

Attention: Travis Marshall

Re: Mined Land Reclamation Board Permit No. M-1980-047 Colony Shale Oil Project Technical Revision 16

Mr. Marshall:

Please see attached to satisfy your letter that was received, via email, April 30, 2012.

We appreciate your assistance with this matter. Should you have any general questions regarding this application, please contact me at 281-654-6246. In addition, technical questions may addressed to Roy Springfield at 713-431-7581. You may also email Roy at roy.l.springfield@exxonmobil.com.

Sincerely,

Jon Ladams

Tom L. Adams Colony Supervisor ExxonMobil Global Services Co. Acting for and on behalf of Exxon Mobil Corporation

attachments: DRMS letter Attachment D (replacement pages)

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