## SPLICE LENGTHS FOR REINFORCEMENT IN NORMAL WEIGHT CONCRETE[1]

### Per ACI 318-08

REINFORCING YIELD STRENGTH: 60 ksi
CONCRETE COMPRESSIVE STRENGTH: 3000 psi

| BAR SIZE | AREA ($in^2$) | DIA. (in) | MIN. CENTER TO CENTER BAR SPACING[4] NO. BAR DIA. (d) | MIN. CENTER TO CENTER BAR SPACING[4] (inches) | Bottom Bars MINIMUM EMBEDMENT LENGTH (in) | Bottom Bars CLASS "A" SPLICE LENGTH[2] (in) | Bottom Bars CLASS "B" SPLICE LENGTH[3] (in) | Top Bars[5] MINIMUM EMBEDMENT LENGTH (in) | Top Bars[5] CLASS "A" SPLICE LENGTH[2] (in) | Top Bars[5] CLASS "B" SPLICE LENGTH[3] (in) |
|---|---|---|---|---|---|---|---|---|---|---|
| #3 | 0.11 | 3/8 | 2 | 0 TO 3/4 | 24.65 | 25 | 33 | 32.04 | 33 | 42 |
| | | | 3 | 3/4 TO 1 1/8 | 16.43 | 17 | 22 | 21.36 | 22 | 28 |
| | | | 4 | 1 1/8 TO 1 1/2 | 12.32 | 13 | 17 | 16.02 | 17 | 21 |
| | | | 5 | 1 1/2 AND ABOVE | 12.00 | 12 | 16 | 12.82 | 13 | 17 |
| #4 | 0.20 | 1/2 | 2 | 0 TO 1 | 32.86 | 33 | 43 | 42.72 | 43 | 56 |
| | | | 3 | 1 TO 1 1/2 | 21.91 | 22 | 29 | 28.48 | 29 | 38 |
| | | | 4 | 1 1/2 TO 2 1/2 | 16.43 | 17 | 22 | 21.36 | 22 | 28 |
| | | | 5 | 2 1/2 AND ABOVE | 13.15 | 14 | 18 | 17.09 | 18 | 23 |
| #5 | 0.31 | 5/8 | 2 | 0 TO 1 1/4 | 41.08 | 42 | 54 | 53.40 | 54 | 70 |
| | | | 3 | 1 1/4 TO 1 7/8 | 27.39 | 28 | 36 | 35.60 | 36 | 47 |
| | | | 4 | 1 7/8 TO 3 1/8 | 20.54 | 21 | 27 | 26.70 | 27 | 35 |
| | | | 5 | 3 1/8 AND ABOVE | 16.43 | 17 | 22 | 21.36 | 22 | 28 |
| #6 | 0.44 | 3/4 | 2 | 0 TO 1 1/2 | 49.30 | 50 | 65 | 64.08 | 65 | 84 |
| | | | 3 | 1 1/2 TO 2 1/4 | 32.86 | 33 | 43 | 42.72 | 43 | 56 |
| | | | 4 | 2 1/4 TO 3 3/4 | 24.65 | 25 | 33 | 32.04 | 33 | 42 |
| | | | 5 | 3 3/4 AND ABOVE | 19.72 | 20 | 26 | 25.63 | 26 | 34 |
| #7 | 0.60 | 7/8 | 2 | 0 TO 1 3/4 | 71.89 | 72 | 94 | 93.46 | 94 | 122 |
| | | | 3 | 1 3/4 TO 2 5/8 | 47.93 | 48 | 63 | 62.30 | 63 | 81 |
| | | | 4 | 2 5/8 TO 4 3/8 | 35.94 | 36 | 47 | 46.73 | 47 | 61 |
| | | | 5 | 4 3/8 AND ABOVE | 28.76 | 29 | 38 | 37.38 | 38 | 49 |
| #8 | 0.79 | 1 | 2 | 0 TO 2 | 82.16 | 83 | 107 | 106.81 | 107 | 139 |
| | | | 3 | 2 TO 3 | 54.77 | 55 | 72 | 71.20 | 72 | 93 |
| | | | 4 | 3 TO 5 | 41.08 | 42 | 54 | 53.40 | 54 | 70 |
| | | | 5 | 5 AND ABOVE | 32.86 | 33 | 43 | 42.72 | 43 | 56 |
| #9 | 1.00 | 1.13 | 2 | 0.00 TO 2.26 | 92.67 | 93 | 121 | 120.48 | 121 | 157 |
| | | | 3 | 2.26 TO 3.38 | 61.78 | 62 | 81 | 80.32 | 81 | 105 |
| | | | 4 | 3.38 TO 5.64 | 46.34 | 47 | 61 | 60.24 | 61 | 79 |
| | | | 5 | 5.64 AND ABOVE | 37.07 | 38 | 49 | 48.19 | 49 | 63 |
| #10 | 1.27 | 1.27 | 2 | 0.00 TO 2.54 | 104.34 | 105 | 136 | 135.64 | 136 | 177 |
| | | | 3 | 2.54 TO 3.81 | 69.56 | 70 | 91 | 90.43 | 91 | 118 |
| | | | 4 | 3.81 TO 6.35 | 52.17 | 53 | 68 | 67.82 | 68 | 89 |
| | | | 5 | 6.35 AND ABOVE | 41.74 | 42 | 55 | 54.26 | 55 | 71 |
| #11 | 1.56 | 1.41 | 2 | 0.00 TO 2.82 | 115.84 | 116 | 151 | 150.60 | 151 | 196 |
| | | | 3 | 2.82 TO 4.23 | 77.23 | 78 | 101 | 100.40 | 101 | 131 |
| | | | 4 | 4.23 TO 7.05 | 57.92 | 58 | 76 | 75.30 | 76 | 98 |
| | | | 5 | 7.05 AND ABOVE | 46.34 | 47 | 61 | 60.24 | 61 | 79 |

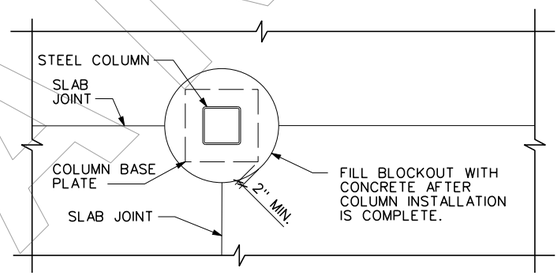
## TABLE 'A' NOTES

1. TABLE A PRESENTS LENGTHS OF TENSION DEVELOPMENT LENGTHS AND TENSION LAP SPLICE LENGTHS BASED ON ACI 318-05, SECTION 12.2.2.
2. CLASS A LAP LENGTHS APPLY WHEN BAR LAPS ARE STAGGERED TO LAP HALF THE BARS AT THE SAME LOCATION OR WHEN BARS ARE LAPPED AT A LOCATION WHERE THE REINFORCEMENT AREA PROVIDED IS AT LEAST TWICE THAT REQUIRED.
3. CLASS B LAP LENGTHS APPLY WHEN ALL BARS ARE SPLICED AT A LOCATION OF MAXIMUM STRESS IN THE BARS.
4. MIN. CONC. COVER MEASURED FROM THE BAR CENTER SHALL BE AT LEAST ½ THE MIN. CENTER TO CENTER BAR SPACING.
5. TOP BARS ARE HORIZONTAL REINFORCEMENT PLACED SO THAT MORE THAN 12" OF CONCRETE IS CAST BELOW THE REINFORCEMENT.
6. MULTIPLY LENGTHS SHOWN BY 1.3 FOR LIGHTWEIGHT AGGREGATE CONCRETE.
7. MULTIPLY LENGTHS SHOWN BY 1.5 (1.3 FOR TOP BARS) FOR EPOXY COATED BARS W/ COVER LESS THAN 3d OR CLEAR SPACING LESS THAN 6d. ALL OTHER EPOXY COATED BARS SHALL BE MULTIPLIED BY 1.2.
8. FOR 4500 PSI CONCRETE MULTIPLY VALUES IN TABLE 'A' BY 0.816. BOTTOM BARS SHALL NOT HAVE AN EMBEDMENT LENGTH, CLASS "A" SPLICE LENGTH, AND CLASS "B" SPLICE LENGTH OF LESS THAN 12".

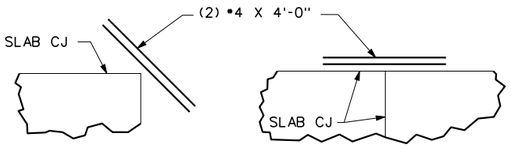
A S-001 TABLE A

## CONCRETE AND FOUNDATION NOTES

1. ALLOWABLE SOIL BEARING PRESSURE (NET) IS 2.0 KSF. SUBGRADE SOIL PREPARATION SHALL CONSIST OF REMOVING EXISTING SOIL MATERIALS FOR THE ENTIRE FOOTPRINT OF THE BUILDING AND FOR A DISTANCE OF 5'-0" OUTSIDE OF THE EDGE OF THE BUILDING EXTERIOR FOOTINGS FOR A DEPTH OF [ '- "] BELOW THE BOTTOM OF FOOTINGS. BACKFILL EXCAVATION WITH AN APPROVED NON-EXPANSIVE FILL MATERIAL COMPACTED AS SPECIFIED IN SECTION 31 00 00 - "EARTHWORK".
2. SUB GRADE PREPARATION FOR STRUCTURAL SLABS ON GROUND, THOSE SLABS ADDRESSED IN STRUCTURAL DRAWINGS, SHALL BE PER <<J/S-002>>, UNO.
3. CONCRETE USED FOR INTERIOR SLABS SHALL HAVE A SPECIFIED MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS. CONCRETE FOR ALL OTHER PURPOSES SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4,500 PSI AT 28 DAYS, UNO.
4. CONCRETE REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF ASTM A615, GRADE 60. REINFORCING TO BE WELDED SHALL CONFORM TO THE REQUIREMENTS OF ASTM A706, GRADE 60. UNLESS NOTED OTHERWISE.
5. UNLESS OTHERWISE NOTED, LAP SPLICES OR EMBEDMENT LENGTHS SHALL CONFORM TO TABLE <<A/S-001>>.
6. UNLESS NOTED OTHERWISE, CONCRETE COVER OVER STEEL REINF SHALL CONFORM TO THE MINIMUMS REQUIRED BY ACI 318-08.
7. FABRICATION OF REINFORCING STEEL SHALL BE IN ACCORDANCE WITH THE DETAILS OF ACI 315-99, "DETAILING OF CONCRETE REINFORCEMENT".
8. ALL SLAB REENTRANT CORNERS SHALL HAVE (2)-#4 X 4'-0" BAR AT 45° TO THE CORNER, UNLESS THERE IS A JOINT COMING OFF THE REENTRANT CORNER.
9. FLOOR SLAB JOINTS SHALL BE CONSTRUCTION OR CONTRACTION JOINTS. JOINTS SHALL BE LOCATED AS SHOWN ON THE FOUNDATION PLANS. FOR CONSTRUCTION AND CONTRACTION JOINT DETAILS SEE <<C/S-002>>.
10. CORNER BARS SHAL BE PROVIDED AT ALL CORNERS AND INTERSECTIONS OF CONCRETE BEAMS, GRADE BEAMS, WALLS, AND STEM WALLS. SEE <<F/S-002>>.
11. ALL SLAB EDGES SHALL BE CHAMFERED ¾" ON EXPOSED CORNERS UNLESS NOTED OTHERWISE.
12. FLOOR SLAB ON GROUND TOP MAT REINFORCING SHALL BE LOCATED 1½" CLEAR FROM TOP OF SLABS AND 3" CLEAR FROM BTM. OF THE SLAB FOR A BTM. MAT IF APPLICABLE UNLESS NOTED OTHERWISE. IF ONLY ONE MAT OF STEEL IS REQUIRED THEN IT SHALL BE CONSIDERED A TOP MAT.
13. FOR TYPICAL CONCRETE SLAB OR WALL OPENING REINFORCING SEE <<D/S-001>>.
14. FOR TYPICAL INTERIOR EQUIPMENT PAD, SEE <<A/S-002>>.
15. FOR TYPICAL EXTERIOR EQUIPMENT PAD, SEE <<B/S-002>>.
16. FOR TYPICAL REINF. AT CONC. SLAB BLOCKOUT FOR STEEL COLUMN, SEE <<B/S-001>>.
17. FOR TYPICAL RECESSED SLAB DETAIL SEE <<G/S-002>>.
18. FOR TYPICAL OUTSIDE STOOP DETAIL SEE <<H/S-002>> AND ARCH. FLOOR PLANS FOR LOCATIONS AND SIZES.



