GENERAL NOTES:

1. DO NOT CHANGE THE SIZE OR SPACING OF STRUCTURAL ELEMENTS WITHOUT THE APPROVAL OF THE ENGINEER.
2. DETAILS SHOWN ARE TYPICAL AND APPLY TO SIMILAR CONDITIONS UNLESS NOTED OTHERWISE.
3. THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY.
4. BRACE STRUCTURE AS REQUIRED FOR CONSTRUCTION AND WIND LOADS UNTIL ALL STRUCTURAL ELEMENTS NEEDED FOR STABILITY ARE INSTALLED.
5. THE DESIGN IS BASED ON THE 2012 VIRGINIA UNIFORM STATEWIDE BUILDING CODE.
6. CONTRACTOR SHALL DETERMINE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. HE/SHE AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY HIS/HER FAILURE TO LOCATE AND PRESERVE ALL UNDERGROUND UTILITIES.
7. INCORRECTLY FABRICATED, DAMAGED, OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE OWNER'S REPRESENTATIVE PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE PRE-APPROVAL BY THE ENGINEER.
8. EACH CONTRACTOR SHALL COOPERATE WITH THE OWNER'S REPRESENTATIVE AND COORDINATE HIS/HER WORK WITH THE WORK OF OTHERS.
9. VERIFY SIZE AND LOCATION OF OPENINGS PRIOR TO BEGINNING WORK. FOR DIMENSIONS NOT SHOWN, SEE MECHANICAL, ELECTRICAL, CIVIL AND ARCHITECTURAL DRAWINGS.
10. VERIFY SIZE AND LOCATION OF EQUIPMENT PADS WITH MECHANICAL AND/OR ELECTRICAL CONTRACTOR AND EQUIPMENT MANUFACTURER.

FOUNDATION AND SOIL PREPARATION NOTES:

1. THE FOUNDATION DESIGN IS BASED ON AN ALLOWABLE SOIL BEARING PRESSURE OF 2,500 POUNDS PER SQUARE FOOT AS RECOMMENDED IN THE GEOTECHNICAL REPORT NO. 14616028.00 BY SCHNABEL ENGINEERING CONSULTANTS, INC. AND DATED JUNE 11, 2014. BEARING STRATUM FOR FOOTINGS SHALL BE VERIFIED IN FIELD BY THE GEOTECHNICAL ENGINEER BEFORE PLACING FORMWORK FOR CONCRETE FOOTINGS. D
2. THE CONTRACTOR SHALL REVIEW THE REPORT AND BORING LOGS DURING THE BIDDING PHASE OF THE PROJECT.
3. BOTTOM OF ALL FOOTINGS SHALL BE A MINIMUM OF1'-6" BELOW FINAL FINISHED GRADE. ADJUST FOOTING ELEVATIONS AS REQUIRED TO MAINTAIN MINIMUM FROST COVER.
4. PROVIDE POSITIVE DRAINAGE FOR ALL TRENCHES DURING CONSTRUCTION. DO NOT ALLOW ANY PONDING OF WATER DURING CONSTRUCTION.
5. DO NOT PLACE FOOTINGS IN WATER OR ON FROZEN GROUND. DO NOT ALLOW GROUND BENEATH FOOTINGS TO FREEZE.
6. BEAR ALL FOOTINGS ON COMPACTED STRUCTURAL FILL OR NATIVE UNDISTURBED SOIL AS APPROVED BY THE GEOTECHNICAL ENGINEER. SOIL BEARING SURFACES, PREVIOUSLY ACCEPTED BY OWNER'S REPRESENTATIVE, WHICH ARE ALLOWED TO BECOME SATURATED, FROZEN OR DISTURBED SHALL BE REWORKED TO SATISFACTION OF OWNER'S REPRESENTATIVE.
7. STRUCTURAL FILL AND SELECTED FILL: SOUND, DURABLE, SAND, GRAVEL, STONE, OR BLENDS OF THESE MATERIALS, FREE FROM ORGANIC, FROZEN OR OTHER DELETERIOUS MATERIALS, AND MEETING THE FOLLOWING GRADATION REQUIREMENTS:

SIEVE	PERCENT PASSING
4"	100
NO. 40	0 - 70
NO. 200	0 - 10

   1. FINES PASSING NO. 200 SHALL BE NON-PLASTIC.
   2. PARTICLE SIZE ANALYSIS SHALL SHOW NO GAP GRADING.

8. THE SOIL BENEATH THE BUILDING AND 5 FEET AROUND THE PERIMETER SHALL BE TREATED AS FOLLOWS:
   A. STRIP THE AREA OF ALL VEGETATION.
   B. PERFORM ALL CUT OPERATIONS.
   C. THE NEXT 6 INCHES SHALL BE THOROUGHLY SCARIFIED, WITH WATER ADDED TO RAISE THE MOISTURE CONTENT TO AT LEAST 3 PERCENTAGE POINTS ABOVE OPTIMUM, AND RE-COMPACTED TO A DENSITY IN THE RANGE OF 95% TO 100% OF STANDARD PROCTOR. THE FIRST LIFT OF FILL SHALL BE PLACED ON THE COMPACTED SUBGRADE WITHIN EIGHT HOURS OF COMPLETING THE COMPACTION.
   D. THE FILL REQUIRED TO RAISE THE BUILDING TO BENEATH THE FLOOR SLAB SHALL BE EITHER ON SITE FILL OR SELECT (STRUCTURAL) FILL. THE SELECT FILL SHALL HAVE A PLASTICITY INDEX BETWEEN 4 AND 12 AND A LIQUID LIMIT LESS THAN 40. PLACE ALL FILL (ON SITE OR SELECT) IN 8-INCH LIFTS AND COMPACT TO AT LEAST 95% OF THE STANDARD PROCTOR DENSITY AT A MOISTURE CONTENT WITHIN -3 AND +3 PERCENTAGE POINTS OF OPTIMUM.
   E. ALL SLABS-ON-GRADE SHALL BEAR ON A BASE COURSE OF CLEAN, COMPACTED CRUSHED STONE A MINIMUM OF 12" THICK. THE CRUSHED STONE SHALL BE VDOT NO. 57 CRUSHED STONE.
   F. EACH LIFT SHALL BE TESTED FOR MOISTURE CONTENT AND IN PLACE DENSITY AT A RATE OF ONE TEST PER 3,000 SQUARE FEET (MINIMUM OF THREE PER LIFT).
9. SUBMITTALS:
   A. PRIOR TO DELIVERY OR USE OF ANY FILL MATERIAL, THE TESTING LABORATORY SHALL SUBMIT THE FOLLOWING REPORTS OF EACH MATERIAL:
      1. DESCRIPTION OF MATERIAL
      2. GRADATION ANALYSIS
      3. MODIFIED PROCTOR LABORATORY COMPACTION TESTS PER ASTM D1557
   B. FIELD REPORTS OF IN PLACE SOIL DENSITY TESTS CALIBRATED FROM THE MODIFIED PROCTOR LABORATORY COMPACTION TEST

CAST-IN-PLACE CONCRETE NOTES:

1. ALL CONCRETE SHALL HAVE A 28 DAY DESIGN COMPRESSIVE STRENGTH OF 4,500 PSI. 20% OF CLASS F FLYASH MAY BE USED WITH THE APPROVAL OF THE ENGINEER AND THE CONCRETE FINISHER/CONTRACTOR BEFORE BIDDING. CONCRETE SHALL BE AIR ENTRAINED FOR CLASS F2 EXPOSURE PER ACI TABLE 4.4.1. TOLERANCE ON AIR CONTENT AS DELIVERED SHALL BE +/- 1.5 PERCENT.
2. BUILDING CONCRETE SHALL HAVE A MAXIMUM WATER TO CEMENT RATIO AS FOLLOWS:
   A. 4,500 PSI CONCRETE - 0.45
3. PLACEMENT OF CONCRETE SHALL BE IN CONFORMANCE WITH ACI 117-06 "SPECIFICATION FOR TOLERANCE FOR CONCRETE AND MATERIALS AND COMMENTARY".
4. IF THE AIR TEMPERATURE IS GREATER THAN 90 DEGREES WITHIN 24 HOURS AFTER PLACEMENT, HOT WEATHER CONCRETE PROCEDURES SHALL BE USED. THE CONTRACTOR SHALL SUBMIT A PROCEDURE TO THE ENGINEER FOR APPROVAL. THESE PROCEDURES MAY INCLUDE THE FOLLOWING:
   A. PLACING THE CONCRETE IN THE EARLY MORNING HOURS
   B. THE USE OF EVAPORATION REDUCER (SEE BELOW)
   C. THE USE OF MISTING AS A CURING METHOD
   D. THE USE OF WET BLANKETS AS A CURING METHOD
   E. THE USE OF A RETARDING ADMIXTURE (NOT PREFERABLE)
5. FOUR 4"X8" CONCRETE CYLINDERS SHALL BE MADE FOR EVERY 50 CUBIC YARDS OR EACH DAY'S POUR, ONE TO BE TESTED AT 7 DAYS, TWO AT 28 DAYS, AND ONE TO HOLD. THE CONCRETE SLUMP, TEMPERATURE, AND AIR CONTENT SHALL BE MEASURED EVERY TIME A SET OF FOUR CYLINDERS IS MADE.
6. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITIONS OF THE AMERICAN CONCRETE INSTITUTE STANDARDS "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE" (ACI 318) AND "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS" (ACI 301).
7. SPLICES IN REINFORCEMENT SHALL MEET CLASS B TENSION LAP REQUIREMENTS UNLESS NOTED OTHERWISE.
8. COVER FOR ALL REINFORCEMENT SHALL MEET THE COVERAGE REQUIREMENTS AS SHOWN IN THE LATEST ACI 318, OR AS SHOWN ON THE DETAILS. COVER DIMENSIONS SHOWN ON THE DETAILS CONTROL OVER ACI.
9. ANY CONCRETE TO BE PLACED FURTHER THAN 16 FEET FROM THE END OF A CONCRETE TRUCK SHALL BE PUMPED WITH A COMMERCIAL CONCRETE PUMPING TRUCK OR OTHER PLACEMENT METHOD APPROVED BY THE ENGINEER. THE CONCRETE TRUCK SHALL NOT BE ALLOWED TO DRIVE OVER THE SUBGRADE OR THE SLAB REINFORCEMENT.
10. REINFORCING STEEL SHALL BE DOMESTIC DEFORMED BILLET STEEL CONFORMING TO ASTM A-615 GRADE 60. #4 REINFORCEMENT BARS AND SMALLER SHALL BE COLD BENT WHENEVER BENDING IS REQUIRED IN THE FIELD. REINFORCEMENT GREATER THAN A #4 BAR MAY NOT BE BENT IN THE FIELD WITHOUT APPROVAL OF THE ENGINEER.
11. WHERE REQUIRED, STEP NEW FOOTINGS UP OR DOWN IN RATIO OF TWO HORIZONTALS TO ONE VERTICAL. CAST STEPPED FOOTINGS MONOLITHICALLY.
12. DOWEL CONCRETE WALLS AND PIERS INTO FOOTINGS/FOUNDATIONS WITH DOWELS THE SAME SIZE AND SPACING AS VERTICAL REINFORCEMENT. EXTEND DOWELS TO WITHIN 3" OF BOTTOM OF FOOTING/FOUNDATION, TERMINATED WITH ACI STD. 90 DEGREE HOOK, UNLESS NOTED OTHERWISE.
13. PROVIDE A ROUGH CONCRETE SURFACE (1/4" MINIMUM AMPLITUDE) AT THE INTERSECTION OF CONCRETE WALLS, AND PIERS WITH THE TOP OF FOOTINGS. DO NOT PROVIDE A KEYWAY UNLESS SHOWN OR NOTED ON THE DRAWINGS
14. PROVIDE 3/4" x 3/4" CHAMFER AT ALL EXPOSED CORNERS UNLESS NOTED OTHERWISE.
15. NO HOLES OR OPENINGS ARE PERMITTED THROUGH CONCRETE SLABS OR WALLS EXCEPT AS FOLLOWS:
   A. WHERE SHOWN AND AS DETAILED ON DRAWINGS.
   B. MISCELLANEOUS HOLES THROUGH SLABS OR WALLS WHICH DO NOT DISPLACE MORE THAN ONE BAR. THESE DO NOT REQUIRE ADDITIONAL REINFORCEMENT.
16. LOCATE ADDITIONAL CONSTRUCTION JOINTS REQUIRED TO FACILITATE CONSTRUCTION AS ACCEPTABLE TO ENGINEER. DETAIL JOINT AND SHOW ON SHOP DRAWINGS.
17. CAST CONCRETE ON SLOPED SURFACES BEGINNING AT LOWEST ELEVATION AND CONTINUING MONOLITHICALLY TOWARD HIGHER ELEVATIONS UNTIL INTENDED POUR IS COMPLETED.
18. REINFORCING BARS, BAR SUPPORTS, AND SPACERS SHALL BE DETAILED AND PROVIDED IN ACCORDANCE WITH THE LATEST ACI DETAILING MANUAL. USE WIRE-BAR SUPPORTS COMPLYING WITH CRSI SPECIFICATIONS. SUPPORTS SHALL NOT BE PLACED FURTHER THAN 4 FEET APART. DAYTON SUPERIOR PRODUCTS (800-745-3700) OR EQUAL UNLESS NOTED OTHERWISE IN THE SPECIFICATIONS:
   A. USE SUPPORTS WITH SAND PLATES OR HORIZONTAL RUNNERS WHERE BASE MATERIAL WILL NOT SUPPORT CHAIR LEGS. CONCRETE BLOCK OR CLAY MASONRY MAY NOT BE USED.
   B. FOR EXPOSED TO VIEW CONCRETE SURFACES WHERE LEGS OF SUPPORTS ARE IN CONTACT WITH THE FORMS, PROVIDE SUPPORTS WITH LEGS THAT ARE PLASTIC PROTECTED (CRSI, CLASS 1) OR STAINLESS STEEL PROTECTED (CRSI, CLASS 2).
19. SEE ARCHITECTURAL AND MECHANICAL/ELECTRICAL DRAWINGS FOR EXACT LOCATIONS AND DETAILS OF DEPRESSED SLABS, FLOOR DRAIN LOCATIONS, PLATFORMS, CURBS, AND PADS.
20. USE ONE OF THE FOLLOWING SEALERS ON ALL INTERIOR EXPOSED CONCRETE SURFACES WHICH DO NOT RECEIVE A STAIN, PAINT OR OTHER TYPE OF COATING:
   A. SEAL HARD BY L&M
   B. EUCO DIAMOND HARD BY EUCLID
21. EVAPORATION REDUCERS SHALL BE USED AFTER EACH FINISHING OPERATION ON THE CAST IN PLACE CONCRETE FLOOR SLAB UNLESS PRIOR APPROVAL FROM THE ENGINEER HAS BEEN OBTAINED TO NOT USE. SEE SPECIFICATIONS FOR PRODUCT REQUIREMENTS.
22. SAWCUTS IN CONCRETE SLABS ON GRADE SHALL BE MADE AS SOON AS THE CONCRETE IS OF SUFFICIENT STRENGTH TO SAW WITHOUT RAVELING THE AGGREGATE. ANY TIME LAPSE GREATER THAN 8 HOURS AFTER PLACING THE CONCRETE SHALL BE PERMITTED ONLY IF APPROVED BY THE ENGINEER. FILL ALL INTERIOR JOINTS WITH MM-80 JOINT COMPOUND.
23. ADHESIVE ANCHORS WITH REBAR OR THREADED RODS SHALL BE AS NOTED BELOW. INSTALL ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS, WHICH INCLUDES CLEANING THE HOLE WITH AIR AND USING A MANUFACTURER APPROVED DISPENSING TOOL WITH MIXING NOZZLE.
   A. INTO CONCRETE: HILTI HIT-HY 200, OR APPROVED EQUAL.
   B. INTO GROUTED OR NON-GROUTED CMU: HILTI HIT-HY 70, OR APPROVED EQUAL.
24. NO PIPING OR CONDUITS SHALL BE INSTALLED IN ANY CONCRETE WITHOUT THE APPROVAL OF THE ENGINEER.
25. WATERSTOPS SHALL BE 6" PVC, CENTER BULB TYPE, SUCH AS GREENSTREAK STYLE 732. SEE SECTIONS FOR LOCATIONS.
26. ALL DOWELS, ANCHOR BOLTS, EMBEDDED STEEL, ELECTRICAL CONDUITS, PIPE SLEEVES, PIPING, WATERSTOPS, INSERTS, GROUNDS, AND ALL OTHER EMBEDDED ITEMS AND FORMED DETAILS SHALL BE IN PLACE BEFORE START OF CONCRETE PLACEMENT. FOR EMBEDDED ITEMS AND REQUIRED DETAILS, SEE CIVIL, MECHANICAL, ELECTRICAL, AND ARCHITECTURAL DRAWINGS. VERIFY SIZE AND LOCATION OF ALL OPENINGS.
27. ALL PIPING AND DUCT PENETRATIONS THROUGH NEW STRUCTURAL SLABS ARE TO BE SLEEVED OR CHASED. NO CORING OF SLAB IS PERMITTED. ALL PIPING THROUGH EXISTING STRUCTURAL SLABS MAY BE CORED IF APPROVED BY ENGINEER.
28. THE VAPOR RETARDER INDICATED ON THE SECTIONS SHALL BE EITHER STEGO 10 MIL CLASS A VAPOR RETARDER OR VAPOR BLOCK 10 BY RAVEN INDUSTRIES. USE STEGO OR RAVEN TAPE ON ALL LAPS AND AROUND ALL PENETRATIONS.
29. SUBMITTALS:
   A. PRODUCT DATA FOR PROPRIETARY MATERIALS AND ITEMS, INCLUDING REINFORCEMENT AND FORMING ACCESSORIES, ADMIXTURES, PATCHING COMPOUNDS, FLY ASH, AND OTHERS AS REQUESTED BY ENGINEER.
   B. SHOP DRAWINGS FOR CONTROL/CONSTRUCTION JOINT LAYOUT.
   C. SHOP DRAWINGS FOR FABRICATION, BENDING, AND PLACEMENT FOR CONCRETE REINFORCEMENT COMPLYING WITH THE LATEST EDITION OF THE ACI DETAILING MANUAL, INCLUDING DETAILS OF CONTROL AND CONSTRUCTION JOINTS. DUPLICATION OF CONTRACT DRAWINGS FOR SHOP DRAWINGS IS NOT PERMITTED.
   D. LABORATORY TEST RESULTS FOR CONCRETE MATERIALS AND MIX DESIGN TESTS. TEST REPORTS SHALL BE LESS THAN 12 MONTHS OLD.

