

GENERAL STRUCTURAL NOTES

GENERAL:

- FIELD VERIFY ALL DIMENSIONS, LOCATIONS AND ELEVATIONS SHOWN ON CONTRACT DRAWINGS FOR EXISTING STRUCTURES. ALL DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER, BEFORE PROCEEDING WITH WORK.
- THE SIZES AND LOCATIONS OF EQUIPMENT PADS AND PEDESTALS, AS WELL AS EQUIPMENT-RELATED OPENINGS AND PENETRATIONS, ARE DEPENDENT ON THE ACTUAL EQUIPMENT FURNISHED. VERIFY AND COORDINATE ALL SUCH ITEMS. DIMENSIONS INDICATED ON THESE DRAWINGS SHALL NOT BE ALTERED WITHOUT APPROVAL OF THE ENGINEER. STRUCTURAL DRAWINGS MAY NOT SHOW ALL EQUIPMENT PADS AND OTHER EQUIPMENT SUPPORTS. REQUIRED REFER TO OTHER DISCIPLINE DRAWINGS.

FOUNDATION:

- FOUNDATIONS SHALL BEAR UPON UNDISTURBED SOIL OR COMPACTED ENGINEERED FILL WITH A MINIMUM ALLOWABLE BEARING STRENGTH OF 2000 PSF. THE CONTRACTOR SHALL OBTAIN THE SERVICES OF A QUALIFIED GEOTECHNICAL ENGINEER LICENSED IN THE STATE OF VIRGINIA WHO IS RESPONSIBLE FOR DETERMINATION OF LATERAL EARTH PRESSURE DETERMINATION AND VERIFICATION OF THE ALLOWABLE BEARING STRENGTH.
- KEEP ALL EXCAVATIONS DRY. STANDING WATER IS NOT ALLOWED IN EXCAVATIONS. ALL EXCAVATIONS SHALL BE INSPECTED AND APPROVED BY THE ENGINEER BEFORE PLACING ANY CONCRETE.
- FOR CIVIL WORK TO BE INCORPORATED IN FOUNDATION WORK, SEE CIVIL DRAWINGS.
- FILL ALL EXCESS EXCAVATION BELOW THE BEARING ELEVATION OF THE CONCRETE IN ACCORDANCE WITH SPECIFICATION SECTION 310000 "EARTHWORK".
- DO NOT PLACE BACKFILL AGAINST PRECAST SUBSTRUCTURE WALLS UNTIL AFTER EXTERIOR COATINGS HAVE BEEN APPLIED AND ALLOWED TO CURE ACCORDING TO MANUFACTURER'S INSTRUCTIONS AND UNTIL AFTER HYDROSTATIC TESTING OF THE STRUCTURES IS COMPLETED AND ACCEPTED.

CAST-IN-PLACE CONCRETE:

