STANDARDS & SPECIFICATIONS

for

JACKSON COUNTY WATER

AND

SEWERAGE AUTHORITY

117 MLK Ave.

Jefferson, GA 30565

Phone: 706-367-1741

Fax: 706-367-1759

http://JCWSA.COM

Table of Contents

SECTION 1: SCOPE AND GENERAL CONDITIONS 1-14

1.0 GENERAL PROVISIONS 1-14

1.0.1 TITLE. .....

1.0.2 PURPOSE. .....

1.0.3 APPLICABILITY. .....

1.0.4 AUTHORITY REPRESENTATION. .....

1.0.5 ALTERNATE MATERIALS AND METHODS OF CONSTRUCTION. .....

1.0.6 MODIFICATIONS. .....

1.0.7 TESTS. .....

1.0.8 INTERPRETATION AND ENFORCEMENT. .....

1.0.9 LIABILITY. .....

1.0.10 PROHIBITED ACTIONS. .....

1.0.11 EMERGENCY WORK. .....

1.0.12 INSURANCE AND INDEMNIFICATION REQUIREMENTS / CONFLICT RESOLUTION. ....

1.0.13 DESIGN REPORT. .....

1.1 CONDITIONS OF THE WORK 1-18

1.1.1 WORKING HOURS. .....

1.1.2 EMERGENCIES. .....

1.1.3 DAILY CLEANUP. .....

1.1.4 FINAL CLEANUP. .....

1.1.5 AUTHORITY TO STOP WORK. .....

1.1.6 AUTHORITY AND DUTIES OF AUTHORITY INSPECTOR. .....

1.1.7 CONTRACTOR'S RESPONSIBILITY FOR WORK. .....

1.1.8 REMOVAL OF UNACCEPTABLE WORK. .....

1.1.9 SCHEDULING OF WORK. .....

1.1.10 SAMPLES AND TESTS. .....

1.1.11 STORAGE OF MATERIALS. 1-20
1.1.12 DEFECTIVE MATERIALS. ....
1.1.13 LOCAL LAWS, ORDINANCES AND CODES. ....
1.1.14 PUBLIC CONVENIENCE AND SAFETY. ....
1.1.15 LOCATION OF EXISTING UTILITIES. ....
1.1.16 PROTECTION AND RESTORATION OF PROPERTY AND SURVEY MONUMENTS. ....
1.1.17 USE OF EXPLOSIVES. ....
1.1.18 PROTECTION OF STREAMS, LAKES AND RESERVOIRS. ....
1.1.19 DUST CONTROL. ....
1.1.20 USE OF AUTHORITY WATER. ....
1.1.21 MAINTENANCE OF DRAINAGE. ....
1.1.22 INTERRUPTION OF SERVICES. ....
1.1.23 EQUIPMENT OPERATED ON STREETS. ....
1.1.24 MATERIAL SUBMITTALS. ....
1.1.25 OPERATION OF AUTHORITY SYSTEMS. ....
1.2 APPROVAL PROCESSES AND INSPECTIONS 1-22
1.2.1 PROCEDURES FOR DEVELOPMENTOF WATER AND/OR WASTEWATER EXTENSIONS. ....
1.2.2 PRELIMINARY APPLICATION. ....
1.2.3 BOARD APPROVAL OF PRELIMINARY APPLICATION. ....
1.2.4 SYSTEM ENGINEERING APPLICATION. 1-23
1.2.5 APPLICATION FOR ACCEPTANCE ....
1.2.6 SUSPENSION OR REVOCATION OF APPROVALS. ....
1.2.7 APPROVED PLANS. ....
1.2.8 GA EPD, GA DOT, USACE, AND JCUDC STANDARDS. ....
1.2.9 NPDES FOR STORMWATER MONITORING. ....
1.2.10 CONSTRUCTION INSPECTION. ....
1.2.11 ADDITIONAL INSPECTIONS AND RE-INSPECTIONS. ....

1.2.12 SYSTEM OWNERSHIP. .....
1.3 FEES (ALSO SEE APPENDIX A) 1-27
1.3.1 PRELIMINARY APPLICATION FEE. .....
1.3.2 SYSTEM ENGINEERING APPLICATION (PLAN REVIEW) FEE. .....
1.3.3 INSPECTION FEES. .....
1.3.4 WATER CONNECTION FEES. .....
1.3.5 WASTEWATER CONNECTION FEES. .....
1.3.6 WATER AND WASTEWATER SERVICE .....
1.4 PLANS AND SPECIFICATIONS 1-30
1.4.1 GENERAL. .....
1.4.2 GENERAL PLAN REQUIREMENTS. .....
1.4.3 PLAN SHEET REQUIREMENTS. .....
1.4.4 PLAN & PROFILE SHEETS. .....
1.4.5 SPECIFICATIONS AND SUPPORT DOCUMENTATION. .....
1.5 DEFINITIONS AND ABBREVIATIONS. 1-33
1.5.1 DEFINITIONS. .....
1.5.2 AUTHORITY ABBREVIATIONS. .....
1.5.3 TERMS. .....
1.5.4 SPECIFICATIONS BY REFERENCE. .....
SECTION 2: WATER SUPPLY FACILITIES 2-37
2.0 GENERAL PROVISIONS 2-37
2.0.1 APPLICABILITY. .....
2.0.2 APPROVAL PROCESS. .....
2.0.3 WATER SUPPLY CONSTRUCTION PLANS. .....
2.0.4 WATER CONNECTION FEE. .....
2.0.5 PROOF OF PAYMENT. .....
2.0.6 MAINTENANCE BOND. .....
2.0.7 TAPPING EXISTING WATER MAINS. .....

2.0.8 TRENCHING, BACKFILLING AND COMPACTING. .....
2.0.9 CROSS CONNECTION CONTROL PROGRAM. .....
2.0.10 MANDATORY BACKFLOW PREVENTION DEVICE INSTALLATIONS. .....
2.1 DESIGN CRITERIA.....2-41
2.1.1 GENERAL. .....
2.1.2 DESIGN FLOW REQUIREMENTS. .....
2.1.3 OPERATING PRESSURE REQUIREMENTS. .....
2.1.4 WATER MAIN SIZES. .....
2.1.5 FIRE HYDRANT LOCATIONS. .....
2.1.6 SPACING OF FIRE HYDRANTS .....
2.1.7 SEPARATE FIRE LINES. .....
2.1.8 FIRE LINE TO NON-RESIDENTIAL AREA. .....
2.1.9 DISTRIBUTION SYSTEM LAYOUT. .....
2.1.10 HYDRAULIC DESIGN. .....
2.1.11 MINIMUM DEPTH. .....
2.1.12 WATER SERVICE. .....
2.1.13 WATER SERVICE LINES. .....
2.1.14 WATER SERVICE SIZE. .....
2.1.15 METERS. .....
2.1.16 METER VAULTS: .....
2.1.17 LOCATION OF METERS AND REMOTE READOUTS: .....
2.1.18 METER SIZING: .....
2.1.19 CURB STOPS. .....
2.1.20 PRESSURE REGULATORS. .....
2.1.21 PRESSURE BOOSTER SYSTEMS. .....
2.1.22 SERVICE LINE STUB-INS. .....
2.1.23 SERVICE LINE TAPS. .....
2.1.24 PUMPING FACILITIES. .....

2.1.25 WATER STORAGE REQUIREMENTS. .....
2.2 SYSTEM MATERIALS AND GENERAL INSTALLATION. 2-50
2.2.1 SERVICE LINE MATERIALS AND GENERAL INSTALLATION. .....
2.3 WATER MAIN CONSTRUCTION 2-55
2.3.1 GENERAL. .....
2.3.2 PIPE INSTALLATION. .....
2.3.3 ALIGNMENT AND GRADE. .....
2.3.4 THRUST BLOCKS. .....
2.3.5 MECHANICAL JOINT RESTRAINTS. .....
2.3.6 SETTING VALVES AND HYDRANTS. .....
2.3.7 STEEL CASING AND CARRIER PIPE INSTALLATION. .....
2.3.8 PLUGGING OF DEAD ENDS. .....
2.3.9 FILLING AND VENTING THE LINE. .....
2.3.10 DISINFECTION AND FLUSHING MAINS. .....
2.3.11 LEAKAGE TESTING. .....
2.3.12 TRACER WIRE. .....
2.3.13 TRENCHING. .....
SECTION 3: WASTEWATER FACILITIES 3-60
3.0 GENERAL PROVISIONS. .....
3.0.1 APPLICABILITY. .....
3.0.2 APPROVAL PROCESS. .....
3.0.3 CONSTRUCTION PLANS. .....
3.0.4 LIFT STATION CONSTRUCTION PLANS .....
3.0.5 TRENCHING, BACKFILLING AND COMPACTING. .....
3.0.6 PRESERVATION OF MONUMENTS. .....
3.0.7 CONNECTION TO AUTHORITY WASTEWATER SYSTEM. .....
3.0.8 CONNECTION TO AUTHORITY WASTEWATER SYSTEM FROM AN OUTSIDE ENTITY.
3.1 DESIGN CRITERIA.....3-63

3.1.1 DESIGN FLOW. .....
3.1.2 HYDRAULIC DESIGN. .....
3.1.3 WASTEWATER MAINS SLOPE REQUIREMENTS. .....
3.1.4 COVER. .....
3.1.5 SEWER LINE PARALLEL TO CREEK. .....
3.1.6 WASTEWATER MAIN EXTENSION. .....
3.1.7 MANHOLES. .....
3.1.8 WASTEWATER SERVICE CONNECTIONS. .....
3.1.9 LOCATION DETAILS. .....
3.1.10 RELATION TO WATER MAINS. .....
3.1.11 GREASE INTERCEPTORS. .....
3.1.12 SAND AND OIL TRAPS. .....
3.1.13 GRINDER PUMPS. .....
3.2 MATERIALS. 3-68
3.2.1 WASTEWATER PIPE. .....
3.2.2 PLUGS. .....
3.2.3 MANHOLES & RISER RINGS. .....
3.2.4 MANHOLE BASE SLABS. .....
3.2.5 CONCRETE. .....
3.2.6 MANHOLE RINGS AND COVERS. .....
3.2.7 BEDDING MATERIALS. .....
3.2.8 STEEL CASINGS FOR BORES. .....
3.3 WASTEWATER MAIN INSTALLATION. 3-70
3.3.1 GENERAL. .....
3.3.2 ALIGNMENT AND GRADE. .....
3.3.3 HANDLING PIPE AND FITTINGS. .....
3.3.4 WASTEWATER LINE INSTALLATION. .....
3.3.5 CONNECTIONS TO EXISTING MANHOLES. .....

3.3.6 CONSTRUCTION OF MANHOLES AND CLEAN-OUTS. .....
3.3.7 STEEL CASING AND CARRIER PIPE INSTALLATION. .....
3.3.8 WYES AND RISERS FOR SERVICE CONNECTIONS. .....
3.3.9 TESTING AND INSPECTION. .....
3.3.10 WASTEWATER SERVICE LINES. .....
3.3.11 WASTEWATER SERVICE LINE GENERAL REQUIREMENTS. .....
3.4 WASTEWATER LIFT STATIONS 3-77
3.4.1 GENERAL. .....
3.4.2 DESIGN APPROACH. .....
3.4.3 LIFT STATION SUBMITTAL CHECKLISTS. .....
3.4.4 LIFT STATION TYPE AND DESIGN CAPACITY. .....
3.4.5 LIFT STATION DESIGN CRITERIA.....
3.4.6 FORCEMAINS .....
SECTION 4: SITE WORK AND EARTHWORK 4-86
4.0 GENERAL PROVISIONS.....
4.0.1 GENERAL. .....
4.0.2 DISPOSAL. .....
4.0.3 COMPACTION TESTING. .....
4.1 MATERIALS 4-86
4.1.1 PIPE BEDDING MATERIALS. .....
4.1.2 STRUCTURAL FILL AND TRENCH BACKFILL. .....
4.1.3 ASPHALT PAVING. .....
4.2 DEMOLITION AND REMOVAL OF STRUCTURES AND OBSTRUCTIONS. 4-88
4.2.1 GENERAL. .....
4.2.2 REMOVAL OF PIPE. 4-88
4.2.3 REMOVAL OF PAVEMENTS, SIDEWALKS, AND CURBS. .....
4.3 SITE PREPARATION 4-89
4.3.1 GENERAL. .....

4.3.2 CLEARING. ....
4.3.3 TOPSOIL. ....
4.4 EARTHWORK 4-90
4.4.1 GENERAL. ....
4.4.2 DEFINITIONS. ....
4.4.3 GRADING TOLERANCES. ....
4.4.4 EXCAVATION. ....
4.4.5 FILLS AND EMBANKMENTS. ....
4.4.6 STRUCTURE BACKFILL. ....
4.4.7 BORROW. ....
4.5 TRENCHING, BACKFILLING AND COMPACTING. 4-93
4.5.1 GENERAL. ....
4.5.2 CONNECTIONS TO EXISTING FACILITIES. ....
4.5.3 TRENCH EXCAVATION FOR PIPELINES AND SERVICE LINES. ....
4.5.4 REMOVAL OF WATER. ....
4.5.5 PREPARATION OF FOUNDATION FOR PIPE LAYING. ....
4.5.6 BEDDING FOR PIPELINES AND SERVICE LINES. ....
4.5.7 BACKFILL FOR PIPELINES AND SERVICE LINES. ....
4.5.8 COMPACTION. ....
4.5.9 COMPACTION TESTING. ....
4.5.10 MAINTENANCE OF BACKFILL. 4-96
4.5.11 PAVEMENT REPLACEMENT. ....
4.6 SITE RESTORATION 4-96
4.6.1 RESTORATION. ....
SECTION 5: CONCRETE WORK 5-0
5.0 APPLICABILITY. 5-0
5.0.1 GENERAL. ....
5.0.2 STANDARDS. ....

5.0.3 SUBMITTALS.
5.1 DESIGN CRITERIA. 5-1
5.1.1 MIX DESIGN.
5.1.2 REINFORCEMENT CLEARANCES.
5.2 MATERIALS 5-2
5.2.1 GENERAL.
5.2.2 CEMENT.
5.2.3 PORTLAND CEMENT CONRETE PAVEMENT—MATERIALS
5.2.4 FLY ASH.
5.2.5 WATER.
5.2.6 ADMIXTURES.
5.2.7 FINE AGGREGATE.
5.2.8 COARSE AGGREGATE.
5.2.9 MIXING.
5.2.10 REINFORCING STEEL.
5.2.11 JOINT FILLER MATERIAL.
5.3 CONCRETE CONSTRUCTION 5-6
5.3.1 FORMWORK.
5.3.2 REINFORCING STEEL.
5.3.3 PLACING CONCRETE.
5.3.4 JOINTS.
5.3.5 FINISHING.
5.3.6 CURING.
5.3.7 COLD WEATHER CONCRETING.
5.3.8 HOT WEATHER CONCRETING.
5.3.9 BACKFILLING.
5.3.10 TESTING.
SECTION 6: APPENDIX – A: APPLICATION PROCESS 6-9

6.0 JCWSA DEVELOPER PERMIT PROCESS FLOWCHART 6-10
6.1 WATER AND/OR WASTEWATER EXTENSION PRELIMINARY APPLICATION 6-12
6.2 WATER/WASTEWATER EXTENSION SYSTEM ENGINEERING APPLICATION 6-14
6.3 WASTEWATER APPLICATION PROCESS AND PAYMENT POLICY 6-15
6.3.1 THE PROCESS FOR APPLYING FOR WASTEWATER SERVICE IS AS FOLLOWS: .....
6.3.2 PRELIMINARY APPLICATION. .....
6.3.3 STAFF REVIEW. .....
6.3.4 JCWSA BOARD APPROVAL. .....
6.3.5 ENGINEERING APPLICATION. .....
6.3.6 DESIGN REVIEW. .....
6.3.7 WASTEWATER APPLICATION AND PAYMENT POLICY RECEIVED BY: .....
6.4 INDUSTRIAL QUESTIONNAIRE 6-18
6.4.1 SECTION A, GENERAL INFORMATION .....
6.4.2 SECTION B, PRODUCT OR SERVICE INFORMATION 6-19
6.4.3 SECTION C, PLANT OPERATIONAL CHARACTERISTICS .....
6.4.4 SECTION D, WATER USE AND DISCHARGE INFORMATION .....
6.4.5 SECTION E, PRIORITY POLLUTANT SURVEY .....
6.4.6 SECTION F, PRIMARY POLLUTANT SURVEY .....
6.5 MODULAR PLANT WASTEWATESERVICES CONTRACT 6-33
6.6 JCWSA PLANS SUBMISSION CHECKLIST 6-36
SECTION 7: APPENDIX - B: INSURANCE & CONFLICT RESOLUTION 7-37
7.0 INSURANCE REQUIREMENTS 7-37
7.0.1 INSURANCE: .....
7.0.2 INDEMNIFICATION .....
7.1 CONFLICT RESOLUTION 7-39
7.1.1 MEDIATION .....
7.1.2 ARBITRATION .....
7.1.3 ANY LITIGATION OF A DISPUTE, ...