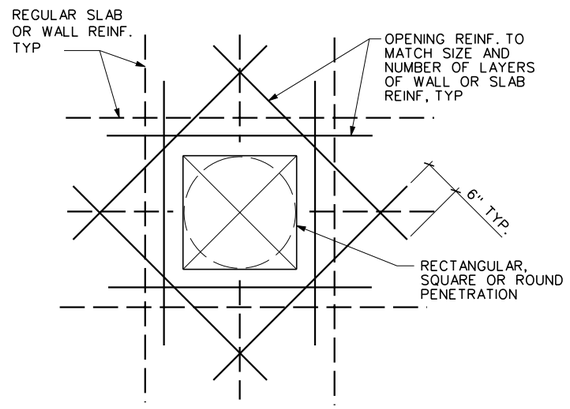

B S-001 TYPICAL AT COLUMN BLOCK OUT IN CONCRETE SLAB
SCALE: NOT TO SCALE




C S-001 TYPICAL REINFORCING AT DISCONTINUOUS CJ'S
SCALE: NOT TO SCALE

## GENERAL STRUCTURAL NOTES

1. DESIGN LOADS (UFC 3-301-01, 27JAN 2010, W/ CHANGE 2 31 JAN 2011, UNO):
   a. COLLATERAL ROOF DEAD LOAD (PEMB): 10 psf.
   b. ROOF LIVE LOAD:----------20 psf.
      FLOOR LIVE LOAD:----------___psf.
   c. WIND LOADS----------ASCE 7-05.
      BASIC WIND SPEED OF __ MPH, EXPOSURE "_".
   d. SEISMIC: USACE UFC 3-310-04-21 JUN 2007 W/CHANGE 1 JAN 27, 2010
      SEISMIC IMPORTANCE FACTOR: __.
      OCCUPANCY CATEGORY: ___.
      MAPPED SPECTRAL RESPONSE ACCELERATIONS:
      $S_S$: __.
      $S_1$: __.
      SITE CLASSIFICATION: __.
      SPECTRAL RESPONSE COEFFICIENTS:
      $S_{DS}$: __.
      $S_{D1}$: __.
      SEISMIC DESIGN CATEGORY: __.
      BASIC SEISMIC-FORCE RESISTING SYSTEM(S): __.
      DESIGN BASE SHEAR: __.
      SEISMIC RESPONSE COEFFICIENT(S): __.
      RESPONSE MODIFICATION FACTOR(S): __.
      ANALYSIS PROCEDURE: EQUIVALENT LATERAL FORCE.
2. ALL PROPRIETARY SYSTEMS OR ACCESSORIES DESIGNATED IN THESE PLANS AS "OR EQUAL" MAY BE SUBSTITUTED WITH ANOTHER SYSTEM THAT HAS LOAD CAPACITY GREATER THAN OR EQUAL, AND DEFLECTION LESS THAN OR EQUAL TO THE SYSTEM DESIGNATED. APPROVAL SHALL BE REQUESTED FOR ANY SUBSTITUTIONS BY THE ENGINEER OF RECORD THROUGH AN RFI. THE CONTRACTOR SHALL BE HELD FINANCIALLY RESPONSIBLE FOR THE REPLACEMENT OF UNAPPROVED SUBSTITUTIONS WHICH ARE NOT EQUIVALENT TO THE DESIGNATED SYSTEM OR ACCESSORY.
3. ALL PROPRIETARY SYSTEMS AND ACCESSORIES SHALL BE INSTALLED WITH STRICT ADHERENCE TO MANUFACTURERS INSTRUCTIONS AND RECOMMENDATIONS.
4. SEE <<S-007>> FOR ABBREVIATIONS USED ON THE STRUCTURAL SHEETS.
5. ALL NOTES, SCHEDULES, SECTIONS, AND DETAILS ON SHEETS <<S-001>> THRU <<S-007>> SHALL APPLY, UNO.




D S-001 TYPICAL REINFORCING AT OPENING IN CONCRETE SLAB OR WALL
SCALE: NOT TO SCALE

EDITOR'S NOTE:
FOUNDATION AND GENERAL STRUCTURAL NOTES. EDITED JAN 18, 2012.

US Army Corps of Engineers
Albuquerque District

| Mark | Description | Date | Appr. |
|---|---|---|---|
| | | | |

File Name: xxxxs-001.dgn
Plot Scale: 1
Plot Date: FEBRUARY 2011
SOL/CONTRACT NO.
PROJECT NO.
Zero Accidents
Zero Tolerance

DESIGN BY: S. BUCKEL
DRAWN BY: J. ROLL
REVIEWED BY: S. BUCKEL

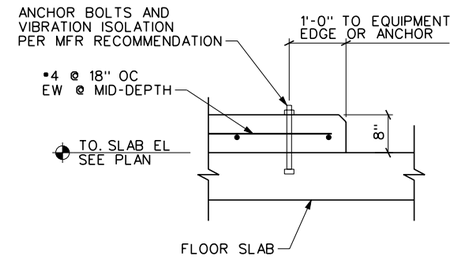
U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS ALBUQUERQUE, NEW MEXICO
CHIEF, FACILITIES DESIGN SECTION
DATE:

CUSTOMER NAME LOCATION OF PROJECT
PROJECT NAME
XXXXXX

FOUNDATION AND GENERAL STRUCTURAL NOTES

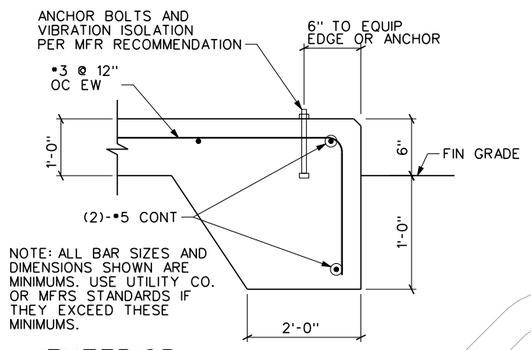
SHEET NO. S-001
1 OF X

SEQUENCE NO. X



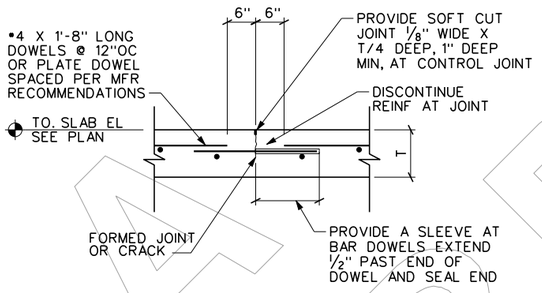

NOTE: EXACT SIZE OF EQUIPMENT PAD IS PER MFR RECOMMENDATIONS

## A INTERIOR EQUIPMENT PAD DETAIL
A / S-002 — SCALE: NOT TO SCALE



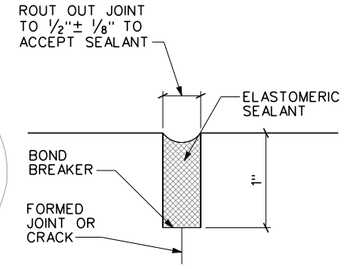

NOTE: ALL BAR SIZES AND DIMENSIONS SHOWN ARE MINIMUMS. USE UTILITY CO. OR MFRS STANDARDS IF THEY EXCEED THESE MINIMUMS.

## B EXTERIOR EQUIPMENT PAD DETAIL
B / S-002 — SCALE: NOT TO SCALE

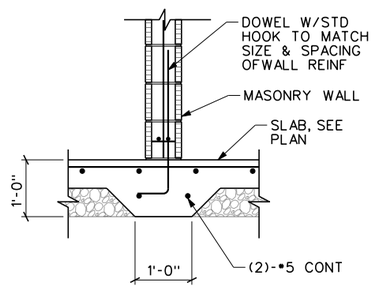



NOTE: ALL JOINTS IN EXPOSED SLABS ARE TO BE SEALED PER <<D/S-002>>.