- PROVIDE CONCRETE WITH THE FOLLOWING 28 DAY SPECIFIED COMPRESSIVE STRENGTH:
 - REINFORCED STRUCTURAL CONCRETE: 4,500 PSI
 - CONCRETE FILL: 3,000 PSI.
- DETAIL AND CONSTRUCT REINFORCED CONCRETE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE ACI 301, "SPECIFICATION FOR STRUCTURAL CONCRETE."
- DETAIL REINFORCING STEEL IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE SP-66, "ACI DETAILING MANUAL," WHICH INCLUDES ACI 315, "DETAILS AND DETAILING OF CONCRETE REINFORCEMENT."
- PROVIDE REINFORCEMENT CONFORMING TO ASTM A615, GRADE 60, DEFORMED BARS.
- UNLESS OTHERWISE NOTED ON THE DRAWINGS, THE CONCRETE COVER FOR REINFORCEMENT SHALL BE AS FOLLOWS:
 - BOTTOM BARS IN FOOTINGS AND IN SLABS ON EARTH OR GRAVEL: 3"
- SUBMIT REINFORCING STEEL DETAILS (SHOP DRAWINGS) AND RECEIVE APPROVAL FROM THE ENGINEER BEFORE PROCEEDING WITH FABRICATION.
- CHAMFER ALL EXPOSED CONCRETE EDGES 3/4" UNLESS OTHERWISE NOTED.
- DETAIL ALL SPLICES AND STANDARD HOOKS FOR REINFORCING BARS NOT DIMENSIONED ON THE DRAWINGS AS INDICATED ON SHEET S-02.
- PROVIDE JOINTS AS DETAILED ON THE DRAWINGS AND ON APPROVED SHOP DRAWINGS. NO ADDITIONAL JOINTS SHALL BE USED NOR ANY OMITTED, UNLESS APPROVED BY THE ENGINEER.
- PROVIDE CONSTRUCTION JOINT INTERFACE CLEAN AND FREE OF LAITANCE. INTENTIONALLY ROUGHEN ALL HORIZONTAL CONSTRUCTION JOINTS, AND VERTICAL CONSTRUCTION JOINTS WHERE INDICATED ON DRAWINGS, TO A FULL AMPLITUDE OF 1/4".
- WHERE A SLAB IS SLOPED (TOP AND/OR BOTTOM), PROVIDE SLOPED REINFORCING PARALLEL TO THE CONCRETE SURFACE.
- SIZE AND LOCATE ANCHOR BOLTS AND EQUIPMENT PADS OR PEDESTALS TO SUIT EQUIPMENT FURNISHED OR AS INDICATED.
- REVIEW ALL DRAWINGS FROM OTHER DISCIPLINES AND COORDINATE ALL OPENINGS, EMBEDDED ITEMS (INCLUDING, BUT NOT LIMITED TO SLEEVES, ANCHORS, CONDUIT) THAT WILL BE INCORPORATED INTO CONCRETE WORK.

PRECAST CONCRETE:

- PRECAST CONCRETE MANHOLES AND WET WELL STRUCTURES SHALL MEET THE REQUIREMENTS OF SPECIFICATION SECTION 034100 AND AS INDICATED HEREIN.
- PROVIDE PRECAST CONCRETE WITH A MINIMUM COMPRESSIVE STRENGTH OF 4500 PSI AT 28 DAYS.
- DETAIL AND CONSTRUCT REINFORCED CONCRETE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE ACI 301, "SPECIFICATION FOR STRUCTURAL CONCRETE."
- DETAIL REINFORCING STEEL IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE SP-66, "ACI DETAILING MANUAL," WHICH INCLUDES ACI 315, "DETAILS AND DETAILING OF CONCRETE REINFORCEMENT."
- PROVIDE REINFORCEMENT CONFORMING TO ASTM A 615, GRADE 60, DEFORMED BARS.
- PROVIDE WELDED WIRE FABRIC CONFORMING TO ASTM A1064.
- UNLESS OTHERWISE NOTED ON THE DRAWINGS, THE CONCRETE COVER FOR REINFORCEMENT SHALL BE AS FOLLOWS:
 - BOTTOM BARS IN FOOTINGS AND IN SLABS ON EARTH OR GRAVEL: 3"
 - SLABS AND WALLS: 1 1/2"
- SUBMIT REINFORCING STEEL DETAILS (SHOP DRAWINGS) AND RECEIVE APPROVAL BEFORE PROCEEDING WITH FABRICATION.
- CHAMFER ALL EXPOSED CONCRETE EDGES 3/4" UNLESS OTHERWISE NOTED.
- PRECAST RISER JOINTS: THE MANUFACTURER SHALL FORM MALE AND FEMALE ENDS OF JOINTS USING THEIR OWN DESIGN. THE JOINTS SHALL BE SEALED BY THE CONTRACTOR AND MADE WATER-TIGHT USING THE MANUFACTURER'S RECOMMENDED ASTM OR AASHTO - APPROVED SEALANT.
- USE LARGEST APPLICABLE RISER UNIT LENGTHS. USE A MAXIMUM OF ONE-1 FOOT LENGTH RISER UNIT PER STRUCTURE, PLACED IMMEDIATELY UNDER ECCENTRIC CONE SECTION FOR MANHOLES.