7.2 OWNERSHIP RIGHTS 7-40

SECTION 8: APPENDIX - C: POLICY & ORDINANCE 8-41

8.0 GREASE TRAP ORDINANCE 8-41

8.0.1 FACILITIES OTHER THAN EATING ESTABLISHMENTS. .....

8.0.2 RESTAURANT GREASE REMOVAL SYSTEMS. .....

8.1 SEWER EASEMENTS & CAPACITY UPGRADE POLICY 8-44

8.1.1 EASEMENT. .....

8.1.2 EASEMENT SEWER LINE. .....

8.1.3 CAPACITY UPGRADE. .....

8.2 MODULAR PLANT POLICY 8-46

8.2.1 GENERAL REQUIREMENTS .....

8.3 CASH IN LIEU OF MAINTENANCE BOND 8-48

SECTION 9: APPENDIX – D: DETAIL DRAWINGS 9-50

Index of Revisions

Revision Number	Board Approved Date	Description
Revision 0.0	Dec. 2006	Original document produced by Prime Engineering
Revision 1.0	02/12/2015	Major revision to entire document produced in house by JCWSA
Revision 1.1	03/12/2015	Added Amendment for the Deposit of Cash Security Funds in lieu of Maintenance Bond
Revision 1.11	04/12/2017	Replace standard detail drawings C-9 Typical Fire Hydrant Detail and C-9 Dead End Fire Hydrant Detail with newly updated versions of same
Revision 1.12	06/13/2019	Multifamily capacity fees added
Revision 1.13	03/12/2020	Pump station policy and exemptions
Revision 1.14	04/14/2022	Meter detail revisions
Revision 1.15	05/12/2022	Multiple revisions: vault detail, PVC sewer encouraged, HDPE forcemain required, Fees changed, Timeline for preliminary application and construction review added
Revision 1.16	06/6/2022	Remove old plans review checklists and replace with a new one.
Revision 1.17	07/18/2022	Revision to C-1 Corridor Detail
Revision 1.18	08/10/2023	Added details C-22 & D-13, Revised detail C-10 to add threaded bolts from the thrust collar to the reducer & from the reducer to the check valve, updated all details to have the date of this revision.

SECTION 1: **SCOPE AND GENERAL CONDITIONS**

1.0 GENERAL PROVISIONS

1.0.1 TITLE.

These regulations shall be known as the Jackson County Water and Sewerage Authority (JCWSA or Authority) Standard Specifications and may be cited as such and shall be referred to herein as the Standard Specifications.

1.0.2 PURPOSE.

The purpose of these Standard Specifications is to establish a uniform standards adopted by the Authority Board for all customers and potential customers of the Authority to conform to and to establish guidelines for planning and design of proposed extensions.

1.0.3 APPLICABILITY.

These Standard Specifications shall apply to the construction, alteration, removal, or repair of any facilities to be constructed by a third party and conveyed to the Authority; and whenever required by the Authority. Additionally, these standards apply to any contractor hired by Developer and any Developer/Owner self-performing the work.

All work on Authority water and wastewater systems shall comply with these Standard Specifications, including the applicable standard detail drawings.

1.0.4 AUTHORITY REPRESENTATION.

The Authority may appoint an engineer, construction inspector, or Authority employee to act on its behalf with respect to these Standard Specifications.

1.0.5 ALTERNATE MATERIALS AND METHODS OF CONSTRUCTION.

The provisions of these Standard Specifications are not intended to prevent the use of materials or methods of construction not specifically prescribed by these procedures. The Authority shall require that sufficient evidence or proof be submitted to substantiate quality and suitability of alternates. Alternate materials or methods shall not be used without written approval of the Authority Engineer.

1.0.6 MODIFICATIONS.

When special conditions are encountered, the Authority may require modifications to, or deviations from these Standard Specifications to protect the interests of the Authority. In such cases the decision of the Authority shall be final. Modifications or deviations shall be in conformity with the intent and purpose of these Standard Specifications and shall not lessen any design requirement or any degree of system integrity. The Authority shall issue authorization for modifications or deviations to the Standard Specifications in writing.

1.0.7 TESTS.

The Contractor shall perform testing as required by these Standard Specifications. In cases where there is insufficient evidence of compliance with the provisions of these Standard Specifications, or evidence that any material or construction does not conform to these Standard Specifications, the Authority may

direct the Contractor to perform additional testing, at no cost to the Authority, as required to demonstrate compliance. Test methods shall be as specified by these Standard Specifications or by other recognized test standards. If recognized and accepted test methods do not exist, the Authority shall determine test procedures.

All testing shall be performed by a testing agency approved by the Authority. A copy of all test reports shall be submitted directly to the Authority by the testing agency. The contractor shall pay all costs for testing.

1.0.8 INTERPRETATION AND ENFORCEMENT.

The Authority, or an Authority appointed representative, shall interpret and enforce these Standard Specifications. Interpretations issued in writing by the Authority shall be final.

1.0.9 LIABILITY.

The Authority assumes no responsibility for contractors constructing facilities for private developers, whether or not the Authority has consulted with the Developer or observed construction and whether or not such facilities may eventually be conveyed to the Authority.

The maintenance of facilities constructed by contractors commences only when such facilities are actually conveyed to the Authority. Authority staff and consultants to the Authority likewise assume no responsibility for the safety or sufficiency of any construction or work conducted by or for a private developer.

1.0.10 PROHIBITED ACTIONS.

No person, firm, or corporation shall construct, alter, repair, or improve, any Authority facilities, or permit the same, in violation of these Standard Specifications.

All projects, including subdivisions and additional subdivision phases, may only connect to water and sewer lines owned by the Authority.

1.0.11 EMERGENCY WORK.

Contractors hired by the Authority to perform emergency work, such as repair of pipeline leaks, shall comply with all applicable sections of these Standard Specifications, including insurance requirements. Contractors performing emergency work shall not be required to obtain a permit prior to performing the work and shall be selected by the Authority on a case by case basis.

1.0.12 INSURANCE AND INDEMNIFICATION REQUIREMENTS / CONFLICT RESOLUTION.

A Contractor hired by the Authority shall not commence work pursuant to any assignment until he has satisfied all insurance requirements established by the Authority Board's latest insurance standards covering all Contractors. The Contractor shall not allow any Subcontractor to commence work until all similar insurance required of the subcontractor has been submitted to the Authority and approved. SEE APPENDIX B.

1.0.13 DESIGN REPORT.

Provide a complete design report prepared by a licensed engineer for any project whose average daily water demand exceeds six thousand gallons per day (6000 gpd) or 15000 gpd for residential. The design report is subject to review by the Authority Engineer. At a minimum the design report shall contain design and/or commentary for the following items. No project (10 ERU's or more) may receive Engineering Application approval until the design report is approved. *Contact JCWSA staff for Design Report guidance document.* Report shall follow the content and outline as shown in *10-State Standards,*

Part 11 Wastewater and Part 1.1 Water.

Engineering Report or Facility Plan.

A. WATER PROJECTS:

1. Design flow requirements (Section 2.1.2) including basis for meter sizing.

2. Operating pressure requirements (Section 2.1.3) including 24-hour pressure tests and fire flow test results.

3. Combination Air/Vacs (Section 2.1.9.E) including calculations for air/vac sizes and locations.

4. Hydraulic Design (Section 2.1.10) including a complete schematic design layout and hydraulic modeling for any proposed water distribution system.

5. Pressure Booster Systems (Section 2.1.21) and/or Pumping Facilities (Section 2.1.31) including complete design drawings and specifications package for proposed booster system. Provide pump curves, system curves, motor controls, electrical design, building design, civil site and grading plan, etc. in addition to any additional requirements on a case-by-case basis as determined by the Authority Engineer.

6. Storage Analysis (2.1.25).

7. Polyethylene Encasement Soils (2.2.U).

B. WASTEWATER PROJECTS:

1. Design flow (Section 3.1.1).

2. Hydraulic Design (Section 3.1.2) including complete schematic design layout and hydraulic modeling of wastewater collection system.

3. Connections to existing manholes (Section 3.3.5). Document existing manhole(s) including all inverts in/out by land survey in the field; and provide design for drop manholes, troughs, etc. Describe/detail how manhole(s) shall be retrofit to be as near to a new manhole as possible.

4. Steel Casing and Carrier Pipe Installation (Section 3.3.7) including a complete description of all necessary permits and applications for stream/river crossings, wetlands crossings, railroad crossings, road crossings (GDOT, Jackson County, etc.).

5. Wastewater Lift Stations (Section 3.4) including complete design drawings and specifications package for proposed lift station. Provide pump curves, system curves, motor controls, electrical design, manhole/sump/vault designs, civil site and grading plan, etc. in addition to any additional requirements on a case-by-case basis as determined by the Authority Engineer. Provide detailed design for pump cycle times, wastewater detention times, wet well sizing, lead-lag (liquid level) probe settings, etc.

6. Force Mains (Section 3.6) including complete design analysis for line sizing including minimum/maximum pipe velocities and pressures. Include detailed design for any air/vacs (if applicable). Include detailed design/drawings for any force main to gravity transition manholes (if applicable).

C. MISCELLANEOUS:

1. Use of explosives (Section 1.1.18). Complete design of any proposed blasting practices including blast surveys, seismic design, etc.

2. Pipe Bedding Materials Disposal (Section 4.2.1) including a description of any known rock excavation/disposal related to the project.

3. Earthwork (section 4.5) including design for any fills, embankments, structural backfill, etc. as it relates to all water and sewer construction and related appurtenances.

4. Trenching, Backfilling and Compacting (Section 4.5) including description/design for proposed backfilling and compaction, removal of water, connection to existing facilities, etc.

5. Pavement replacement (Section 4.7) including design for any paving which is proposed to be installed within Authority right-of-ways and/or easements.

6. Concrete mix design (Section 5.2.1).

7. Concrete construction practices (Section 5.4).

1.1 CONDITIONS OF THE WORK

1.1.1 WORKING HOURS.

All work completed under these Standard Specifications shall be performed during regular working hours which are 7:00 am to 6:00 pm, Monday through Friday. The Contractor shall not perform work outside of regular working hours or on Saturday, Sunday or any Authority holiday without written consent of the Authority.

1.1.2 EMERGENCIES.

When, in the opinion of the Authority, an emergency arises due to work under these Standard Specifications, and immediate action is necessary to protect public interests, the Authority may, with or without notice to the Contractor or the Developer, perform the required work to mitigate the emergency. The Contractor or Developer shall pay for the cost of such work. The performance of

emergency work by the Authority shall not relieve the Contractor of responsibility for damages resulting from the performance of work under these Standard Specifications.

1.1.3 DAILY CLEANUP.

At all times during construction, the Contractor shall maintain the site, partially finished structures, material stockpiles and other like areas in a reasonable state of order and cleanliness. Additionally, Authority staff may require cleanup of any portion of the construction site.

1.1.4 FINAL CLEANUP.

Upon completion of the work, the Contractor shall remove from the project area all surplus and discarded materials, rubbish, and temporary structures, and leave the project area in a neat and presentable condition. The Contractor shall restore all work that has been damaged by his operations.

The Contractor shall inspect the interior of all manholes and catch basins within the construction limits for construction materials, dirt, stones, or other debris resulting from the activities of the Contractor, and shall remove all debris found.

1.1.5 AUTHORITY TO STOP WORK.

The JCWSA, or "Authority" shall have the authority to stop the work whenever such stoppage may be deemed necessary. The Authority shall resolve all questions that arise as to the quality and acceptability of materials furnished, work performed, interpretation of the plans and specifications, and acceptable fulfillment of the requirements of these Standard Specifications.

1.1.6 AUTHORITY AND DUTIES OF AUTHORITY INSPECTOR.

The Authority Inspector works under the direct supervision of the Authority Engineer. The Authority Inspector shall observe, and accept or reject, work completed and all material furnished. Observations may extend to any part of the work, and to the preparation, fabrication, or manufacture of the materials.

No member of the Authority staff, its representatives or the Authority inspector shall act as foreman or perform other duties for the Contractor, nor interfere with the management of the work performed by the contractor. Instructions or advice given by the Inspector or any other representative of the Authority shall not release the contractor from fulfilling the terms of these Standard Specifications.

The presence or absence of the Inspector shall not relieve the Contractor of the responsibility of complying with these Standard Specifications. The inspector shall at all times have reasonable and safe access to the work, and the contractor shall provide proper facilities for such access.

1.1.7 CONTRACTOR'S RESPONSIBILITY FOR WORK.

The Contractor shall be responsible for controlling and supervising the work. It shall be the responsibility of the Contractor to ensure that all work is constructed in accordance with these Standard Specifications.

1.1.8 REMOVAL OF UNACCEPTABLE WORK.

Work that does not conform to these Standard Specifications shall be considered unacceptable work.

Unacceptable work shall be immediately removed and/or otherwise corrected by the Contractor.

1.1.9 SCHEDULING OF WORK.

Work shall be accomplished in accordance with a schedule approved by the Authority. Deviations from the approved schedule shall be made only with written approval of the Authority.

1.1.10 SAMPLES AND TESTS.

Sampling and testing shall be in accordance with generally accepted industry standard practices unless methods and procedures are otherwise set forth in these Standard Specifications.

The Contractor shall furnish all submittals, tests and reports required by the Authority to determine compliance of materials with these Standard Specifications. The Contractor may be required to furnish a written statement identifying the origin, composition and process of manufacture of a material.

1.1.11 STORAGE OF MATERIALS.

Materials shall be stored in a manner that insures the preservation of their quality and suitability for the work. Materials shall be stored only in locations approved by the Authority.

1.1.12 DEFECTIVE MATERIALS.

Materials not in conformance with requirements of these Standard Specifications shall be considered defective and shall be rejected. Rejected materials shall be removed from the work site within twenty-four hours.

1.1.13 LOCAL LAWS, ORDINANCES AND CODES.

The Contractor shall comply with all current federal, state and local laws, including the Jackson County Unified Development Code (JCUDC), pertaining to the work being performed. The Contractor shall obtain all necessary permits and approvals prior to commencement of the work.

1.1.14 PUBLIC CONVENIENCE AND SAFETY.

The Contractor shall erect the appropriate barricades, signs, or other safety measures, provide for adequate drainage and erosion control around the work, and take other necessary precautions to safeguard the work and the public. Work performed in, along or adjacent to public roads shall comply with the Georgia Department of Transportation's Construction Manual, Section 150 and Manual of Uniform Traffic Control Devices (MUTCD), Part 6.

Fire hydrants shall remain visible from the street and accessible to the Fire Department at all times. No obstructions shall be placed within ten (10) feet of a fire hydrant.

1.1.15 LOCATION OF EXISTING UTILITIES.

In accordance with the Georgia Utility Facilities Protection Act (GUFPA), Contractor must contact Georgia 811 at least forty eight (48) hours, but no more than ten (10) working days in advance of any excavation, boring, tunneling, grading, demolition or similar work. The Contractor shall be responsible for the location of all underground utilities located by the appropriate utility company prior to commencing work. The Contractor shall avoid unnecessary exposure of underground utilities and shall protect underground utilities from damage due to performance of the work. The Contractor shall not

hinder or interfere with any person engaged in the protection or operation of underground utilities.

The Authority shall locate existing water and sewer system underground facilities which it owns or operates. The Contractor shall contact Georgia 811 prior to working within ten feet (10') of any overhead power line.

1.1.16 PROTECTION AND RESTORATION OF PROPERTY AND SURVEY MONUMENTS.

The Contractor shall prevent damage to public or private property adjacent to the work. The Contractor at his expense shall restore property damaged by the Contractor's operations. At least seventy-two (72) hours prior to commencing work the Contractor shall give written notice to owners of property that may be affected by the Contractor's operations.

The Contractor shall protect and preserve existing survey monuments. Monuments disturbed or removed by the contractor shall be referenced and replaced by a Professional Land Surveyor registered in the State of Georgia, at the Contractor's expense.

1.1.17 USE OF EXPLOSIVES.

When blasting is permitted, the Contractor shall use the utmost care to protect life and property. Blasting shall be permitted only when approved in writing by the Authority. A licensed blasting contractor shall perform blasting.

Excessive blasting or overshooting shall not be permitted. The Authority may order discontinuance of any method of blasting which leads to overshooting, is dangerous to the public, or destructive to property.

The Authority may require seismic monitoring or any other appropriate measure to protect the general public or any public or private property.

1.1.18 PROTECTION OF STREAMS, LAKES AND RESERVOIRS.

A. Georgia Law. The Owner/Developer/Contractor shall follow practices and standards of Georgia Law, the Erosion and Sedimentation Act of 1975, as amended, and as outlined in The Manual for Erosion and Sediment Control in Georgia.

   1. Precautions. Take all necessary precautions to prevent pollution of State waters.

   2. Spilled Sewage. Spilling sewage to grade, trench, or waters of the State during construction and testing is strictly prohibited.

   3. Report of Technical Review. Submit to the Authority a "Report of Technical Review" from the Oconee River Soil & Water Conservation District stating that the erosion and sediment control plan for the project or activity meets the requirements of the erosion control ordinance or rules and regulations governing land-disturbing activities under the provisions of the Erosion and Sedimentation Act of 1975, as amended.

1.1.19 DUST CONTROL.

The Contractor shall take the necessary steps to control dust arising from operations connected with the work. Sprinkling with water, or other approved methods shall control dust. Dust control shall include roadways to and from the project whenever applicable.

1.1.20 USE OF AUTHORITY WATER.

The Contractor may purchase, when available, reasonable amounts of water from the Authority for construction purposes. Water shall be obtained at points designated by the Authority. All water obtained from the Authority's system shall be equipped with a suitable backflow prevention device and metered by obtaining a hydrant meter from the Authority. A contract and deposit shall be required prior to the release of any hydrant meter.

1.1.21 MAINTENANCE OF DRAINAGE.

The Contractor shall not prevent or obstruct the flow of water in street gutters or natural drainages, and shall utilize proper methods to maintain the flow of surface water while work is in progress.

1.1.22 INTERRUPTION OF SERVICES.

Before starting work, the contractor shall plan and coordinate for the disconnection or interruption of all services including water, sewer, cable T.V., telephone, gas, and electric power. Disconnections or interruptions shall be made in accordance with the regulations of the utility that controls the supply of the service.

Authority approval shall be obtained a minimum of forty-eight (48) hours prior to disconnection or interruption of water or sewer service. Twenty-four (24) hours prior to the interruption of service, the Contractor shall provide written notice to all users whose service shall be interrupted. No line shall be shut down for more than a four (4) hour period at one time.

Interruption of sewer service is prohibited except under emergency situations and under direct observation of the Authority.

1.1.23 EQUIPMENT OPERATED ON STREETS.

Only pneumatic-tired equipment shall be permitted to operate over paved surfaces. The contractor shall be responsible for damage to the street surface resulting from his operations.