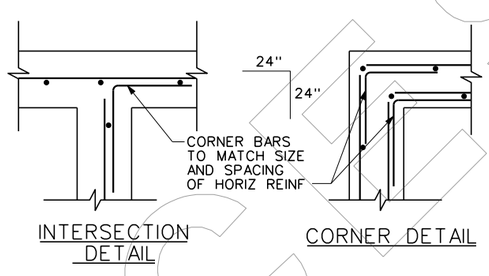
## C SLAB ON GROUND CONTRACTION OR CONSTRUCTION JOINT DETAIL
C / S-002 — SCALE: NOT TO SCALE



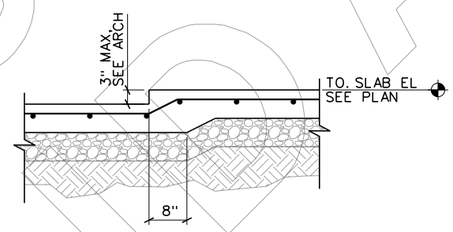

## D JOINT SEALANT DETAIL
D / S-002 — SCALE: NOT TO SCALE



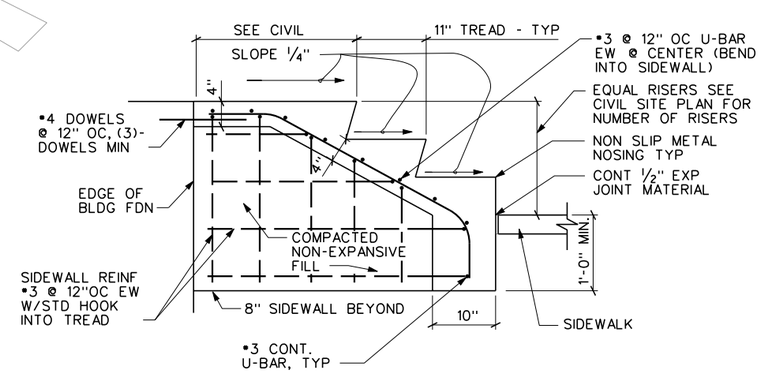

## E THICKENED SLAB DETAIL
E / S-004 — SCALE: NOT TO SCALE



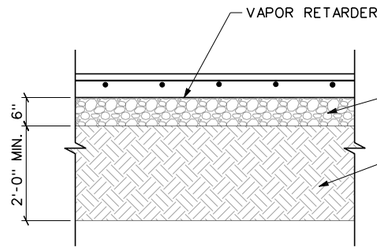

## F CORNER BAR DETAILS
F / S-002 — SCALE: NOT TO SCALE




## G RECESSED FLOOR SLAB DETAIL
G / S-002 — SCALE: NOT TO SCALE




## H OUTSIDE STOOP SECTION
H / S-002 — SCALE: NOT TO SCALE




## J SUB GRADE PREP FOR STRUCT SLABS ON GROUND
J / S-002 — SCALE: NOT TO SCALE

EDITOR'S NOTE:
TYPICAL FOUNDATION DETAILS. EDITED March 15, 2012.

SUPERSEDED
NOT FOR CONSTRUCTION

US Army Corps of Engineers
Albuquerque District

| Mark | Description | Date | Appr. |
|---|---|---|---|
| | | | |

File Name: xxxxs-002.dgn
Plot Scale: 96:1
Plot Date: FEBRUARY 2011
SOL/CONTRACT NO.
PROJECT NO.
Zero Accidents Zero Tolerance

DESIGN BY: J. STAGES
DRAWN BY: J. STAGES
REVIEWED BY: S. BUCKEL

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ALBUQUERQUE, NEW MEXICO

CHIEF, FACILITIES DESIGN SECTION
DATE:

CUSTOMER NAME, LOCATION OF PROJECT
PROJECT NAME
XXXXXX

# TYPICAL FOUNDATION DETAILS

SHEET NO.
S-002
2 OF X

SEQUENCE NO.
X

# STRUCTURAL STEEL NOTES

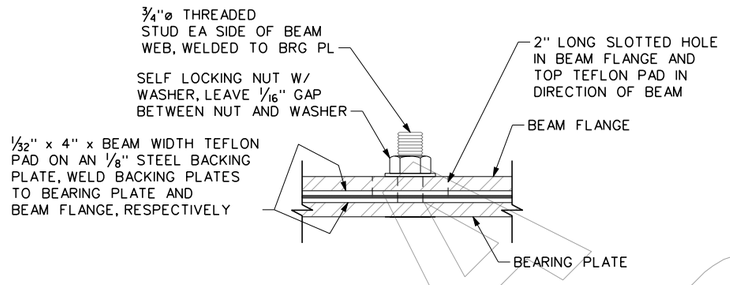
1. STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH THE AISC "STEEL CONSTRUCTION MANUAL" 13TH EDITION.
2. ALL WIDE FLANGE SHAPES SHALL BE ASTM A992. ALL OTHER STRUCTURAL STEEL, OTHER THAN TUBES, SHALL BE ASTM A36. ALL TUBE STEEL SHALL BE ASTM A500, GRADE B.
3. ALL BOLTS FOR STEEL CONNECTIONS SHALL BE ASTM A325 WITH A MINIMUM DIAMETER OF ¾" UNLESS OTHERWISE NOTED. ALL BOLTED CONNECTIONS NOT DETAILED SHALL BE DESIGNATED AS BEARING-TYPE CONNECTIONS, WASHERS SHALL BE INSTALLED UNDER NUTS OF FASTENERS.
4. ALL WELDING SHALL CONFORM TO THE PROVISIONS OF AWS D1.1:2010 CODE, USING E70XX ELECTRODES.
5. ALL FILLET WELDS SHALL BE 3/16" MIN. SIZE, UNO. MIN. CONNECTION OF ADJACENT STEEL PARTS SHALL BE MADE WITH FILLET OR FLARE BEVEL WELD ALL AROUND, UNO.
6. ALL CAST IN PLACE ANCHOR BOLTS SHALL BE ASTM A307 OR ASTM F1554, UNLESS NOTED OTHERWISE.
7. ALL ANCHORS NOTED AS EPOXY ANCHORS SHALL BE ALL THREAD RODS CONFORMING TO ASTM A307 OR ASTM F1554 EMBEDDED IN HILTI HIT HY 150 ADHESIVE, OE. ROD DIAMETER AND EMBEDMENT SHALL BE AS NOTED ON PLAN.
8. ALL STEEL BEAMS BEARING ON MASONRY OR CONCRETE WALLS SHALL BE SLIDE BEARING CONNECTIONS AS DETAILED ON <<J1/S-004>> UNLESS NOTED OTHERWISE.
9. FOR CONCRETE SLAB ON STEEL DECK CONTRACTION AND CONSTRUCTION JOINTS, SEE DETAIL <<G/S-006>>.
10. BEAM TO BEAM AND BEAM TO COLUMN CONNECTIONS SHALL BE PER THE CONNECTION SCHEDULES ON <<S-006>> UNLESS NOTED OTHERWISE.
11. ALL DECK ANGLES SHALL BE SPLICED TOGETHER AS SHOWN IN <<D/S-003>>.
12. FOR FRAMING AT ROOF PENETRATIONS, SEE TYPICAL DETAIL <<B/S-006>> SEE ARCH AND MECH DRAWINGS FOR ROOF OPENINGS.
13. SEE STEEL DECK SCHEDULE THIS SHEET FOR DECKING AND ATTACHMENT INFORMATION.
14. STEEL BAR JOISTS:
    a. WEB REINFORCING PER <<E/S-006>> SHALL BE PROVIDED AT ALL LOCATIONS WHERE LOADS GREATER THAN 50LB ARE APPLIED TO THE TOP OR BOTTOM CHORD OF JOISTS.
    b. STEEL BAR JOIST BRIDGING IS NOT SHOWN ON THE FRAMING PLANS. PROVIDE BRIDGING PER SJI SPECIFICATIONS AND OSHA STEEL ERECTION STANDARDS. SEE <<C/S-006>> AND <<D/S-006>> FOR BRIDGING CONNECTION DETAILS.
    c. UNLESS NOTED OTHERWISE, ALL STEEL BAR JOISTS SHALL BE DESIGNED FOR A NET WIND UPLIFT LOAD OF 15 PSF.
    d. FOR BRACING OF JOISTS ON EACH SIDE OF A COLUMN SEE DETAILS <<A/S-006>>.
    e. K & KCS-SERIES JOISTS SHALL BE ATTACHED TO BEARING PLATES, BEAMS AND JOIST GIRDERS WITH EITHER A MINIMUM OF (2)-1/8"x 1" LONG FILLET WELDS OR TWO 1/2"ø ASTM A307 BOLTS, UNLESS SPECIFICALLY DETAILED.
    f. LH & DLH-SERIES JOISTS SHALL BE ATTACHED TO BEARING PLATES, BEAMS AND JOIST GIRDERS WITH EITHER A MINIMUM OF (2)-1/4"x 2" LONG FILLET WELDS OR TWO ¾"ø ASTM A307 BOLTS, UNLESS SPECIFICALLY DETAILED.

## STEEL DECK SCHEDULE

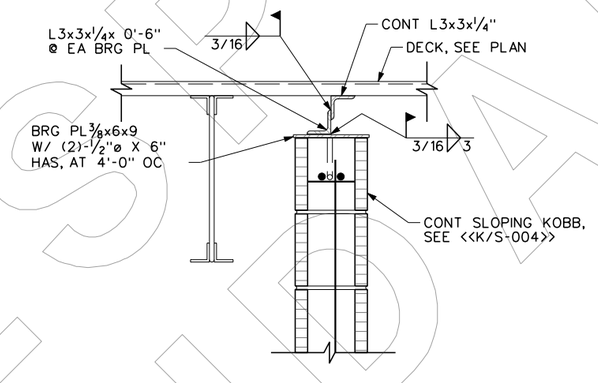
| LABEL | DESCRIPTION | SUPPORT FASTENERS | EDGE FASTENERS | SIDELAP FASTENERS |
|---|---|---|---|---|
| 1.5B | VULCRAFT 1.5" TYPE 'B', 20 GAGE DECK | 5/8"ø PUDDLE WELDS IN 7/36 PATTERN | 5/8"ø PUDDLE WELDS @ 12"OC | #10 SCREWS @ 12"OC |
| 2VLI | VULCRAFT 2" TYPE VLI, 20 GAGE DECK | 5/8"ø PUDDLE WELDS IN 7/36 PATTERN | 5/8"ø PUDDLE WELDS @ 12"OC | #10 SCREWS @ 12"OC |
| | | | | |

STEEL DECK SCHEDULE NOTES:

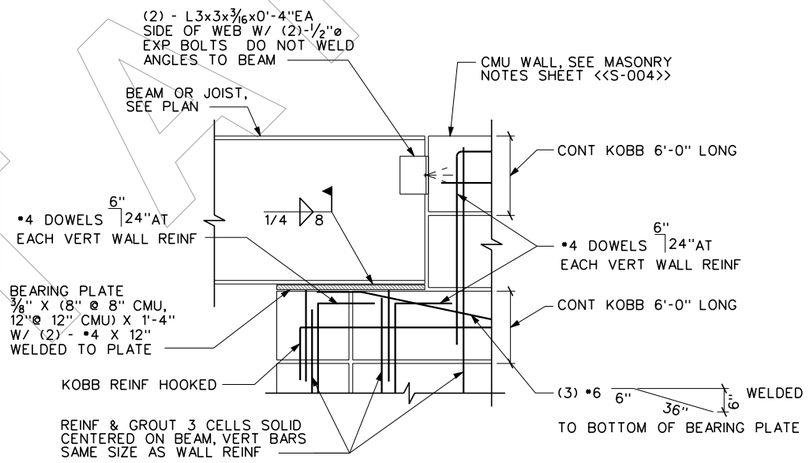
a. DECKING SHALL BE CONTINUOUS OVER AT LEAST (3) SUPPORTS.
b. EACH DECKING PANEL SHALL BE ATTACHED TO SUPPORTING MEMBERS AND ADJACENT PANELS AS INDICATED.
c. DECKING SHALL BE AS INDICATED OR APPROVED EQUAL.
d. FOR FRAMING AT ROOF PENETRATIONS, SEE TYPICAL DETAIL <<B/S-006>> SEE ARCH AND MECH DRAWINGS FOR ROOF OPENINGS.




