

STRUCTURAL GENERAL NOTES

1. MATERIAL DESIGN STRENGTHS:
CAST IN PLACE CONCRETE:

ALL CONCRETE (NORMAL WEIGHT)F'C = 4,000 PSI
REINFORCING STEEL, DEFORMED (ASTM A615, GR. 60) . . .FY = 60,000 PSI
STRUCTURAL STEEL (ASTM A709, GRADE 36)FY = 36,000 PSI
STRUCTURAL STEEL TUBING (ASTM A500 GR. B)FY = 42,000 PSI
STRUCTURAL STEEL PIPE (ASTM A501
OR ASTM A53 TYPES E OR S GRADE B)FY = 35,000 PSI
CONCRETE MASONRY UNITS (ASTM C90 GRADE N-1):
EXTERIOR WALLS (TYPE S MORTAR)F'M = 1,500 PSI
GROUT FOR MASONRY WALLS (ASTM C-476).F'C = 2,500 PSI
SOIL BEARING CAPACITY 1,500 PSF

2. DESIGN CODES

VIRGINIA UNIFORM STATEWIDE BUILDING CODE, LATEST EDITION (1BC 2000)
ACI 350-01 & ACI 350.1R-01 "ENVIRONMENTAL ENGINEERING CONCRETE
STRUCTURES."
ACI 530/ASCE 5 (2003 EDITION) "BUILDING CODE REQUIREMENTS FOR
MASONRY STRUCTURES."
ASCE 7 (1998 EDITION) "MINIMUM DESIGN LOADS FOR BUILDINGS AND
OTHER STRUCTURES."

3. DESIGN LOADS:

ROOF LOADS:
GROUND SNOW LOAD 35 PSF & SLOPING SNOW LOAD

FLOOR LOADS:

LIVE LOADS:
ALL SLABS. 100 PSF

LATERAL LOADS:

EQUIVALENT FLUID PRESSURES.
WASTEWATER 65 PCF/FT
AT-REST EARTH. 90 PCF/FT
DIGESTED SLUDGE. 70 PCF/FT
DEWATERED SLUDGE. 85 PCF/FT

WIND LOADS: BASED ON BOCA (LATEST EDITION).

BASIC WIND SPEED, V 90 MPH
EXPOSURE CATEGORY B
IMPORTANCE FACTOR, I 1.0

EARTHQUAKE LOADS: BASED ON BOCA (LATEST EDITION).

EFFECTIVE PEAK VELOCITY - RELATED ACCELERATION, AV. . . . 0.10
SEISMIC USE GROUP I
SITE CLASSIFICATION D
IMPORTANCE FACTOR, I 1.0

4. SEE EQUIPMENT MANUFACTURER'S DRAWINGS FOR SIZES AND/OR LOCATION
OF ANCHOR BOLTS, SLEEVES, OPENINGS, OR EMBEDMENTS IN CONCRETE OR
GRATING, EQUIPMENT PADS, SUPPORT FRAMES, OR ATTACHMENTS TO STRUCTURAL
STEEL. CONTRACTOR SHALL COORDINATE AND VERIFY SIZE AND LOCATION OF ALL
ANCHOR BOLTS, SLEEVES, OPENINGS, ETC. TO SUIT EQUIPMENT PROVIDED. THE
DIMENSIONS OF ALL CONCRETE BASINS AND STRUCTURAL SUPPORTS SHALL BE
VERIFIED BY THE CONTRACTOR FOR EQUIPMENT PROVIDED. BOLT EQUIPMENT TO
SUPPORTS PER MANUFACTURER'S RECOMMENDATIONS. PROVIDE ANCHOR BOLTS
AS REQUIRED TO SUIT THE EQUIPMENT PROVIDED.

5. ALL INFORMATION ON EXISTING CONDITIONS IS OBTAINED FROM BEST
AVAILABLE SOURCES. THE ACTUAL AS-BUILT CONSTRUCTION MAY POSSIBLY
DIFFER FROM WHAT IS ASSUMED IN THE CONTRACT DOCUMENTS. THE
CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS NOTED ON THE CONTRACT
DOCUMENTS, AND SHALL NOTIFY THE ENGINEER IN WRITING OF ANY
DISCREPANCIES BETWEEN THE EXISTING CONDITIONS AND THE CONTRACT
DOCUMENTS.