CONCRETE MASONRY UNIT (CMU) WALL NOTES:

1. REFER TO THE ARCHITECTURAL DRAWINGS OR SPECIFICATIONS FOR TYPES OF MASONRY OTHER THAN CONCRETE MASONRY, SUCH AS BRICK. THESE NOTES DO NOT APPLY TO 4" VENEER CMU.
2. MORTAR SHALL CONFORM TO TABLE 1 OF ASTM C270, TYPE S. THE MORTAR MIX DESIGN (BY VOLUME) SHALL BE SUBMITTED TO THE ENGINEER BEFORE CONSTRUCTION BEGINS. HOLLOW CONCRETE MASONRY UNITS SHALL CONFORM TO ASTM C90 NORMALWEIGHT SPECIFICATIONS WITH A MINIMUM COMPRESSIVE STRENGTH OF 1900 PSI. THE SPECIFIED COMPRESSIVE STRENGTH, f'm, IS 2,000 PSI.
3. COARSE CONCRETE GROUT SHALL CONFORM TO ASTM C476 WITH A MAXIMUM AGGREGATE SIZE OF 3/8" AND A SLUMP OF 8 TO 11 INCHES. GROUT MAY BE EITHER READY MIXED OR JOB MIXED, AND SHALL BE BASED ON A MIX DESIGN (BY VOLUME) APPROVED BY THE ENGINEER. THE AMOUNT OF COARSE AGGREGATE SHALL NOT EXCEED THE AMOUNT OF FINE AGGREGATE. EVIDENCE THAT THE MIX DESIGN SHOULD ACHIEVE A 28 DAY MINIMUM COMPRESSIVE STRENGTH OF 2500 PSI SHALL BE PROVIDED TO THE ENGINEER. HOWEVER, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COMPRESSIVE STRENGTH.
4. WHEN MIXING MORTAR AND GROUT, CONTAINERS OF KNOWN VOLUME SHALL BE USED. MEASUREMENT USING SHOVELS SHALL NOT BE ALLOWED. FOR GROUT, THE SAND AND PEA GRAVEL SHALL BE TAKEN FROM SEPARATE PILES, NOT FROM A PRE-BLENDED PILE. IF MEASUREMENT BY SHOVELING OR USE OF A PRE-BLENDED PILE IS DISCOVERED, THE ENGINEER MAY REQUIRE ALL WALLS BUILT SO FAR TO BE TESTED PER ASTM C 1314 BY CUTTING 3 MASONRY PRISMS AND 3 GROUT CORES OUT OF THE WALL FOR EVERY 5,000 SQUARE FEET OF WALL, AND MAY REQUIRE ANY AREA OF WALL TESTING BELOW 1,500 PSI TO BE REPLACED AT NO COST TO THE OWNER.
5. THREE GROUT PRISMS SHALL BE MADE DURING THE FIRST DAY OF MASONRY WORK AND FOR EVERY 5,000 SF OF WALL (OR LESS) THEREAFTER, WITH ALL THREE PRISMS TESTED AT 28 DAYS. THE ENGINEER MAY REQUIRE ANY AREA OF WALL TESTING BELOW 2,000 PSI TO BE REPLACED AT NO COST TO THE OWNER. EVERY TIME A SET OF GROUT PRISMS IS MADE, THE LABORATORY SHALL VERIFY:
   A. PROPORTIONS OF MORTAR AND GROUT MIXING
   B. REBAR AND JOINT REINFORCEMENT SIZES AND LOCATIONS
   C. PROPER GROUT PLACEMENT AT REBAR
   D. HEADJOINTS ARE FULLY MORTARED
   E. CONTROL JOINTS ARE REINFORCED AND FULLY MORTARED
   F. PROPER COLD AND HOT WEATHER PROCEDURES USED
6. COLD WEATHER AND HOT WEATHER PROCEDURES SHALL BE USED IN ACCORDANCE WITH ACI 530.1/ASCE 6/TMS 602 ARTICLE 1.8C AND 1.8D.
7. REINFORCING STEEL SHALL BE NEW DOMESTIC DEFORMED BILLET STEEL CONFORMING TO ASTM A-615 GRADE 60.
8. ALL NON-LOAD BEARING CMU WALLS SHALL BE REINFORCED HORIZONTALLY WITH STANDARD TRUSS TYPE DUR-O-WALL, AT 16 INCHES ON CENTER. HORIZONTAL BOND BEAMS SHALL BE LOCATED AT THE TOP COURSE OF THE WALL AND ABOVE AND BELOW OPENINGS. HORIZONTAL BEAMS SHALL BE REINFORCED WITH 2 #5 BARS, IN 8 INCH AND 12 INCH WALLS, OR 1 #4 BAR, IN 6 INCH WALLS. PROVIDE 1 #4 BAR VERTICAL REINFORCEMENT ON EACH SIDE OF AN OPENING. EXTEND REINFORCEMENT 2 FEET PAST EACH CORNER OF AN OPENING. REFER TO THE LINTEL SCHEDULE FOR ADDITIONAL REINFORCEMENT. ALL REINFORCEMENT BARS IN CMU WALL SHALL BE PROVIDED WITH 1" CONCRETE GROUT COVER.
9. THE MINIMUM SPLICE LENGTH FOR ALL VERTICAL AND HORIZONTAL REINFORCEMENT IN ALL MASONRY SHALL BE AS FOLLOWS:
   #5 BARS - 2'-7" (MIN)
10. PROVIDE VERTICAL CONTROL JOINTS AT LOCATIONS APPROVED BY THE ARCHITECT, WITH A MAXIMUM SPACING OF 20 FEET. HORIZONTAL BOND BEAM REINFORCEMENT SHALL CONTINUE THROUGH ALL CONTROL JOINTS IN ALL WALLS (BOTH LOAD-BEARING AND NON-LOAD BEARING WALLS). CONTROL JOINTS SHALL CONSIST OF A VERTICAL MASONRY JOINT, RAKED BACK AND CAULKED.