A S-003 SLIDE BEARING PLATE DETAIL
SCALE: NTS




B S-003 TYPICAL CONNECTION OF DECK TO CMU WALL DETAIL
SCALE: NTS




C S-003 ANCHORAGE OF DRAG STRUT (BEAM, PURLIN OR JOIST) ON END OF CMU WALL DETAIL
SCALE: NTS

# PRE-ENGINEERED METAL BUILDING NOTES

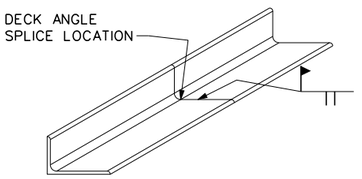
1. THE BUILDING SHALL BE A PRE-ENGINEERED METAL STRUCTURE OF THE AREA AND HEIGHT SHOWN.
2. MINIMUM WEB THICKNESS OF RIGID FRAMES SHALL BE 3/16". LIGHT GAGE ENDWALL COLUMNS ARE NOT ALLOWED.
3. THE NUMBER AND SPACING OF THE RIGID FRAMES, COLUMNS, X-BRACING AND PORTAL FRAMES SHALL BE AS SPECIFIED ON THE DRAWINGS, (NO EXCEPTIONS).
4. THE BUILDING SHALL BE DESIGNED AND FABRICATED ACCORDING TO AISC AND AISI LATEST SPECIFICATIONS, THE DIMENSIONAL TOLERANCES APPLICABLE TO ROLL FORM STEEL UNDER THE AISC "STANDARD MILL PRACTICE" SECTION SHALL BE REQUIRED IN THE FABRICATION OF THE RIGID FRAMES.
5. THE BUILDING SHALL BE DESIGNED TO SUPPORT ALL MECHANICAL & ELECTRICAL EQUIPMENT INCLUDING HEATERS, SPRINKLERS, EXHAUST SYSTEMS, AND ALL OTHER DEVICES. ADDITIONAL GIRTS OR PURLINS SHALL BE PLACED IN CONVENIENT LOCATIONS FOR SUPPORT AND ATTACHMENT OF ALL MECHANICAL AND ELECTRICAL EQUIPMENT.
6. DESIGN LOADS SHALL CONFORM WITH THE GENERAL NOTES. LOAD COMBINATIONS SHALL COMPLY WITH THE MBMA METAL BUILDING SYSTEMS MANUAL.
7. LATERAL LOADS SHALL BE RESISTED BY ROD X-BRACING, RIGID FRAMES, OR PORTAL FRAMES. WALL AND ROOF PANELS SHALL NOT BE DESIGNED AS DIAPHRAGMS TO TAKE LATERAL LOADS. CABLE BRACING IS NOT ALLOWED.
8. WIND LOADING SHALL BE BASED ON PARTIALLY ENCLOSED BUILDING CALCULATION WITH HANGER AND OVERHEAD DOORS CONSIDERED AS OPENINGS.
9. THE BUILDING SHALL BE DESIGNED FOR LOADS, LATERAL AND OTHERWISE, INDUCED ON THE BUILDING BY INTERRIOR PARTITION WALLS.
10. ANCHOR BOLTS SHALL BE DESIGNED BY A REGISTERED STRUCTURAL ENGINEER ENGAGED BY THE CONTRACTOR FOR THE LOADS FURNISHED BY THE METAL BUILDING MANUFACTURER, UNLESS NOTED OTHERWISE. THE ANCHOR BOLT DESIGN SHALL INCLUDE EMBEDMENT DEPTHS. ANCHOR BOLTS SHALL BE FURNISHED BY THE CONTRACTOR.
11. A FOUNDATION REACTIONS SUBMITTAL SHALL BE SUBMITTED BEFORE FOUNDATION REINFORCING SHOP DRAWINGS ARE SUBMITTED AND SHALL INCLUDE MAGNITUDES AND DIRECTIONS OF REACTIONS TO ALLOW FOR VERIFICATION OF FOUNDATION DESIGNS. THE SUBMITTAL SHALL INCLUDE REACTION ENVELOPES FOR BOTH LOAD CASES AND LOAD COMBINATIONS.

# INSULATED METAL WALL PANELS

1. PANELS AND CONNECTIONS SHALL BE DESIGNED TO SPAN VERTICALLY BETWEEN THE HSS GIRTS FOR THE FOLLOWING LOADS:
   -EXTERNAL PRESSURE: xx PSF
   -SUCTION (NEGATIVE PRESSURE): xx PSF
2. WALL PANEL AND CONNECTION DESIGN SHALL BE STAMPED BY A REGISTERED PROFESSIONAL ENGINEER AND SUBMITTED FOR APPROVAL.

# PRE-ENGINEERED STAIRS

1. STAIR STRINGERS, TREADS, RISERS, LANDINGS, RAILINGS, AND OTHER ACCESSORIES TO COMPRISE A COMPLETE SYSTEM SHALL BE DESIGNED AND PROVIDED BY THE CONTRACTOR.
2. CONNECTIONS OF THE STAIR SYSTEM TO THE SUPPORTING STRUCTURE SHALL BE DESIGNED AND PROVIDED BY THE CONTRACTOR.
3. SUBMIT DESIGN CALCULATIONS AND DRAWINGS STAMPED BY A REGISTERED PROFESSIONAL ENGINEER.
4. SEE ARCH FOR ADDITIONAL REQUIREMENTS.




D S-003 DECK ANGLE SPLICE
SCALE: NTS

EDITOR'S NOTE:
STRUCT NOTES AND TYPICAL DETAILS. EDITED MARCH 9, 2012.

PRELIMINARY

US Army Corps of Engineers
Albuquerque District

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File Name: xxxxs-0003.dgn
Plot Scale: 96ti
Plot Date: FEBRUARY 2011
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Zero Accidents
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DESIGN BY: J. STAGES
DRAWN BY: J. ROLL
REVIEWED BY: S. BUCKEL

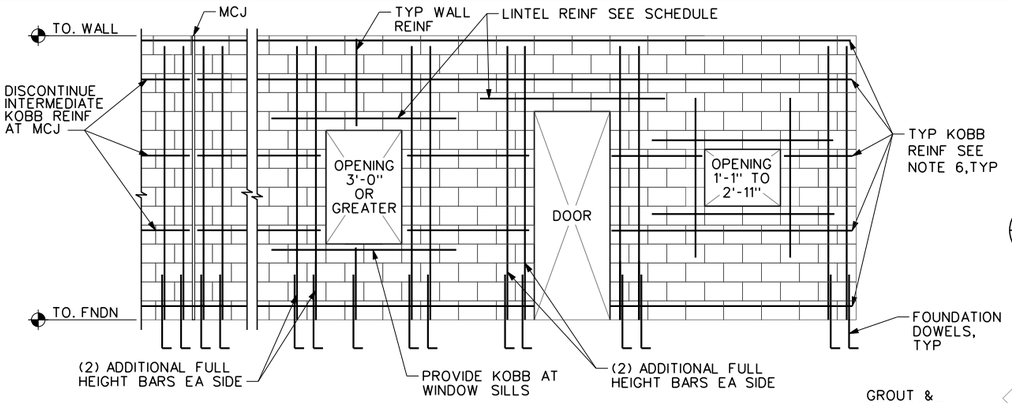
U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS ALBUQUERQUE, NEW MEXICO
CHIEF, FACILITIES DESIGN SECTION
DATE:

CUSTOMER NAME, LOCATION OF PROJECT
PROJECT NAME
XXXXXX

STRUCTURAL NOTES AND TYPICAL DETAILS

SHEET NO.
S-003
3 OF X

SEQUENCE NO.
X

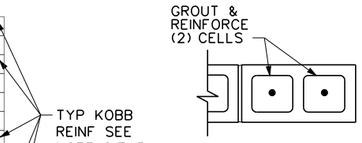



A S-004 TYPICAL WALL REINF
SCALE: NOT TO SCALE

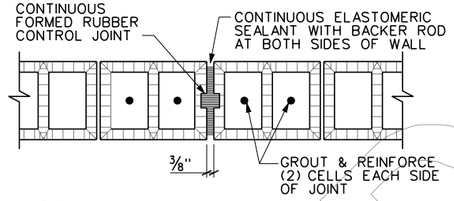
## CMU LINTEL SCHEDULE

| DESIGNATION | LINTEL BEARING LENGTH | LINTEL DEPTH | BOTTOM BARS | TOP BARS | COMMENTS |
|---|---|---|---|---|---|
| L1 | 24" | 8" | (2)-#5 | NA | AT ALL SPANS 3'-4" AND LESS UNO |
| L2 | 24" | 16" | (2)-#5 | NA | AT ALL SPANS FROM 3'-4" TO 6'-8" UNO |
| L3 | 24" | 24" | (2)-#5 | (2)-#5 | AT ALL SPANS FROM 6'-9" TO 10'-0" UNO |

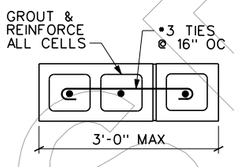
NOTE: -SEE ARCH AND MECH DRAWINGS FOR OPENING SIZES AND LOCATIONS
-SEE <<G/S-004>> FOR LINTEL DETAIL