6. THE CONTRACTOR SHALL REQUEST IN WRITING AND HIGHLIGHT ON THE SHOP
DRAWINGS ANY PROPOSED CHANGES IN THE MATERIALS, DETAILS, ETC. INDICATED
ON THE DRAWINGS OR SPECIFICATIONS. ANY CHANGES MUST BE APPROVED BY
THE ENGINEER IN WRITING.

7. THE DESIGN, ADEQUACY, AND SAFETY OF ERECTION BRACING, SHORING,
TEMPORARY SUPPORTS, ETC. IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

FOUNDATIONS

1. FOUNDATION DESIGN IS BASED ON A SUBSURFACE INVESTIGATION BY
GEOTECHNICS, INC. DATED AUGUST 30, 2004 COMMISSION NUMBER 3218.

2. FOOTING ELEVATIONS SHOWN REPRESENT THE MINIMUM DEPTH TO WHICH
FOOTINGS SHALL BE CARRIED. IF FOOTING EXCAVATIONS REVEAL DISTURBED,
UNSTABLE, OR UNSUITABLE SOIL, THE ENGINEER SHALL BE NOTIFIED. FOOTINGS
SHALL BE LOWERED AS REQUIRED TO OBTAIN SUITABLE BEARING. ALL UNSUITABLE
FOUNDATION MATERIAL SHALL BE REMOVED AND FOOTINGS SHALL REST ON
UNDISTURBED SOIL OR PRE-ENGINEERED FILL USING SUITABLE MATERIAL OR
COMPACTED #21B BASE COURSE WITH A MINIMUM BEARING CAPACITY OF 1,500
PSF. COMPACT EACH LAYER OF FILL OR BACKFILL TO 95% OF THE MAXIMUM
DENSITY AT OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D 698.

3. ALL FOOTINGS ARE LOCATED ON WALL CENTERLINES UNLESS OTHERWISE
NOTED.

CONCRETE

1. ALL REINFORCING SHALL BE DETAILED, FABRICATED, AND PLACED IN
ACCORDANCE WITH ACI 315 (LATEST EDITION) UNLESS OTHERWISE NOTED. ALL
SPICES SHALL BE CLASS B TENSION WITH ALL APPLICABLE MODIFICATION
FACTORS, UNLESS OTHERWISE NOTED. SPICES NOT INDICATED MAY BE PROVIDED
IF PROPERLY DETAILED ON SHOP DRAWINGS AND APPROVED BY THE ENGINEER.
SPICES OF HORIZONTAL BARS SHALL BE STAGGERED UNLESS OTHERWISE NOTED.
EMBEDMENT LENGTHS SHALL BE EQUAL TO TENSION DEVELOPMENT LENGTHS
UNLESS OTHERWISE NOTED. STANDARD HOOKS CONFORMING TO ACI 318 SHALL
BE USED UNLESS OTHERWISE NOTED. DOWELS IN WALL AND COLUMNS SHALL
MATCH SIZE AND SPACING OF MAIN REINFORCING BARS UNLESS OTHERWISE NOTED.
ALL COLUMN TIES AND BEAM STIRRUPS SHALL BE CLOSED TYPE (ACI TYPE T1)
UNLESS OTHERWISE NOTED. SPREAD REINFORCING AT OPENINGS AND SLEEVES
UNLESS OTHERWISE DETAILED. DO NOT CUT REINFORCING BARS. CONCRETE
PROTECTION FOR REINFORCEMENT SHALL CONFORM TO ACI 301 (LATEST EDITION)
AND SHALL BE INDICATED ON THE SHOP DRAWINGS. ALL SPICE LENGTHS AND
EMBEDMENT LENGTHS, BENDING DIAGRAMS, AND ASSEMBLY DIAGRAMS SHALL BE
INDICATED ON THE SHOP DRAWINGS. PROVIDE 2-#5 CONTINUOUS AT THE TOP
OF ALL WALLS. THE CONTRACTOR SHALL KEEP A COPY OF ACI 301 (LATEST
EDITION) AND PUBLICATION SP-15 AT THE JOBSITE.