DELEGATED DESIGN:

- DESIGN RESPONSIBILITY FOR ALL PRECAST CONCRETE AND PRECAST MANHOLES IS DELEGATED TO A QUALIFIED SPECIALTY STRUCTURAL ENGINEER LICENSED IN THE STATE OF VIRGINIA SELECTED BY THE CONTRACTOR.
- DELEGATED ENGINEERED SYSTEMS AND COMPONENTS SHALL SATISFY THE MOST STRINGENT REQUIREMENTS OF THE "CODES AND STANDARDS" LISTED ON THIS SHEET.
- COORDINATE WITH THE CONTRACT DOCUMENTS FOR PROFESSIONAL LICENSURE AND SEALING REQUIREMENTS, DESIGN CRITERIA, DETAILS OF THE SYSTEM/COMPONENT INTERFACE WITH THE PRIMARY STRUCTURE, SUBMITTAL REQUIREMENTS, AND CALCULATION REQUIREMENTS.

POST-INSTALLED ANCHORS OR REINFORCING STEEL DOWELS:

- THE ADHESIVE ANCHORING SYSTEM USED FOR POST-INSTALLED ANCHORS AND REINFORCING STEEL SHALL CONFORM TO ACI 355.4 (2011) "QUALIFICATION OF POST-INSTALLED ADHESIVE ANCHORS IN CONCRETE AND COMMENTARY" AND THE CURRENT APPLICABLE ICC ES ACCEPTANCE CRITERIA. THE ADHESIVE ANCHORING SYSTEM FOR ANCHORAGE TO CONCRETE SHALL BE THE FOLLOWING:
 - HILTI HIT-HY 200 (ICC ESR-3187) AS MANUFACTURED BY HILTI CORPORATION, OR APPROVED EQUAL.
- SUBMIT ICC ES EVALUATION REPORTS FOR PROPOSED ADHESIVE ANCHORING SYSTEM.
- NUTS AND WASHERS SHALL BE STAINLESS STEEL IN ACCORDANCE WITH ASTM F594, TYPE 316, AND ASTM A240, TYPE 316, RESPECTIVELY. THREADED RODS SHALL BE ASTM 543, TYPE 316.
- POST-INSTALLED ANCHORS SHALL HAVE THE SIZE, EMBEDMENT DEPTH AND SPACING AS REQUIRED BY THE MANUFACTURERS MOUNTING INSTRUCTIONS.
- THE ADHESIVE ANCHORING SYSTEM SHALL BE STORED, HANDLED AND INSTALLED PER THE MANUFACTURERS WRITTEN INSTRUCTIONS.
- MANUFACTURER REPRESENTATIVE TO PROVIDE ONSITE TRAINING FOR ADHESIVE ANCHOR SYSTEM.

ALUMINUM:

- FABRICATE ALL STRUCTURAL ALUMINUM IN ACCORDANCE WITH THE SPECIFICATIONS OF THE ALUMINUM ASSOCIATION (AA) ADM11-2015, "ALUMINUM DESIGN MANUAL."
- WELD ALL ALUMINUM IN ACCORDANCE WITH THE AMERICAN WELDING SOCIETY (AWS) D1.2, "STRUCTURAL WELDING CODE - ALUMINUM" (2014).
- PROVIDE ALLOY AND TEMPER 6061-T6 FOR STRUCTURAL ALUMINUM.
- COAT ALL ALUMINUM IN CONTACT WITH CONCRETE AND OTHER DISSIMILAR METALS WITH BITUMINOUS PAINT ON THE CONTACT SURFACE.