1.1.24 MATERIAL SUBMITTALS.

The Contractor shall submit detailed information, specifications and drawings for each type of material or equipment proposed for incorporation into the work. The information submitted shall be in sufficient detail to demonstrate compliance with these Standard Specifications. Materials and equipment shall not be incorporated into the work until approved by the Authority.

1.1.25 OPERATION OF AUTHORITY SYSTEMS.

Only Authority personnel shall operate Authority systems. Developers, contractors, private owners and other persons shall not operate Authority facilities including valves, fire hydrants, pumps and other system components.

1.2 APPROVAL PROCESSES AND INSPECTIONS

1.2.1 PROCEDURES FOR DEVELOPMENTOF WATER AND/OR WASTEWATER EXTENSIONS.

The procedures for the development permit process as summarized below are also represented schematically in Appendix A, Figure A-1 JCWSA *Developer Permit Process Flowchar*t.

1.2.2 PRELIMINARY APPLICATION.

The Developer shall complete a Preliminary Application Form (found in Appendix A, Figure A-2 *Water and/or Wastewater Preliminary Application*) and submit it to the Authority for water and/or wastewater service for the proposed development. The Developer shall provide all information as requested by the Authority Engineer in order to clarify the nature and extent of the Developer's need for water and wastewater to serve the proposed development.

Following the approval of the Preliminary Water and Sewer Application the following deadlines must be met:

1. A complete Engineering Application, per Section 1.4, must be submitted within 6 months.
2. Approval of the Engineering Application must be completed within 2.5 years of Preliminary Application approval (see Section 1.2.4).
3. Final buildout must be completed within 5-years of Preliminary Application approval.

Failure to meet these deadlines shall result in invalidation of any unused water or sewer capacity at the sole discretion of the Authority.

1.2.3 BOARD APPROVAL OF PRELIMINARY APPLICATION.

If the development is anticipated to require more than six-thousand (6,000) GPD (gallons per day) of water for commercial and industrial projects or fifteen-thousand (15,000) GPD of water for residential projects, approval by the Authority Board is required. For developments less than six-thousand gallons per day (6,000 GPD or 15000 gpd for residential), review and approval are by the Authority Manager. The Authority Manager, in his or her discretion, may elect to present such Preliminary Applications to the Authority Board to be approved or denied, using the same procedures as outlined herein. After review, the Authority Manager shall present the Developer's completed application to the Board (if greater than 6,000 GPD, or 15000 gpd for residential) with his recommendation for acceptance or denial. The Board shall then approve or deny the Developer's Preliminary Application.

NOTE: In the event the Board does not render a decision concerning the proposed development at its first regularly scheduled meeting, a final Board decision shall be rendered at its next regularly scheduled meeting.

1.2.4 SYSTEM ENGINEERING APPLICATION.

If the Preliminary Application is accepted by the Authority, the Developer shall then be authorized to continue with the approval process for water and/or wastewater service for his development. At this point the System Engineering Application (found in Appendix A, Figure A-3 *Jackson County Water and Sewerage Authority Water and/or Wastewater Extension Engineering Application)* shall be completed and submitted to JCWSA for approval. The System Engineering Application must be submitted within six (6) months of the date of approval of the Preliminary Application and must also receive Authority

approval before permission to begin construction is granted.

After successful completion of the application and design approval process and following a preconstruction conference, written authorization to proceed with construction shall be granted.

NOTE: Design Approval is valid for twelve (12) months, beginning on the Design Approval Date. Developer/Contractor may request, in writing, one twelve (12) month extension, provided the request is received by the Authority at least one month prior to expiration of the initial Design Approval period.

After completion of the construction process the Owner/Developer shall submit application to the Authority Manager for Initial Acceptance and two-year maintenance period of the completed water and/or wastewater system by the JCWSA. The maintenance period shall be 2 years or 75% build-out, whichever is longer.

1.2.5 APPLICATION FOR ACCEPTANCE

Applications for acceptance of constructed water/wastewater systems shall include but not be limited to the following items:

A. Punch List

Following construction, JCWSA representatives shall conduct a field inspection of new water/wastewater systems and issue a list of any items requiring modification or repair (punch list). Upon completion of all punch list items and receipt of the documents listed below, the project shall be eligible for the Authority to issue the Initial Acceptance Letter.

B. Record Drawings

Record Drawings are required in hard copy format. These plans must include all construction and project details, and truly reflect the final project as it was constructed. This shall be field verified through inspection by the Authority and certified as accepted by the Final Acceptance Letter. Record drawings must show as constructed NAD_1983_StatePlane_Georgia_West_FIPS_1002_US Survey Feet, locations of all valves, meters, hydrants, manholes and additionally any other items where requested by the Authority Engineer. All CAD files of the completed record drawings (NAD_1983_StatePlane_Georgia_West_FIPS_1002_US Survey Feet) shall be submitted to the Authority Engineer.

C. Easements

All easements duly prepared in a final form acceptable to the Authority Engineer. Proof of recordation of easements from the Jackson County Court Clerk shall be required prior to project acceptance. Recordation, including all associated fees, is the responsibility of the Owner/Developer/Contractor.

D. Property title verification for easements.

E. POLICY: ACCEPTING WATER AND WASTEWATER IMPROVEMENTS

1 Initial Operational Inspection and Approval: Upon developer's submission of the water and wastewater improvements for operational inspection and approval, the Authority Engineer

and Construction Inspector shall conduct an Operational Inspection of said improvements for compliance with the JCWSA Standard Specifications. "Operational Inspection" means critical examination by the Construction Inspector or Authority Engineer. The examination must find that constructed facilities are in conformance with all requirements of the JCWSA Standard Specifications. The Operational Inspection shall include a video inspection of the wastewater pipes contracted by the Developer, a copy of which shall be provided to the Construction Inspector for review. Approval for use shall be given in writing by the Authority Engineer. No conditional approvals shall be given.

2 Acceptance by the Authority: Upon written certification by the Authority Engineer or the Construction Inspector that the water and wastewater improvements depicted on the record drawing surveys are in conformance with the JCWSA Standard Specifications and are in good repair, the Authority shall accept the dedication of said water and wastewater improvements in form acceptable to the Authority Manager, in his/her sole discretion. This acceptance shall hereinafter be referred to as the "Initial Acceptance." Authority's acceptance of the developer's dedication of the water and wastewater improvements shall be subject to the provisions of this Section, to include the implementation of that Developer's Maintenance Period and Maintenance Bond as described also, in this Section

3 Developer's Maintenance Period: Developer shall maintain water and wastewater improvements in the development for a period of 2 years from Initial Acceptance or until Certificates of Occupancy have been issued for improvements on 75 percent of the principle buildings on the lots shown on the subdivision's final plat, whichever occurs later.

4 Maintenance Bond: During the Developer's Maintenance Period, the developer initially shall obtain and maintain a maintenance bond acceptable to the Authority. The bond shall be renewed or extended, as necessary, until Certificates of Occupancy have been issued on 75 percent of the principal buildings on the lots shown on the subdivision's final plat. Letters of Credit shall not be accepted.

5 Maintenance Bond Amount: The maintenance bond shall be calculated as follows:

1. Water: Twenty dollars per lineal foot of 8-inch and larger pipe, or $20,000, whichever is greatest.
2. Sewer: Twenty dollars per lineal foot of 8-inch and larger pipe, or $20,000, whichever is greatest.
3. Lift Station: $100,000.

1.2.6 SUSPENSION OR REVOCATION OF APPROVALS.

The Authority may suspend or revoke the written approval issued under the provisions of these Standard Specifications if the approval was issued in error, or on the basis of incorrect information supplied by the applicant. In the event an approval is suspended or revoked, approval fees shall not be refunded.

1.2.7 APPROVED PLANS.

The Contractor shall keep one copy of the Authority approved Plans on site at all times during the work. The Authority shall have access to this copy at all times during the work.

1.2.8 GA EPD, GA DOT, USACE, AND JCUDC STANDARDS.

No part of this approval process is intended to relieve the Developer of the responsibility to comply with applicable requirements of the Georgia Environmental Protection Division (EPD), Georgia Department of Transportation (GDOT), Jackson County Unified Development Code (JCUDC), U.S. Army Corps of Engineers (USACE), or any other appropriate regulatory agency.

1.2.9 NPDES FOR STORMWATER MONITORING.

Prior to construction, Developer shall provide evidence that the NPDES for storm water monitoring has been submitted and the Comprehensive Monitoring Program (CMP) has been developed and monitoring is to be performed and by whom.

1.2.10 CONSTRUCTION INSPECTION.

A. Final Inspection

When 75 percent build-out (as defined in Section 1.2.5.E.3) is achieved, and prior to expiration of the maintenance period, a final acceptance inspection of water and wastewater improvements shall be conducted by the Authority. This final inspection shall require meeting the same requirements of the initial operating inspection as specified in the JCWSA Standard Specifications. Final acceptance shall not occur until the developer performs a final television video inspection of the wastewater pipes and delivers those videos to the Construction Inspector for review.

B. Inspection Requests.

It shall be the responsibility of the Developer to notify the Construction Inspector that such work is ready for inspection. Each request for inspection shall be made at least twenty-four (24) hours and/or one working day before such inspection is required unless other arrangements are made with the Authority's Construction Inspector. It shall be the responsibility of the person requesting the inspection to provide facility access for the Authority's Construction Inspector.

C. Test Results.

On any facilities that the Authority intends to take ownership of and operate, a final inspection shall be made upon work's completion. Evidence must be submitted to the Authority indicating that the installation was subjected to and passed testing requirements as set out in the JCWSA Standard Specifications or have been observed by the Construction Inspector to be in conformance.

D. Written Notice of Deficiencies.

The Authority shall give to the Contractor written notice of deficiencies noted during the inspections. The Authority may, by written order, stop further water and sewer facility construction until all deficiencies are corrected. Partial inspections shall not be performed unless prior written approval is granted by the Authority. The Developer must correct all noted defects or deficiencies in materials and workmanship and make such repairs as required by the Authority Engineer to equal the design as-built condition of the improvements.

E. Final Acceptance by the Authority

Upon written certification by the Authority Engineer or the Construction Inspector that the water and wastewater improvements depicted on the as built surveys are in conformance with the JCWSA Standard Specifications and are in good repair, the Authority shall release the maintenance bond and accept the improvements into perpetual maintenance and ownership. The Authority shall not release the maintenance bond until all deficiencies are corrected.

1.2.11 ADDITIONAL INSPECTIONS AND RE-INSPECTIONS.

The Authority may make or require additional other inspections if necessary to ascertain compliance with the provisions of these Standard Specifications. Re-inspection fees may be assessed when work requested to be inspected is incomplete, or when work does not comply with these Standard Specifications. Re-inspection fees may also be assessed when approved plans are not readily available to the inspector or for failure to provide access at the scheduled time of inspection. When re-inspection fees have been assessed, no additional inspection of the work shall be performed until the required fees have been paid.

1.2.12 SYSTEM OWNERSHIP.

Any water or sewer system tied to or served from a water supply or sewer system already owned, maintained or operated by the Authority shall become the property of the Authority and shall be maintained by the Authority after the specified Maintenance Period and Final Acceptance by the Authority.

Subject to the requirements set forth in applicable State Laws, a new or existing water system not served by an Authority main may also be accepted by the Authority for ownership and operation after careful evaluation of the system by the Authority. Such systems may require certain corrections and/or adjustments to comply with these Standards and Specifications. Applications for transferring an existing water system to the Authority shall be made by the owners of such systems to the Authority Manager and submitted by the Manager to the Authority Board and legal counsel for review and possible ownership acceptance.

1.3 FEES (ALSO SEE APPENDIX A)

1.3.1 PRELIMINARY APPLICATION FEE.

The Preliminary Application Fee shall be paid in full at the time the Preliminary Application is submitted for approval. Preliminary Application Fees shall be paid initially and upon any re-submittals of Preliminary Applications.

1.3.2 SYSTEM ENGINEERING APPLICATION (PLAN REVIEW) FEE.

The System Engineering Application fee shall be submitted to the Authority at the time the Application is received. System Engineering Application fees for water systems, wastewater systems, and wastewater lift stations are listed in Appendix A.

1.3.3 INSPECTION FEES.

Development Inspection Fees are designed to offset the cost of Authority inspections for all private

developments. Payment is mandatory for all developments that are approved by both the Authority and the Jackson County Public Development Department. The fee shall be due and payable to the Authority at the time of the Project's mandatory preconstruction meeting which is held between the Owner/Developer, Contractor and the Authority. The fee is calculated based on, but not limited to, the total lineal feet of water and sewer associated with the project.

1.3.4 WATER CONNECTION FEES.

Water Connection Fees are paid to the Authority prior to submission of a building permit application to Jackson County's Public Development Department. The Authority shall provide a receipt for the Water Connection Fee for the applicant to include with his Building Permit Application. Water Connection Fees are based on meter size and fire meter size requirements. Water Connection fees shall be charged for each development based on the Authority Board's current fee structure which is based on meter and fire meter size. All meters are owned, furnished and maintained by the Authority. The water connection fee, or meter fee, represents a purchase of available water capacity of the Authority's system.

1.3.5 WASTEWATER CONNECTION FEES.

Except for existing developments with a valid "Wastewater Treatment Services Contract" with the Authority still in effect, the Wastewater Connection Fees are paid at the time the Water Connection Fees are paid to the Authority, prior to acquiring a Jackson County Building Permit. The amount to be paid shall be based on the number of ERU's for the proposed building(s) in a proposed development and is calculated as follows:

A. For sewerage an ERU is established as an Average Daily Flow of three-hundred (300) gallons per day (gpd). The sewer connection fee is calculated by dividing the average daily flows anticipated from the building by three-hundred (300) gpd and then multiplying that number by the Authority Board's current standard connection fee per ERU (assuming the wastewater quality is in normal ranges; parameters as determined by the Authority). In the event that service to a new building or industry shall require substantial capital improvements to the Authority's Wastewater System (due either to the proposed wastewater quality or hydraulic peaking) additional wastewater fees may be assessed by the Authority on a case by case basis.

B. Residential homes shall each pay one (1) ERU based on the Authority Board's current standard connection fee.

C. Multi-family and Multi-Unit Developments

Multi-Family Residential units, Fee per unit

Three or more bedrooms one (1) ERU

Two bedrooms, 0.75 ERU, maximum living area 1200 s.f.

One bedroom, 0.50 ERU, maximum living area 750 s.f.

Common area capacity (if applicable) to be determined on a case-by-case basis, reviewed by the Authority Engineer.

Notes:

1) Commercial/Industrial structures estimated average daily volume of wastewater to be generated according to JCWSA standards. Cost basis per ERU, rounded up to nearest whole ERU.
2) Multi-Unit Commercial/Industrial Buildings average daily volume of wastewater to be generated according to JCWSA standards. Cost basis per ERU, rounded up to nearest whole ERU.
4. Exception: When units are individually owned, with each owner receiving a recordable deed to the individual unit purchased, minimum of 0.5 ERUs per unit, based upon estimated average daily volume of wastewater to be generated by individual unit.
3) Fractional ERUs only allowed for (1) Multi-Family Residential, and (2) Multi-Unit Commercial/Industrial units falling under Note 2 exception above.
4) Mixed uses will be defined on a case-by-case basis adhering to the provisions above, as closely as practicable in the opinion of the Authority Engineer.
5) All capacity estimates are subject to review and approval by the Authority Engineer.
6) The classification of structures will be made by the Authority Engineer, upon consultation with JCWSA policies and the codes and ordinances of the applicable local governmental authorities.

Definitions:

1) **Multi-family residential** is a classification of housing where multiple separate housing units for residential inhabitants are contained within one building or several buildings within one complex. Multi-family residential shall include (but are not limited to) duplexes, triplexes, quadraplexes, townhouses, apartments, dormitories, and condominiums.
2) **Commercial/Industrial structures** is any commercial or industrial building used for offices, business parks, financial institutions, medical facilities, or the manufacture, distribution, or sale of any goods or services. This classification shall also include hotels and motels for the purposes of this section.
3) **Multi-Unit Commercial/Industrial** is a classification where multiple separate business units for commercial and/or industrial purposes are contained within one building or several buildings within one complex.
4) **Living Area** includes all heated or cooled space within the exterior walls of the structure. For the purposes of this definition, unfinished areas which may be heated or cooled in the future (excluding garages) shall also be included.

1.3.6 WATER AND WASTEWATER SERVICE

A. Water service may be provided with or without wastewater service at the sole discretion of the Authority Board.

B. Wastewater service shall not be provided by the Jackson County Water and Sewerage Authority without water service also being purchased unless application for such is made in writing to the Authority Manager and subsequently approved by the Authority Board.

C. Disconnection of water service for cause shall be defined as disconnection of both water and wastewater service.

D. Disconnection of service for cause shall include but not be limited to:
    1. Non-payment of water or wastewater bill.
    2. Violation of the Authority's Water Service (Subscriber) Agreement requirements
    3. Discharge of wastewater flow or wastewater strength in violation of EPD Rules and Regulations, the Authority's Sewer Use Policy and/or Industrial Pre-Treatment Policy.
    4. Violation of the Authority's Cross Connection Control Program requirements.
    5. Violation of any state, county or International Plumbing Code requirements.
    6. Other conditions as may be set from time to time by the Authority Board.

1.4 PLANS AND SPECIFICATIONS

1.4.1 GENERAL.

A Registered Professional Engineer (or Land Surveyor, strictly limited, where allowed by Georgia Law OCGA 43-15-12), licensed to practice in the State of Georgia, shall prepare and affix stamp/signature to all plans, computations and specifications for work covered by these Standard Specifications.

1.4.2 GENERAL PLAN REQUIREMENTS.

Plans and specifications shall have sufficient clarity to indicate the location, nature, and extent of the work proposed. Plans shall be drawn to standard engineering scales of: 1"=10', 1"=20', 1"=30', 1"=40', 1"=50',or 1"=60'. Other scales require approval from the Authority Engineer.