ALUMINUM GRATING NOTES:

1. ALUMINUM GRATING SHALL COMPLY WITH APPLICABLE PROVISIONS AND RECOMMENDATIONS OF THE FOLLOWING:
   A. NAAM METAL BAR GRATING MANUAL DESIGNATED ANSI/NAAMM MBG 531 (ALUMINUM AND LIGHT DUTY STEEL AND STAINLESS STEEL GRATING).
2. ALUMINUM MATERIAL SHALL BE ASTM B221, ALUMINUM ALLOY, EXTRUDED BARS, RODS, WIRE, SHAPES AND TUBING.
3. ALUMINUM GRATING SHALL BE:
   A. IKG BORDEN, INC. - TYPE FS,
   B. OHIO GRATINGS, INC. - TYPE 15-SG-4,
   C. OR EQUAL
4. PERIMETER FRAMES SHALL BE EXTRUDED DESIGN, ALLOY 6063-T6 AND SHALL BE PROVIDED BY MANUFACTURER OF APPROVED GRATING SYSTEM. FRAME ASSEMBLIES SHALL BE SHOP FABRICATED WITH MITER CUTS AND WELDED CORNERS AND SHALL BE SIZED TO MATCH GRATING DEPTH. ALL EXPOSED WELDS SHALL BE GROUND SMOOTH.
5. VERTICAL AND HORIZONTAL LEGS OF FRAME SHAPE SHALL HAVE 1/4" WALL THICKNESS. FRAME SHALL BE DESIGNED TO PROVIDE A CONTINUOUS SLOT TO ACCOMMODATE FASTENERS, AND SHALL HAVE A CONTINUOUS EXTRUDED ANCHOR.
6. TRAFFIC SURFACE FOR ALUMINUM BAR GRATINGS SHALL BE GROOVED.
7. INSTALL GRATING IN ACCORDANCE WITH SHOP DRAWINGS AND STANDARD INSTALLATION CLEARANCES AS RECOMMENDED BY THE NAAMM METAL BAR GRATING MANUAL.
8. PERFORM ALL CUTTING AND FITTING REQUIRED FOR INSTALLATION. GRATING SHALL BE PLACED SUCH THAT CROSS BARS ALIGN.
9. WHEREVER GRATING IS PIERCED BY PIPES, DUCTS AND STRUCTURAL MEMBERS, CUT OPENINGS NEATLY AND ACCURATELY TO SIZE AND WELD A RECTANGULAR BAND BAR OF THE SAME HEIGHT AND MATERIAL AS BEARING BARS.
10. CUTOUTS FOR CIRCULAR OBSTRUCTIONS ARE TO BE AT LEAST 2" LARGER IN DIAMETER THAN THE OBSTRUCTION. CUTOUTS FOR ALL PIPING 4" OR LESS SHALL BE MADE IN THE FIELD.
11. ALL RECTANGULAR CUTOUTS ARE TO BE MADE TO THE NEXT BEARING BAR BEYOND THE PENETRATION WITH A CLEARANCE NOT TO EXCEED BEARING BAR SPACING.
12. UTILIZE STANDARD PANEL WIDTHS WHEREVER POSSIBLE.
13. EDGE BAND ALL GRATING PANELS WITH ALUMINUM RECTANGULAR BAR OF SAME SIZE AS GRATING BARS. WELD EDGE BANDING AT EVERY GRATING BAR WITHIN CENTER 75 PERCENT OF BAR DEPTH. GRIND SMOOTH ALL WELDS THAT EXTEND PAST THE TOP OR BOTTOM EDGE.
14. SIZE OF GRATING PANELS SHALL NOT EXCEED 60 POUNDS PER SECTION.
15. GRATING SECTIONS SHALL BE FASTENED DOWN WITH TYPE 316 STAINLESS STEEL SADDLE CLIPS. PROVIDE A MINIMUM OF FOUR FASTENERS (ONE AT EACH CORNER) PER PANEL.
16. ALL ALUMINUM FRAMES AND SUPPORTS IN DIRECT CONTACT WITH CONCRETE OR MASONRY SHALL BE BACKPAINTED WITH BITUMINOUS PAINT.

PRE-ENGINEERED METAL BUILDING NOTES

1. BEFORE FABRICATION, SHOP DRAWINGS OF THE METAL BUILDING SHALL BE SUBMITTED TO CHA FOR REVIEW AND COMMENT. SHOP DRAWINGS AND CALCULATIONS SHALL BE SIGNED AND SEALED BY AN ENGINEER LICENSED IN THE COMMONWEALTH OF VIRGINIA.
2. THE LATERAL DEFLECTION OF THE LATERAL FORCE RESISTING SYSTEMS SHALL NOT EXCEED H/180 FOR ANY BUILDING AND H/300 FOR ANY BUILDING WITH MASONRY VENEER HIGHER THAN 8 FEET ABOVE FINISH FLOOR. THE LATERAL DEFLECTION OF THE GIRTS AND METAL SIDING SHALL BE L/120 FOR ANY WALL, AND L/240 FOR ANY TRIBUTARY AREA WITH MASONRY VENEER.
3. ALL COLD-FORMED STEEL SHALL BE DESIGNED BY THE METAL BUILDING ENGINEER PER AISI-NASPEC 2001. THE FOLLOWING ARE ADDITIONAL MINIMUM REQUIREMENTS FOR THE PURLINS AND GIRTS ON THIS PROJECT:
   A. BOTH FLANGES SHALL BE BRACED AT 8 FT OC MAXIMUM.
   B. BRACING LINES SHALL CONSIST OF 16 GAGE STRAPS X 1.5" WITH A #12 SCREW AT EACH FLANGE.
   C. BRACING LINES SHALL BE ANCHORED WITH 2 HORIZONTAL AND 2 DIAGONAL L1.5X1.5X16 GAUGE ANGLES AT EACH END BAY, AT BOTH SIDES OF RIDGES, AND AT 50 FT OC MAXIMUM. HORIZONTAL ANGLES SHALL BE COPED AND ATTACHED TO EACH FLANGE WITH 2 #12 SCREWS. ATTACH DIAGONALS TO HORIZONTALS WITH 2#12 SCREWS.
   D. BRACING STRAPS MAY BE OMITTED ON FLANGES THAT ARE BRACED WITH THROUGH-FASTENED ROOF PANELS OR METAL SIDING.
4. THE METAL BUILDING ENGINEER SHALL DETERMINE THE DIAMETER OF THE ANCHOR BOLTS REQUIRED FOR THE TYPICAL ANCHOR BOLT DETAIL.

PRE-ENGINEERED METAL BUILDING DESIGN CRITERIA:

THE METAL BUILDING SHALL BE DESIGNED FOR THE FOLLOWING MINIMUM LOADS AND SHALL BE DESIGNED IN ACCORDANCE WITH THE 2012 VIRGINIA UNIFORM STATEWIDE BUILDING CODE:

BUILDING CLASSIFICATION:	III	
ROOF DEAD LOAD:	SELF WEIGHT PER BUILDING MANUFACTURER	
COLLATERAL LOAD:	5	PSF
ROOF LIVE LOAD:	20	PSF
MONORAIL FOR STRAINERS :	1300	LBS
MONORAIL FOR TREATED WATER PUMPS:	4300	LBS
SNOW LOAD:		
GROUND SNOW LOAD:	30	PSF
FLAT-ROOF SNOW LOAD:	23.1	PSF
SNOW EXPOSURE FACTOR, Ce:	1.0	
SNOW IMPORTANCE FACTOR, I:	1.1	
THERMAL FACTOR, Ct:	1.0	
WIND DESIGN DATA:		
BASIC WIND SPEED (3 SECOND GUST):	120	MPH
WIND IMPORTANCE FACTOR:	1.0	
WIND EXPOSURE CATEGORY:	C	
INTERNAL PRESSURE COEFFICIENTS:	+/- 0.18	

ALL NEW COMPONENTS AND CLADDING NOT DESIGNED BY THE ENGINEER SHALL BE DESIGNED FOR 25 PSF UNLESS OTHERWISE APPROVED BY THE ENGINEER.

EARTHQUAKE DESIGN DATA:	
SEISMIC IMPORTANCE FACTOR:	1.25
MAPPED SPECTRAL RESPONSE ACCELERATIONS:	SS = 0.170 S1= 0.073
SITE CLASS:	D
SEISMIC DESIGN CATEGORY:	B
BASIC SEISMIC-FORCE-RESISTING SYSTEM:	PER BUILDING MANUFACTURER
DESIGN BASE SHEAR, V:	PER BUILDING MANUFACTURER
SEISMIC RESPONSE COEFFICIENT, Cs:	PER BUILDING MANUFACTURER
RESPONSE MODIFICATION FACTOR, R:	PER BUILDING MANUFACTURER
ANALYSIS PROCEDURE USED:	PER BUILDING MANUFACTURER

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (518) 453-4500 www.chacompanies.com

NO.	DATE	REVISIONS AND RECORD OF ISSUE	BY	CHK	APP
D	12/10/15	ISSUED FOR CONSTRUCTION			
C	08/17/15	ISSUED FOR FINAL REVIEW AND PRICING			
B	07/31/15	ISSUED FOR PERMITTING			
A	12/15/14	LEVEL 2 DESIGN DOCUMENTS			

BLACK & VEATCH
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Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP & LAKES TO FOREST WATER LINE EXTENSION

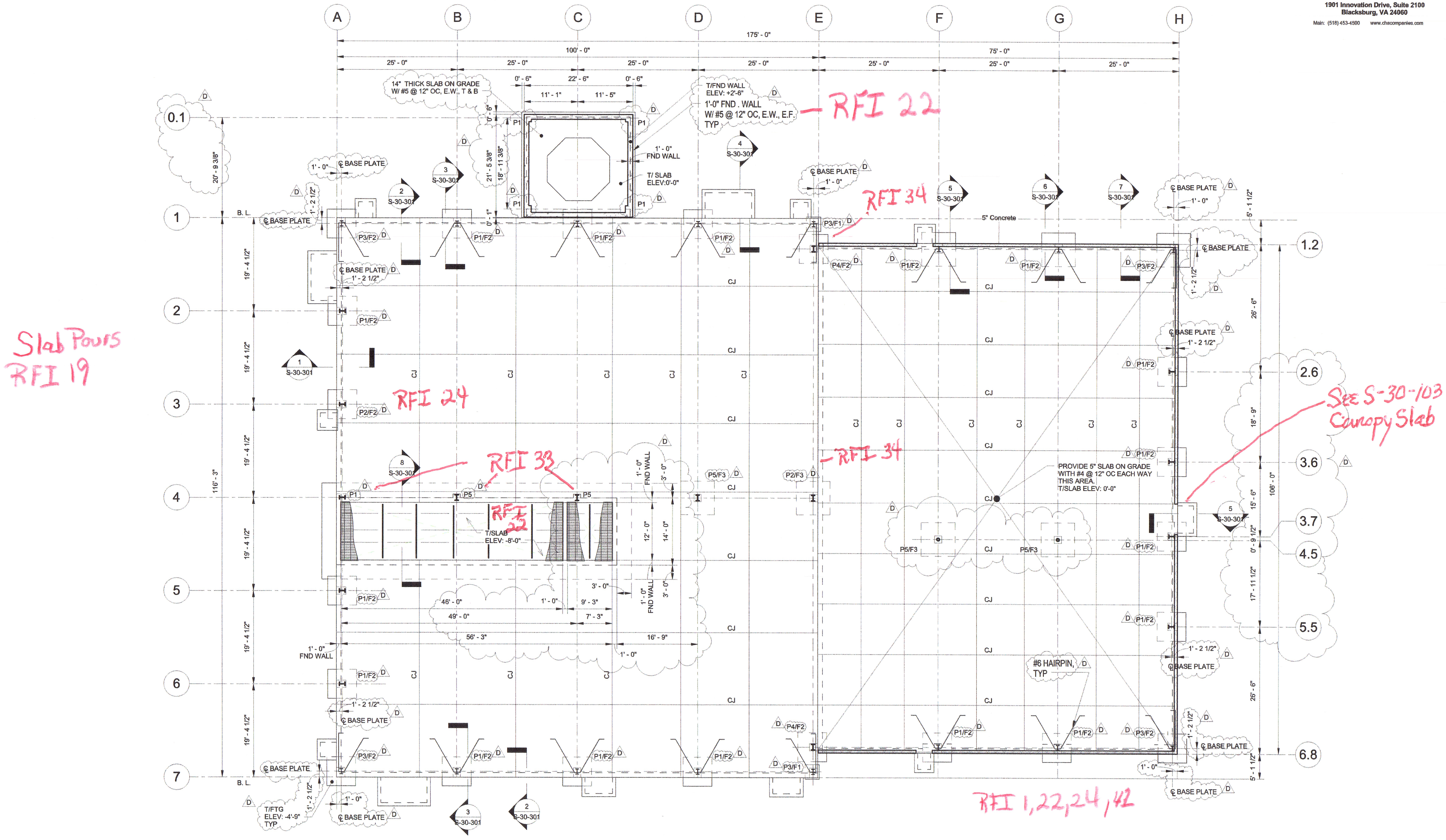
STRUCTURAL - GENERAL NOTES AND DESIGN CRITERIA

DESIGNED: EAB
DETAILED: C.E.C.
CHECKED: Checker
APPROVED: Approver
DATE: 05/16/14

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

CHA PROJECT NO. 27872

ISSUED FOR CONSTRUCTION



NOTES:
1. PROVIDE A 10" SLAB ON GRADE WITH #4 @ 12" OC EACH WAY, TOP AND BOTTOM, UNLESS NOTED OTHERWISE. T/SLAB ELEV: 0'-0" UNLESS NOTED OTHERWISE ON PLAN.
2. * DIMENSIONS ARE BASED ON DRAWINGS PROVIDED BY BUTLER MANUFACTURING DATED NOVEMBER 2015. DIMENSIONS SHALL BE COORDINATED WITH APPROVED PRE-ENGINEERED METAL BUILDING SHOP DRAWINGS PRIOR TO REBAR FABRICATION AND CONCRETE PLACEMENT.
3. B.L. - DENOTES BLDG. LINE
4. CJ - DENOTES CONTROL JOINT (D)