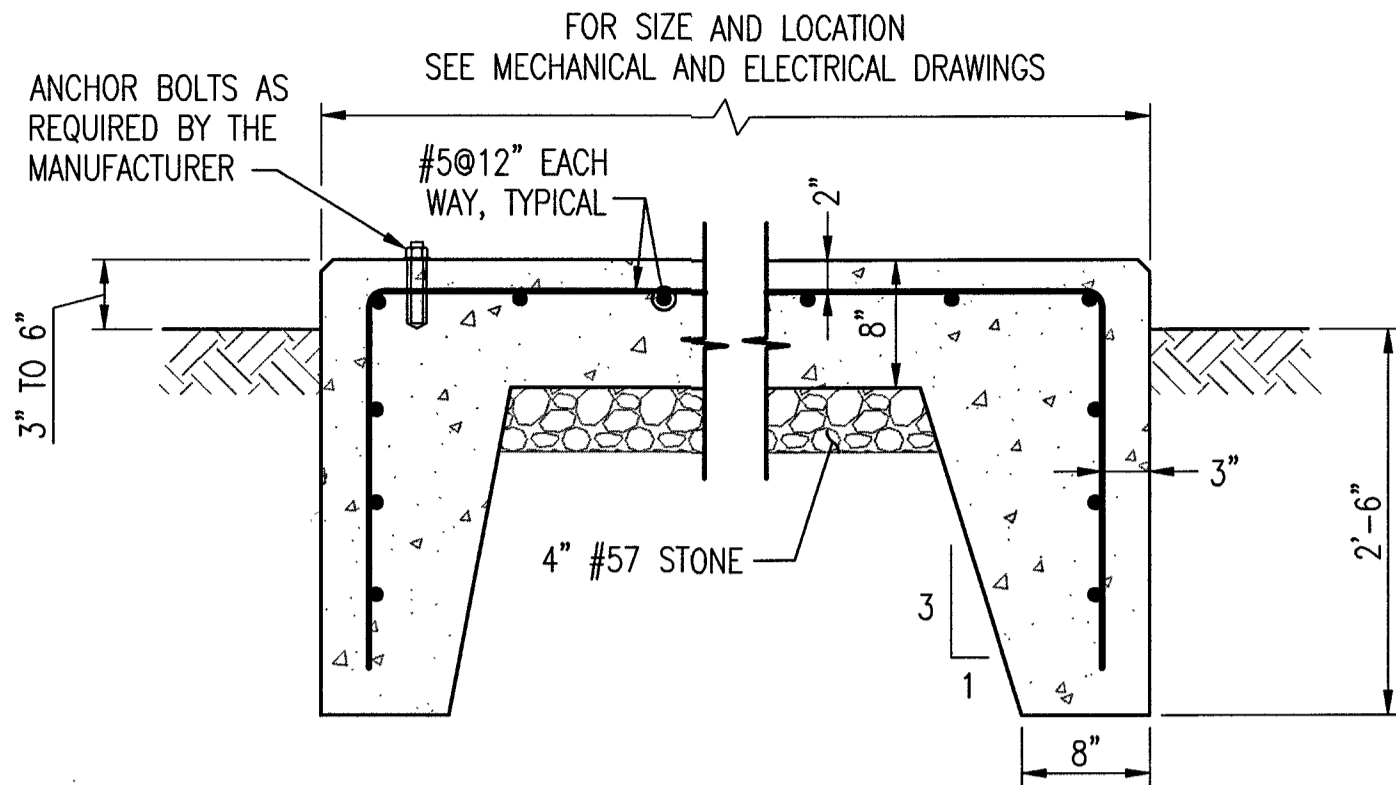
DESIGN LOADS:

ALL LOADS INDICATED BELOW ARE UNFACTORED.