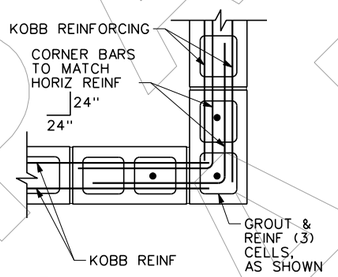

B S-004 END OF WALL DETAIL
SCALE: NOT TO SCALE



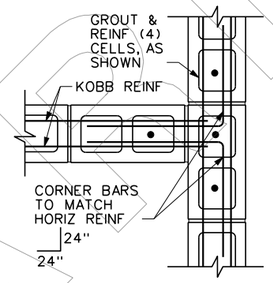

C S-004 CONTROL JOINT DETAIL
SCALE: NOT TO SCALE



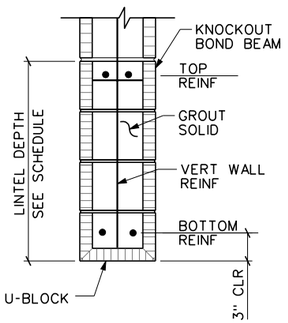

D S-004 WALL PIER DETAIL
SCALE: NOT TO SCALE



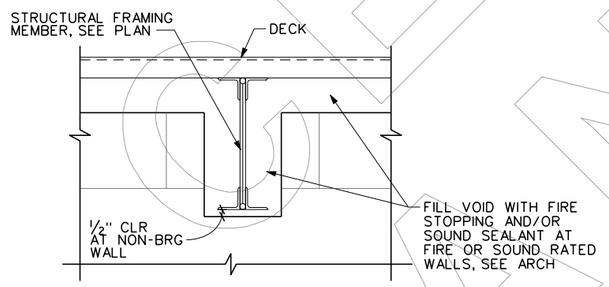

E S-004 CORNER DETAIL
SCALE: NOT TO SCALE



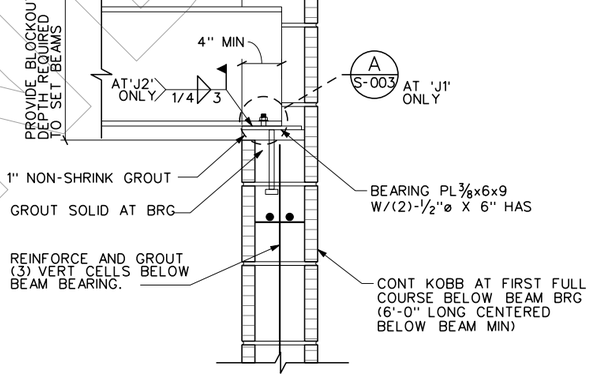

F S-004 INTERSECTION DETAIL
SCALE: NOT TO SCALE



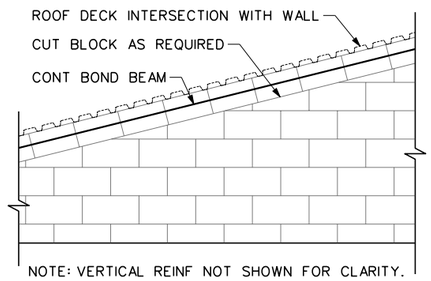

G S-004 CMU LINTEL
SCALE: NOT TO SCALE




H S-004 MEMBER THRU MASONRY WALL DETAIL
SCALE: NOT TO SCALE

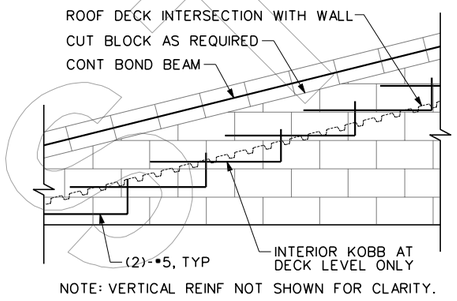



J1 S-004 J2 S-004 TYPICAL BEAM BRG ON CMU
SCALE: NTS




CONDITION WITH NO PARAPET WALL

K S-004 TOP OF WALL DETAIL
SCALE: NOT TO SCALE




CONDITION WITH A PARAPET WALL

L S-004 TOP OF WALL DETAIL
SCALE: NOT TO SCALE

## MASONRY NOTES

1. ALL CMU SHALLHAVE A SPECIFIED MINIMUM COMPRESSIVE STRENGTH OF 1900 PSION NET AREA AT 28 DAYS f'm=1500psi. 3 CELL BLOCK SHALL NOT BE USED.
2. ASTM C270 TYPE "S" MORTAR SHALL BE USED.
3. ALL REINFORCED CELLS SHALL BE FILLED SOLID WITH 2000 PSICONCRETE GROUT. ALL MASONRY BELOW GRADE SHALL BE GROUTED SOLID.
4. VERTICAL CELLS TO BE FILLED SHALL HAVE VERTICAL ALIGNMENT SUFFICIENT TO MAINTAIN A CLEAR UNOBSTRUCTED CONTINUOUS VERTICAL CELL NOT LESS THAN 2" X 3" IN PLAN DIMENSIONS.
5. FOUNDATION DOWELS WITH STANDARD HOOKS SHALL EXTEND INTO THE FOUNDATION 4" FROM THE BOTTOM OF THE FOUNDATION OR 9" MIN WHICHEVER IS GREATER, UNLESS NOTED OTHERWISE. LAPS OR SPLICES OF REINFORCING STEEL IN MASONRY SHALL BE 2'-0" OR 48 BAR DIAMETERS IN LENGTH, WHICHEVER IS GREATER. FOUNDATION DOWELS SHALL MATCH THE SIZE AND SPACING OF THE VERT WALL REINFORCING.
6. CONTINUOUS KNOCK OUT BOND BEAMS SHALL BE PROVIDED AT THE FIRST COURSE ABOVE FINISHED FLOOR OR GRADE, AT THE TOP OF ALL CMU WALLS AND INTERMEDIATELY AT 4'-0" OC. MAX. BOND BEAMS SHALL BE REINFORCED WITH (2)-#5 CONT.AND GROUTED SOLID. CORNER BARS SHALL BE PROVIDED AT ALL CORNERS AND WALL INTERSECTIONS.
7. VERTICAL WALL REINFORCING SHALL EXTEND CONTINUOUSLY FROM THE TOP OF FOUNDATION TO EMBED AT LEAST 6" INTO THE TOP OF WALL BOND BEAM.
8. ADDITIONAL VERTICAL WALL REINFORCING SHALL BE PROVIDED AS FOLLOWS. BAR SIZES SHALL MATCH THE TYPICAL WALL REINFORCING USED IN THE WALL AND SHALL EXTEND FROM FOUNDATION TO TOP OF WALL.
   a. AS SHOWN ON DRAWINGS.
   b. AT CORNER INTERSECTIONS OF WALLS, SEE <<E/S-004>>.
   c. AT "T" INTERSECTIONS OF WALLS, SEE <<F/S-004>>.
   d. AT END OF WALLS, SEE <<B/S-004>>.
   e. AT BOTH SIDES OF OPENINGS 3'-0" OR GREATER (IN HEIGHT OR WIDTH) SEE <<A/S-004>> AND <<B/S-004>>
9. CONTROL JOINTS SHALL BE AS DETAILED IN <<A & C/S-004>>. IF NOT SHOWN ON PLAN CONTROL JOINTS SHALL BE PROVIDED AT NOT MORE THAN 25' O.C., UNO.
10. CORNER BLOCKS SHALL BE INTERWOVEN BETWEEN INTERSECTING WALLS.
11. EVERY PIER OR WALL SECTION WHOSE WIDTH IS BETWEEN 1'-4" AND 3'-0" SHALL HAVE HORIZONTAL SHEAR STEEL IN THE FORM OF TIES, SEE <<D/S-004>>.
12. UNLESS NOTED OTHERWISE, PROVIDE ADDITIONAL (2)-#5 REINF. ALONG SIDES, TOP AND BOTTOM OF ALL CMU WALL OPENINGS GREATER THAN 12" SQUARE. EXTEND REINFORCING 24" BEYOND OPENING, SEE <<A/S-004>>.
13. VERTICAL WALL REINFORCING SHALL BE AS FOLLOWS, UNO:
    8" CMU EXTERIOR ..... #  @  " O.C.
    12" CMU EXTERIOR..... #  @  " O.C.
    8" CMU INTERIOR ..... #  @  " O.C.
    12" CMU INTERIOR ..... #  @  " O.C.

EDITOR'S NOTE:
MASONRY NOTES AND TYPICAL DETAILS. EDITED MARCH 15, 2012.

US Army Corps of Engineers
Albuquerque District

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Zero Tolerance

DESIGN BY: J. STAGES
DRAWN BY: J. ROLL
REVIEWED BY: S. BUCKEL

U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS ALBUQUERQUE, NEW MEXICO
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XXXXXXX