ISSUED FOR CONSTRUCTION

CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (518) 453-4500 www.chacompanies.com

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CHK	APP
12/10/15	ISSUED FOR CONSTRUCTION	D			
08/17/15	ISSUED FOR FINAL REVIEW AND PRICING	C			
07/31/15	ISSUED FOR PERMITTING	B			
12/15/14	LEVEL 2 DESIGN DOCUMENTS	A			

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SW:
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PLOTTED:
USER:
DWG VER: D
XREF1:
XREF2:
XREF3:
XREF4:

COMMONWEALTH OF VIRGINIA
CHRISTOPHER J.B. JEDRICH
Lic. No. 042360
PROFESSIONAL ENGINEER

BLACK & VEATCH
Building a world of difference
Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP & LAKES TO FOREST WATER LINE EXTENSION

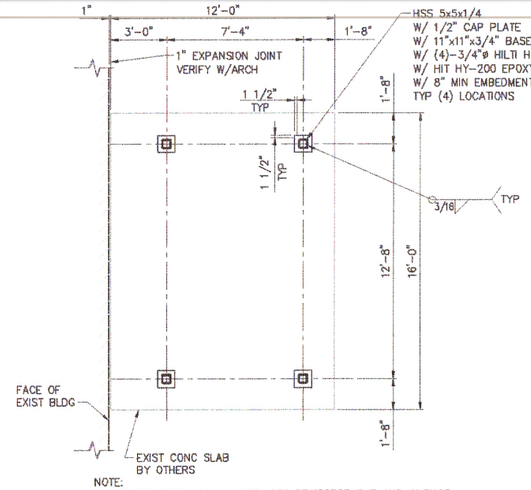
STRUCTURAL - MEMBRANE/ADMIN BUILDING FOUNDATION/OPERATING FLOOR PLAN

DESIGNED: E.A.B.
DETAILED: C.E.C.
CHECKED: C.J.J.
APPROVED: Approver
DATE: 05/16/14

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

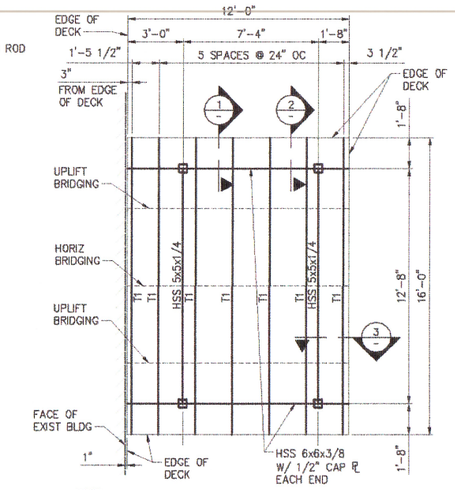
CHA PROJECT NO. 27872

S-30-102



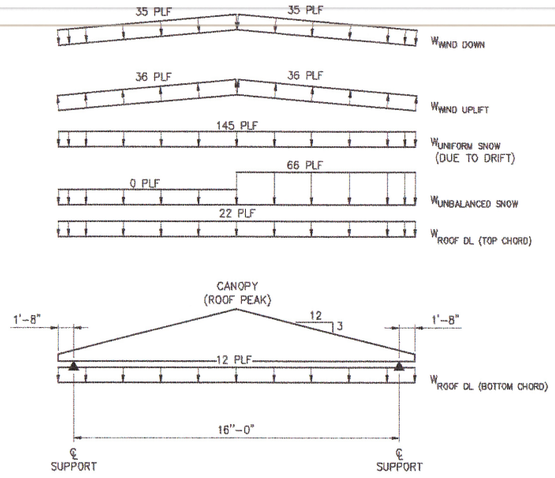
NOTE:
1. CONTRACTOR SHALL COORDINATE REINFORCEMENT AND ANCHOR BOLT LOCATION IN FIELD TO AVOID CONFLICTS.

ADMIN. BLDG. CANOPY COLUMN PLAN
SCALE: 1/4"=1'-0"



NOTE:
1. T1 :DENOTES PRE-ENGINEERED WOOD TRUSS. CONTRACTOR SHALL SUPPLY TRUSS MANUFACTURER WITH TRUSS LOAD DIAGRAM.

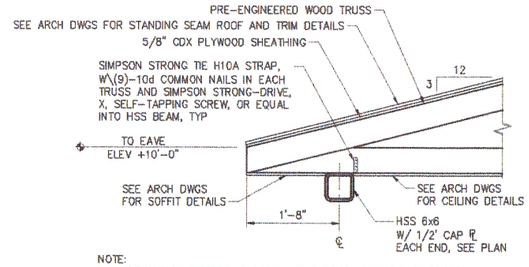
ADMIN. BLDG. CANOPY ROOF FRAMING PLAN
SCALE: 1/8"=1'-0"



T-1

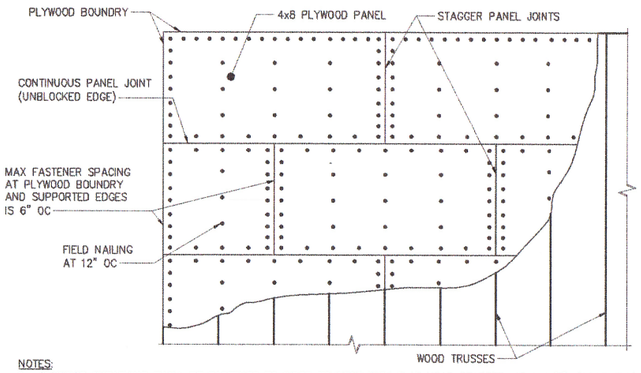
NOTE:
1. TRUSS SHALL BE DOUBLE PITCHED TOP CHORD WITH FLAT BOTTOM CHORD
2. ALL LOADS SHALL BE INCORPORATED INTO TRUSS DESIGN

TRUSS LOAD DIAGRAM
SCALE: NTS



NOTE:
1. COORDINATE COLUMN AND BEAM ENCLOSURE WITH ARCHITECTURAL

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



NOTES:
1. PLYWOOD SHEATHING SHALL BE FASTENED TO WOOD TRUSSES WITH FLAT HEAD STABBER, ø8x1-1/2", CLEAR ZINC SCREWS BY GRABBER CONSTRUCTION PRODUCTS OR EQUAL. DRYWALL SCREWS SHALL NOT BE USED.

TYPICAL PLYWOOD FASTENING DETAIL
NOT TO SCALE

GENERAL NOTES:

1. ALL DIMENSIONS TO, OF, AND IN EXISTING STRUCTURES SHALL BE VERIFIED IN FIELD BY CONTRACTOR AND ALL DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER.
2. DO NOT CHANGE THE SIZE OR SPACING OF STRUCTURAL ELEMENTS WITHOUT THE APPROVAL OF THE ENGINEER.
3. DETAILS SHOWN ARE TYPICAL AND APPLY TO SIMILAR CONDITIONS UNLESS NOTED OTHERWISE.
4. THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY.
5. BRACE STRUCTURE AS REQUIRED FOR CONSTRUCTION AND WIND LOADS UNTIL ALL STRUCTURAL ELEMENTS NEEDED FOR STABILITY ARE INSTALLED. THESE ELEMENTS ARE AS FOLLOWS: ROOF DECK, MOMENT CONNECTIONS, ETC.
6. THE DESIGN IS BASED ON THE 2012 VIRGINIA UNIFORM STATEWIDE BUILDING CODE.
7. CONTRACTOR SHALL DETERMINE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. HE/SHE AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY HIS/HER FAILURE TO LOCATE AND PRESERVE ALL UNDERGROUND UTILITIES.
8. INCORRECTLY FABRICATED, DAMAGED, OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE OWNER'S REPRESENTATIVE PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE PRE-APPROVAL BY THE ENGINEER.
9. EACH CONTRACTOR SHALL COOPERATE WITH THE OWNER'S REPRESENTATIVE AND COORDINATE HIS/HER WORK WITH THE WORK OF OTHERS.
10. VERIFY SIZE AND LOCATION OF EQUIPMENT PADS WITH MECHANICAL AND/OR ELECTRICAL CONTRACTOR AND EQUIPMENT MANUFACTURER.

STEEL NOTES:

1. STRUCTURAL STEEL FABRICATION AND ERECTION SHALL CONFORM TO THE AISC MANUAL OF STEEL CONSTRUCTION.
2. WELDED CONNECTIONS SHALL CONFORM TO THE LATEST REVISED CODE OF THE AMERICAN WELDING SOCIETY.
3. ANY CONNECTIONS WITHOUT WELD SYMBOLS SHALL BE AT A MINIMUM WELDED ALL AROUND WITH THE MINIMUM FILLET OR BUTT WELD SIZE.
4. STRUCTURAL STEEL ANGLES, PLATES, ETC. SHALL CONFORM TO ASTM A36 REQUIREMENTS (36 KSI). STRUCTURAL STEEL W AND C SHAPES SHALL CONFORM TO ASTM A992 (50 KSI). STRUCTURAL TUBING AND PIPES SHALL CONFORM TO THE ASTM A500 GRADE B REQUIREMENTS (46 KSI).
5. DO NOT PLACE HOLES THROUGH STRUCTURAL STEEL MEMBERS EXCEPT AS SHOWN AND DETAILED ON STRUCTURAL DRAWINGS.
6. ALL STRUCTURAL STEEL TUBE TO TUBE CONNECTIONS SHALL BE FULL PENETRATION WELDS.
7. SUBMITTALS:
   A. PRODUCT DATA OR MANUFACTURER'S SPECIFICATIONS AND INSTALLATION INSTRUCTIONS FOR THE FOLLOWING PRODUCTS. INCLUDE LABORATORY TEST REPORTS AND OTHER DATA TO SHOW COMPLIANCE WITH SPECIFICATIONS.
      1) STRUCTURAL STEEL INCLUDING CERTIFIED COPIES OF MILL REPORTS COVERING CHEMICAL AND PHYSICAL PROPERTIES.
      2) STRUCTURAL STEEL PRIMER PAINT.
      3) SHRINKAGE RESISTING GROUT.
   B. SHOP DRAWINGS PREPARED UNDER SUPERVISION OF A LICENSED STRUCTURAL ENGINEER, INCLUDING COMPLETE DETAILS AND SCHEDULES FOR FABRICATION AND ASSEMBLY. DUPLICATION OF CONTRACT DRAWINGS FOR SHOP DRAWINGS IS NOT PERMITTED.

WOOD NOTES:

1. PRE-ENGINEERED WOOD TRUSSES SHALL BE OF TYPE IN WHICH CHORDS AND WEB MEMBERS ARE IN ONE PLANE. USE GUSSET PLATES, WHICH DEVELOP DESIGN STRENGTH REQUIRED AT JOINTS, FOR CONNECTIONS. COMPLY WITH THE "DESIGN SPECIFICATION FOR METAL PLATE CONNECTED WOOD TRUSSES" (T.P.I.), LATEST EDITION.
2. AT A MAXIMUM OF 8 FEET ON CENTER, PROVIDE 2X4 BRACING OVER MULTIPLE BOTTOM CHORDS OF ROOF TRUSSES. SKEW THE BRACING EACH WAY IN THE HORIZONTAL PLANE TO CREATE A LATERAL V-BRACING SYSTEM. PROVIDE BRACING IN ACCORDANCE WITH "COMMENTARY AND RECOMMENDATIONS FOR HANDLING, INSTALLING & BRACING METAL PLATE CONNECTED WOOD TRUSSES, HIB-91" (T.P.I.)
3. PRE-ENGINEERED WOOD ROOF TRUSSES SHALL BE DESIGNED FOR LOADS AND COMBINATIONS DEFINED BY THE APPLICABLE BUILDING CODE AND AS INDICATED ON THE TRUSS LOADING DIAGRAM. MAXIMUM TRUSS DEFLECTION SHALL BE L/360 FOR TOTAL LIVE LOAD AND L/240 FOR TOTAL LOAD. NO SNOW LIVE LOAD REDUCTION WILL BE PERMITTED FOR SLOPE.
4. OSB SHEATHING MAY BE USED IN LIEU OF PLYWOOD SHOWN ON THE PLANS UNLESS NOTED OTHERWISE OR EXPOSED TO HIGH MOISTURE.
5. FURNISH GABLE END TRUSSES WITH VERTICAL 2"X4" STUDS AT 24" O.C. PLACE STUDS WITH STRONG AXIS PERPENDICULAR TO END WALL.
6. COMPLY WITH "WCD NO.1 – MANUAL FOR WOOD FRAME CONSTRUCTION", BY AMERICAN WOOD COUNCIL, UNLESS OTHERWISE INDICATED.
   A. PROVIDE ANCHOR AND NAILS TO COMPLY WITH THE FOLLOWING:
   B. NATIONAL EVALUATION REPORT NO. NER-272 FOR PNEUMATIC OR MECHANICAL DRIVEN STAPLES, P-NAILS, AND ALLIED FASTENERS.
7. "RECOMMENDED NAILING SCHEDULE" OF REFERENCED FRAMING STANDARD AND WITH "NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION" BY AMERICAN WOOD COUNCIL.
8. SUBMITTALS:
   A. PRODUCT DATA FOR LUMBER, METAL CONNECTOR PLATES, HARDWARE, FABRICATION PROCESS, AND FASTENERS.
   B. SHOP DRAWINGS INDICATING SPECIES, SPECIES GROUP, SIZES, AND STRESS GRADES OF LUMBER TO BE USED; PITCH, SPAN, CAMBER, CONFIGURATION, AND SPACING FOR EACH TYPE OF TRUSS REQUIRED; TYPE, SIZE, MATERIAL, FINISH. DESIGN VALUES, AND LOCATION OF METAL CONNECTOR PLATES; AND BEARING DETAILS.
   C. TO THE EXTENT ENGINEERING DESIGN CONSIDERATIONS ARE INDICATED AS FABRICATOR'S RESPONSIBILITY, INCLUDE DESIGN ANALYSIS INDICATING LOADING, ASSUMED ALLOWABLE STRESS, STRESS DIAGRAMS AND CALCULATIONS, AND OTHER INFORMATION NEEDED FOR REVIEW THAT HAVE BEEN SIGNED AND SEALED BY A QUALIFIED PROFESSIONAL ENGINEER RESPONSIBLE FOR THEIR PREPARATION. INCLUDING ALL TRUSS TO TRUSS CONNECTIONS AND ASSOCIATED CONNECTORS.
   D. PROVIDE SEALED AND SIGNED SHOP DRAWINGS THAT HAVE BEEN PREPARED BY OR UNDER THE DIRECT SUPERVISION OF A QUALIFIED PROFESSIONAL ENGINEER LICENSED IN THE STATE OF VIRGINIA.