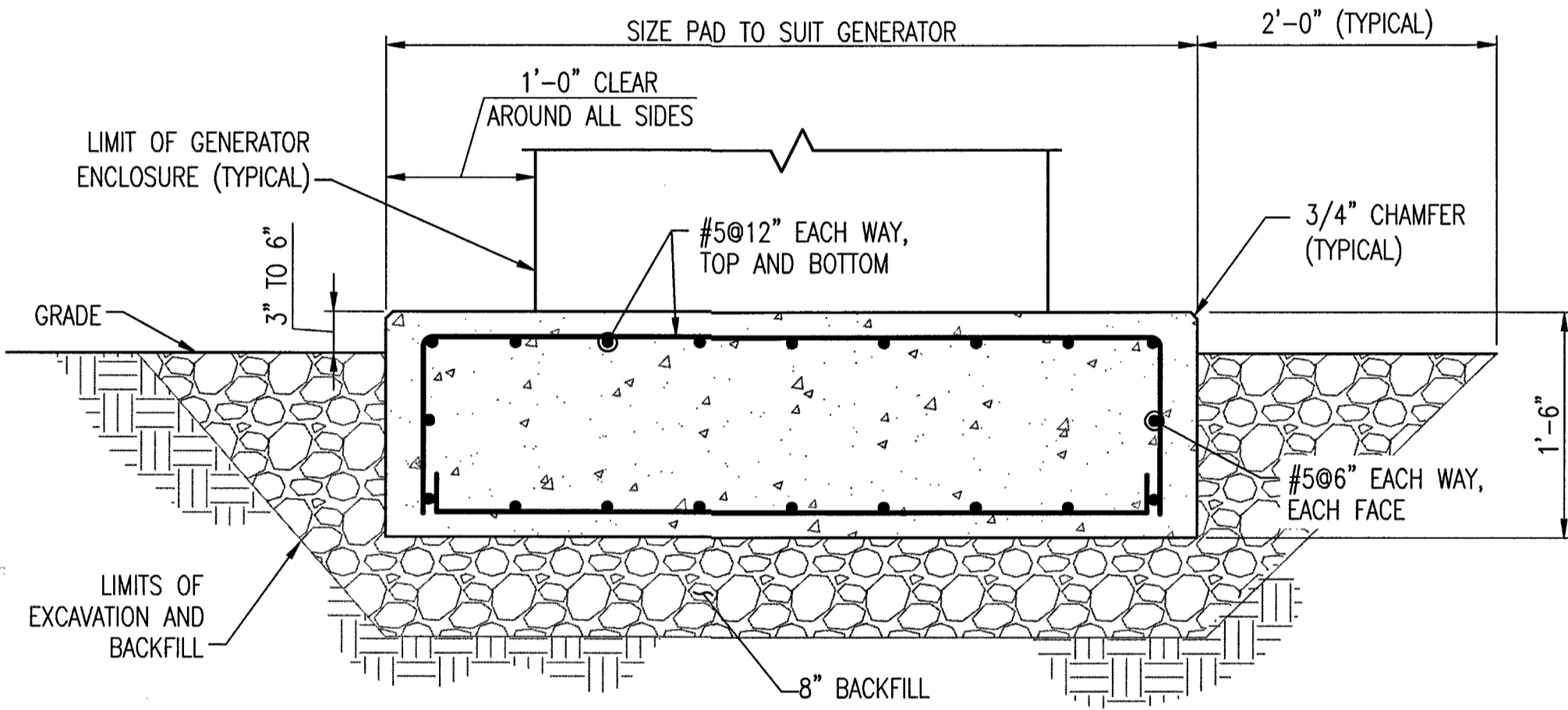
- STRUCTURE RISK CATEGORY: II
- DEAD LOADS:
 - STRUCTURES: ACTUAL CALCULATED WEIGHT
 - ESTIMATED EFFECTIVE UNIT WEIGHT OF SOIL: 120 PCF
 - ASSUMED DESIGN WATER TABLE ELEVATION: AT TOP OF STRUCTURE
 - ESTIMATED AT-REST EARTH PRESSURE COEFFICIENT (K_o): 0.5
- LIVE LOADS:
 - TOP SLABS AND HATCHES OF MANHOLES AND VAULTS: 300 PSF
 - TRUCK: AASHTO HS 20-40 LOADING
- SNOW LOAD:
 - GROUND SNOW LOAD (P_g): 30 PSF