2. MAJOR CONSTRUCTION JOINTS ARE SHOWN. INTERMEDIATE JOINTS IN WALLS,
SLABS, COLUMNS, AND FLOOR FRAMING ARE NOT SHOWN UNLESS REQUIRED BY
THE DESIGN. ALL CONSTRUCTION AND CONTROL JOINTS SHALL BE SHOWN ON THE
SHOP DRAWINGS. CONSTRUCTION JOINTS MAY BE OMITTED OR RELOCATED IF
PROPERLY DETAILED ON THE SHOP DRAWINGS AND APPROVED BY THE ENGINEER.
(JOINT LOCATIONS MUST BE APPROVED BY THE ENGINEER BEFORE SUBMITTING
REINFORCING STEEL SHOP DRAWINGS). MAXIMUM SPACING OF CONTROL JOINTS
FOR SLAB ON GRADE SHALL BE 15 FEET. ALL CONSTRUCTION AND EXPANSION
JOINTS AT OR BELOW ELEVATION 98.00 SHALL HAVE WATERSTOPS.

3. THE UNIT OF OPERATION OF CONCRETE PLACEMENT SHALL NOT EXCEED 30
FEET IN ANY DIRECTION. AT LEAST 72 HOURS SHALL ELAPSE BEFORE CONCRETE
IS PLACED ADJACENT TO PREVIOUSLY CAST CONCRETE.

4. BACKFILLING ADJACENT TO FOUNDATION WALLS SHALL NOT OCCUR UNTIL
SLABS AND/OR BEAMS DESIGNED TO BRACE WALLS HAVE BEEN PLACED AND SLAB
AND/OR BEAM CONCRETE HAS REACHED 70 PERCENT OF ITS 28-DAY DESIGN
COMPRESSIVE STRENGTH. BACKFILLING ADJACENT TO CANTILEVER RETAINING
WALLS SHALL NOT OCCUR UNTIL WALL CONCRETE HAS REACHED ITS 28-DAY
DESIGN COMPRESSIVE STRENGTH.

5. CHAMFER ALL EXPOSED EDGES OF CONCRETE 3/4 INCH.

6. CONCRETE SHALL BE PLACED IN LAYERS NOT OVER 18 INCHES DEEP AND
EACH LAYER SHALL BE COMPACTED BY MECHANICAL INTERNAL-VIBRATING
EQUIPMENT SUPPLEMENTED BY HAND SPADING, RODDING AND TAMPING. VIBRATORS
SHALL NOT BE INSERTED INTO LOWER COURSES THAT HAVE BEGUN TO SET.
CONCRETE SHALL BE PLACED BY CHUTES OR ELEPHANT TRUNKS WHEN THE
VERTICAL DROP EXCEEDS 4'-0".

7. CONTRACTOR SHALL NOTIFY ENGINEER 48 HOURS PRIOR TO PLACING ANY
CONCRETE SO THAT REINFORCEMENT, SLEEVES, PIPES, INSERTS, HANGERS, ETC.,
CAN BE INSPECTED FOR CONFORMANCE WITH PLANS AND SPECIFICATIONS.

8. EXPANSION ANCHORS SHALL BE TRUBOLT BY RAMSET FASTENING SYSTEMS,
RED HEAD BY ITT PHILLIPS DRILL DIVISION, KWIK-BOLT BY HILTI FASTENING
SYSTEMS, OR APPROVED EQUAL, AND SHALL BE GALVANIZED. MINIMUM WORKING
(SERVICE) LOADS SHALL BE AS FOLLOWS FOR 4000 PSI CONCRETE:

DIAMETER (INCHES)	SHEAR (LBS)	TENSION (LBS)
1/2	1700	1375
5/8	2650	1650
3/4	3830	2535

9. EPOXY ANCHORS OF EQUAL SIZE AND MATERIAL MAY BE SUBSTITUTED FOR
EXPANSION ANCHORS PROVIDED MINIMUM WORKING (SERVICE) LOADS ARE EQUAL
TO OR GREATER THAN THOSE FOR EXPANSION ANCHORS. EPOXY ANCHORS SHALL
BE GALVANIZED AND SHALL BE HILTI HVA ADHESIVE ANCHORS TYPE H.A.S. STD.,
MOLLY PARABOND BY EMHART, RAWL CHEM-STUDS, OR APPROVED EQUAL.