DESIGN LOADS:

RISK CATEGORY: I

THE FOLLOWING DESIGN LOADS WERE USED FOR THIS CANOPY:

ROOF DEAD LOADS:

STANDING SEAM ROOFING:	4	PSF
PROTECTION BOARD:	3	PSF
3/4" SHEATHING:	3	PSF
CEILING:	6	PSF
TOTAL	16	PSF

ROOF LIVE LOAD: 20 PSF

ROOF SNOW LOAD

GROUND SNOW LOAD:	30	PSF
FLAT-ROOF SNOW LOAD:	23.1	PSF
SNOW EXPOSURE FACTOR:	1.0	
SNOW LOAD IMPORTANCE FACTOR:	0.8	
THERMAL FACTOR:	1.2	
DRIFT LOAD:	72.5	PSF

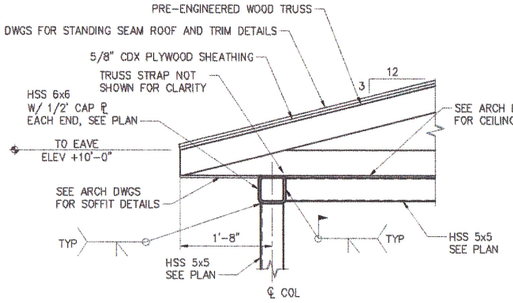
WIND DESIGN DATA:

BASIC WIND SPEED (3 SECOND GUST):	120 MPH
WIND EXPOSURE CATEGORY:	C
INTERNAL PRESSURE COEFFICIENTS:	+/- 0.18

ALL NEW COMPONENTS AND CLADDING NOT DESIGNED BY THE ENGINEER SHALL BE DESIGNED FOR 25 PSF UNLESS OTHERWISE APPROVED BY THE ENGINEER.

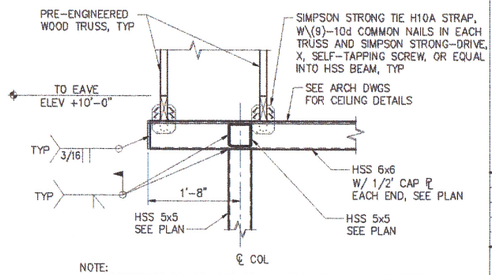
EARTHQUAKE DESIGN DATA:

SEISMIC IMPORTANCE FACTOR:	1.0
MAPPED SPECTRAL RESPONSE ACCELERATIONS:	SS = 0.170 S1 = 0.073
SITE CLASS:	D
SEISMIC DESIGN CATEGORY:	B
BASIC SEISMIC-FORCE-RESISTING SYSTEM:	ORDINARY STEEL MOMENT FRAMES
DESIGN BASE SHEAR:	1.1 kips
SEISMIC RESPONSE COEFFICIENT:	Cs = 0.05
RESPONSE MODIFICATION FACTOR:	R = 4.5
ANALYSIS PROCEDURE USED:	EQUIVALENT LATERAL FORCE METHOD



NOTE:
1. COORDINATE COLUMN AND BEAM ENCLOSURE WITH ARCHITECTURAL

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



NOTE:
1. COORDINATE COLUMN AND BEAM ENCLOSURE WITH ARCHITECTURAL
2. GABLE END TRUSS FRAMING NOT SHOWN FOR CLARITY

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

ISSUE FOR CONSTRUCTION

CHA
1901 Boxcroft Drive, Suite 2100
Blacksburg, VA 24060
Ph: (540) 552-0444 • www.chacompanies.com

NO.	BY	DATE	REVISIONS AND RECORD OF ISSUE
A	CEC	12/01/16	ISSUE FOR CONSTRUCTION

XREF1:
XREF2:
XREF3:
XREF4:
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PLOTTED:
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DWG VER:

COMMONWEALTH OF VIRGINIA
CHRISTOPHER J.B. CRAWFORD
Lic. No. 042080
12-02-16
PROFESSIONAL ENGINEER

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Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP

ADMIN BUILDING CANOPY PLANS,
TRUSS LOAD DIAGRAM, SECTIONS,
GENERAL NOTES AND DESIGN DATA

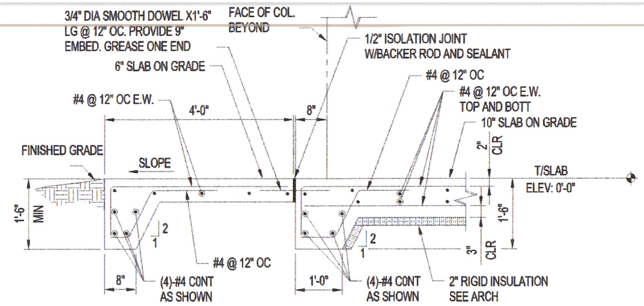
DESIGNED: JS
DETAILED: CEC
CHECKED: CJJ
APPROVED: CJJ
DATE: 12/02/16

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

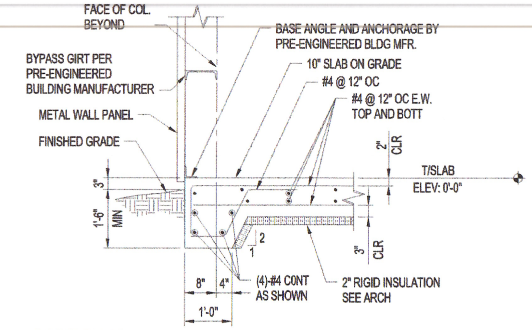
PROJECT NO.

S-30-103
SHEET
1 OF 1

F07900
07000

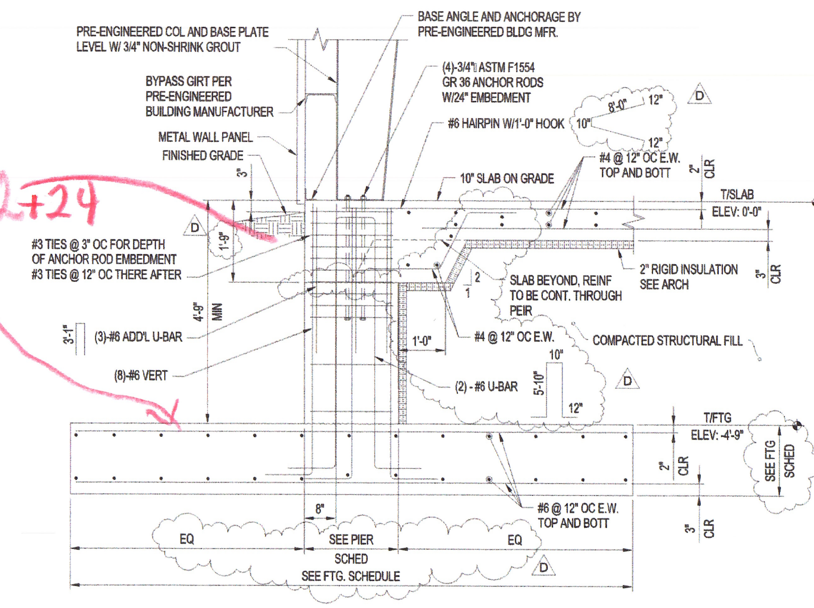


SECTION 01
1/2" = 1'-0"

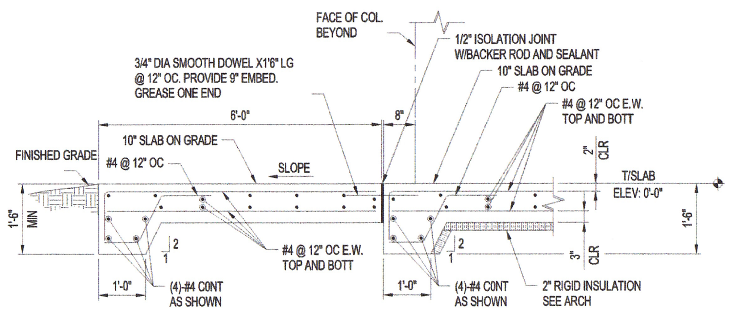


SECTION 02
1/2" = 1'-0"

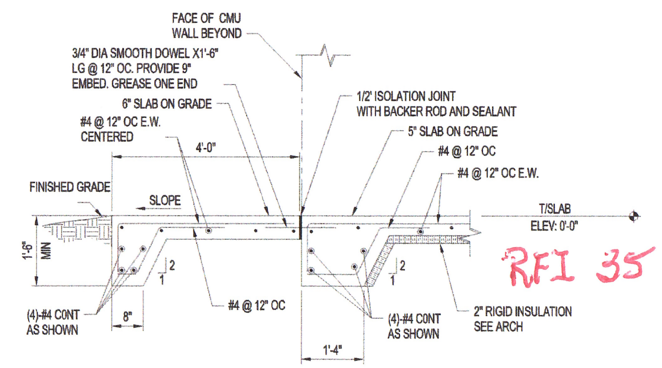
RFI 1+22+24 Typ



SECTION 03
1/2" = 1'-0"



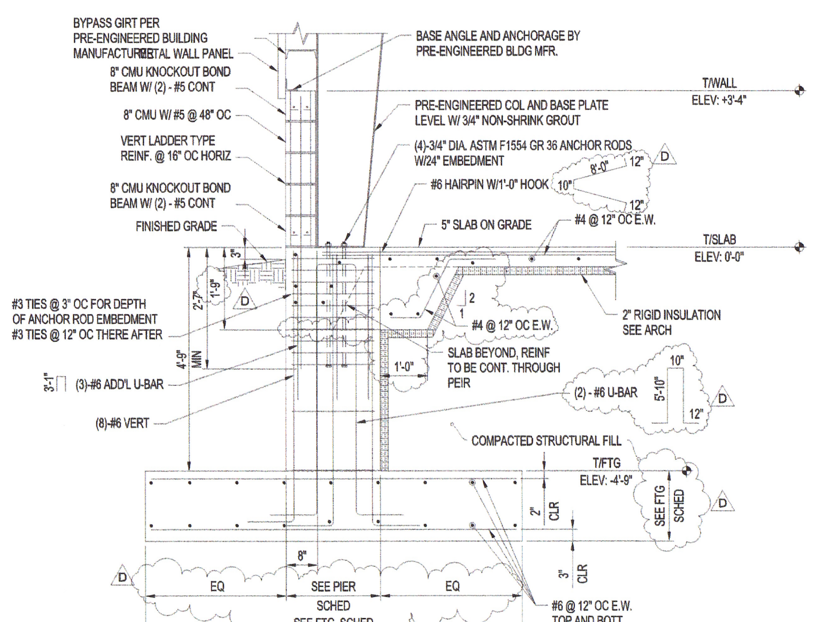
SECTION 04
1/2" = 1'-0"



