

SPECIFICATIONS – DUCTILE IRON PIPE

- ALL DUCTILE IRON PIPE FOR THIS PROJECT SHALL BE NEW AND PURCHASED SPECIFICALLY FOR THIS PROJECT. THE CONTRACTOR SHALL PROVIDE MEADE GUNNELL ENGINEERING AND SURVEYING (MGES) WITH COPIES PURCHASE VERIFICATION FOR ALL DIP FOR THIS PROJECT. THIS PERTAINS TO THE 10-INCH DIAMETER DIP SPILLWAY BARREL AND THE 18-INCH DIAMETER EMERGENCY SPILLWAY CULVERTS.
- ALL DIP FOR THIS PROJECT SHALL BE DELIVERED TO THE PROJECT SITE IN 20 FOOT LONG SECTIONS AS MANUFACTURED. NO PARTIAL SECTIONS OF DIP WILL BE ACCEPTED.
- ALL DUCTILE IRON PIPE FOR THIS PROJECT SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS.
- ANSIAWWA C104/A21.4 -- AMERICAN NATIONAL STANDARD FOR CEMENT-MORTAR LINING FOR DUCTILE IRON PIPE AND FITTINGS FOR WATER.
- ANSIAWWA C110/A21.10 -- AMERICAN NATIONAL STANDARD FOR DUCTILE IRON AND GRAY IRON FITTINGS, 3-INCH THROUGH 48-INCH, FOR WATER AND OTHER LIQUIDS.
- ANSIAWWA C111/A21.11 -- AMERICAN NATIONAL STANDARD FOR RUBBER-GASKETED JOINTS FOR PRESSURE PIPE AND FITTINGS. DIP JOINTS FOR THIS PROJECT SHALL BE FASTITE (AMERICA CAST IRON PIPE COMPANY) OR TYTON (UNITED STATES PIPE AND FOUNDRY COMPANY).
- ANSIAWWA C150/A21.50 -- AMERICAN NATIONAL STANDARD FOR THICKNESS DESIGN OF DUCTILE IRON PIPE.
- ANSIAWWA C151/A21.51 -- AMERICAN NATIONAL STANDARD FOR DUCTILE IRON PIPE, CENTRIFUGALLY CAST FOR WATER.
- ALL DIP FOR THIS PROJECT SHALL BE INSTALLED IN ACCORDANCE WITH ANSIAWWA C600 *INSTALLATION OF DUCTILE IRON WATER MAINS AND THEIR APPURTENANCES.
- THE 10 INCH DIAMETER DIP FOR THE SPILLWAY BARREL SHALL BE SPECIAL THICKNESS CLASS 50 WITH A MINIMUM THICKNESS OF 0.29 INCHES.
- THE 18 INCH DIAMETER DIP FOR THE SPILLWAY BARREL SHALL BE SPECIAL THICKNESS CLASS 54 WITH A MINIMUM THICKNESS OF 0.47 INCHES.
- THE 10" DIA DIP DRAIN INTAKE CONDUIT SHALL BE FLANGED IN ACCORDANCE WITH ANSI B16.1 CL 125 TO ATTACH TO THE PROPOSED 12-IN DIAMETER RESERVOIR DRAIN VALVE.

SPECIFICATIONS – CONCRETE

- AN INDEPENDENT TESTING FIRM SHALL BE RETAINED BY THE OWNER TO CONDUCT SLUMP, AIR CONTENT, COMPRESSIVE STRENGTH TESTING SAMPLING OF CONCRETE AT THE PROJECT SITE. THIS FIRM SHALL ALSO BE RETAINED TO PROVIDE STRENGTH TESTING OF THE CONCRETE CYLINDERS IN THEIR LABORATORY.
- ALL CONCRETE FOR THIS PROJECT SHALL MEET THE FOLLOWING REQUIREMENTS.
- CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.
- CONCRETE SHALL HAVE AN ENTRAINED AIR CONTENT OF FROM FOUR PERCENT TO SIX PERCENT BY VOLUME. THE ACCEPTABLE TEST METHOD IS ASTM C173.
- CONCRETE SHALL HAVE A MAXIMUM SLUMP OF FOUR INCHES UPON DELIVERY TO THE PROJECT SITE. THE ACCEPTABLE TEST METHOD IS ASTM C1611.
- NO WATER SHALL BE ADDED TO THE CONCRETE AT THE JOB SITE WITHOUT THE EXPLICIT WRITTEN APPROVAL OF AN ONSITE ENGINEER FROM MEADE GUNNELL ENGINEERING AND SURVEYING (MGES).
- ONE SET OF FOUR COMPRESSIVE STRENGTH TEST CYLINDERS SHALL BE CAST AT THE JOB SITE FOR EACH 50 CUBIC YARDS OF CONCRETE DELIVERED TO THE SITE. THE ACCEPTABLE TEST METHOD IS ASTM C31.
- THE CYLINDERS SHALL BE STORED IN AN ON SITE LOCATION APPROVED BY THE TESTING FIRM FOR A MINIMUM OF 24 HOURS. AFTER A MINIMUM OF 24 HOURS, THE CYLINDERS SHALL BE TRANSPORTED TO THE TESTING FIRMS LABORATORY FOR STORAGE AND TESTING.
- THE COMPRESSIVE STRENGTH CYLINDERS SHALL BE TESTED AT 7 AND 28 DAYS TO VERIFY THEIR COMPRESSIVE STRENGTH. COPIES OF ALL CONCRETE TESTING SHALL BE PROVIDED TO MGES FOR INCLUSION INTO THE FINAL CERTIFICATION PACKAGE TO THE DIVISION OF LAND RESOURCES AT THE COMPLETION OF CONSTRUCTION.
- THE FOLLOWING ASTM STANDARDS APPLY TO THE TESTING OF CONCRETE FOR THIS PROJECT:
 - ASTM C39 - STANDARD TEST METHOD FOR COMPRESSIVE STRENGTH OF CYLINDRICAL CONCRETE SPECIMENS
 - ASTM C31 - STANDARD TEST METHOD FOR MAKING AND CURING TEST SPECIMENS IN THE FIELD.
 - ASTM C39 - STANDARD TEST METHOD FOR CAPPING CYLINDRICAL CONCRETE SPECIMENS.
 - ASTM C39 - STANDARD PRACTICE FOR LABORATORIES TESTING CONCRETE AGGREGATES FOR USE IN CONSTRUCTION AND CRITERIA FOR LABORATORY EVALUATION.
 - ASTM C39 - STANDARD PRACTICE FOR USE OF UNBOUNDED CAPS IN DETERMINATION OF COMPRESSIVE STRENGTH OF HARDENED CONCRETE CYLINDERS.