Plans submitted for review should include: 1 hard copy and one optimized PDF no larger than 40 MB. If the plan set is larger than 40 MB, then a second PDF shall be provided with a limited selection of the most applicable sheets (Cover, Site plan, Grading plan, Utility plan, Utility details, Sewer profiles and Stormwater profiles).

Each set of construction drawings shall include a separate overall utility drawing, showing water, sanitary sewer, storm sewers, power, telephone, gas, etc. included in the project. Residential subdivisions shall not be required to show power, telephone, or gas unless they are in conflict with water and/or sewer construction. The overall utility drawing shall show all of the pipe sizes, locations, connections to existing facilities and other pertinent information that would add to the overall understanding of the project utilities. Any overall utility plan that is illegible, or contains work not related to utilities may be rejected by the Authority Engineer. A complete engineering application must be approved by JCWSA prior to beginning construction.

The following items shall be shown on all plans:

1. Title Block

2. Scale. Scales shall be stated and shown graphically (both horizontal and vertical for plan and profile sheets).
3. Date of preparation and revision. All revisions must be clouded and numbered.
4. Name, address, telephone, email and registration number of professional engineer or firm.
5. Professional engineer's seal and signature.
6. Drawing numbers.
7. "Call Before You Dig" Note.
8. Statement:

All work shall be constructed to the Jackson County Water and Sewerage Authority Standard Specifications. This drawing has been reviewed and found to be in general compliance with these Standard Specifications and other Authority requirements. THE ENGINEERING DESIGN AND CONCEPT REMAINS THE RESPONSIBILITY OF THE PROFESSIONAL ENGINEER WHOSE STAMP AND SIGNATURE APPEAR HEREON.

9. Approved by:_____
Name Title Date

1.4.3 PLAN SHEET REQUIREMENTS.

All plan sheets shall contain the following information:

A. North arrow.

B. Property lines; indicate lots to be served by solid lines; other property lines dotted.

C. Ownership and/or subdivision information.

D. Street names and easements with width dimensions.

E. Existing utility lines locations and their depth to include water, gas, telephone, storm drain, irrigation ditches, sanitary sewers, and other pertinent details, i.e. houses, curbs, water courses, etc.

F. Contour Interval: slopes with grades less than 2% require 1' minor and 5' major contours. Where slopes exceed 2%, 2' minor and 10' major shall be allowed.

G. The county, city, village, land district and land lot, and subdivision, it the property lies within a particular subdivision.

H. Size: 8-1/2 inches by 11 inches and not larger than 24" by 36 inches. Minimum line width of 0.01 inches. Minimum text height of 1/12" (0.0833).

I. Plans shall conform to all application checklists contained in these standards.

J. All projects involving the construction of any building or facility must have a separate utility plan whereby water and sewer portions of the project are clearly identified, with all other non-applicable portions of the project greyed-out in the background or otherwise given low visual priority. Under no circumstances shall the utilities solely be shown on overall site plans, grading plans, etc. The Authority Engineer shall not review utility plans until this requirement is satisfied.

1.4.4 PLAN & PROFILE SHEETS.

All plan & profile sheets shall contain the following information:

A. Vertical and horizontal grids with scales.

B. Ground surface existing (dotted) and proposed (solid).

C. Existing utilities where crossed.

D. Horizontal Controls and Benchmarks, NAD_1983_StatePlane_Georgia_West_FIPS_1002_US Survey Feet.

E. Manhole invert and rim elevations.

F. Plan shall be shown above the profile with the left-hand stationing matching beginning stationing of the profile below. Rotate plan view to read left to right across sheet. Breakup plan view on to multiple profiles as necessary to maintain a general plan over profile view.

G. Exaggerate vertical scale to exaggerate as much as possible on vertical grid.

H. Accurately show all drop manholes on profile and detail all drop manholes on separate detail.

I. All locations of air and/or vacuum relief valves on plan and profile sheet.

J. All natural/manmade structures where crossed.

K. Any known rock outcroppings and bedrock.

L. Plan & Profile sheets are required for all water lines greater than 12” in diameter.

M. Plan & Profile sheets are required for the construction of all sewer lines, both gravity and force main.

1.4.5 SPECIFICATIONS AND SUPPORT DOCUMENTATION.

The following shall be included with submitted construction plans:

A. Reference on plans to Authority Standard Specifications.

B. Use of Authority Standard Details where applicable.

C. Reference on plans to other agency Standard Specifications, such as (GA DOT) or, (GA EPD) that are required or proposed.

D. Where reference to other commonly available Standard Specifications shall not suffice, copies of specifications are to be provided.

E. Copies of written approval from other affected agencies as required.

F. Landfill Certification Letter:

This shall reference correspondence upon a governmental letterhead, or a stamped and sealed statement from the design engineer of record, to officially document and certify that proposed waterlines and sewer lines shall not be constructed upon former landfills or dumps.

G. Wetlands Certification:

Includes the required Wetlands Certification that (1) the National Wetlands Inventory Map has been consulted; (2) the appropriate plan sheet DOES/DOES NOT indicate wetlands as shown on the map; and (3) if wetlands are indicated the landowner or developer has been advised that land disturbance of protected wetlands shall not occur unless the appropriate Section 404 Permit or Letter of Permission has been obtained from the Army Corps of Engineers. Also see Section 915 of the Jackson County UDC.

1.5 DEFINITIONS AND ABBREVIATIONS.

1.5.1 DEFINITIONS.

Whenever the following terms are used in these Standard Specifications, they shall be defined as follows:

Standard Specifications shall refer to the body of directions, provisions, and requirements contained herein, describing the method or manner of construction, and the quality of materials furnished.

Authority Manager shall refer to the Jackson County Water and Sewerage Authority Manager.

Authority Engineer shall refer to the Georgia Professional Engineer on staff at the Jackson County Water and Sewerage Authority with full authority to approve or disapprove all plans submitted, as well as mandate any changes that may be necessary as provided for within these Standards and Specifications. The Authority Engineer also performs his duties as the local delegation from the Georgia EPD.

Authority Inspector shall refer to the construction inspector on the Authority staff who works under the direct supervision of the Authority Engineer in all matters pertaining to these Standards and Specifications.

Board shall refer to the duly appointed Board of the Jackson County Water and Sewerage Authority.

Contractor shall refer to the utility contractor who meets the requirements as stated in Appendix G and is approved by the Board.

Developer shall refer to the person, firm corporation, association, partnership or designated agent who undertakes (or proposed to undertake) to construct or extend water or wastewater facilities to serve his or her proposed development. This term shall also apply to any private landowner requesting extension of service.

EPD-Environmental Protection Division of the Georgia Dept. of Natural Resources shall refer to the organization that maintains regulatory purview over water and wastewater facilities owned by Jackson County Water and Sewerage Authority.

Equivalent Residential Unit (ERU) shall refer to the housing unit consisting of a single-family residential unit or equivalent in terms of water and/or wastewater usage, presently established at three hundred gallons per day (300 gpd).

Jackson County Water and Sewerage Authority shall refer to the political subdivision of the State created in 1986 by an Act of the Georgia General Assembly (Act No. 1367).

Wastewater System shall refer to the Jackson County Water and Sewerage Authority wastewater system including treatment facilities, sanitary sewers and service taps, lift stations, forcemains and other appurtenances all owned and operated by the Authority Board and under the management and day to day operation of the Authority Manager.

Water System shall refer to the Jackson County Water and Sewerage Authority water system including water distribution lines, booster pump stations, water storage tanks, service taps, fire hydrants, and other appurtenances all owned and operated by the Authority Board and under management and day to day operation of the Authority Manager.

1.5.2 AUTHORITY ABBREVIATIONS.

AASHTO shall mean the American Association of State Highway and Transportation Officials.

ACI shall mean the American Concrete Institute.

AISC shall mean the American Institute of Steel Construction.

ANSI shall mean the American National Standards Institute.

ASTM shall mean the American Society for Testing and Materials.

AUTHORITY shall mean the Jackson County Water and Sewerage Authority

AWG shall mean the American Wire Gauge.

AWWA shall mean the American Water Works Association.

GA DOT shall mean the Georgia Department of Transportation.

GA EPD shall mean the Georgia Environmental Protection Division.

FCC shall mean the Federal Communications Commission.

GPCD shall mean gallons per capita per day.

GPD shall mean gallons per day

GPM shall mean gallons per minute.

GRC shall mean galvanized rigid conduit.

GUFPA shall mean Georgia Utility Facility Protection Act

JCUDC shall mean Jackson County Unified Development Code

JCWSA shall mean Jackson County Water and Sewerage Authority

MGD shall mean million gallons per day.

MJ shall mean mechanical joint

MUTCD shall mean Manual of Uniform Traffic Control Devices

NEC shall mean the National Electrical Code.

NEMA shall mean the National Electrical Manufacturers Association.

NFPA shall mean the National Fire Protection Association

PVC shall mean polyvinyl chloride.

PSI shall mean pounds per square inch.

UL shall mean Underwriters Laboratories, Inc.

USACE shall mean the U.S. Army Corps of Engineers

USDA shall mean the United States Department of Agriculture.

1.5.3 TERMS.

Whenever, in these Standard Specifications, the words “shall”, “as ordered”, “as directed”, “as required”, as permitted”, “as allowed”, or words or phrases of like import are used, it shall be understood that the order, direction, requirement, permission, or allowance of the Authority is intended.

The words “approved”, “reasonable”, “suitable”, “acceptable”, “accepted”, “properly”, “satisfactory”, or words of like effect and import, shall mean approved, reasonable, suitable, acceptable, accepted, proper, or satisfactory in the judgment of the Authority.

Whenever the word “Authority” is used in these Standard Specifications, it shall mean the Jackson County Water and Sewerage Authority or its designated representative.

1.5.4 SPECIFICATIONS BY REFERENCE.

All specifications, i.e., ASTM*, ANSI, ACI, AWWA,* etc. made a portion of these Standard Specifications by reference shall be the latest edition.

Throughout these Standard Specifications, any section referenced shall include all sub-sections of that section. Any portion of these Standard Specifications that may be applicable to any other section, whether referenced or not, shall apply.

SECTION 2: **WATER SUPPLY FACILITIES**

2.0 GENERAL PROVISIONS

2.0.1 APPLICABILITY.

All water main construction within the Authority and all water service line construction connecting to the Authority's water mains shall be designed and constructed in accordance with these Standard Specifications and the Authority approved plans. The requirements stated herein shall apply to new water system construction and repairs to existing facilities.

2.0.2 APPROVAL PROCESS.

If application for service is accepted by the Authority as described in Section 1 of these Standards, then the Developer shall be authorized to proceed with the approval process for his development.

The following steps apply to the approval for installation of water mains, fire hydrants, valves, fittings, services and appurtenances by private developers in either commercial, industrial, or residential developments where the proposed water system shall be tied to or served from any water main already owned, maintained or operated by the Jackson County Water and Sewerage Authority or for any system within Jackson County to be accepted by the Authority for ownership and operation. The cost of installation and connection to the Authority's main shall be the responsibility of the Developer.

A. One copy of preliminary plans showing the type of development, location and general plan for water lines and other appurtenances shall be submitted to the Authority.

B. Flow and Pressure Tests shall be conducted by the Developer in the area of the proposed development (only where the proposed development is to be tied to or served from an existing Authority main). Prior scheduling with Authority staff is required for flow and pressure tests. Results of Flow and Pressure Tests shall be included with the Developer's Preliminary Application. High and low pressure for a given twenty-four (24) hour period shall be shown. Flow testing shall be done in accordance with requirements in the AWWA manual M17 (latest edition) – Installation, Field Testing, and Maintenance of Fire Hydrants, and NFPA 291: Recommended Practice for Fire Flow Testing and Marking of Fire Hydrants (latest edition). A site map showing flow and residual, with hydrants (numbered appropriately) shall be provided with each report.

C. Developer's or their representative's comments must be addressed to the Authority by the Developer relating to the availability of water including both flow and pressure or other items pertinent to the development. Authority Engineer may approve flow and pressure tests or require additional tests by Owner/Developer to determine availability of water at the proposed development. It is the responsibility of the Owner/Developer's engineer to design fire pumps, fire apparatus, etc. as required for the proposed development.

D. The Developer must then submit one copy of construction plans as outlined in these Standards to the Authority for review. These plans must carry the stamp of a Registered Professional

Engineer duly licensed in the State of Georgia or other registered professional, licensed and authorized in the State of Georgia and duly qualified and capable of designing water systems and computing flows and pressures in said systems. Plans shall include all erosion control measures and NPDES storm water permit compliance requirements including a copy of the erosion control approval, the Notice of Intent (NOI) to be sent to EPD, and the Comprehensive Monitoring Program.

E. If approved as submitted, one (1) copy of plans stamped approved shall be returned to the Developer.

F. If changes are required, a checklist shall be returned to the Developer.

G. After the changes have been made, the Developer must submit one (1) additional copy of construction plans to the Authority for review.

H. If all changes have been properly made, one (1) copy stamped "Approved" shall be returned to the Developer. This process must be repeated until the plans are approved.

I. Copies of permits or approvals from other appropriate regulatory agencies must be submitted to the Authority prior to the beginning of construction. This includes erosion and sediment control permits, Georgia DOT permits, Jackson County Public Development road and building permits, railroad permits, US Army Corps of Engineers approvals, Georgia Power permits, etc.

J. One copy of "Record Drawings" shall be submitted to the Authority immediately after construction completion. These plans shall be submitted in an easy-to-read hard copy and digital copies. Refer to Section 1.2.5.B for additional Record Drawing requirements.

K. Approval Expiration:

1. Plan approval for the original applicant is valid for one year from the date of Authority stamped approval. Approval expires if utilities construction has not begun within that year, and the Authority may reevaluate the project under the Standards and Specifications in effect at that time.

2. Developer/Contractor may request, in writing, one 12-month extension, provided the request is received, by the Authority, one month prior to expiration of the initial term.

2.0.3 WATER SUPPLY CONSTRUCTION PLANS.

In addition to the requirements listed in Section 1.4 of these Standard Specifications, water supply construction plans shall include the following items:

A. Water mains.
   1. Size.
   2. Length.
   3. Materials used and types of joints.
   4. Location dimensions.

B. Fittings.
    1. Tees.
    2. Crosses.
    3. Reducers.
    4. Bends.
    5. Plugs.
    6. Blow-offs / Sampling Stations

C. Valves.

D. Fire Hydrants.

E. Plan, profile and complete details for off-site transmission mains, pump stations, special valves, vaults, tanks, etc.

F. Standard bedding detail (cross-section).

G. Service connections or stub-ins details.

H. Any other applicable details.

2.0.4 WATER CONNECTION FEE.

Water connection fees must be paid prior to applying for the Jackson County Building Permit, and are described in more detail in Section 1.3.4 of these Standards. Building permits are not issued by the Authority; they are issued by Jackson County Public Development

2.0.5 PROOF OF PAYMENT.

Developers of systems to be accepted by the Authority shall provide proof that all bills relating to Project construction have been paid and any or all liens have been satisfied, including lien waivers from all suppliers, contractors/subcontractors, engineers, surveyors, etc.

2.0.6 MAINTENANCE BOND.

Reference Section 1.2.5 E for bonding requirements.

2.0.7 TAPPING EXISTING WATER MAINS.

Tapping existing water mains shall be either wet taps or a shutdown of a portion of the main line to facilitate a tie in. A contractor who specializes in the type of work being performed shall perform tapping of all mains. The shutdown of any portion of the water system shall be allowed only when uncontrolled circumstances do not permit a wet tap. All residential service line taps shall be wet taps. The Authority shall approve any shut down of the water system in writing. The Authority shall be notified at least forty-eight (48) hours prior to the commencement of any tapping work. The tapping procedure must be approved by the Authority Engineer. The Contractor must schedule the Authority Inspector to be present during tapping.

2.0.8 TRENCHING, BACKFILLING AND COMPACTING.

Trenching, backfilling and compacting shall be performed in accordance with all applicable portions Section 4, Site Work and Earthwork contained in these Standards.

2.0.9 CROSS CONNECTION CONTROL PROGRAM.

The Authority maintains a Cross Connection Control Program consistent with Georgia EPD Rules for Safe Drinking Water, International Plumbing Code and EPA guidelines. To acquire and maintain water service, the Owner/Developer shall be responsible for properly installing and maintaining the appropriate device based on the degree of hazard present at a property in accordance with these Standards and the International Plumbing Code. Violations of Authority cross connection requirements are not permitted and subject the water subscriber/property owner to immediate termination of service and other enforcement action in accordance with Georgia State law (391-3-5-.13). Additional backflow prevention information can be found in the Authority's Cross Connection Control Program; See Appendix A-8 of these Standards.

For the purposes of this section, a cross connection shall be defined as "any physical arrangement whereby a public water supply is connected, directly or indirectly with any non-potable or unapproved water supply system, groundwater well, storm sewer, sanitary conduit, pool, storage reservoir, plumbing fixture, or other device which contains or may contain any contaminated water, liquid, or other waste of unknown or unsafe quality that could impart a contaminant to the public water supply as a result of backflow."

2.0.10 MANDATORY BACKFLOW PREVENTION DEVICE INSTALLATIONS.

Below is a list of suspected high-hazard installations. The following general fields of installations shall be required to have backflow prevention devices installed on water service lines in accordance with the Authority's Cross Connection Control Program (see Appendix A-8) and the International Plumbing Code.