MASONRY NOTES AND TYPICAL DETAILS

SHEET NO.
S-004
4 OF X

SEQUENCE NO.
X

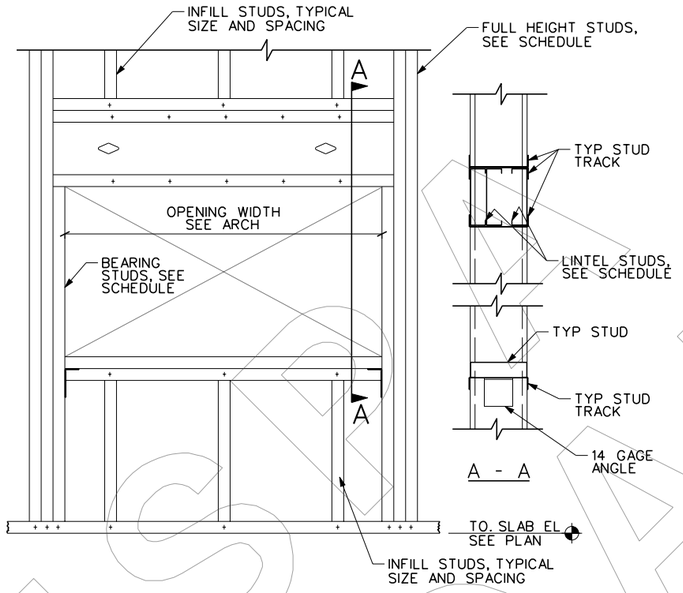
GOVERNMENT

# STRUCTURAL STUD WALL NOTES

1. STRUCTURAL STUDS WALLS ARE THOSE LOCATED AND IDENTIFIED ON STRUCTURAL PLAN SHEETS AND DETAILS AND SHALL BE CONSTRUCTED AS DESCRIBED HEREIN.
2. STRUCTURAL STUD WALL AND EXTERIOR SOFFIT FRAMING SHALL CONFORM TO THE STRUCTURAL STUD SCHEDULE THIS SHEET.
3. ALL WELDING SHALL CONFORM TO THE PROVISIONS OF AWS D1.1 AND ANSI/AWS D1.3-10. WHERE THE WELD THROAT IS NOT SHOWN ON THE DRAWINGS, THE WELD THROAT SHALL BE AT LEAST AS LARGE AS THE THICKNESS OF THE THINNEST SHEET JOINED. ALL WELDS SHALL PROVIDE COMPLETE FUSION OF THE SHEETS WITHOUT "BLOWOUTS".
4. AT TRACK BUTT JOINTS, ABUTTING PIECES OF TRACK SHALL BE SECURELY ANCHORED TO A COMMON STRUCTURAL ELEMENT OR THEY SHALL BE SPLICE WELDED TOGETHER.
5. STRUCTURAL STUD WALLS SHALL BE ANCHORED TO THE FOUNDATION WITH ¾"ø X 4" EMBED EPOXY ANCHORS SPACED AT 4'-0" OC MAX AND LOCATED NO MORE THAN 8" FROM WALL ENDS OR CORNERS, UNLESS NOTED OTHERWISE.
6. ALL STRUCTURAL STUD WALLS SHALL HAVE ROWS OF HORIZONTAL BRIDGING INSTALLED AT A MAXIMUM OF 4'-0" OC BRIDGING AND INSTALLATION SHALL BE IN ACCORDANCE WITH SSMA STANDARDS.
7. AT A MINIMUM ALL STRUCTURAL STUD WALLS SHALL HAVE A CONTINUOUS 14 GAGE TRACK AT THE TOP AND BOTTOM OF THE WALL. THE TRACK SHALL MATCH THE SIZE OF STUD IT IS BEING APPLIED TO AND SHALL HAVE AT LEAST AN 1¼" WIDE FLANGE.
8. ALL STRUCTURAL STUDS SHALL BEAR FULLY ON THE BOTTOM TRACKS. ALL STUDS SHALL BE ATTACHED TO TRACKS WITH (1)-•12 SCREW IN EACH FLANGE, MINIMUM.
9. FOR STUD WALL OPENINGS SEE STUD WALL OPENING DETAIL AND LINTEL SCHEDULE THIS SHEET.
10. FASTEN ALL VERTICAL FASCIA STUDS TO CONT LEDGER ANGLE WITH A MINIMUM 14 GAGE CLIP ANGLE WELDED TO LEDGER ANGLE & FASTENED TO STUD WEB EITHER BY WELDING OR SELF-TAPPING SCREWS.
11. VERTICAL SLIDE CLIPS SHALL BE PER <<C/S-005>> AND DEFLECTION TRACKS SHALL BE PER <<E/S-005>>.
12. STRUCTURAL WALL TRACKS SHALL BE ATTACHED TO STRUCTURAL STEEL MEMBERS WITH (1)-•12 SELF TAPPING SCREW @ 16"OC, (2)-HILTIX-EGN FASTENERS @ 16"OC, OR (1)-1/8" FILLET WELD ON EACH FLANGE @ 16"OC.
13. CONNECTIONS BETWEEN FASCIA AND SOFFIT STUDS AND OTHER STRUCTURAL ELEMENTS SHALL BE MADE WITH (2)-•12 SCREWS OR (2)-1"x1/8" FILLET WELDS MIN, ONE ON EACH FLANGE, UNLESS NOTED OTHERWISE.
14. TRACKS OF FASCIA AND SOFFIT FRAMING IN CONTINUOUS CONTACT WITH OTHER TRACKS SHALL BE CONNECTED TO THEM WITH •12 SCREWS AT 16" OC OR 1" OF 1/8" FILLET WELD @ 16" OC, MIN UNO.

## STRUCTURAL STUD SCHEDULE

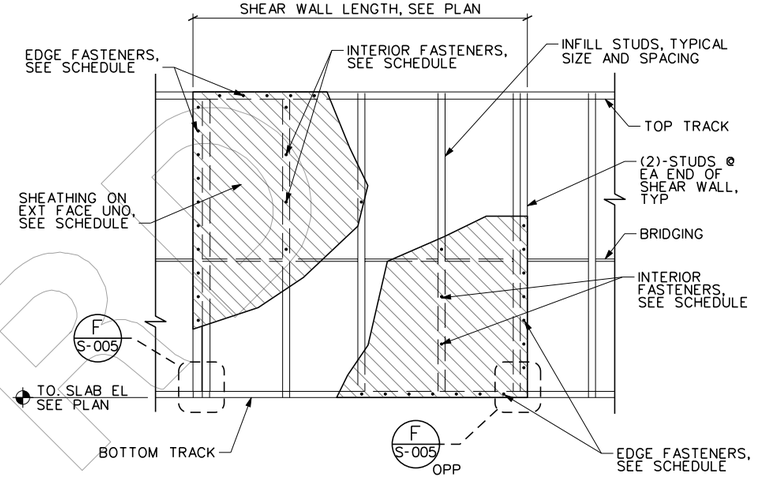
| LABEL | SSMA DESIGNATION | STUD SPACING | COMMENTS |
|---|---|---|---|
| 6" STUD | 600S200-54 | 16"OC | TYPICAL STUD WALL FRAMING, UNO. |
| 4" STUD | 400S162-54 | 16"OC | TYPICAL SOFFIT & FASCIA FRAMING, UNO. |
| 10" STUD | 100S162-54 | 16"OC | AS NOTED |




## STUD LINTEL SCHEDULE

| OPENING WIDTH | LINTEL STUDS | BEARING STUDS | KING STUDS | COMMENTS |
|---|---|---|---|---|
| UP TO 6'-6" | (2)-STUDS | (2)-STUDS | (2)-STUDS | -- |
| 6'-7" - 10'-0" | (3)-STUDS | (2)-STUDS | (2)-STUDS | -- |
| | | | | |

NOTE: STUDS SHALL BE THE SAME AS WALL STUDS DEFINED THIS PAGE



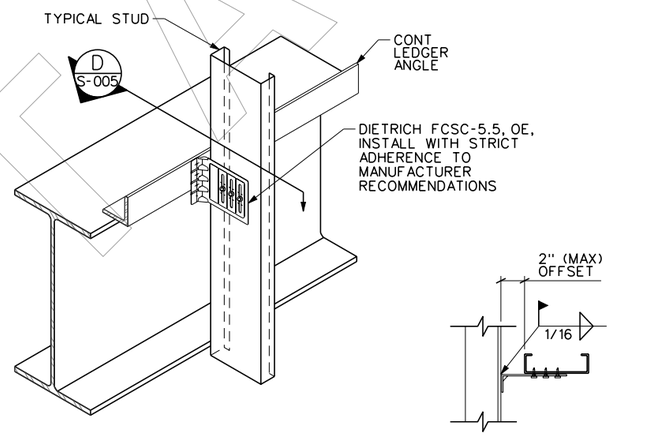

## SHEET METAL SHEAR WALL SCHEDULE

| SHEAR WALL LABEL | SHEATHING | EDGE FASTENERS | INTERIOR FASTENERS | ANCHORS |
|---|---|---|---|---|
| SW1 | 22 GA | •8 X ½" SCREW @ 4" OC | •8 X ½" SCREW @ 12" OC | ¾"ø X 12" EMBED EPOXY ANCHOR |
| SW2 | 22 GA (2)-SIDES | •8 X ½" SCREW @ 4" OC | •8 X ½" SCREW @ 12" OC | ¾"ø X 12" EMBED EPOXY ANCHOR |
| | | | | |

NOTES:
1. SCREWS SHALL HAVE MODIFIED TRUSS HEADS, BE GALVANIZED AND BE LOCATED AT LEAST ⅜" FROM PANEL EDGES.
2. ALL SHEATHING PANELS SHALL BE GALVANIZED AND BE AT LEAST 12" WIDE.
3. EDGES OF PANELS SHALL BE FULLY BLOCKED.

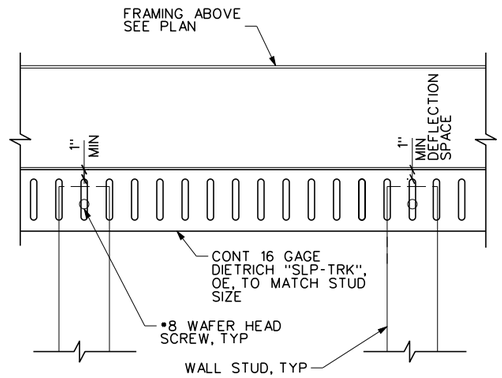
A S-005 STUD WALL OPENING DETAIL
SCALE: NOT TO SCALE

B S-005 SHEAR WALL ELEVATION
SCALE: NOT TO SCALE

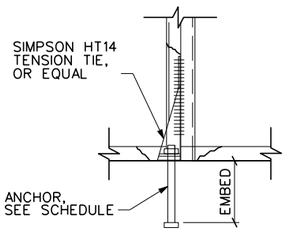



C S-005 VERTICAL SLIDE CLIP DETAIL
SCALE: NOT TO SCALE

D S-005 SECTION
SCALE: NOT TO SCALE




E S-005 TYPICAL DEFLECTION TRACK CONNECTION
SCALE: NOT TO SCALE




F S-005 SECTION
SCALE: NOT TO SCALE

EDITOR'S NOTE:
STRUCT STUD WALL NOTES AND TYPICAL DETAILS. EDITED MARCH 15, 2012.

US Army Corps of Engineers
Albuquerque District

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DESIGN BY: J. STAGES
DRAWN BY: J. STAGES, J. ROLL
REVIEWED BY: S. BUCKEL

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STRUCTURAL STUD WALL NOTES AND TYPICAL DETAILS

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S-005
5 OF X

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X

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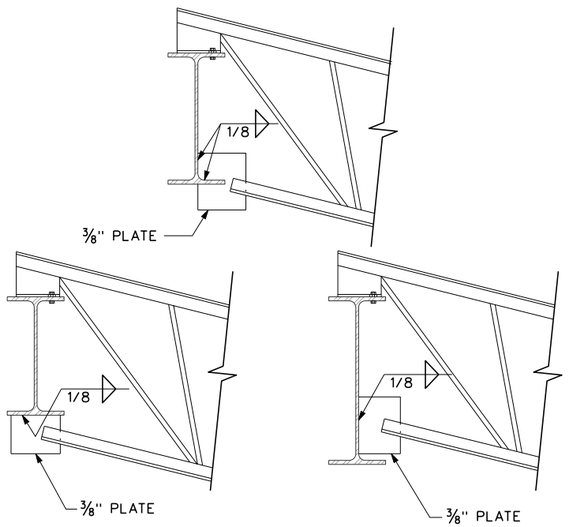
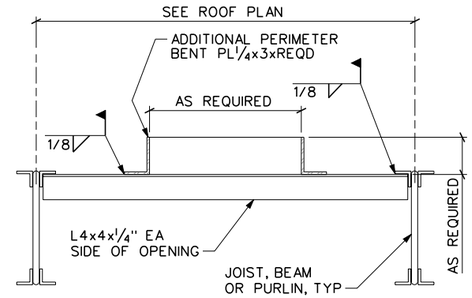