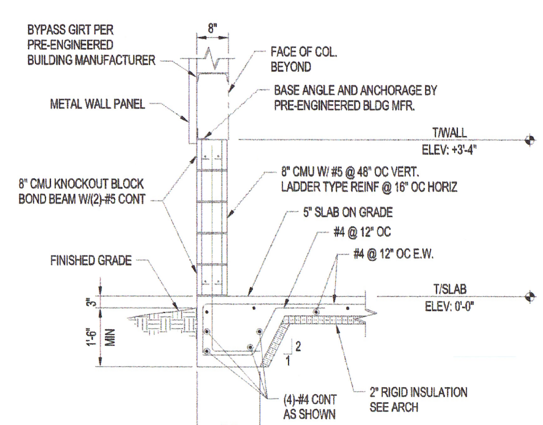
RFI 35

SECTION 05
1/2" = 1'-0"

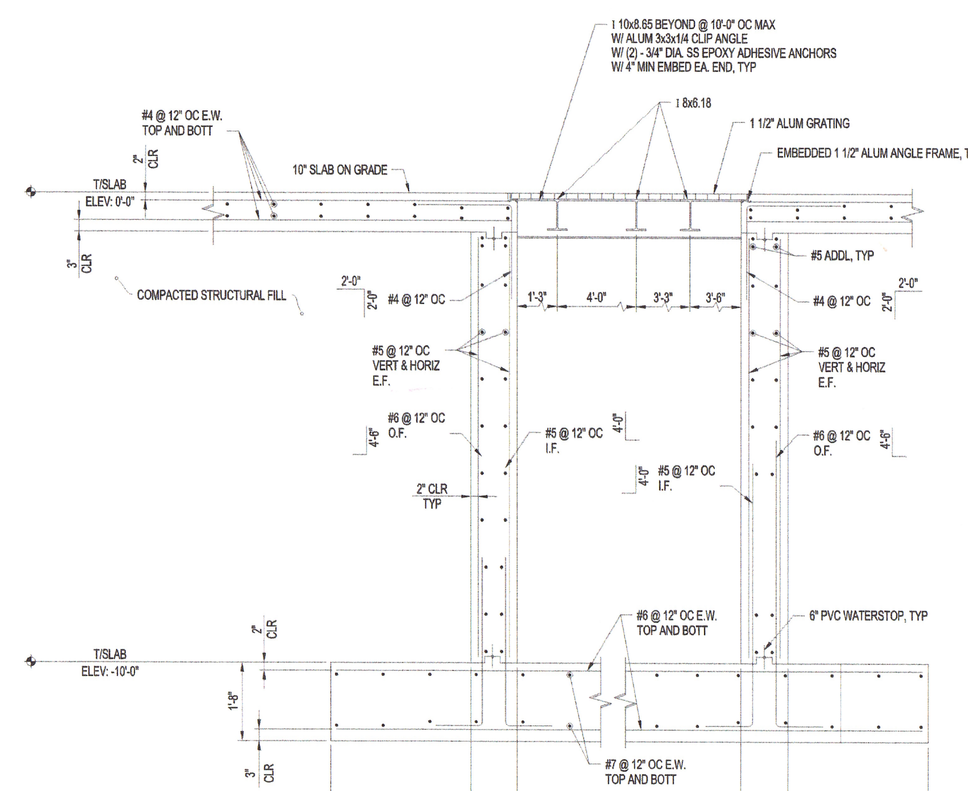
Slabs - RFI 19



SECTION 06
1/2" = 1'-0"



SECTION 07
1/2" = 1'-0"



SECTION 08
1/2" = 1'-0"

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1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (518) 453-4500 www.chacompanies.com

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B	07/31/15	ISSUED FOR PERMITTING	
A	12/15/14	LEVEL 2 DESIGN DOCUMENTS	
NO.	DATE	REVISIONS AND RECORD OF ISSUE	BY CHK APP

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USER:
XREF1: XREF2: XREF3: XREF4:
DWG VER: D

COMMONWEALTH OF VIRGINIA
CHRISTOPHER J.B. JEDBECH
Lic. No. 042380

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Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP & LAKES TO FOREST WATER LINE EXTENSION
STRUCTURAL - MEMBRANE/ADMIN BUILDING FOUNDATION SECTIONS

DESIGNED: EAB
DETAILED: C.E.C.
CHECKED: Checker
APPROVED: Approver
DATE: 05/16/14

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

CHA PROJECT NO. 27872

S-30-301
SHEET 3 OF 7

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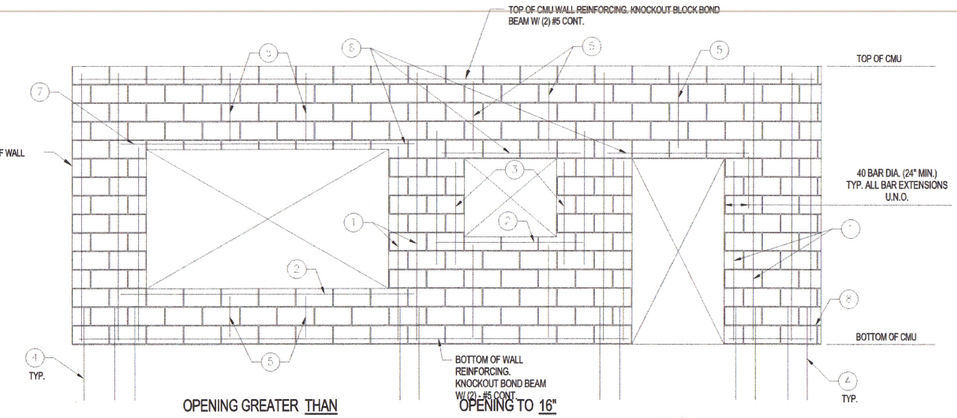


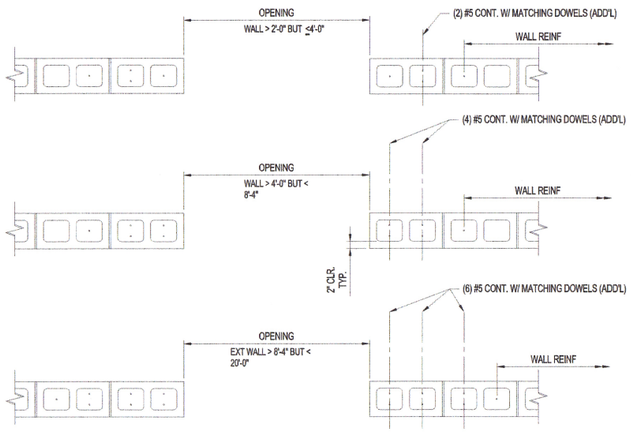
OPENING GREATER THAN 16" WIDE

OPENING TO 16" WIDE

DOOR

1. SEE TYPICAL CMU WALL OPENING DETAIL, THIS SHEET. BARS IN CORES DIRECTLY ADJACENT TO OPENING EXTEND TO UNDERSIDE OF LINTEL BEARING. BARS IN CORES 12" AND GREATER FROM OPENINGS EXTEND FULL HEIGHT OF WALL, TYP.
2. SILL BARS. KNOCK OUT BLOCK BOND BEAM W/(2) #5 CONT. BELOW ALL OPENINGS
3. (1) #5 EACH SIDE
4. SEE TYPICAL CMU WALL REINFORCING DETAIL
5. BETWEEN BARS SHOWN, PROVIDE TYPICAL WALL REINF PER TYP. WALL REINFORCING DETAIL
6. U-BLOCK OR STEEL LINTELS, SEE LINTEL SCHEDULE. PROVIDE KNOCKOUT BOND BEAM W/(2)#5 CONTINUOUS ABOVE ALL STEEL LINTELS
7. IF FULL LENGTH IS NOT AVAILABLE, EXTEND AS FAR AS POSSIBLE, HOOK 90°, THEN EXTEND. BEYOND BEND, REMAINDER OF LENGTH REQ'D (NOT LESS THAN 12")
8. PROVIDE HORIZONTAL LADDER TYPE JOINT REINFORCEMENT AT 16" O.C. MAX.

TYP. MASONRY WALL REINFORCEMENT LAYOUT DETAIL
SCALE: N.T.S.



TYP. ADDITIONAL REINFORCING AT CMU OPENING DETAIL
NOT TO SCALE

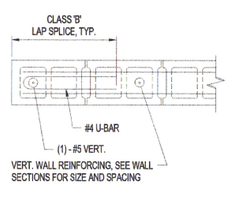
INTERIOR LINTEL SCHEDULE

(NON-LOADBEARING MASONRY PARTITION WALLS ONLY)

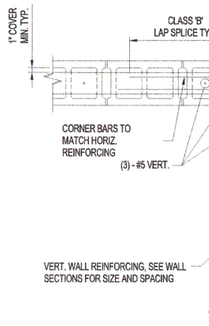
MAXIMUM MASONRY OPENING	MASONRY WALL THICKNESS				
	4 INCH WALLS	6 INCH WALLS	8 INCH WALLS	10 INCH WALLS	12 INCH WALLS
4'-0"	(1) L4x3 1/2x1/4	(2) L3x2 1/2x1/4	(2) L4x3 1/2x1/4	L5x5x1/4 + L4x3 1/2x1/4	(3) L4x3 1/2x1/4
6'-0"	(1) L5x3 1/2x1/4	(2) L3 1/2x2 1/2x1/4	(2) L5x3 1/2x1/4	L5x5x1/4 + L5x3 1/2x1/4	(3) L4x3 1/2x1/4
8'-0"	(1) L6x3 1/2x1/4	(2) L3 1/2x2 1/2x1/4	(2) L6x3 1/2x1/4	L5x5x5/16 + L5x3 1/2x5/16	(3) L4x3 1/2x1/4

NOTES
1. INTERIOR LINTELS ARE NOT SHOWN ON STRUCTURAL PLANS.
2. ALL HORIZONTAL LINTEL ELEMENTS SUPPORTING EXTERIOR WYTHES OF MASONRY SHALL BE HOT DIP GALVANIZED.
3. SEE ARCHITECTURAL AND MECHANICAL DRAWINGS FOR SIZE AND LOCATION OF OPENINGS.
4. FOR OPENINGS OVER 8'-0" CONSULT STRUCTURAL ENGINEER.
5. ALL ANGLES SCHEDULED ABOVE SHALL BE ORIENTED WITH LONG LEGS VERTICAL, U.N.O.
6. TACK WELD BACK-TO-BACK VERTICAL LEGS OF MULTIPLE ANGLE LINTELS.
7. LOOSE LINTELS UP TO 4'-0" TO HAVE A 4" MIN. BEARING, UP TO 8'-0" TO HAVE 6" MIN. BEARING.
8. STEEL LINTELS SHALL NOT BE USED IN MASONRY FIREWALLS. ONLY CMU LINTELS ARE ACCEPTABLE. AT MASONRY OPENINGS NOT SHOWN ON STRUCTURAL DRAWINGS, CONSULT ARCHITECT.

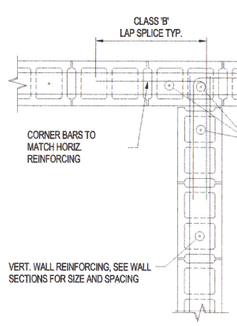
TYP. INTERIOR LINTEL SCHEDULE
NOT TO SCALE



END

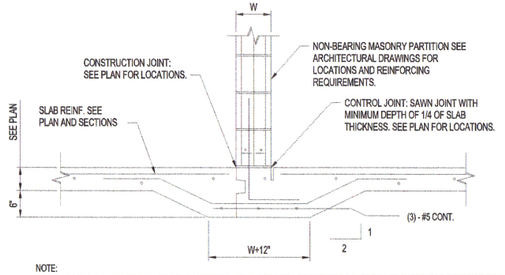


CORNER



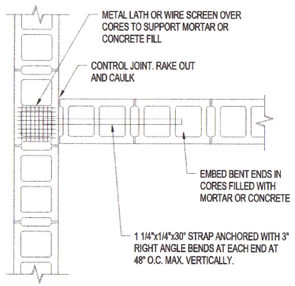
INTERSECTION

TYP. BOND BEAM DETAILS
NOT TO SCALE

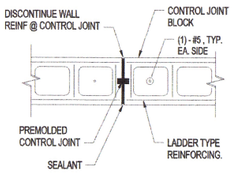


NOTE:
1. PROVIDE EITHER CONSTRUCTION OR CONTROL JOINT, NOT BOTH. BOTH TYPES OF JOINTS ARE SHOWN FOR INFORMATIONAL PURPOSES.
2. COORDINATE JOINT LOCATIONS WITH PLANS AND REINFORCING SUPPLIER.
3. SEE SPECIFICATIONS FOR UNDER SLAB MATERIAL REQUIREMENTS.
4. NOT INTENDED FOR USE AT LIQUID CONTAINMENT STRUCTURES.