CODES AND STANDARDS:

- INTERNATIONAL BUILDING CODE IBC 2015 INCLUDING THE MODIFICATIONS MADE BY LOCAL JURISDICTION.
- AMERICAN SOCIETY OF CIVIL ENGINEERS ASCE 7-10, "MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES."
- AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES."
- AMERICAN CONCRETE INSTITUTE ACI 318-11 "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE."
- AMERICAN CONCRETE INSTITUTE ACI 350-06, "CODE REQUIREMENTS FOR ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES."
- AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) "MANUAL OF STEEL CONSTRUCTION" - FOURTEENTH EDITION - ALLOWABLE STRESS DESIGN OR LOAD AND RESISTANCE FACTOR DESIGN
- ALUMINUM ASSOCIATION "ALUMINUM DESIGN MANUAL" 2015.

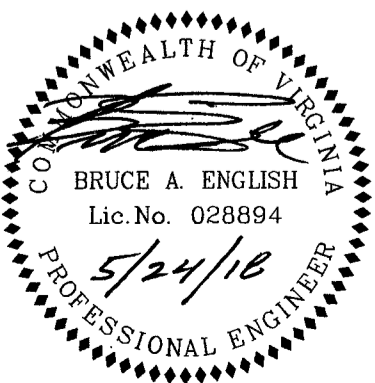


TYPICAL EXTERIOR
EQUIPMENT PAD DETAIL
NO SCALE



- NOTES:
- EXCAVATE TO THE LIMITS SHOWN HEREIN OR AS DIRECTED BY THE ENGINEER, AND BACKFILL WITH DENSE GRADED AGGREGATE BASE (21-A STONE) TO THE BOTTOM OF FOUNDATION. THE ENGINEER MAY ALLOW THE USE OF CRUSHER RUN (CR-6) AND RECYCLED CONCRETE BASE MATERIAL WITH MAXIMUM PARTICLE SIZE OF 1" AND LESS THAN 6% FINES (#200 SIEVE) AS SUBSTITUTES FOR 21-A STONE.
 - COMPACT BACKFILL MATERIAL WITH MECHANICAL TAMPERS OR OTHER COMPACTION EQUIPMENT APPROVED BY THE ENGINEER THAT PRODUCES AN UNYIELDING SURFACE TO THE SATISFACTION OF THE ENGINEER.
 - CONCRETE SHALL BE PLACED ON THE SAME DAY EXCAVATION TO THE SUBGRADE IS ACHIEVED IN ORDER TO MINIMIZE DISTURBANCE TO THE FOUNDATION SUBGRADE, AND ONLY AFTER THE ENGINEER APPROVES THE SUITABILITY OF THE SUBGRADE.
 - FOUNDATION SUBGRADES SHALL BE DRY AND IN AN UNYIELDING STATE AS DETERMINED BY THE ENGINEER.
 - SEE MECHANICAL SHEETS FOR GENERATOR LOCATION AND DETAILS.

TYPICAL GENERATOR PAD
NO SCALE



WESTERN VIRGINIA WATER AUTHORITY
601 South Jefferson Street, Suite 300
Roanoke, VA 24011

DES: BJK	SCALE: NO SCALE
DRAWN: BJK	HORIZ: N/A
CHECK: BAE	VERT: N/A
DATE: 05/24/18	

SUMMIT VIEW BUSINESS PARK UTILITY IMPROVEMENTS,
PHASE 1

STRUCTURAL TYPICAL NOTES AND DETAILS

DRAWING
S0.01

SHEET
55

As-Built

REV	DATE	DESCRIPTION