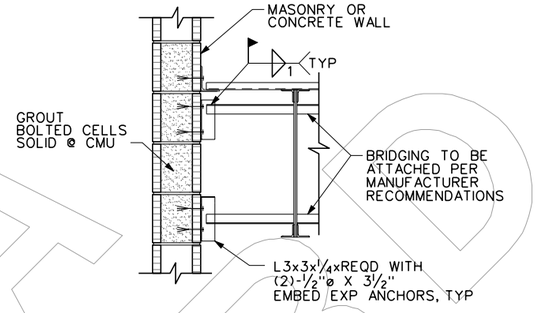

## A S-006 BRACING FOR JOISTS ON EACH SIDE OF A COLUMN

SCALE: NOT TO SCALE



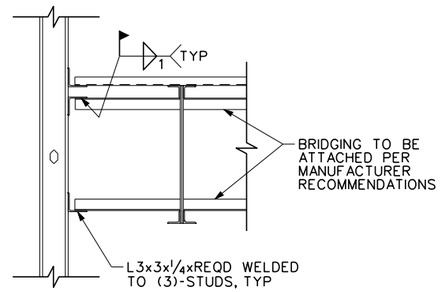

## B S-006 ROOF DECK PENETRATION

SCALE: NOT TO SCALE



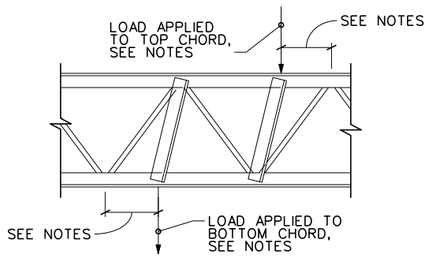

## C S-006 JOIST BRIDGING CONNECTION AT CMU OR CONCRETE WALL

SCALE: 3/4" = 1'-0"




## D S-006 JOIST BRIDGING CONN. AT STUD WALL

SCALE: 3/4" = 1'-0"

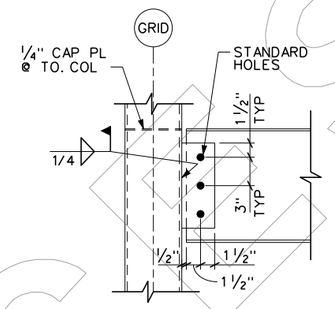



NOTES:

1. JOIST STIFFNERS NOT REQUIRED FOR LOADS APPLIED WITHIN 6" OF PANEL POINTS FOR TOTAL LOADS LESS THAN 50LB.
2. FOR JOIST SIZE AND SLOPE SEE PLAN.
3. FIELD WELDING AND FIELD CONNECTIONS TO JOISTS SHALL BE PERFORMED IN ACCORDANCE WITH MFR RECOMMENDATIONS.

## E S-006 JOISTS WEB REINFORCING

SCALE: NOT TO SCALE




**BEAM TO HSS COLUMN CONNECTION SCHEDULE**

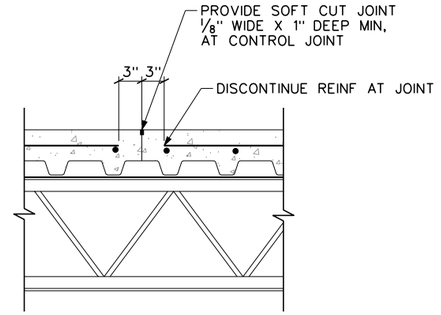
| BEAM | SHEAR TAB | BOLTS |
|---|---|---|
| W10 | 3/8" | (2)-3/4"ø |
| W12 | 3/8" | (3)-3/4"ø |
| W14 | 3/8" | (3)-3/4"ø |
| W16 | 3/8" | (4)-3/4"ø |
| W18 | 3/8" | (4)-3/4"ø |
| W21 | 3/8" | (5)-3/4"ø |
| W24 | 3/8" | (6)-3/4"ø |
| W27 | 3/8" | (7)-3/4"ø |
| W30 | 3/8" | (8)-3/4"ø |

**BEAM TO BEAM CONNECTION SCHEDULE**

| BEAM | SHEAR TAB | BOLTS |
|---|---|---|
| W8 | 3/8" | (2)-3/4"ø |
| W10 | 3/8" | (2)-3/4"ø |
| W12 | 3/8" | (3)-3/4"ø |
| W14 | 3/8" | (3)-3/4"ø |
| W16 | 3/8" | (4)-3/4"ø |
| W18 | 3/8" | (4)-3/4"ø |
| W21 | 3/8" | (5)-3/4"ø |
| W24 | 3/8" | (5)-3/4"ø |

## F S-006 BEAM CONNECTION DETAILS

SCALE: NOT TO SCALE




NOTE: ALL JOINTS IN EXPOSED SLABS ARE TO BE SEALED PER <<D/S-002>>.

## G S-006 SLAB ON DECK CONSTRUCTION OR CONTRACTION JOINT DETAIL

SCALE: NOT TO SCALE

3/4" = 1'-0"

EDITOR'S NOTE:
TYPICAL FRAMING DETAILS. EDITED MARCH 15, 2012.

US Army Corps of Engineers
Albuquerque District

| Mark | Description | Date | Appr |
|---|---|---|---|
| | | | |

File Name: xxxxs-006.dgn
Plot Scale: 1=1
Plot Date: FEBRUARY 2011
SOL/CONTRACT NO.
PROJECT NO.
Zero Accidents Zero Tolerance

DESIGN BY: J. STAGES
DRAWN BY: J. ROLL
REVIEWED BY: S. BUCKEL

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ALBUQUERQUE, NEW MEXICO

CHIEF, FACILITIES DESIGN SECTION
DATE:

CUSTOMER NAME, LOCATION OF PROJECT
PROJECT NAME
XXXXXX

# TYPICAL FRAMING DETAILS

SHEET NO.
S-006
6 OF X

SEQUENCE NO.
X

DISAPPROVED

# STRUCTURAL QUALITY ASSURANCE PROGRAM

THE CONTRACTOR SHALL ENGAGE INDEPENDENT INSPECTORS TO IMPLEMENT THE FOLLOWING INSPECTIONS IN ACCORDANCE WITH IBC 2006:

| INSPECTION ITEM | SCOPE OF INSPECTION | FREQUENCY* |
|---|---|---|
| EARTHWORK | | |
| GENERAL EXCAVATION | INSPECT STRATA FOR CONFORMANCE TO THE STRUCTURAL DRAWINGS AND THE SPECIFICATIONS. VERIFY THAT EXCAVATION IS TO PROPER DEPTH OR MATERIAL. VERIFY THAT EXCAVATION IS CONTROLLED AND CONTAINS NO UNSUITABLE MATERIALS. | PER SPECIFICATIONS |
| BEARING SURFACES OF FOOTINGS | INSPECT BEARING SURFACES FOR CONFORMANCE TO THE REQUIREMENTS OF THE STRUCTURAL DRAWINGS AND THE SPECIFICATIONS. | PER SPECIFICATIONS |
| FILL MATERIAL | TEST MATERIAL FOR CONFORMANCE TO SPECIFICATIONS. PERFORM LABORATORY COMPACTION TESTS IN ACCORDANCE WITH THE SPECIFICATIONS TO DETERMINE OPTIMUM WATER CONTENT AND MAXIMUM DRY DENSITY. | PER SPECIFICATIONS |
| INSTALLATION OF CONTROLLED STRUCTURAL FILL | PROVIDE INSPECTION OF THE INSTALLATION IN ACCORDANCE WITH THE SPECIFICATIONS. | PER SPECIFICATIONS |
| DENSITY OF FILL | PERFORM FIELD DENSITY TESTS OF THE IN-PLACE FILL IN ACCORDANCE WITH THE SPECIFICATIONS. | PER SPECIFICATIONS |
| CONCRETE (CAST-IN-PLACE) | | |
| REINFORCEMENT INSTALLATION | INSPECT REINFORCING FOR ASTM TYPE, GRADE, SIZE, QUANTITY, CONDITION, AND PLACEMENT. VERIFY ADEQUATE COVER PER DRAWINGS AND SPECIFICATIONS | PERIODIC |
| ANCHOR RODS | INSPECT ANCHOR RODS AND HOLDDOWN ANCHORS PRIOR TO AND DURING PLACEMENT OF CONCRETE. | PERIODIC |
| MASONRY | | |
| BEGINNING OF CONSTRUCTION | AS MASONRY CONSTRUCTION BEGINS, THE FOLLOWING SHALL BE VERIFIED TO ENSURE COMPLIANCE:<br>A. PROPORTIONS OF SITE-PREPARED MORTAR.<br>B. CONSTRUCTION OF MORTAR JOINTS<br>C. LOCATION OF REINFORCEMENT | PERIODIC |
| PRIOR TO GROUTING | PRIOR TO GROUTING, VERIFY THAT THE FOLLOWING ARE IN COMPLIANCE:<br>A. GROUT SPACE<br>B. GRADE AND SIZE OF REINFORCEMENT AND CONNECTORS.<br>C. PLACEMENT OF REINFORCEMENT AND CONNECTORS.<br>D. PROPORTIONS OF SITE-PREPARED GROUT.<br>E. CONSTRUCTION OF MORTAR JOINTS. | PERIODIC |
| GROUTING | VERIFY THAT THE PLACEMENT OF GROUT IS IN COMPLIANCE WITH SPECIFICATIONS | |
| MATERIAL SAMPLING | OBSERVE PREPARATION OF GROUT SPECIMENS AND MORTAR SPECIMENS. | PERIODIC |
| STRUCTURAL STEEL | | |
| BOLTING | TEST AND INSPECT BOLTED CONNECTIONS IN ACCORDANCE WITH SPECIFICATIONS. VERIFY BOLT SIZE AND GRADE. | PERIODIC |
| WELDING | CHECK WELDER QUALIFICATIONS. VISUALLY INSPECT FILLET WELDS AND TEST FULL-PENETRATION FIELD WELDS IN ACCORDANCE WITH SPECIFICATIONS | PERIODIC |
| STRUCTURAL FRAMING, BRACING, DETAILS, AND ASSEMBLIES | INSPECT FOR SIZE, GRADE OF STEEL, CAMBER, INSTALLATION, AND CONNECTION DETAILS. CHECK AGAINST CONSTRUCTION DOCUMENTS AND APPROVED SHOP DRAWINGS. | PERIODIC |
| OPEN WEB STEEL JOISTS | INSPECT FOR SIZE, PLACEMENT, BRIDGING, BEARING, AND CONNECTION TO STRUCTURE. VISUALLY INSPECT ALL WELDS OF A MINIMUM OF 5 PERCENT OF THE JOISTS, RANDOMLY SELECTED. | PERIODIC |
| ANCHOR RODS | VERIFY THAT ALL ANCHOR RODS HAVE BEEN PROPERLY TIGHTENED AND HAVE ADEQUATE FIT-UP. | PERIODIC |
| METAL DECKING | VERIFY GAUGE WIDTH AND TYPE. INSPECT PLACEMENT, LAPS, WELDS, SIDELAP ATTACHMENT, AND SCREWS OR OTHER MECHANICAL FASTENERS. CHECK WELDER'S QUALIFICATIONS | PERIODIC |
| FIELD CORRECTION OF FABRICATED ITEMS | REVIEW DOCUMENTATION OF APPROVED REPAIRS AND VERIFY COMPLETION OF REPAIRS. | PERIODIC |
| COLD FORMED STEEL | | |
| SHEAR WALLS, AND HOLDDOWNS | INSPECT THICKNESS AND GRADE OF SHEET METAL STRUCTURAL PANEL, BLOCKING, HOLD-DOWN ANCHORS, AND THE EDGE AND FIELD ATTACHMENT OF THE SHEET METAL PANEL TO THE FRAMING FOR CONFORMANCE TO THE CONSTRUCTION DOCUMENTS APPROVED SUBMITTALS. | PERIODIC |