1. Sewage Lift Stations
2. Wastewater Treatment Facilities
3. Funeral Homes
4. Hospitals (Clinics, including Veterinary Clinics, etc.)
5. Plating and Chemical Companies
6. Laboratories (Industrial and Medical)
7. Meat Packing Houses and Rendering Plants
8. Agricultural/Farming Operations
9. Manufacturing Plants
10. Lawn and Irrigation Systems
11. Car Washes
12. Nursing and Convalescent Homes
13. Professional Buildings (Doctors, Dentists, etc.)
14. Retail Complexes
15. Restaurants and Cafeterias
16. Schools

17. Motels and Hotels four (4) or more stories
18. Laundries and Cleaners
19. Major Office Buildings
20. Apartment Houses (High rise four (4) stories or more)

In applying the recommendations outlined in this section, it is vital that the degree of protection provided be commensurate with the degree of hazard present. In situations where health hazards or unknown hazards exist, the reduced pressure principle backflow device shall be used because it offers the highest known degree of reliability.

Backflow prevention devices from the following manufacturers are approved by the Authority: Febco, Conbraco, Zurn-Wilkins and Watts. Other manufacturer's products may be used upon prior approval by the Authority Engineer.

2.1 DESIGN CRITERIA

2.1.1 GENERAL.

Water distribution systems shall comply with the requirements of Georgia Environmental Protection Division's (EPD's) "Rules for Safe Drinking Water", Chapter 391-3-5, as well as these Standard Specifications for water main and service line construction. They may include special criteria established by the Authority for the overall hydraulics of the water utility system. Special criteria shall be outlined at scheduled pre-design meetings if determined necessary by the Authority.

2.1.2 DESIGN FLOW REQUIREMENTS.

The design of the water distribution system shall be based on the following water demands:

UNIT WATER DEMANDS FOR FUTURE LAND USE

Land Type	Avg. Demand	Max. Day/ Avg. Day	Peak Hr./Max Day
Residential	300 GPD/ERU	2.6	1.5
Commercial[1]	1650 GPD/Acre	2.6	1.5
Industrial[1]	1650 GPD/Acre	2.6	1.5
Park[1]	3060 GPD/Acre	2.6	1.5

[1] Numbers shown are for planning purposes only. In all cases, the Owner/Developer's engineer shall provide calculations to justify estimated water consumption. Schools are considered commercial for the purposes of this table.

Minimum design fire flow shall be as noted below:

Multifamily	1,000 gpm
Shopping Centers	1,000 gpm
Motels, Light Industry and Schools	750 gpm
Heavy Industry, Large/Tall Buildings	
(Warehouses, Office Buildings. Institutional)	1,000 gpm
Residential	500 gpm

Exceptions may be made to increase or decrease minimum fire flows when deemed necessary by the Authority or any applicable building codes. Demand for other than residential to be determined for each specific development.

2.1.3 OPERATING PRESSURE REQUIREMENTS.

All areas shall be designed to have a maximum static head of three-hundred (300) feet (one-hundred-thirty [130] psi) and a minimum static head of one hundred-four (104) feet (forty-five [45] psi). Distribution systems shall also be designed to maintain a twenty (20) psi residual pressure during a maximum usage day plus fire flow event, and a forty (40) psi residential residual during peak hour residential flows. The maximum pressure drop from static head to maximum day plus fire flow, or peak hour residential flow, shall not exceed thirty (30) psi. The service pressures listed above are design figures for new developments and are not represented by the Authority to be a guarantee of supply conditions for the existing distribution system.

Where proposed developments cannot meet the criteria of this section the Owner/Developer's Engineer may be required to provide, storage and pumping facilities for their development. Proposed systems shall be approved by the Authority Engineer on a case-by-case basis and shall require a complete design report, modeling, schematic design, etc.

2.1.4 WATER MAIN SIZES.

Any system, whether served from an existing Authority water main or otherwise, shall have a minimum size of eight-inch (8") pipe installed. All piping in a proposed subdivision along main streets shall be eight inches (8"). Piping on cul-de-sac may be six inches (6") if the total length is less than six hundred feet (600') and no future extension shall ever occur. Cul-de-sacs of longer length shall have eight inch (8") piping along the street (with the last 600 feet [600'] reduced to six inches [6"]) unless looping is provided. Actual sizes may be larger depending on the size required to meet the demand of the proposed development.

Where a water main extension from an existing Authority water main is required along an existing public right of way or future supply route, the size of pipe to be used shall be either eight inches (8"), the size required to meet the demand of the development, or a size equal to the existing Authority main, whichever is largest. The Authority, at its sole discretion, may require a larger pipe size if payment is made by the Authority for the difference in cost.

Water mains shall be laid in public road right-of-ways whenever practicable. Water mains ran outside road right-of-ways shall be pre-approved by the Authority Engineer. Any required easements must be acquired and deeded to the Authority.

2.1.5 FIRE HYDRANT LOCATIONS.

Fire hydrants to be located on privately held property shall be the responsibility of the Owner/Developer's fire system design engineer and in accordance with the local fire district's guidelines, in accordance with all applicable building codes.

2.1.6 SPACING OF FIRE HYDRANTS

In cases where the Authority is to accept a new project for system ownership and operation the spacing requirements of fire hydrants shall be as follows:

A. Single Family Residential Subdivisions: Fire hydrants shall be spaced not more than five-hundred feet (500') apart as measured along street curb line and at an overall spacing that shall not average less than one hydrant to two-hundred thousand (200,000) square feet throughout an individual subdivision. Where blocks are over eight hundred feet (800') in length, intermediate hydrants shall be placed in the center of the blocks. A hydrant shall be placed in the end of each cul-de-sac over three-hundred feet (300') in length. Shorter cul-de-sacs (less than 300' in length) shall have a hydrant placed at the beginning of the cul-de-sacs bulb. Fire hydrants shall be located on the northeast corner of intersections whenever possible. Additional fire hydrants shall be located as necessary to permit all portions of buildings to be reached by hose lays of not more than three-hundred (300) feet in length.

B. Along public roads in areas of low housing density, hydrant spacing can be reduced to a maximum of one-thousand (1,000) feet with a hydrant at each intersection. Areas of low housing density are defined as having homes generally spaced five-hundred feet (500') apart or greater, or as determined by the Authority Engineer.

C. No installation requiring fire hydrants shall have spacing greater than one-thousand (1,000) feet apart as measured along the main supply line.

2.1.7 SEPARATE FIRE LINES.

Facilities that require separate fire lines shall provide backflow preventers in accordance with the Authority's Cross Connection Control Program and Georgia Law. Refer to Standard Detail C-17, Double Check Vault.

2.1.8 FIRE LINE TO NON-RESIDENTIAL AREA.

The property owner shall maintain all fire lines extending from the Authority's vault at the right-of-way or easement. A gate valve shall always be located at the tee (tie-in) at the Authority's main line.

A. All plans and design criteria for development shall meet all applicable National Fire Protection Association (NFPA), International Fire Code (IFC) and local fire district guidelines and codes. In all cases, the design and final sizing of fire protection infrastructure shall be the responsibility of the Owner/Developer's design engineer.

2.1.9 DISTRIBUTION SYSTEM LAYOUT.

A. Dead-ends.

1. Dead ends shall be minimized by looping whenever possible. Lines at ends of long cul-de-sacs shall be looped along lot lines to adjacent streets. Long cul-de-sacs shall be defined a cul-de-sacs longer than six-hundred (600) feet. Length of a cul-de-sac shall be determined by measuring along the centerline of the street from the center of the cul-de-sac turn around radius to the center line of the street with which the cul-de-sac intersects.

2. Install a fire hydrant at the end of a six-inch (6") or larger dead-end pipe.

3. Connect no more than twenty (20) and no less than five (5) individual residences to a single, un-looped main.

4. Construct water pipe from eight-inch (8") diameter pipe minimum. The use of six-inch (6") diameter pipe for dead-ends no longer than six hundred feet (600') is acceptable.

5. Extend mains and laterals to development boundaries and completely across individual lot frontage.

B. Water line location in Cul-de-sacs, Reference Standard Detail C-2 and E-2.

C. LOCATION OF WATER LINES AND FIXTURES.

On existing and proposed roads, water lines shall be located a minimum of eight (8') feet from the edge of pavement or back of curb with a minimum cover of forty-eight inches (48") or as required by the Georgia Department of Transportation or applicable road department. Waterlines shall not be located within 1' of the edge of the sidewalk or under sidewalk. Reference the Jackson County Unified Development Code (JCUDC) and the Standard Details of these Specifications (Standard Detail C-1 Utility Placement) for additional information regarding waterline location. Exceptions shall be made only by written approval by the Authority.

D. VALVE SPACING.

The maximum spacing for valves shall, in all distribution mains and lateral lines, shall be approximately one-thousand feet (1000') or at every other hydrant. Four-way and three-way street intersections shall require four (4) and three (3) valves respectively, one located on each extended property line. For a succession of short blocks perpendicular to the direction of the distribution main, and without residential or commercial services between intersections, one of the mainline valves at an intersection may be omitted, provided the one-thousand foot (1000') maximum spacing requirement is maintained. Valves shall be placed at each end of a line running through an easement on private property, on each

side of a major creek or channel crossing, and on each side of a distribution line that provides service to a hospital, school or large industrial user.

E. COMBINATION AIR/VAC VALVES.

Combination air/vac valves shall be installed at each high point in all transmission mains and for all pipelines twelve-inches (12") or larger, or where required by the Authority Engineer to prevent air or vacuum accumulations. Combination air/vac valves shall be installed in pre-cast manholes or vaults fitted with air vents open to the atmosphere. Reference Standard Detail C-16, Air Release Valve Manhole.

F. BLOW-OFF ASSEMBLIES.

Provisions shall be included in the design to allow for the flushing of distribution mains and lateral lines at all low points in the system, at all dead ends, or at any point noted on the approved plans. The blow-off assembly shall be installed perpendicular to and on the downhill side of the main or line and shall drain to the nearest gutter line or drainage channel.

2.1.10 HYDRAULIC DESIGN.

Transmission and Distribution mains shall be designed using the Hazen-Williams friction coefficients and maximum head losses noted below unless prior approval is granted by the Authority. The given head losses shall apply at peak hourly flows.

Maximum Head Loss by Pipe Size

Pipe Size	Hazen-Williams Coefficient "C"	Max. Head Loss
6" - 12"	110	3.0' per 1,000'
14" - 16"	120	2.5' per 1,000'
20"	130	2.0' per 1,000'
Over 20"	As directed by the Authority	TBD

All pipes shall be designed to have a maximum velocity of ten feet per second (10 fps) at maximum day flow plus fire flow conditions. Maximum velocity through pumping stations shall be 5.5 feet per second at maximum day demand plus fire flow condition.

2.1.11 MINIMUM DEPTH.

All water pipes shall be installed with a minimum of forty-eight inches (48") of cover from finished grade to the top of the pipe.

2.1.12 WATER SERVICE.

All existing structures provided water service by a unapproved well or other non-regulated private

water service, and are now applying for water service from the Authority's system, must either fill in their well(s), physically disconnect the well's plumbing from the dwelling's potable water supply, or install a Reduced Pressure Backflow Preventer (RPZ) when connection is made to the Authority system. If the RPZ option is chosen, the device must be tested annually and in accordance with the Authority's Cross Connection Program. The cost of device installation and test is borne by the property owner.

All new structures except single-family residences applying for water service from the Authority system must obtain a plumbing permit from Jackson County Public Development, and install a backflow preventer in a manner as required by the Authority and per the Authority's Cross Connection Program, as well as the International Plumbing Code. Refer to Section 1.3.6 of these Standards for Terms of Service.

2.1.13 WATER SERVICE LINES.

Authority approval of service line locations is required for all services. Water service lines at the curb stop shall be no deeper than five feet - six inches (5'-6"). Water service lines shall be a minimum of three feet (3') from the property line or as shown in Standard Detail C-4.

A Water and/or Sewer Preconstruction Meeting is required before any digging can take place. Unmetered / unauthorized connections are strictly forbidden. Water use is prohibited without the use of a meter and accompanying JCWSA Water Service Agreement, or without prior written permission from the Authority Manager. If this provision is violated, the responsible party of the offending service shall be immediately assessed a one-thousand dollar ($1000) fine per day.

2.1.14 WATER SERVICE SIZE.

Water services shall be adequately sized to meet the requirements of the facility being served. The minimum size water service shall be one inch (1"). The service line and meter shall be sized by the Developer or his Engineer in accordance with either the AWWA Manual M22 - *Sizing Water Service Lines & Meters* or by the latest edition of the International Plumbing Code. Bullnose connections are prohibited. The water service line shall be continuous copper with no couplings allowed.

Service lines shall be the same size as the corporation stop unless written permission is granted by the Authority Engineer.

2.1.15 METERS.

Meters are owned, maintained and installed by the Authority, and issued upon obtaining a Jackson County Building Permit and the appropriate application (subscriber agreement) and payment to the Authority has been received. The Authority shall furnish the meter and remote reader for all services. All other service line components such as pipe, fittings, meter vaults, backflow preventers and meter setters, shall be furnished and installed by the Developer/Owner for all new projects. *Exception: JCWSA shall supply and install all service components up to "curb stop" as shown on Standard Details C-5 & C-6 for new services on existing, Authority-owned water mains.*

Water meters shall be set when the owner requests water for the structure or facility. All meter installations shall be ordered from Jackson County Water and Sewerage Authority at least forty-eight

(48) hours in advance. Note: If the meter cannot be set due to improper line, meter setter or meter box installation, a fifty dollar ($50.00) fee shall be assessed for each return visit.

The Authority owns, supplies and maintains the water meter, which was paid for at the time a Building Permit was issued by Jackson County. The property owner/water subscriber is purchasing available water capacity and connection to that capacity, not the actual meter. It is the Owner/Water Subscriber's responsibility to ensure that the water billing address is correct and bills are paid promptly. The Owner/Subscriber shall notify the Authority of any change of ownership or of any change of billing responsibility.

2.1.16 METER VAULTS:

Meter vaults, generally precast concrete, are required for installations requiring a three-inch (3") meters or larger. Reference Standard Detail C-17. The vault shall be designed and installed so as to prevent the accumulation of groundwater or rainwater within its interior. This may be accomplished through gravity drainage piping or sumps with pumps.

2.1.17 LOCATION OF METERS AND REMOTE READOUTS:

All meter sets, vaults and remote readouts locations shall be approved by the Authority and shall not be obstructed in any way at any time as to prevent the Authority from total access for maintenance or repairs.

2.1.18 METER SIZING:

A. Minimum size

Meters shall be three-quarter inch (¾") and shall be suitable for one single-family residence or commercial facility with a peak demand of twenty gallons per minute (20 gpm) or less.

B. Other Meters

Owner/Developers proposing service for other than a single-family residential structure shall submit a basis of meter sizing to prevent under-sizing and oversizing of meters. Said submittal shall propose average and peak (in gpm) daily water usage and shall be based on either AWWA Manual M22 or the latest edition of the International Plumbing Code. All proposed meter sizes are subject to approval by the Authority Engineer.

C. METER CHECK VALVES

Testable check valves shall be required for all meters one and one-half inch (1-1/2") and larger. Reduced pressure principle backflow preventers (RPZ's) may be required where conditions exist that could cause a flow of water from the property to the water supply main. All testable check valves or RPZ's are to be approved by the Authority Engineer or his designee prior to installation. Residential meters one inch (1") in size and less require non-testable double check valves incorporated into the meter setter. All backflow devices shall require compliance with the Authority's Cross Connection Control Program (see Appendix H).

2.1.19 CURB STOPS.

Curb stops shall be installed on all service lines to provide a means to shut off the service line. The curb

stop and stop box shall be located as shown on Standard Detail, C-5.

2.1.20 PRESSURE REGULATORS.

An appropriate pressure regulator shall be installed on all service lines on the customer's side of the water meter. The type of device and its proper installation is the responsibility of the property owner/water subscriber.

2.1.21 PRESSURE BOOSTER SYSTEMS.

In locations where the Authority's water distribution system is not capable of providing adequate pressure and/or fire flow to certain individual lots, the Authority may require installation of pressure booster systems within the affected area. Booster systems may be required when static pressure at the meter is less than forty-five (45) psi or where determined necessary by the Authority. The Authority shall approve all booster systems. Generally, booster systems shall not be allowed when the water main and service pipeline sizes can be increased to provide sufficient pressure and flow.

2.1.22 SERVICE LINE STUB-INS.

Water service lines shall be in a separate trench and shall be a minimum of ten feet (10') horizontally from sewer service lines. Water service lines shall be a minimum of eighteen inches (18") above any sanitary sewer crossing. See Standard Detail C-3.

2.1.23 SERVICE LINE TAPS.

Service line taps on water mains shall be made under full line pressure. Taps shall be made in the upper half of the main at the ten o'clock or two o'clock position. The tap shall be made on the same side of the main as the water meter. See Standard Detail C-5.

Tapping shall be performed after the water main has passed pressure, disinfection, and bacteriological tests.

All residential taps for meter sizes up to one inch (1") shall be made using a double strap tapping saddle with corporation stop and three-quarter inch (¾") or one inch (1") Type K-copper service line tubing only. Service taps shall have a minimum separation of eighteen inches (18") and shall be no closer than eighteen inches (18") to a coupling or bell. Splices in service lines shall be avoided whenever possible. Upon completion of all service taps, a visual inspection shall be made by the Authority to check for leakage.

2.1.24 PUMPING FACILITIES.

A. GENERAL.

In locations where the Authority's water distribution system is not capable of providing adequate water pressure and/or fire flow to a development area, the Authority may require the construction of a pumping facility in order to provide proper service. The Authority may not approve the installation of a pumping facility where, in the opinion of the Authority such an installation would have an adverse effect on the operation, or future operation, of the Authority's water system. The Owner/Developer's engineer shall provide the Authority Engineer a complete design report for review and acceptance by the Authority. Drawings shall conform to Section 1.4 of these Standard Specifications. The drawings and

design report are subject to a comprehensive review by the Authority Engineer.

The pumping facility shall satisfy all requirements of the GA EPD Rules for Safe Drinking Water, Chapter 391-3-5 and of these Standard Specifications. The Developer shall prepare a set of "Record Drawings" of the pumping facility in accordance with Section 1.2.5.B of these Standard Specifications. Upon completion of the pumping facility, the Contractor shall also provide the Authority with two (2) copies of an "Operation & Maintenance Manual" for the facility.