SPECIFICATIONS – RESERVOIR DRAIN VALVE

- THE RESERVOIR DRAIN VALVE SHALL BE A 8-INCH DIAMETER RESILIENT WEDGE GATE VALVE AS MANUFACTURED BY CLOW, WATERMAN OR AMERICAN DARLING. THE RESILIENT WEDGE GATE VALVE SHALL MEET OR EXCEED ALL REQUIREMENTS OF AWWA C605 AND HAVE A FULL GRAY DUCTILE IRON BODY.

SPECIFICATIONS – PRECAST MANHOLE

- THE 48-INCH DIAMETER PRECAST CONCRETE MANHOLE SECTIONS FOR THE SPILLWAY RISER STRUCTURE SHALL MEET THE FOLLOWING SPECIFICATIONS:
 - MANHOLE: WALL STEEL ASTM C-478 AND AASHTO M-199
 - BASE STEEL: ASTM C-990 AND AASHTO M-189
 - REINFORCING STEPS: ASTM C-478
 - JOINT SEALANT FOR THE PRECAST MANHOLES SHALL CONFORM TO ASTM C990-06 STANDARD SPECIFICATION FOR JOINTS FOR CONCRETE PIPE MANHOLES, AND PRECAST BOX SECTIONS USING PREFORMED FLEXIBLE JOINT SEALANTS.

SPECIFICATIONS – RIPRAP AND AGGREGATE

- RIPRAP FOR THIS PROJECT SHALL BE NCDOT CLASS B GRADATION.
- CRUSHED STONE FOR THIS PROJECT SHALL BE NCDOT NO. 57 GRADATION.
- FINE AGGREGATE FOR THIS PROJECT SHALL BE NCDOT 2S GRADATION SAND

SPECIFICATIONS – EARTHFILL AND COMPACTION

- Soils for use in the dam embankment shall be classified as ML, CL, SM or SC in accordance with the Unified Soil Classification System (USCS).
- Earthfill shall be placed in lifts with a maximum thickness of nine inches prior to compaction.
- Earthfill within four feet of conduits, structures and drains shall be placed in lifts with a maximum thickness of four inches prior to compaction and compacted using hand held or manually operated compaction equipment such as that manufactured by Wacker or Rammax.
- All earth fill shall be placed and compacted at a moisture content of -2 to +4 percent of optimum moisture content as determined by the standard Proctor moisture-density relationship curve. Soil that is outside the specified range of moisture contents shall be conditioned to bring the moisture content to within the specified moisture content range.
- Compaction testing shall be conducted at a frequency of one test per 5,000 square feet per vertical foot of earthfill.
- For earthfill compacted using hand-held or manually operated equipment compaction testing shall be conducted at a frequency of one test per 25 feet of conduit structure or drain per vertical foot of earthfill.
- All rock fragments greater than 12 inches in diameter shall be removed from the earthfill prior to placement.
- All root fragments and organic material shall be removed from the earthfill prior to placement.
- Acceptable methods of compaction testing shall include the latest version of the following standard specifications:
 - ASTM D1556 – Standard test method for density testing and unit weight of soil in place by the sand cone method.
 - ASTM D2937 – Standard test method for density of soil in place by the drive cylinder method.
 - ASTM D6780 – Standard test method for density of soil and soil aggregate in place by the nuclear method.

DATE	DESCRIPTION
07/02/07	INITIAL – PLAN SUBMISSION TO NCDENR, DAM SAFETY

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	DATE 07-02-2007
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ALEX PORTER DAM – PROPOSED
 DAVIDSON, NORTH CAROLINA

PROJECT SPECIFICATIONS

JOB NUMBER 890.20	SHEET NUMBER APD-110
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