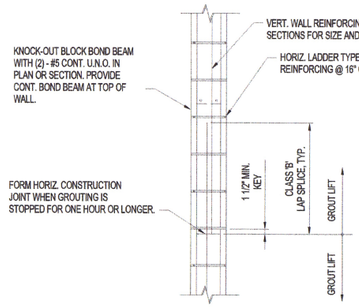
TYP. SHALLOW FOOTING DETAIL
NOT TO SCALE



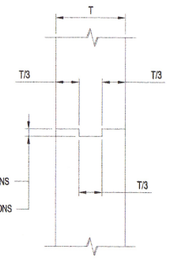
TYP. MASONRY DETAIL AT INTERSECTION
NOT TO SCALE



TYP. MASONRY CONTROL JOINT DETAIL
NOT TO SCALE



TYP. MASONRY WALL VERTICAL LAP SPLICE DETAIL
NOT TO SCALE



FOR WALLS 10" THRU 36"

FOR SLABS 10" THRU 36"

TYP. CONCRETE KEYS
NOT TO SCALE

REINFORCING LAP LENGTH			
BAR SIZE	LAP CLASS	VERT.	HORIZ.
#3	B	18	24
#4	B	25	32
#5	B	31	40
#6	B	37	48
#7	B	54	70
#8	B	62	80
#9	B	69	90
#10	B	77	100

NOTES:
1. TABLE TO BE INCLUDED ON ALL REINFORCING SHOP DRAWINGS.

TYP. REINFORCING LAP LENGTH SCHEDULE

ISSUED FOR CONSTRUCTION

	DATE	REVISIONS AND RECORD OF ISSUE	IND.	BY	CHK
A	12/15/14	LEVEL 2 DESIGN DOCUMENTS			JAPP
B	07/31/15	ISSUED FOR PERMITTING			
C	08/17/15	ISSUED FOR FINAL REVIEW AND PRICING			
D	12/10/15	ISSUED FOR CONSTRUCTION			

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XREF3:
XREF4:
DWG VER: D

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CHRISTOPHER J.B. HEDRICH
Lic. No. 042960
PROFESSIONAL ENGINEER

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Black & Veatch Corporation
Kansas City, Missouri

BEDFORD REGIONAL WATER AUTHORITY
SMITH MOUNTAIN LAKE WTP & LAKES TO FOREST WATER LINE EXTENSION

STRUCTURAL - STANDARD DETAILS

DESIGNED: EAB
DETAILED: C.E.C.
CHECKED: Checker
APPROVED: Approver
DATE: 05/16/14

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

CHA PROJECT NO. 27872

S-30-501
SHEET 5 OF 7

ISSUED FOR CONSTRUCTION

D7000

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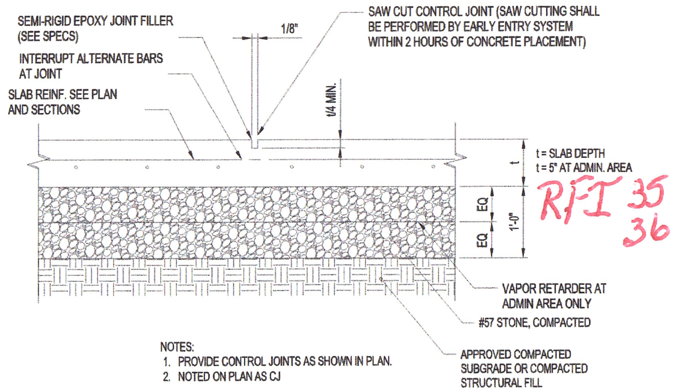
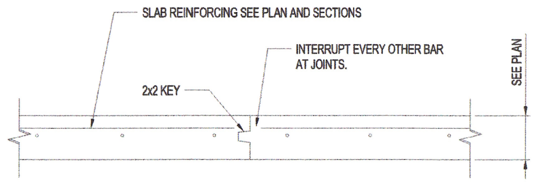
Blacksburg, VA 24060
Main: (518) 453-4500 www.chacompanies.com



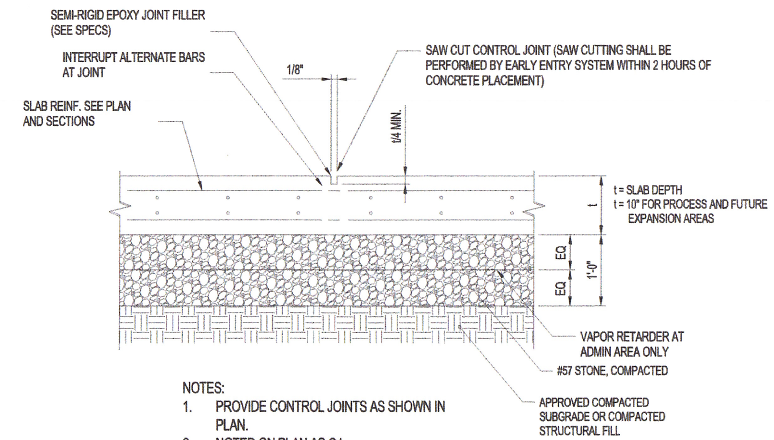
NOTES:
1. PROVIDE CONTROL JOINTS AS SHOWN IN PLAN.
2. NOTED ON PLAN AS CJ

TYP. SLAB ON GRADE CONTROL JOINT DETAIL
NOT TO SCALE



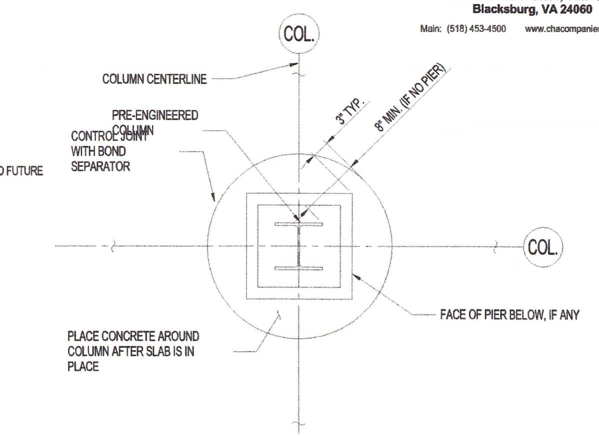
NOTE:
1. COORDINATE CONSTRUCTION JOINT LOCATIONS WITH PLANS AND REINFORCING SUPPLIER.
2. LOCATION CONSTRUCTION JOINTS AT CONTROL JOINT LOCATIONS.
3. SEE SPECIFICATIONS FOR UNDER SLAB MATERIAL REQUIREMENTS.

TYP. SLAB ON GRADE CONSTRUCTION JOINT DETAIL
NOT TO SCALE

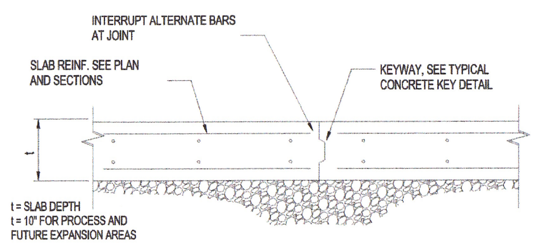


NOTES:
1. PROVIDE CONTROL JOINTS AS SHOWN IN PLAN.
2. NOTED ON PLAN AS CJ

TYP. SLAB ON GRADE CONTROL JOINT DETAIL
NOT TO SCALE

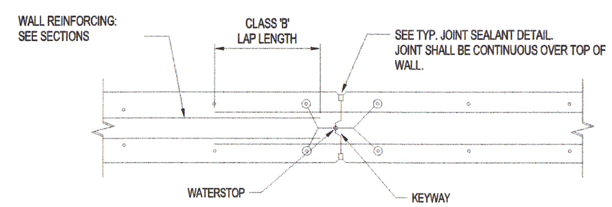


TYP. COLUMN ISOLATION JOINT DETAIL
NOT TO SCALE



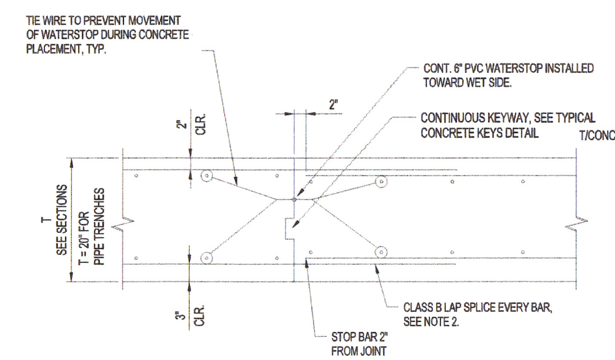
NOTES:
1. COORDINATE CONSTRUCTION JOINT LOCATIONS WITH PLANS AND REINFORCING SUPPLIER.
2. LOCATE CONSTRUCTION JOINTS AT CONTROL JOINT LOCATIONS.

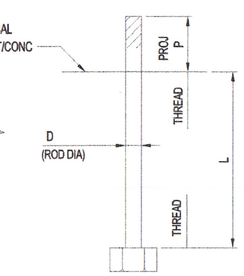
TYP. SLAB ON GRADE CONSTRUCTION JOINT DETAIL
NOT TO SCALE



NOTE:
1. LOCATE AT 30'-0" OC MAXIMUM, UNLESS NOTED OTHERWISE ON PLANS.
2. PROVIDE CONTINUOUS WATERSTOP AT ALL WALLS. STOP WATERSTOP 2" BELOW TOP OF WALL.

TYP. CONCRETE FOUNDATION WALL CONSTRUCTION JOINT DETAIL (PLAN) AT PIPE TRENCHES AND CONTAINMENT AREAS
NOT TO SCALE





NOTE:
1. SEE PLAN FOR REQUIRED CONSTRUCTION JOINT LOCATIONS.
2. REINFORCING STEEL SHALL BE LAPPED PER REINFORCING LAP LENGTH SCHEDULE U.N.O.
3. SEE SECTIONS FOR SLAB SIZE AND REINFORCING.
4. PROVIDE 48 HOURS BETWEEN ADJACENT POURS AT CONSTRUCTION JOINTS, TYP

TYP BASE SLAB CONSTRUCTION JOINT DETAIL AT PIPE TRENCHES AND CONTAINMENT AREAS
NOT TO SCALE

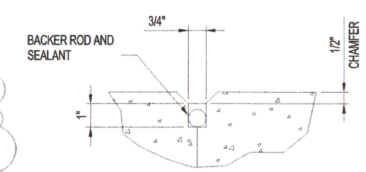
ANCHOR ROD SCHEDULE				
No.	D	L	P	MATERIAL
AB1	3/4"	18"	3"	ASTM F1554, GR 36
AB2	1 1/2"	18"	3"	ASTM F1554, GR 36

D

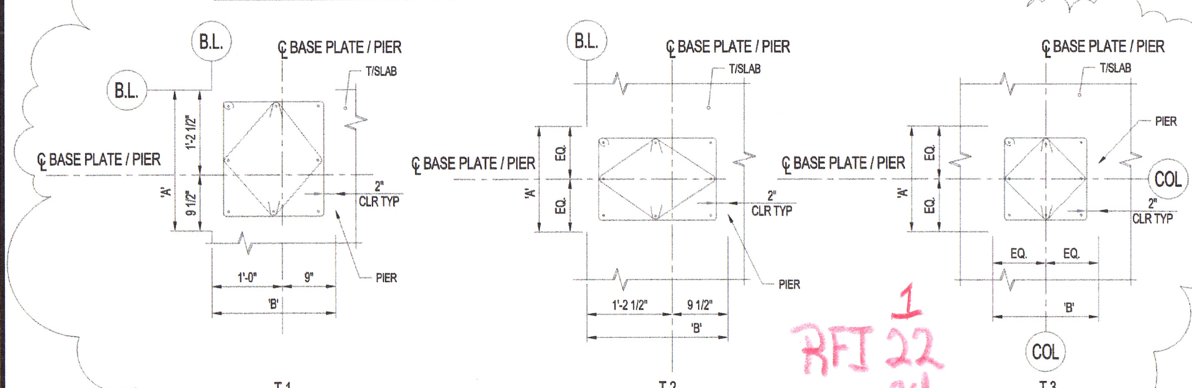
NOTES:
1. FOR PRE-ENGINEERED BLDG. ANCHOR ROD LAYOUT AND LOCATIONS, SEE APPROVED PRE-ENGINEERED BLDG MANUFACTURER'S DRAWINGS.