(CONT)

| INSPECTION ITEM | SCOPE OF INSPECTION | FREQUENCY* |
|---|---|---|
| INSTALLATION | VERIFY THAT TYPE, SIZE, QUANTITY, LOCATION, DETAILS, AND CONNECTIONS OF FRAMING AND BRACING MEMBERS CONFORM TO APPROVED SUBMITTALS AND THE CONSTRUCTION DOCUMENTS. | PERIODIC |
| WELDING | CHECK WELDERS' QUALIFICATIONS. VERIFY THAT WELDING CONFORMS TO AWS SPECIFICATIONS, APPROVED SUBMITTALS AND THE CONSTRUCTION DOCUMENTS. VISUALLY INSPECT WELDS | PERIODIC |
| OTHER FASTENERS | VERIFY FASTENER TYPE AND INSTALLATION PROCEDURES. VERIFY THAT FASTENERS CONFORM TO APPROVED SUBMITTALS AND THE CONSTRUCTION DOCUMENTS. VERIFY THAT FASTENERS ARE INSTALLED TIGHT. | PERIODIC |
| FIELD CORRECTION OF FABRICATED ITEMS | REVIEW DOCUMENTATION OF APPROVED REPAIRS AND VERIFY COMPLETION OF REPAIRS. | PERIODIC |

*NOTE: PERIODIC INSPECTION IS DEFINED AS THE PART-TIME OR INTERMITTENT OBSERVATION OF WORK REQUIRING INSPECTION BY AN APPROVED INSPECTOR WHO IS PRESENT IN THE AREA WHERE THE WORK HAS BEEN OR IS BEING PERFORMED AND AT THE COMPLETION OF THE WORK.

# STRUCTURAL ABBREVIATIONS AND SYMBOLS

| | |
|---|---|
| AB | ANCHOR BOLT |
| ACI | AMERICAN CONCRETE INSTITUTE |
| ADH | ADHESIVE |
| ADJ | ADJACENT |
| AFF | ABOVE FINISHED FLOOR |
| AGG | AGGREGATE |
| AISC | AMERICAN INSTITUTE OF STEEL CONSTRUCTION |
| AISI | AMERICAN IRON STEEL INSTITUTE |
| ALT | ALTERNATE |
| ANC | ANCHOR(AGE) |
| ANSI | AMERICAN NATIONAL STANDARDS INSTITUTE |
| APPROX | APPROXIMATE |
| ARCH | ARCHITECT(URAL) |
| ASCE | AMERICAN SOCIETY OF CIVIL ENGINEERS |
| ASTM | AMERICAN SOCIETY FOR TESTING AND MATERIALS |
| AWS | AMERICAN WELDING SOCIETY |
| BET | BETWEEN |
| BF | BRACED FRAME |
| BLDG | BUILDING |
| BM | BEAM |
| BOF | BOTTOM OF FOOTING |
| BOT | BOTTOM |
| BRG | BEARING |
| BRDG | BRIDGING |
| CJ | CONSTRUCTION JOINT/CONTROL JOINT |
| CL | CENTER LINE |
| CLR | CLEAR, CLEARANCE |
| CMP | CORRUGATED METAL PIPE |
| CMU | CONCRETE MASONRY UNIT |
| COL | COLUMN |
| CONC | CONCRETE |
| CONN | CONNECTION |
| CONST | CONSTRUCTION |
| CONT | CONTINUOUS, CONTINUE |
| CORR | CORRUGATED |
| DEG | DEGREE |
| DTL | DETAIL |
| DIAG | DIAGONAL |
| DIA,⌀ | DIAMETER |
| DIM | DIMENSION |
| DL | DEAD LOAD |
| DWG | DRAWING |
| EA | EACH |
| EF | EACH FACE |
| EIFS | EXTERIOR INSULATION FINISH SYSTEM |
| ELEC | ELECTRIC(AL) |
| EL | ELEVATION |
| ENGR | ENGINEER |
| EQ | EQUAL |
| EQUIP | EQUIPMENT |
| EW | EACH WAY |
| EXIST | EXISTING |
| EXP | EXPANSION |
| EXT | EXTERIOR |
| FD | FLOOR DRAIN |
| FDN | FOUNDATION |
| FF | FINISHED FLOOR |
| FG | FINISHED GRADE |
| FIN | FINISH(ED) |
| FLEX | FLEXIBLE |
| FLR | FLOOR(ING) |
| FOM | FACE OF MASONRY |
| FR | FRAME(D), FRAMING |
| FS | FAR SIDE |
| FT | FOOT, FEET |
| FTG | FOOTING |
| GA | GAGE, GAUGE |
| GALV | GALVANIZED |
| GEN | GENERAL |
| GOVT | GOVERNMENT |
| GRD | GROUND/GRADE |
| HAB | HEADED ANCHOR BOLT |
| HAS | HEADED ANCHOR STUD |
| HC | HOLLOW CORE |
| HDR | HEADER |
| HORIZ | HORIZONTAL |
| HS | HIGH STRENGTH |
| HSB | HIGH STRENGTH BOLT |
| HSS | HOLLOW STRUCTURAL STEEL |
| HT | HEIGHT |
| ID | INSIDE DIAMETER |
| IN | INCH |
| INSUL | INSULATE(D), INSULATION |
| INT | INTERIOR |
| JST | JOIST |
| JT | JOINT |
| K | KIP |
| KO | KNOCK-OUT |
| KOBB | KNOCK-OUT BOND BEAM |
| KSF | KIPS PER SQUARE FOOT |
| KSI | KIPS PER SQUARE INCH |
| LG | LENGTH |
| LB | POUND |
| LL | LIVE LOAD |
| LLH | LONG LEG HORIZONTAL |
| LLV | LONG LEG VERTICAL |
| LONG | LONGITUDINAL |
| LW | LIGHTWEIGHT |
| LWC | LIGHTWEIGHT CONCRETE |
| MAT'L | MATERIAL |
| MAX | MAXIMUM |
| MBR | MEMBER |
| MECH | MECHANIC(AL) |
| MET | METAL |
| MFR | MANUFACTURE(R, ING) |
| MIN | MINIMUM |
| MISC | MISCELLANEOUS |
| MK | MARK |
| NIC | NOT IN CONTRACT |
| NO, # | NUMBER |
| NOM | NOMINAL |
| NS | NEAR SIDE |
| NTS | NOT TO SCALE |
| OC | ON CENTER |
| OCEW | ON CENTER EACH WAY |
| OD | OUTSIDE DIAMETER |
| OE | OR EQUAL |
| OPNG | OPENING |
| OPP | OPPOSITE |
| OPT | OPTIONAL |
| PAR | PARALLEL |
| PC | PRECAST CONCRETE |
| PCC | PORTLAND CEMENT CONCRETE |
| PCF | POUNDS PER CUBIC FOOT |
| PED | PEDESTAL |
| PERF | PERFORATE(D) |
| PERP | PERPENDICULAR |
| PLF | POUNDS PER LINEAL FOOT |
| PL | PLATE |
| PSF | POUNDS PER SQUARE FOOT |
| PSI | POUNDS PER SQUARE INCH |
| PT | POINT |
| QTY | QUANTITY |
| RAD | RADIUS |
| RCP | REINFORCED CONCRETE PIPE |
| REBAR | REINFORCING BAR |
| REF | REFERENCE |
| REINF | REINFORCE(D, ING) |
| REQD | REQUIRED |
| REV | REVISION(S), REVISED |
| SCH | SCHEDULE |
| SEC | SECOND |
| SHT | SHEET |
| SIM | SIMILAR |
| SJI | STEEL JOIST INSTITUTE |
| SMS | SHEET METAL SCREWS |
| SOG | SLAB ON GRADE |
| SPEC | SPECIFICATION(S) |
| SQ | SQUARE |
| SSMA | STEEL STUD MANUFACTURER'S ASSOCIATION |
| SST | STAINLESS STEEL |
| STA | STATION |
| STD | STANDARD |
| STL | STEEL |
| STRUC | STRUCTURAL |
| SW | SIDEWALK |
| SY | SQUARE YARD |
| SYM | SYMMETRY, SYMMETRICAL |
| T&B | TOP AND BOTTOM |
| TECH | TECHNICAL |
| TEMP | TEMPERATURE |
| THK | THICK(NESS) |
| T&G | TONGUE AND GROOVE |
| T.O. | TOP OF |
| TOC | TOP OF CONCRETE |
| TOF | TOP OF FOOTING |
| TOL | TOLERANCE |
| TOS | TOP OF STEEL |
| TOW | TOP OF WALL |
| TRANS | TRANSVERSE |
| TYP | TYPICAL |
| UNO | UNLESS NOTED OTHERWISE |
| VR | VAPOR RETARDER |
| VERT | VERTICAL |
| VOL | VOLUME |
| W/ | WITH |
| W/O | WITHOUT |
| WL | WIND LOAD |
| WP | WORK POINT |
| WSCT | WAINSCOT |
| WT | WEIGHT |
| WWF | WELDED WIRE FABRIC |
| YD | YARD |
| <<X/S-XXX>> | SECTION OR DETAIL REFERENCE |

EDITOR'S NOTE:
STRUCT QA AND ABBREVIATIONS. EDITED DEC 14, 2011.

US Army Corps of Engineers
Albuquerque District

| Mark | Description | Date | Appr. |
|---|---|---|---|

File Name: xxxxs-0007-QA.dgn
Plot Scale: 1=1
Plot Date: FEBRUARY 2011
SOL/CONTRACT NO.
PROJECT NO.

DESIGN BY: J. STAGES
DRAWN BY: J. STAGES
REVIEWED BY: S. BUCKEL

U.S. ARMY ENGINEER DISTRICT, CORPS OF ENGINEERS, ALBUQUERQUE, NEW MEXICO
CHIEF, FACILITIES DESIGN SECTION
DATE:

CUSTOMER NAME, LOCATION OF PROJECT
PROJECT NAME
XXXXXX

STRUCTURAL QUALITY ASSURANCE PROGRAM

SHEET NO.
S-007
7 OF X

SEQUENCE NO.
X