10. CONTRACTOR SHALL BE REQUIRED TO ALTER CONCRETE TANK DESIGN(S) AND
CONFIGURATIONS IF NECESSARY TO ACCOMMODATE EQUIPMENT PROVIDED. ANY
CHANGES NECESSARY SHALL BE SEALED BY A PROFESSIONAL ENGINEER LICENSED
IN THE STATE OF VIRGINIA. ALL ASSOCIATED COSTS SHALL BE BORNE BY THE
CONTRACTOR.

MASONRY

1. PROVIDE GALVANIZED HORIZONTAL TRUSS TYPE JOINT REINFORCING WITH
3/16 INCH SIDE RODS AND NO. 9 GAGE CROSS RODS AT 16" O/C UNLESS
OTHERWISE NOTED.

2. REINFORCED MASONRY. ALL REINFORCED CELLS SHALL BE FULLY GROUTED
FROM TOP TO BOTTOM OF WALL. ALL CELLS CONTAINING ANCHOR BOLTS SHALL
BE FULLY GROUTED. THE MASONRY CONTRACTOR SHALL BUILD, REINFORCE, AND
GROUT THE WALLS IN 4'-0" LIFTS, VIBRATING GROUT IMMEDIATELY AFTER EACH
LIFT. THE REINFORCING STEEL FABRICATOR SHALL PROVIDE REBARS FOR 4'-0"
HIGH VERTICAL LIFTS PLUS A BAR LAP OF 36 X BAR DIAMETER. UNLESS
OTHERWISE NOTED OR DETAILED, CENTER REINFORCING IN BLOCK CELLS AND TIE
IN PLACE AT INTERVALS OF 4'-0" O/C MAXIMUM. IN ADDITION TO REINFORCING
SHOWN, PROVIDE ONE #5 VERTICAL BAR EACH SIDE OF ALL OPENINGS, AND AT
CORNERS AND INTERSECTIONS UNLESS OTHERWISE NOTED. PROVIDE REBAR
DOWELS OF SAME SIZE AND SPACING AS VERTICAL REINFORCING FROM WALL
FOOTINGS. DOWELS SHALL HAVE STANDARD ACI HOOKS AND SHALL LAP 36 X BAR
DIAMETER WITH FIRST LIFT OF VERTICAL REINFORCING.

STEEL/ALUMINUM

1. WELDING ELECTRODES SHALL MEET REQUIREMENTS OF AWS A5.1, E70XX
SERIES. THE MINIMUM SIZE OF ALL FILLET WELDS SHALL BE AS SHOWN ON
TABLE J2.4 OF AISC SPECIFICATIONS UNLESS OTHERWISE NOTED.

2. ALL EXPOSED STEEL SHALL BE TYPE 304 STAINLESS STEEL, OR GALVANIZED
PER ASTM A525, G90 AS INDICATED, UNLESS OTHERWISE NOTED.

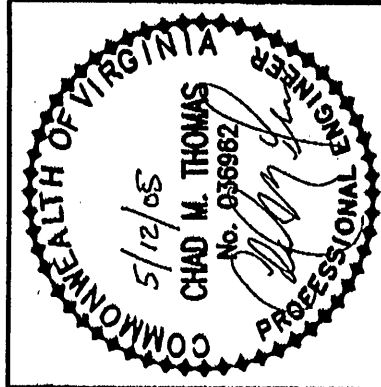
3. ALL GRATING SHALL BE ALUMINUM.

4. ALL HANDRAIL SHALL BE ALUMINUM.

WOOD TRUSSES

1. WOOD TRUSSES SHALL BE DESIGNED FOR THE FOLLOWING LOADS:

LIVE (SNOW) LOAD 35 PSF
WIND LOAD. 90 MPH
WIND LOAD NET UPLIFT. 15 PSF
DEAD LOAD-TOP CHORD 5 PSF
DEAD LOAD-BOTTOM CHORD 5 PSF
DEAD LOAD TRUSSES & BRACING. . . PER MANUFACTURER



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FINCASTLE WASTEWATER TREATMENT PLANT
GENERAL NOTES
BOTETOURT COUNTY, VIRGINIA

Vertical Scale:
N/A

Horizontal Scale:
AS SHOWN

Commission Number:
2305

Sheet No.:

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