ANCHOR ROD SCHEDULE
SCALE: NTS

PIER SCHEDULE							
MARK	TYPE	SIZE		ANCHOR BOLT (AB) TYPE	REINFORCING		REMARKS
		A	B		VERTICALS	TIES	
P1	T2	18"	24"	(4) - AB1	(8) - #6 BARS	#4 @ 3" O.C.	PROVIDE ADD'L #6 U-BAR TENSION REINFORCEMENT
P2	T2	18"	21"	(4) - AB1	(8) - #6 BARS	#4 @ 3" O.C.	PROVIDE ADD'L #6 U-BAR TENSION REINFORCEMENT
P3	T1	24"	21"	(4) - AB1	(8) - #6 BARS	#4 @ 3" O.C.	PROVIDE ADD'L #6 U-BAR TENSION REINFORCEMENT
P4	T2	18"	21"	(4) - AB2	(8) - #6 BARS	#4 @ 3" O.C.	PROVIDE ADD'L #6 U-BAR TENSION REINFORCEMENT
P5	T3	18"	18"	(4) - AB1	(8) - #6 BARS	#4 @ 3" O.C.	PROVIDE ADD'L #6 U-BAR TENSION REINFORCEMENT

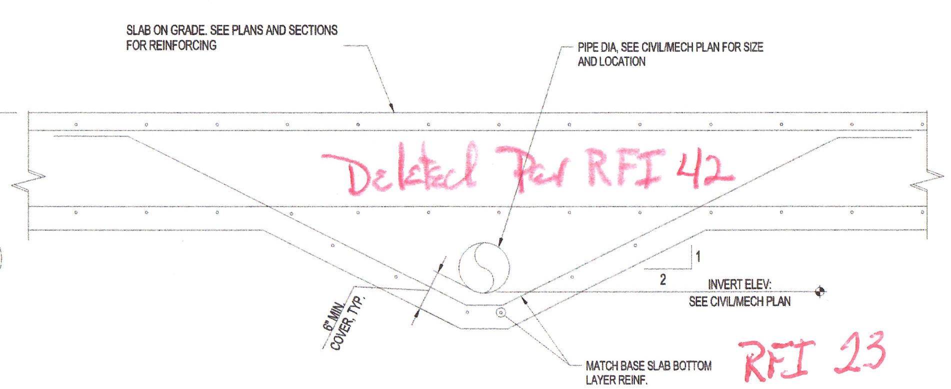


TYP JOINT SEALANT DETAIL
NOT TO SCALE



NOTES:
1. DIMENSIONS "A" AND "B" REPRESENTS LIMIT OF PIER & PIER REINFORCING.
2. PIER ELEVATIONS ARE NOTED ON PLAN.
3. COLUMN POCKET DIMENSIONS DO NOT ALWAYS EQUAL PIER DIMENSIONS.

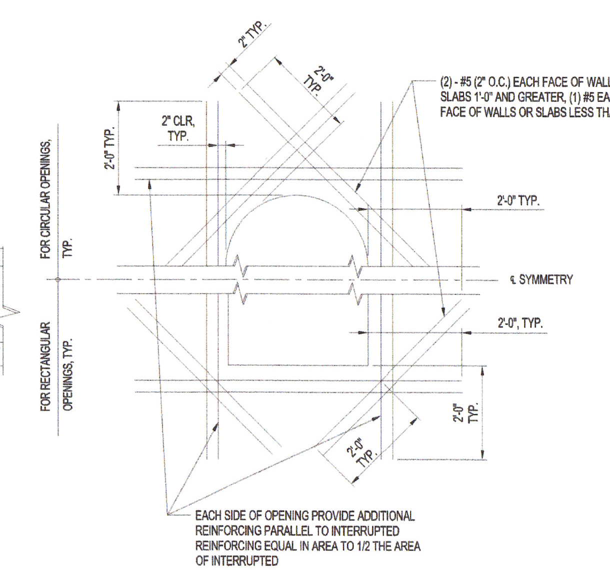
TYP. PIER SCHEDULE AND PLAN DETAILS
NOT TO SCALE



TYP CONCRETE ENCASEMENT AROUND UNDERGROUND PIPES
NOT TO SACLE

FOOTING SCHEDULE				
MARK	SIZE	DEPTH	REINFORCING TOP & BOTTOM, EACH WAY, U.N.O.	REMARKS
F1	3'-0" x 3'-0"	1'-6"	(4) - #6	
F2	6'-0" x 6'-0"	1'-6"	(7) - #6	
F3	7'-0" x 7'-0"	1'-6"	(8) - #6	

D



NOTES:
USE ABOVE REINFORCING AROUND OPENING 1'-0" AND LARGER UNLESS NOTED OTHERWISE ON DRAWINGS. FOR OPENINGS LESS THAN 1'-0", NO ADDITIONAL REINFORCING IS REQUIRED, UNLESS NOTED OTHERWISE ON DRAWINGS.

TYP. REINFORCING AT RECTANGULAR AND CIRCULAR OPENINGS IN SLABS AND WALLS
NOT TO SCALE

ISSUED FOR CONSTRUCTION

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CHK	APP
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08/17/15	ISSUED FOR FINAL REVIEW AND PRICING	C			
07/31/15	ISSUED FOR PERMITTING	B			
12/15/14	LEVEL 2 DESIGN DOCUMENTS	A			

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SMITH MOUNTAIN LAKE WTP & LAKES TO FOREST WATER LINE EXTENSION

STRUCTURAL - STANDARD DETAILS

DESIGNED: E.A.B.
DETAILED: C.E.C.
CHECKED: Checker
APPROVED: Approver
DATE: 05/16/14

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

CHA PROJECT NO. 27872

S-30-502
SHEET 6 OF 7

D7000

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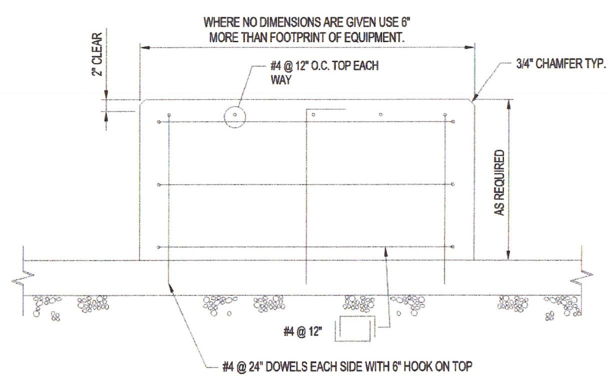
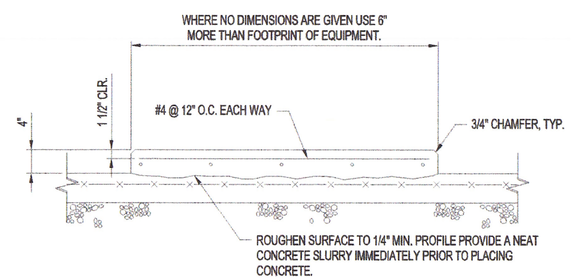
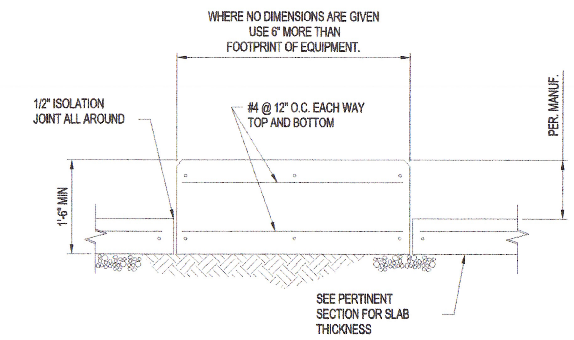


HEAVY EQUIPMENT/PUMP PAD



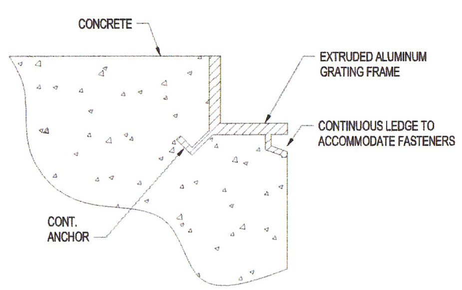
GENERAL HOUSEKEEPING PAD



ISOLATED EQUIPMENT PAD

TYP. EQUIPMENT PAD REINFORCING DETAILS

NOT TO SCALE

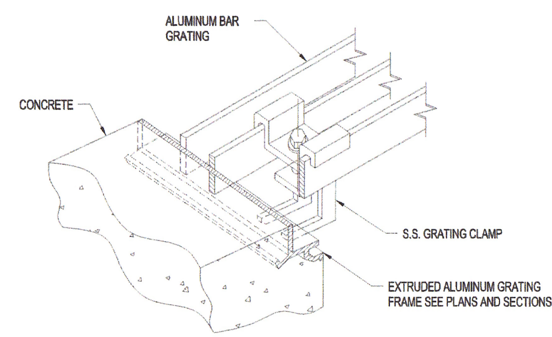


NOTES:

1. BACKPAINT ALL ALUMINUM IN CONTACT WITH CONCRETE WITH BITUMINOUS PAINT

TYP. ALUMINUM GRATING FRAME DETAIL

NOT TO SCALE

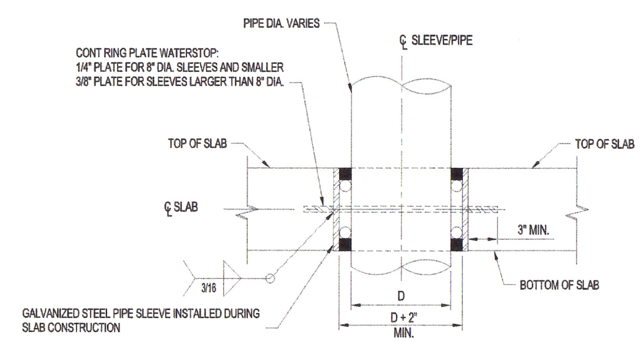


NOTES:

1. PROVIDE MANUFACTURER'S STANDARD EMBEDDED ANGLE TO ACCOMMODATE MANUFACTURER'S STANDARD GRATING CLAMPS OR SUBMIT PROPOSED GRATING CLAMP AND ANCHOR DETAIL FOR REVIEW AND APPROVAL

TYP. ALUMINUM GRATING CLAMP CONNECTION DETAIL

NOT TO SCALE

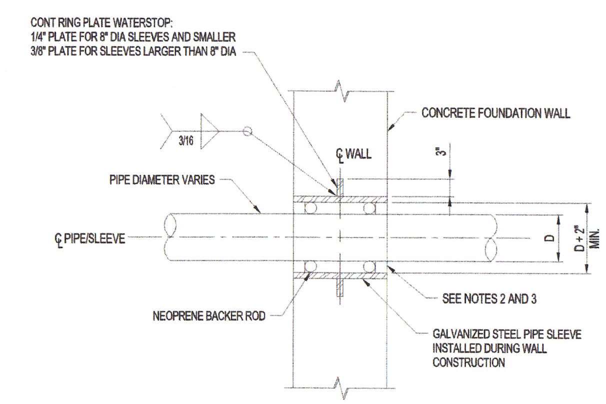


NOTE:

1. D = NOMINAL PIPE SIZE DIAMETER
2. REFERENCE CIVIL AND MECHANICAL DRAWINGS FOR QUANTITIES AND LOCATIONS.

TYP. PIPE SLEEVE THRU NEW SLAB ON GRADE

SCALE: NTS



NOTE:

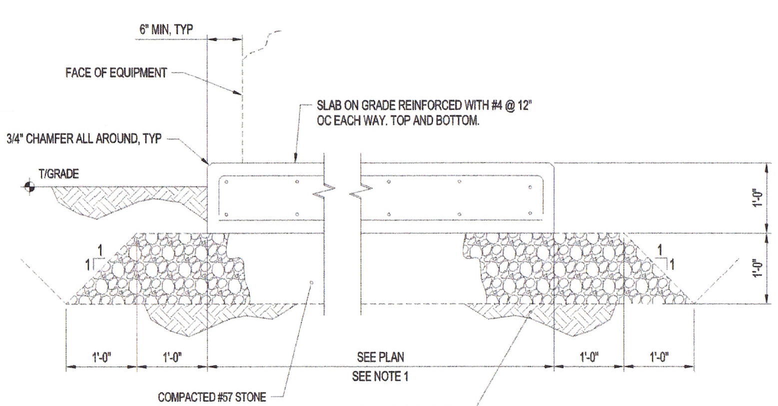
1. D = NOMINAL PIPE SIZE DIAMETER
2. SEAL GAP BETWEEN PIPE AND PIPE SLEEVE WATER TIGHT WITH MASTIC OR BITUMINOUS COATING.
3. SEAL GAP BETWEEN PIPE AND CONCRETE WALL WATER TIGHT WITH "LINK-SEAL" OR EQUAL.
4. REFERENCE CIVIL AND MECHANICAL DRAWINGS FOR QUANTITIES AND LOCATIONS.

TYP. PIPE SLEEVE THROUGH NEW FOUNDATION WALL

NOT TO SCALE

See RFI 50
Generator Detail

See RFI 47
GAC Pad Detail



NOTE:

1. CONCRETE PAD TO EXTEND 6" MINIMUM BEYOND EQUIPMENT ON ALL SIDES. COORDINATE DIMENSIONS WITH EQUIPMENT.

GENERATOR CONCRETE PAD DETAIL

NOT TO SCALE

ISSUED FOR CONSTRUCTION

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C	08/17/15	ISSUED FOR FINAL REVIEW AND PRICING			
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A	12/15/14	LEVEL 2 DESIGN DOCUMENTS			

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DWG VER: D

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SMITH MOUNTAIN LAKE WTP & LAKES TO FOREST WATER LINE EXTENSION

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DESIGNED: E.A.B.
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DATE: 05/16/14

0 1/2 1
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CHA PROJECT NO. 27872

S-30-503

SHEET 7 OF 7