B. DESIGN CRITERIA.

The Authority on a case-by-case basis shall establish specific design criteria for water pumping facilities. Prior to commencing design, the developer and his engineer shall meet with the Authority Engineer to develop design criteria for the project.

Pump stations shall have a minimum of two (2) pumps and shall be capable of pumping the peak design flow with the largest pump out of service. All pumping equipment shall be manufactured, supplied and warranted by the same company.

The station shall be sized to accommodate all pumps, electrical equipment and controls required to operate the facility. The station shall be lighted, heated and well ventilated, and if required shall be designed for easy expansion. The architectural finish of the station shall blend with that of the surrounding architecture.

A standby generator, capable of operating the entire station for a minimum of four hours, shall be provided and shall be located outside of the building in an all-weather, sound attenuated enclosure. Additional requirements for generators are listed in Section 3.4.5.T and 3.5.5.T of these Standards. Engine driven pumps may also be allowed at the sole discretion of the Authority.

C. CONTROLS AND TELEMETRY.

A telemetry system shall be incorporated at the pump station for control monitoring and reporting. The system shall, at a minimum, be capable of differentiating between varieties of emergency conditions including high and low pressures, pump failures and power failure. The telemetry system shall be fully compatible with the Authority's telemetry system and shall be reviewed and accepted by the Authority Engineer prior to installation.

D. SITE IMPROVEMENTS.

An eight-foot (8') fabric height chain link fence with barbed wire shall be installed around the perimeter of the pump station site. Refer to Section 3.4.5 for more details. Upon completion of the pump station construction all disturbed areas within the site shall be fertilized, seeded and mulched in accordance with Section 4.6, Site Restoration, of these Standard Specifications.

Landscaping and various other improvements required are covered by the Jackson County Unified Development Code.

2.1.25 WATER STORAGE REQUIREMENTS.

All projects proposing the addition of one-hundred equivalent residential units (100 ERU's) or more shall

evaluate the need for necessary additional storage. Water system storage goals are forty percent (40%) of average day demand and twenty percent (20%) of peak day demand. Owner/Developer's engineer shall determine whether or not the proposed project will tax existing storage capacity beyond the aforementioned system storage goal. If the project causes the storage goal to be exceeded, the Authority Engineer may require the Owner/Developer to install additional water storage via either ground storage tank(s) or tower(s). All design and construction of future storage shall be as required; where required and directed by the Authority Engineer. The Authority shall provide, upon request, current system-wide values for average day demand and peak day demand.

2.2 SYSTEM MATERIALS AND GENERAL INSTALLATION.

A. GENERAL.

All materials used for potable water system shall be certified for such by the American National Standards Institute/National Sanitation Foundation Standard 61 (ANSI/NSF 61). No materials used shall adversely affect the drinking water quality or the public health. All materials, excluding fire hydrants, shall be "lead free" in accordance with the "Reduction of Lead in Drinking Water Act" of 2014.

B. PIPE.

All pipes used for water main construction shall be ductile iron unless otherwise approved in writing by the Authority. Ductile iron pipe shall conform to ANSI/AWWA A21.50/C150. Pipe shall be Pressure Class 350 minimum unless otherwise approved by the Authority. Flanged pipe shall be Class 53. Pipe shall be manufactured in accordance with ANSI/AWWA A21.51/C151. Pipe shall be standard cement lined and seal coated with approved bituminous seal coat in accordance with ANSI specification A21.4 (AWWA C104), latest revision.

C. JOINTS.

Buried pipelines shall have push-on joint in conformance with AWWA C111 or manufacturer's standard restrained joint as appropriate. Exposed piping, valves, and fittings, in vaults and manholes, shall have flanged joints in conformance with AWWA C115. Use of other exposed restrained joints must be approved in writing by the Authority Engineer. Flanges for ductile iron pipe shall have ANSI B16.1, Class 125 drilling unless service conditions warrant heavier flanges. Flange gaskets shall be "Romac" tapping flange gaskets, or Authority approved equal.

D. MJ FITTINGS.

Fittings shall be furnished in accordance with ANSI Specifications A21.10 (AWWA C153, or C110 as appropriate), latest revision. Class designation shall be compatible with the pipe class designated for the project. A standard thickness cement mortar lining shall be applied in conformance with AWWA C104 or epoxy coated lining in conformance with AWWA C116. All fittings shall receive a bituminous outside coating approximately one (1) mil thick.

E. GATE VALVES.

Buried gate valves in sizes four inches (4") to twelve inches (12") shall be of the iron body, non-rising bronze stem, and resilient-seated type conforming to AWWA standard C509. Buried gate valves shall be installed as shown in Standard Detail C-7. Exposed gate valves shall be outside screw and yoke (OS&Y),

bronze trimmed with flanged ends. Valves shall open counter-clockwise (left) and be furnished with a two-inch (2") square operating nut for buried locations and a hand wheel for exposed locations. Gate valves shall be manufactured by Mueller, M&H, Kennedy, Pratt or Authority approved equal.

F. BUTTERFLY VALVES.

Valves having a nominal diameter greater than twelve inches (12") shall be butterfly valves designed for direct burial or exposed service and shall conform to AWWA specification C504, Class 250B. Buried valves shall be rated for underground installation and installed as shown in Standard Detail C-8, Buried Butterfly Valve. Valves shall open left (counter-clockwise). Butterfly valves shall be as manufactured by Mueller, M&H, Kennedy, Dezurik, Henry-Pratt or Authority approved equal.

G. PRESSURE REDUCING/SUSTAINING VALVES or PRV/PSVs

Shall maintain a constant downstream pressure regardless of fluctuations in demand. When the upstream pressure becomes equal to the spring setting of the pressure sustaining control, the valve shall throttle to maintain a constant inlet pressure. If the downstream pressure is greater than the upstream pressure, the valve shall close automatically to prevent return flow. The valve shall be equipped to provide for slow opening and closing by means of independent, field adjustable opening and closing speed controls.

Valve design shall allow the repair of all internal parts through the top flange without removing the valve from the pipe. Pressure reducing/pressure sustaining valves shall be globe-type with direct acting pilot manufactured by "Cla-Val", or Authority approved equal. No parts of the pilot system may be of plastic material.

H. FIRE HYDRANTS.

All fire hydrants shall be dry barrel, open-left and comply with the latest specifications of ANSI/ AWWA C502. The hydrants shall be designed for two-hundred-fifty (250) pounds working pressure with a four and one-half inch (4- ½") main valve opening, be of simple design, easy to operate, effectively and positively drained and protected from damage by freezing, and convenient for repairing and replacing parts. Hydrants shall be factory painted silver in color.

The center of the installed Fire Hydrant safety flange shall be six inches (6") above final grade and have a distance of no less than three feet (3') in circumference clear of all obstructions around the fire hydrant nut. Hydrant extensions shall be provided if required by specific grading conditions. Hydrants shall be equipped with one (1), four and one-half inch (4 ½") pumper nozzle and two (2), two and one-half inch (2-1/2") diameter hose connections, which shall have threads meeting the latest requirements of the State Fire Insurance Commission.

The connection at the base of the hydrant shall be mechanical joint for 6" ductile iron pipe. The depth from the surface of the ground to the bottom of the connection pipe shall be at least thirty-six inches (36"). Each hydrant shall be tested to the AWWA hydrant pressure testing standard, but not less than five-hundred (500) psi with a two-hundred-fifty (250) psi rated working pressure. Any hydrant showing defects by leakage, sweating, or otherwise, shall be rejected. The barrel and all parts shall withstand these tests. These tests shall be made in the field after the hydrants are installed. All fire hydrant

laterals (leads) shall be of six-inch (6") ductile iron pipe and shall have a properly restrained six inch (6") gate valve between the main line and fire hydrant. Hydrants shall be "Muller Centurion 250", "M&H Model 129" or Authority approved equal.

I. VALVE BOXES.

Valve box parts shall be made of gray cast iron in compliance with the requirements of ASTM A48 or ASTM A126. The casting shall be coated with two coats of coal-tar pitch varnish. Valve boxes shall be complete with bases and accessories. Valve box shall be of sufficient length to reach from the pipe to at least 1-inch above the final ground elevation. Extension pieces shall be those recommended by the manufacturer.

The operating nut depth shall not exceed 5 ½ feet. If the depth of the operating nut is to be deeper than 5 ½ feet then an extension shall be attached to the operating nut. The extension shall extend to be a minimum of eight inches (8") and a maximum of twenty four inches (24") from finished grade. The operating nut shall be centered in the valve box and turn freely. The word "WATER" shall be embossed with large letters across the lid for potable water installations only.

Valve boxes shall be the three-piece adjustable screw type. The following patterns are acceptable:

1. Mueller screw-type 5 ½" H-10357 with No. 160 oval base
2. Tyler screw-type 6" cast iron valve box assembly series 6860 with No. 160 oval base.
3. Clay and Bailey screw-type 6" cast iron valve box assembly No. P-108 with No. 160 large oval base.
4. Authority approved equal

J. COMBINATION AIR/VAC RELEASE VALVES.

Combination air/vac release valves shall be designed to exhaust large volumes of air when the system is filled with water and to allow large volumes of air to enter the pipeline when the system is drained. The air and vacuum relief portion of the valve shall have a discharge orifice area, which is equal to or greater than the valve inlet. The valve shall also be capable of venting small quantities of entrained air, which typically accumulate at high points in the pipeline during system operation. Entrained air shall be vented under pressure by means of a small, independently controlled orifice. The combination air release valve shall be designed for a minimum working pressure of two-hundred-fifty (250) psi Release valves shall be installed in appropriate manholes and in a manner as shown in Standard Detail C-16, Air Release Valve Manhole.

The combination air release valve body, cover and baffle shall be cast iron conforming to ASTM A48 or ASTM A126 and AWWA C512. The valve float shall be stainless steel conforming to ASTM A240. The float retainer, outlet orifice plug, float cushion retainer, restraining screws and internal lock nuts and washers shall be stainless steel conforming to ASTM A276. The float cushion and outlet orifice seat shall be synthetic Buna-N rubber manufactured in compliance with ASTM SB800.

K. BLOW-OFF ASSEMBLY / SAMPLING STATION.

Blow-off assemblies shall be required where determined necessary by the Authority Engineer. Design of

all blow-off assemblies is subject to Authority review and approval.

L. VAULTS.

Vaults shall be pre-cast or cast-in-place concrete and shall be constructed in accordance with these Standards. Pre-cast vaults shall be designed so that joints and corners are waterproof. Vaults shall be waterproofed after construction by use of sealants, epoxies, or other approved methods. Vaults shall be designed to resist all lateral and vertical loads imposed. Vault and roof shall be designed to support the overhead fill, any surcharge and an H-20 traffic loading. The Owner/Developer's engineer shall provide calculations to the Authority showing the ability of the vault to withstand H-20 loadings.

Vaults for water service to commercial and industrial projects shall be appropriately sized to house the meter and testable double check valve assembly (DCVA), including the meter bypass piping and isolating valves. There shall be sufficient space to allow full access to service the meter the backflow prevention assembly as well. Reference Standard Detail C- 17.

M. MANHOLES.

Refer to Section 3.2.3, 3.2.4 and 3.2.6 of these Standard Specifications.

N. MANHOLE BASE.

Refer to Section 3.2.4 of these Standard Specifications.

O. SUMP PITS for VAULTS/MANHOLES.

A pre-cast or formed concrete sump shall be provided in all vaults and manholes that house any form of valve or metering device. Sump must be accessible from directly above by drop hose.

P. VENT PIPES.

1. Vent pipes shall be installed in all vaults and pits unless vented hatches or positive ventilation equipment is present. Installations that contain electrical equipment shall have a blower attached to the vent system.
2. Vent pipes shall be six-inch (6") nominal diameter galvanized steel pipe, Grade 40, conforming to A.S.T.M. Standard Designation A 53 or flanged ductile iron. The vent screen shall be a three-fourths inch (3/4") No. 9-11 flattened expanded galvanized metal screen.

Q. JOINT RESTRAINTS.

Pipe Bell restraints for buried ductile iron pipe shall be the pipe manufacturer's standard restrained joint system (RJ), or for MJ fittings, joint restraints shall be MEGALUG® as manufactured by "EBAA Iron Sales", "Romac Grip-Ring", or Authority approved equal. Restraining gaskets such as field-locks, field flex-rings, etc. shall not be substituted for the required joint restraints.

R. BEDDING.

Bedding materials shall be in accordance with Section 4.1.1, Pipe Bedding Materials, of these Standard Specifications.

S. CONCRETE.

Concrete shall conform to Section 5, Concrete Work, of these Standard Specifications.

T. STEEL CASINGS FOR BORES.

Steel casing pipe shall comply with all applicable requirements of Section 3.3.9, Steel Casings for Bores, of these Standard Specifications.

U. Polyethylene Encasement for Buried Iron Pipe and Fittings.

Whenever installing ductile iron water or sewer main the existing soils may be evaluated by the Authority in accordance with "Polyethylene Encasement for Ductile Iron Pipe Systems, ANSI/AWWA Standard C105, Appendix A. Should the evaluation indicate a point value equal to ten (10) or more, the soil is corrosive to ductile iron pipe, and polyethylene encasement of all buried ductile iron pipe and fittings must be provided in accordance with "ANSI/AWWA Standard C105".

The Authority may also evaluate whether the soil is a "Uniquely Severe Environment", according to ANSI/AWWA Standard C105, A.3. If the soil is a Uniquely Severe Environment corrosion protection practices shall be approved on a case-by-case basis by the Authority Engineer.

Polyethylene Encasement (in accordance with said ANSI/AWWA C105 specification) shall be provided wherever any ductile iron line is under the influence of any other cathodic protection system; specifically when crossing buried steel gas piping.

2.2.1 SERVICE LINE MATERIALS AND GENERAL INSTALLATION.

A. SERVICE LINE PIPE AND FITTINGS.

Service lines shall be seamless copper tube or ductile iron pipe. Service line materials shall conform to one of the following specifications:

1. Seamless copper tube, Type K (soft), shall be used for service lines three quarter inch (3/4") through 2 inches (2") for buried installations. Type L copper shall be used for exposed copper piping. Pipe fittings for "K" copper service lines shall be all brass, certified lead free, construction in accordance with AWWA C-800. Fittings used inside a building or a meter vault (two inch (2") meter and larger) may be of the sweat (lead free solder) copper type.

2. Ductile Iron Pipe shall be used for all service lines three inch (3") and larger. Pipe fittings for DIP service lines shall comply with Sections 2.2.3 and 2.2.4 of these Standard Specifications.

B. CORPORATION STOPS.

Corporation Stops shall be manufactured in accordance with AWWA C800, with AWWA taper thread on the inlet side.

C. CURB STOPS.

Curb stops/ball valves shall have a body constructed of lead free waterworks brass with flared outlets. Styles shall be Ford Ball #B-22, Mueller #H- 15204, or Authority approved equal.

D. CURB STOP BOXES.

Curb stops are to be incorporated with the meter setter. Should site conditions necessitate the need for a curb stop on the Authority's side of the service line, it shall be equipped with a box. Curb stop boxes shall be arch pattern base, which do not permit the transfer of loading onto the curb stop valve. Curb boxes shall be constructed of cast iron and steel, as manufactured by the Mueller Company or Authority approved equal.

E. PRESSURE REGULATORS.

The regulator type and its proper installation is the responsibility of the property owner/water subscriber. See also the JCWSA Water Service Agreement, Policies and Schedule of Fees, Section 9.

F. METER COUPLINGS.

Meters one and one-half inch (1-1/2") and larger shall be provided with a coupling to allow for the removal of the meter without disturbing the pipe. Couplings shall be Ford LOK-PAK Meter Couplings or Authority approved equal.

G. METER SETTERS.

Meter setters shall be of an all copper and brass construction and shall have a positive ¼ turn shut-off valve on the inlet side of the setter with padlock wings. Additionally, double check valves from the manufacturer shall be incorporated with the setter. All meter setters shall be pre-approved by the Authority Engineer.

H. VALVES FOR USE WITH METERS.

Gate or ball valves two inch (2") and smaller to be used with copper service pipe shall be brass, with non-rising stems and solid wedge disc. Gate valves shall meet the requirements of AWWA Standard C800. Valves shall be Nibco #T22 or Authority approved equal.

Valves three inches (3") and larger for use with ductile iron service pipe shall be gate valves conforming to Section 2.2.5, Gate Valves, of these Standard Specifications.

I. TAPPING SADDLES.

Water service tapping saddles for service lines 2-inch (2") diameter and smaller shall be bronze casting, lead free or epoxy coated, with double silicone bronze straps. Single strap saddles shall not be permitted. Tapping saddles being used shall be "Smith-Blair #323", "Ford 202B", "Mueller #16100 Series", "Romac 202BS" or Authority approved equal.

J. METER BOXES AND COVERS.

All meter boxes shall be pre-approved by the Authority Engineer as shown in Detail C-5 and C-6 of the Standard Details.

2.3 WATER MAIN CONSTRUCTION

2.3.1 GENERAL.

All work shall conform to applicable portions of the most current AWWA C600. Installation of Ductile Iron Water Mains and Appurtenances and to the pipe manufacturer's recommendations.

2.3.2 PIPE INSTALLATION.

The Contractor shall provide proper equipment, tools and facilities required for convenient performance of the work. All pipe, fittings, valves, and hydrants shall be carefully lowered into the trench in such a manner as to prevent damage to pipe materials and to protect coatings and linings. Under no circumstances shall pipe or fittings be dropped or dumped into the trench; any pipe or fittings that are dumped shall be removed from the work site and shall not be used.

All pipe and fittings shall be carefully examined for cracks and other defects immediately before installation in final position. The groove in the bells of ductile iron pipe shall be full and continuous. Defective pipe or fittings shall be tagged and removed from the job site within twenty-four (24) hours. All foreign matter or dirt shall be removed from the interior and ends of pipe and accessories before they are lowered into position in the trench.

Precautions shall be taken to prevent foreign material, including trench water from entering the pipe. During construction, no debris, tools, clothing, gravel or other foreign materials shall be placed in the pipe. The Contractor shall provide and maintain adequate equipment to properly remove and dispose of all water entering the trench or other part of the work. At times when pipe laying is not in progress, the open ends of pipe shall be closed by means of a water tight plug.

Cutting of pipe for inserting valves, fittings, or closures pieces shall be done in a neat and workman-like manner without damage to the pipe or lining. Cuts shall result in a smooth end, at right angles to the axis of the pipe. Pipe ends shall be smooth and beveled with a file or other tools according to the pipe manufacturer's recommendations.

Rubber gaskets shall be lubricated and installed according to the manufacturer's recommendation. Extreme care shall be used to keep joints clean during assembly.

Ductile iron pipe, fittings and appurtenances in proximity to gas lines equipped with cathodic protection (rectifier type) shall be protected with polyethylene film wrap per the most current AWWA Standard C-105. Miscellaneous steel or other ferrous pipe for blow-offs, etc., shall be similarly protected. Refer to Section 2.2.U.

2.3.3 ALIGNMENT AND GRADE.

Where required by the Authority, field survey parties under the supervision of a registered land surveyor shall determine alignment and grade of the pipe and the location of fittings, valves, and hydrants. The required minimum depth of cover between the top of the pipe barrel and the finished grade shall be four feet and zero inches (4'-0"). The water main shall be laid to the required lines and grades with fittings, valves, and hydrants at the required locations. All valve boxes shall be brought to the finished grade.

2.3.4 THRUST BLOCKS.

Thrust blocks shall be constructed at all bends and fittings in addition to joint restraint systems such as "Megalugs®" or "Grip-Rings", Reference Standard Detail C-13, Thrust Blocks. Care shall be taken not to block outlets or to cover bolts, nuts, clamps or other fittings or make them inaccessible. A bond breaker

shall be placed between the pipe and the thrust block to aid in ease of future removal. Thrust blocks shall bear against undisturbed earth. Formwork for thrust blocks and anchors shall be constructed using wood forms. Wood forms shall be removed before backfilling. Newly placed thrust blocks shall be allowed to set, undisturbed, for a minimum of twenty-four (24) hours prior to backfilling, tamping or compacting. Thrust blocks shall be mixed concrete with a compressive strength of 3000 psi minimum.

2.3.5 MECHANICAL JOINT RESTRAINTS.

Mechanical joint restraints shall be used at all bends and fittings along with thrust blocks. In addition, mechanical joint restraints shall be installed at the following locations:

1. Fire hydrants.
2. Fire line connections.
3. Domestic connections.
4. Vertical and horizontal bends.
5. Vertical and horizontal offsets.

When pipe is to be buried, harness rods may only be used with written permission of the Authority Engineer. Harness rods shall be used only at locations shown on the approved plans and only with prior approval of the Authority. Harness rods intended for buried service must be encased in polyethylene sleeves and taped at both ends to prevent corrosion.

2.3.6 SETTING VALVES AND HYDRANTS.

Immediately prior to the installation of a valve or hydrant the valve or hydrant shall be carefully inspected; the interior shall be thoroughly cleaned; the valve or hydrant shall be operated as many times as necessary to determine that all parts are in proper working order with the valve seating properly and the hydrant drain valve operating properly. Valves and hydrants shall be set plumb, in a vertical position and securely braced in place. Each hydrant shall have a six-inch (6”) gate valve on the inlet line and shall be connected to the main by a six-inch (6”) ductile iron pipe.

Hydrants shall be set three-inches (3”) to six inches (6”) above the established finished grade as measured from the break-away flange, with hose nozzles parallel to the curb or centerline of the street, and the pumper nozzle facing the curb or street.

Valves shall be provided with valve boxes centered and plumb over the operating nut of the valve. The boxes shall be supported by the soils and isolated from the valve to prevent any shock or stress being transmitted to the valve. Valve boxes shall be maintained in a plumb position during backfilling.

Hydrants shall be provided with a drainage pit with nine (9) square feet of surface area and two feet (2’) of depth below the barrel of the inlet. Pits shall be backfilled with one and one-half inch (1-1/2”), washed, crushed, rock to a level six inches (6”) above the barrel drain hole. A concrete thrust block shall be provided at the bowl of each hydrant and shall be placed so as to not obstruct the barrel drain hole. Refer to Standard Detail C-9, Typical Fire Hydrant Assembly. Hydrants and valves shall be backfilled to the ground surface as specified in Section 4, Site Work and Earthwork, of these Standard Specifications

2.3.7 STEEL CASING AND CARRIER PIPE INSTALLATION.

Steel casing and carrier pipe shall be installed in accordance with Section 3.2.8 and 3.3.7, Steel Casings for Bores, of these Standard Specifications.

2.3.8 PLUGGING OF DEAD ENDS.

Standard plugs or caps shall be installed at dead ends of all fittings and pipes, and adequate restraint shall be provided. Reference Standard Detail C-11, Stub & Plug for Future Connection.

2.3.9 FILLING AND VENTING THE LINE.

Only Authority personnel shall operate valves owned by the Authority. Pipelines shall be slowly filled with water and all air expelled from the pipe. All hydrants, air and vacuum relief valves, and other vents shall be open during the filling of pipelines. Where hydrants or other permanent vents are not available in the line, the Contractor shall install the required temporary vents. The rate of filling pipelines shall not exceed the venting capacity or a rate that could damage the pipe. Any non-disinfected pipelines requiring filling from the Authority water system shall require a backflow protection device (where directed) and the presence of Authority personnel to minimize contamination hazards.

2.3.10 DISINFECTION AND FLUSHING MAINS.

Disinfection and flushing shall be performed in accordance with AWWA C651, "Standard for Disinfecting Water Mains".

Following chlorination, the main shall be thoroughly flushed until the water runs clear with no chlorine residual in excess of that carried in the existing system.

The contractor shall take the necessary precautions to prevent any chlorine solution or residual flow into existing water facilities or receiving waters and shall assume responsibility for any damages caused by heavily chlorinated water. Water mains shall not be placed in service or tapped until successful chlorination and bacteriological testing have been performed. These samples shall be delivered to an approved, certified testing laboratory for tests by the Authority, and if samples show evidence of contamination upon testing, the above procedure of disinfection shall be repeated until approved samples are obtained. No connections shall be made to the existing system until all of the samples have been tested and approved.

Following disinfection and flushing, a bacteriological test shall be performed. Authority personnel shall take samples for bacteriological testing. If the test fails, the line shall be re-chlorinated, re-flushed and retested. The Authority shall require at least forty-eight (48) hours notice for testing. Lines which fail bacteriological testing shall not be accepted by the Authority.

2.3.11 LEAKAGE TESTING.

Pressure and leakage tests shall be conducted in accordance with AWWA C600. Test pressure shall be the greater of working pressure plus fifty (50) psi or one-hundred-fifty (150) pounds per square inch, measured at the high point of the section being tested. The maximum length of line to be tested shall be one thousand feet (1,000'). All joints in connections shall be watertight within tolerances set forth in AWWA 600. Any leakage that is discovered by observation or tests shall be located and corrected by the Contractor. Pressure and leakage tests shall not be conducted until the line has been disinfected. Please

refer to AWWA standard C-600, “Installation of Ductile Iron Pipe Water Mains and their Appurtenances “.

The Authority shall waive metered charges for the water necessary for testing the lines where appropriate. However, any water lost through breakage of the lines or unnecessary or excessive flushing of lines shall be charged to the Contractor.

Any section of the line not meeting the above test shall have the leaks found and corrected at once and re-tested until the leakage falls within the limits specified above. All water used for re-testing shall be paid for by the Contractor. Lines which fail pressure testing shall not be accepted by the Authority.

2.3.12 TRACER WIRE.

Tracer wire and locater tape is required on all pipelines (both ductile and PVC). Tracer wire shall be electric conductive wire, and shall be taped to the pipe at four foot (4’) intervals. Locater tape shall be similar and equal to Lifeguard Type II with standard imprint-“Caution Water Line Below”, by Lifeguard, Inc. P.O. Box 426, Wheaton, Illinois 60187 and shall be installed 12 to 18 inches above the pipe. All water main pipeline shall be marked. Trace wire test stations are to be located at all blow offs, and behind all fire hydrants. Wire shall be a minimum of 12 AWG. After installation there shall be a minimum of twenty four inches (24”) of slack wire available in the test box or valve box. Wire shall be coated with HDPE or HMWPE and colored blue for water pipe and green for sewer pipe. Wire coated with THHN is prohibited.

2.3.13 TRENCHING.

Trenching for water and sewer lines shall be separated horizontally at least ten (10) feet apart and be in full compliance with Georgia EPD Minimum Standards for Public Water Systems Section 7.2.5.g “separations”. Additionally sleeving or casing may be required as directed by the Authority Engineer in order to protect public health. Trenches shall remain open after taps are made until the Authority’s personnel can inspect all installations. Water service lines shall be installed according to detail. Common trenching is not allowed unless approved in writing by the Authority.

SECTION 3: **WASTEWATER FACILITIES**

3.0 GENERAL PROVISIONS.

3.0.1 APPLICABILITY.

All wastewater main construction within the Authority system and all wastewater service line construction connecting to the Authority's wastewater mains shall be completed in accordance with these Standard Specifications and the approved plans. The requirements of this Section are the minimum required for JCWSA water and sewer projects but do not waive any Jackson County UDC requirements. These Standard Specifications shall cover new construction and repairs to existing facilities.

3.0.2 APPROVAL PROCESS.

A. As described in Section 1 of these Standards, the Authority shall review all construction plans for conformance with these Standard Specifications. Engineering design shall remain the responsibility of the design engineer.

B. Owners or authorized representatives of any development except a single family residence shall submit a letter to the Authority outlining the proposed development, number of units, projected daily sewage flow in gallons per day, instantaneous peak flow in gallons per minute (gpm), peak factor and other data as may be necessary for the Authority to understand the nature and impact of the proposed development on the Authority's system. This shall apply to all developments. Commercial/Industrial developments shall follow the requirements of the Authority's Industrial Pretreatment Program Policy and Sewer Use Policy.

C. One (1) copy of preliminary plans showing the type of development, location and general plan for sewer lines and other appurtenances must be submitted to the Authority and, if applicable, one (1) copy of the Design Report (see Section 1.0.13). The minimum finished floor elevation must be indicated on each lot.

D. For plans that include pump stations and force mains, site development plans must show a plan of the entire sub-basin (drainage basin) which drains to the lift station, to include contours and projected flow calculations of the entire master planned drainage basin at build-out. Proposed locations of sewer access by adjoining properties within the sub-basin to the sewer system via easement shall be shown. Reference Figure F-2.

E. Comments shall then be addressed to the Developer by the Authority Engineer.

F. As described in Section 1, within six (6) months of the date of Preliminary Application approval, the developer must then submit one (1) copy of construction plans as outlined in these Standards to the Authority for review. These plans must carry the stamp of a professional engineer licensed in the State of Georgia and duly qualified and capable of designing sewer systems and computing flows.

G. If approved as submitted, one (1) copies of plans stamped approved shall be returned to the Owner/Developer.

H. If changes are required, a review letter shall be returned to the Owner/Developer.

I. After the changes have been made, the Owner/Developer must submit one (1) additional copy of construction plans to the Authority for review. This process shall continue until plans are acceptable to the Authority.

J. If all changes have been properly made, one (1) copies stamped, "Approved" shall be returned to the Owner/Developer.

K. Copies of permits or approvals from other appropriate regulatory agencies must be submitted to the Authority prior to the beginning of construction. This includes erosion and sediment control permits, Georgia DOT permits, USACE approval, county road permits, Georgia Power permits, railroad permits, etc.

L. One copy of "Record Drawing" plans shall be submitted to the Authority immediately after construction completion. These plans shall be submitted in hard copy and electronically in CAD format, ("Microstation" or "AutoCAD") and only one set is required.

M. Approval Expiration: Plan approval for the original applicant is valid for one year from the date of Authority stamped approval. Developer/Contractor may request, in writing, one twelve (12) month extension, provided the request is received by the Authority at least one (1) month prior to expiration of the initial period.

3.0.3 CONSTRUCTION PLANS.

In addition to the general plan requirements listed in Section 1.4 and 3.0.2.C, Sewer Construction Plans shall include the following:

1. All erosion control measures
2. NPDES storm water permit compliance requirements including a copy of the erosion control approval and the Notice of Intent (NOI) sent to Georgia EPD
3. Comprehensive Monitoring Program
4. Georgia EPD Stream Buffer Encroachment Permit, that specifically includes sewer crossings as applicable
5. Approvals from the U.S. Army Corps of Engineers
6. Landfill certification letter
7. Wetlands Certification
8. Sanitary sewer mains to include pipe diameters, all materials, slopes and length between manholes. Combined plan and profile sheets are required to include stationing and number designation, elevation of inverts in and out of manholes and elevation of manhole rims
9. Manhole stub-outs
10. Proposed future extensions

11. Wye and riser connection for services
12. Standard bedding cross-section
13. Concrete encasement locations
14. Bore and Jack locations.

3.0.4 LIFT STATION CONSTRUCTION PLANS

Plans shall include the following:

1. Pump submittal with shop drawings and specifications
2. Detailed wet well elevations
3. Valve information with shop drawings
4. Standby generator submittal with shop drawings and specifications
5. Telemetry equipment submittal compatible with the Authority's
6. Single line electrical drawing showing power distribution for station and complete electrical design by an electrical engineer
7. Force main plan and profile
8. Any and all items that demonstrate compliance with Section 3.4, Lift Stations, of these Standards. Additional items may be required by the Authority Engineer on a case-by-case basis.
9. Complete set of construction plans for the entire project.

3.0.5 TRENCHING, BACKFILLING AND COMPACTING.

Trenching, backfilling and compacting shall be performed in accordance with Section 4.6, Trenching, Backfilling and Compacting, of these Standard Specifications.

3.0.6 PRESERVATION OF MONUMENTS.

Monuments which are moved or disturbed shall be replaced by a licensed professional land surveyor at the Contractor's expense.

3.0.7 CONNECTION TO AUTHORITY WASTEWATER SYSTEM.

The Authority shall not allow flow of any kind into the existing wastewater system until final written acceptance of the wastewater lines by the Authority.

3.0.8 CONNECTION TO AUTHORITY WASTEWATER SYSTEM FROM AN OUTSIDE ENTITY.

The Authority shall not allow flow of any kind into the existing wastewater system without Authority written approval. Wastewater flow entering the Authority system from an outside entity shall be metered. Prior to written approval, a meeting with the Authority Engineer is required, and in most cases, Board action shall be required.

3.1 DESIGN CRITERIA

3.1.1 DESIGN FLOW.

The design shall include consideration of providing service for the entire master planned drainage basin (sub-basin) at build-out to the outfall point. The following wastewater flow rates shall be used:

Wastewater Flow Rates by User Type

User Type	Unit Wastewater Flow Rate
Residential[1]	300 gallons/ERU/day
Commercial[1]	1,500 gallons/acre/day
Industrial[1]	1,300 gallons/acre/day
Park/Recreation	50 gallons/acre/day
Elementary Schools	15 gallons/student/day
Jr. & Sr. High Schools	20 gallons/student/day

[1]Numbers shown for planning purposes only. Developer's engineer must provide site specific calculations to justify any large residential, commercial, or industrial flows. All calculations are subject to review and approval by the Authority Engineer.

Wastewater peaking flows shall be computed using the following equation:

PF = 3.5 x ADF

Where ADF = average daily flow

NOTE: Peaking factor may be adjusted by Authority Engineer on a case-by-case basis.

3.1.2 HYDRAULIC DESIGN.

Wastewater mains less than fifteen inches (15") in diameter shall carry the peak design flow at a maximum flow depth of fifty percent (50%) of the pipe diameter. Wastewater mains fifteen inches (15") in diameter and larger shall carry the peak design flow at a maximum flow depth of seventy-five percent (75%) of the pipe diameter.

The minimum velocity at the average design flow rate shall be two (2) feet per second. Where actual flow shall be considerably below the design flow for several years, the Authority may require that the minimum velocity be attained by suitable grades at the partial peak design flow rate. Maximum allowable velocity shall not exceed ten (10) feet per second at seventy-five percent (75%) flow depth in the pipe.

Care shall be taken to design invert elevations at manholes in such a manner that the energy gradient is consistently falling in the direction of flow (generally dropping one-tenth of a foot {0.10'} across the

manhole). In addition, when the velocity of an upstream wastewater line entering a manhole at peak flow is above critical velocity, the hydraulic gradient shall be computed to insure that a surcharge shall not occur at a service connection, and that the energy gradient shall remain level across the manhole.

3.1.3 WASTEWATER MAINS SLOPE REQUIREMENTS.

Wastewater mains shall be eight inch (8”) diameter or larger. The following minimum grades (based on a Mannings formula n = 0.015) shall apply. In extreme circumstances and when it serves the best interests of JCWSA and it’s customers, the Authority Engineer may approve in writing slopes less than the absolute minimum grades presented below.

Minimum Grades for Sewers

Sewer Diameter	Minimum Grade	Max number of ERUs
4" lateral	2% (4% when possible)	
6" lateral	2% (4% when possible)	
6" service stub	2% (4% when possible)	
8"	0.70%	300
10"	0.50%	500
12"	0.40%	750
15"	0.30%	1200
16"	0.30%	1500
18"	0.24%	1900
21"	0.20%	2600
24"	0.16%	3200
27"	0.14%	Per Authority Engineer
30"	0.12%	Per Authority Engineer
36"	0.10%	Per Authority Engineer

NOTE: Sewers larger than thirty six inches (36”) shall be designed and constructed to give mean velocities, when flowing full, of not less than three feet per second (3 fps), based on Manning’s formula using “n” value of 0.013. Sewers this size and larger also require Georgia EPD design approval.

3.1.4 COVER.

Wastewater mains shall ordinarily have a minimum of eight feet (8’) of cover to finished ground surface. Where cover is less than four feet (4’) underneath paved areas the pipe must be ductile iron pipe (DIP). Where pipe has less than four feet (4’) of cover, provisions shall be made to protect the pipe from impact and loading subject to written approval of the Authority Engineer.

Sewer lines must avoid passing through a detention pond. In the event that it cannot be avoided the pipe must be a ductile iron pipe and have a minimum of 4 feet (4’) of cover. Any sewer line that passes under a detention pond must be installed in a casing. Pipe shall not be located within the dam or outlet structure. All manholes must be located outside the detention pond.

3.1.5 SEWER LINE PARALLEL TO CREEK.

In the event that a sewer line runs parallel to a creek or lake the sewer must be placed so that there is a twenty-five foot (25') undisturbed buffer along the edge of the bank as measured from the top of bank as stated under the Official Code of Georgia Annotated (Volume 10, Title 12, Georgia Erosion and Sedimentation Act, 12-7-6-16).

Exceptions to the Georgia EPD buffer requirement can only be granted by the Georgia EPD through their formal variance process.

Any sewer line parallel to a creek, stream, or lake shall be designed such that the top of the proposed pipe is one-foot (1') foot below the bottom of the creek bed. The elevation of the creek bed must be indicated on the plans. Creek crossings shall be made only when absolutely necessary and should be nearly perpendicular. Creek crossing shall be DIP, concrete encased, and stabilized with riprap and/or other stabilizing material upon completion as directed by the Authority. Sewer lines shall be designed to cause minimum impact on waters of the United States.

3.1.6 WASTEWATER MAIN EXTENSION.

Wastewater mains shall be extended at least ten feet (10') uphill from the lowest lot corner of the uppermost lot to be served. Wastewater mains shall terminate in a manhole. Service connections shall not be made at manholes, but shall be provided above or below the manhole. Manholes shall be stubbed out and plugged with suitable size pipe wherever future extension of the wastewater main is anticipated.

3.1.7 MANHOLES.

Manholes shall have a minimum diameter of forty-eight inch (48") and shall be provided at every change in direction, grade, or at connections with intersecting sewer mains. Maximum spacing between manholes shall be four hundred feet (400') for lines fifteen inches (15") diameter or smaller or five hundred feet (500') for lines eighteen inches (18") diameter or larger. Wastewater lines between manholes shall be straight in line and grade.

Inside drops shall be avoided wherever possible. Inside drop manholes shall be provided for a wastewater line entering a manhole at an elevation eighteen inches (18") or more above the manhole invert. Where the difference in elevation is less than eighteen inches (18"), the invert shall be filleted to prevent solids deposition. Reference Standard Details D-1 or D-1-A,

Manhole steps shall be twelve inches (12") on center. The first step shall be a maximum of eighteen inches (18") below finished grade. Manhole steps must be in line with access, and in line with other steps in manhole.

3.1.8 WASTEWATER SERVICE CONNECTIONS.

Wyes shall be provided in the wastewater main for service stub in connections at each lot or building site. Fittings shall be angled upwards so that the upper invert of a one-eighth bend connected to the fitting shall have an elevation equal to or higher than the inside crown of the wastewater main. Riser connections shall be installed where the elevation of the top of the fitting is more than twelve feet (12')

below finished ground. Riser connections shall ordinarily reach to a grade ten feet (10') below finished ground surfaces.

Wastewater service lines shall not be located closer than three feet (3') to a side property line, and shall not be constructed through or in front of an adjoining property. Wastewater service lines shall be located a minimum of ten feet (10') to the low side of the water service. Reference Standard Detail C-1, Utility Placement, and the Jackson County UDC for additional details regarding utility location requirements.

As may be required by the Authority, a manhole shall be installed instead of a wastewater service connection when a greater than four inch (4") connection is to be made to a main serving a commercial or industrial facility.

Buildings constructed as a shell, with the intention of being used for subdivided suites for commercial purposes, shall have wastewater service connections extending a minimum of six feet (6') outside of the building with a clean-out for each set of proposed bathrooms or suites. All commercial and industrial facilities shall have a clean-out on the outside of the building, located a minimum of three feet (3') from the building, on the wastewater service connection. Commercial and Industrial Facilities may be required to install a manhole if the Authority deems it necessary to have a sampling point in accordance with its Industrial Pretreatment Program and Sewer Use Policy.

Rainwater leaders, roof drains, surface drains or ground water drains shall not be connected to the wastewater system. Each wastewater service system shall be separate from the drainage system.

3.1.9 LOCATION DETAILS.

Wastewater mains shall be installed in local or collector streets and shall be located on the centerline of the street wherever possible. Mains installed in easements shall only be allowed where approved by the Authority Engineer. Mains and manholes shall be located to provide reasonable access for maintenance crews at all times. Reference the Standard Details and the Jackson County UDC for additional details regarding utility location requirements.

3.1.10 RELATION TO WATER MAINS.

Wastewater lines shall be located a minimum of ten feet (10') horizontally, from existing or proposed water mains (centerline distance). Where wastewater lines cross water mains, the wastewater line shall be a minimum of eighteen inches (18"), clear, below the water main. Reference Standard Detail C-3, Water & Sewer Clearance. If this clear distance is not feasible, the crossing shall be designed and constructed so as to protect the water main. The Authority Engineer shall approve the crossing design.

Minimum protection shall consist of the installation of a ductile iron pipe wastewater line. The wastewater line shall be encased in concrete if above the waterline. The encasement shall be at least six inches (6") thick around the entire pipe and shall extend a distance of ten feet (10') on either side of the water main.

3.1.11 GREASE INTERCEPTORS.

Grease interceptors shall be installed in all food serving, food preparing, food catering, or other

establishments capable of discharging large amounts of grease into the wastewater system. Grease interceptors shall be located outdoors, on private property, within thirty feet of the facility served, and shall be easily accessible at all time for maintenance and examination. Grease interceptors shall comply with the requirements of the most current International Plumbing Code as adopted by Jackson County Public Development and the Authority Sewer Use Policy. See Standard Detail D-8 and Appendix F for sizing criteria of grease interceptors.

3.1.12 SAND AND OIL TRAPS.

Sand and oil traps shall be installed at all service stations, truck or car wash facilities, vehicle maintenance facilities, machine shops and other establishments capable of discharging large amounts of sand and oil into the wastewater system. Sand and oil traps shall be located outdoors, on private property, within thirty feet of the facility served, and shall be easily accessible at all time for maintenance and examination. Sand and oil traps shall comply with the requirements of the most current International Plumbing Code as adopted by Jackson County Public Development. See Standard Detail D-9 of these Standards.

3.1.13 GRINDER PUMPS.

Grinder pump installations shall not be allowed.

3.2 MATERIALS.

3.2.1 WASTEWATER PIPE.

A. DUCTILE IRON PIPE (DIP)

1. Pipe shall be designed in accordance with AWWA/ANSI Specification C150/A21.50. Pipe shall be Pressure Class 150 minimum.

2. Pipe shall be manufactured in accordance with AWWA/ANSI Specification C151/A21.51-86.

3. Pipe and fittings, for all DIP gravity sewer lines shall be ”Protecto 401” or “Tnemic Series 431 Permasheild PL” lined.

4. Push-on joints shall conform to ANSI Specification A21.11 (AWWA C111), latest revision.

5. Flanged joints shall conform to ANSI Specification A21.15 (AWWA C115), latest revision.

6. Fittings shall be furnished in accordance with ANSI Specifications A21.10 (AWWA C153 or C110 as appropriate), latest revision and shall be a minimum of the pressure rating of the joining pipe. Joints shall be mechanical joint conforming to latest ANSI and AWWA Specifications. Cement mortar or epoxy coated lining, shall be furnished for all fittings.

7. Ductile Iron Pipe shall be used where sewer crosses under twenty four (24”) or larger storm pipes with a vertical separation of less than eighteen inches (18”).

8. SDR 26 PVC is required when depth of cover exceeds fifteen feet (15’). -

9. Sewer lines over 20’ deep are prohibited.

10. DIP is required inside of bored and jacked casing pipe. HDPE may be allowable at the Authority Engineers discretion.

11. HDPE is preferred in casings for forcemains.

B. PVC SEWER PIPE (up to twenty-four inch (24”) diameter)

1. Unless otherwise required in Section 3.2.1-A, all sewer lines shall be SDR35 PVC or SDR 26 PVC. The Authority Engineer shall consider DIP or other materials when recommended by the design engineer on a case-by-case basis.

2. All PVC sewer pipe and fittings shall be manufactured in accordance with ASTM D3034, with a minimum SDR 35. The design engineer shall provide calculations justifying the proposed SDR of new pipe based on the depth of cover and laying conditions.

3. Bedding for all PVC sewer shall be “Class B” per the JCWSA standard detail C-12.

C. STEEL PIPE

1. Use steel pipe for casing aerial spans and as casing in jack and bore work.
2. Pipe shall conform to ASTM A-139, Grade B, electric fusion welded steel pipe.
3. The interior and exterior of the carrier pipe shall be coated with coal-tar enamel. Casing pipe may be uncoated on the interior and shall have a bituminous coating on the exterior.
4. Field welded joints of carrier pipe shall be field coated.
5. Minimum wall thickness for casing pipe shall be one-quarter inch (1/4") up to twenty-four inch (24") diameter.
6. Provide stainless steel casing spacers with polymer skids, minimum three (3) per joint.

3.2.2 PLUGS.

A compression stop as recommended by the pipe manufacturer shall be provided to seal the end joint of stub in connections and dead-end stubs.

3.2.3 MANHOLES & RISER RINGS.

Manholes shall be constructed of precast concrete per ASTM C-478. Cones shall be of the eccentric type. Precast manhole sections shall be sealed with O-ring rubber gaskets or "Ram-Nek" type flexible joint sealant.

Manhole steps shall be one-half inch (1/2") diameter, grade 60, steel-reinforcing rod completely encapsulated in Copolymer Polypropylene as manufactured by M.A. Industries, Inc., or equal.

Connection of pipes to precast manholes shall be accomplished using grout in place, flexible sleeves, or integrally cast compression gaskets. For grouting, a waterstop gasket shall be installed on plastic pipes prior to the space between the pipe wall and the edge of the block out being grouted, inside and outside, with non-shrink grout. Flexible sleeves shall be "KOR-N-SEAL®", "Lock Joint®", "Fernco®", or Authority approved equal. Compression gaskets shall be A-Lok®, or Authority approved equal.

Mortar for manholes shall be mixed in the following proportions by volume: One (1) part Portland cement; one-half (1/2) part hydrated lime; and two (2) parts sand. The cement, lime, and sand shall be thoroughly mixed dry and only enough water added to form a mortar of proper consistency. Mortar shall be used within one (1) hour after mixing with no re-tempering permitted. Mortar that has taken a partial set shall not be used.

Riser Rings shall be precast concrete, and in total shall not exceed six inches (6") in total height without prior approval of the Authority Engineer.

3.2.4 MANHOLE BASE SLABS.

Manhole base slabs may be poured in place or precast. The slab shall be designed to uniformly support the earth load and any other reasonable loads that may occur. The minimum slab thickness shall be six inches (6"). The minimum reinforcement shall be welded wire fabric, 4x4/W4xW4. Splicing of the welded wire fabric shall be by lapping one space and securing the wire mesh together. All wire fabric

shall conform to the requirements of the "Wire Reinforcement Institute, Inc."

3.2.5 CONCRETE.

Concrete shall conform to Section 5, Concrete Work, of these Standard Specifications. Type II cement shall be used.

3.2.6 MANHOLE RINGS AND COVERS.

Cast iron manhole ring and covers shall conform to ASTM A-48 with a minimum tensile strength of 25 KSI (Class 25) and designed for AASHTO H-20 loads. The quality shall be such that a blow from a hammer shall produce an indentation on a rectangular edge of the casting without flaking the metal. Pamrex covers with Cretex chimney seals shall be allowed as an alternate type.

Standard manhole covers shall be furnished with two (2) three-quarter inch (3/4") vent holes and shall be as shown in Standard Detail D-3, 24" Manhole Ring & Cover.

Manhole covers within the 100 year flood plain shall be of watertight, bolt down construction or "EJ Revolution" gasketed watertight.

"EJ Revolution" manhole covers or Authority approved equal are required where the elevation of the cover is equal to or greater than twelve inches (12") above grade.

3.2.7 BEDDING MATERIALS.

Bedding materials shall be in conformance with Section 4.1.1, Pipe Bedding Materials, of these Standards.

3.2.8 STEEL CASINGS FOR BORES.

Steel casing pipe for bores shall be seamless welded steel tubing having an inside diameter of at least four inches (4") greater than the outside diameter of the bell or joint of the carrier pipe to be installed therein. The minimum wall thickness of the tubing shall be one-quarter inch (¼") for casings up to twenty four inch (24") in diameter as shown in the Standard Details. In all cases, the design engineer shall indicate proposed casing dimensions based on engineering factors.

3.3 WASTEWATER MAIN INSTALLATION.

3.3.1 GENERAL.

Installation of PVC wastewater main shall conform to ASTM D-2321, "Recommended Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe". Ductile Iron Pipe shall be installed per AWWA C600. All work shall conform to Authority accepted plans, specifications, special provisions and the above designation.

3.3.2 ALIGNMENT AND GRADE.

Wastewater mains, structures and appurtenances shall be constructed accurately to the line and grade as shown on the approved plans. Construction stakes shall be placed by field parties under the direct supervision of a Registered Professional Land Surveyor licensed to practice in the State of Georgia.

The grade and alignment shall be maintained by use of suitable surveying instruments (checking the

invert of each piece of pipe) or laser equipment, operated continuously during the construction.

Note: Wastewater mains shall be installed within road right-of-ways wherever practicable.

3.3.3 HANDLING PIPE AND FITTINGS.

All pipe, fittings, and specials shall be unloaded, stockpiled, hauled, distributed, installed and otherwise handled in a manner that shall prevent breakage or other damage thereto and which shall insure delivery and installation in a sound and acceptable condition. PVC pipe shall be stored or covered in a manner to protect against direct sunlight exposure.

3.3.4 WASTEWATER LINE INSTALLATION.

Wastewater lines shall be constructed continuously upgrade from an existing wastewater line except when otherwise approved by the Authority Engineer. Special care shall be taken to lay wastewater pipe to exact line and grade with spigot ends pointing in the direction of flow.

Bedding material shall be placed per the standard detail. A continuous trough shall be excavated in the bedding to receive the bottom quadrant of the pipe barrel. Bell holes shall be excavated so that after placement, only the barrel of the pipe bears on the bedding.

Prior to making pipe joints, all surfaces of the joint shall be clean and dry. Lubricants shall be used as recommended by the pipe manufacturer. The joint shall be carefully pushed home using approved methods of leverage. Care shall be taken to prevent pinching or rolling of the gasket. Adjustment to final line and grade shall then be made. PVC wastewater pipe shall be secured in place by installation of bedding material tamped under and along it up to a level of twelve inches (12”) over the top of the pipe.

Wastewater lines shall be kept thoroughly clean and free of gravel, dirt and debris. Whenever work ceases for any reason, the unfinished end of the pipe shall be securely closed with a temporary plug. Pipe trenches shall be continuously dewatered as required by Section 4 of these Standards.

Pipe shall not be covered until a representative of the Authority has inspected it.

3.3.5 CONNECTIONS TO EXISTING MANHOLES.

Wastewater pipe connections to existing manholes, where there is no pipe stubbed out, shall be made in such a manner that the finished work shall conform as nearly as practicable to the essential requirements specified for new manholes. The contractor shall core and boot the existing manhole as necessary to insert the new wastewater pipe. The existing concrete foundation bench shall be chipped to the cross-section of the new pipe in order to form a smooth continuous invert similar to what would be formed in a new concrete base. Non-shrink grout shall be used as necessary to smoothly finish the new invert. Rubber boots, gaskets, and/or non-shrink grout shall be used to seal the new line so the junction is watertight. The bypassing of raw wastewater onto the ground or into a receiving stream is strictly prohibited.

3.3.6 CONSTRUCTION OF MANHOLES AND CLEAN-OUTS.

Concrete bases shall extend at least six inches (6”) below the bottom of the pipe and shall be benched up to at least two inches (2”) over the top of the pipe. The shape of the invert shall conform exactly to the lower half of the pipe it connects. Side branches shall be constructed with as large a radius of curvature as possible. Reference Standard Details D-1 and D-2. Inverts shall be plastered with cement mortar and left smooth and clean.

Precast manhole sections shall not be placed on the foundation until after it has reached sufficient strength to provide support without damage. The top of the bench shall be thoroughly cleaned. Sealant shall be applied to the precast section bearing seat. The first precast section shall be carefully lowered onto the bench so that the sealant is forced out from under the section evenly on all sides. Each succeeding precast section shall be jointed in a similar manner. Sealant shall be raked back in all joints to a minimum depth of one half inch, and all joints shall be grouted, inside and outside the manhole. All lifting holes and other imperfections in manhole walls shall be filled with non-shrink grout.

The top of the manhole shall be a minimum of twelve inches (12”) and a maximum of eighteen inches (18”) below the finished street or ground surface elevation. Concrete extension risers or collars shall be used to bring the manhole ring and cover up to finished street or ground surface elevation.

3.3.7 STEEL CASING AND CARRIER PIPE INSTALLATION.

Pits shall be excavated such that the timber blocking can be installed to give an unyielding backing for the hydraulic boring machine or jacks and to prevent sloughing of the header face. Sub-grade on which rails or guides are to be set shall be stabilized with washed rock where soft or springy ground is encountered.

Sections of the steel casing shall be trimmed, beveled and aligned in the pit so that when welded together the thrust of the boring machine shall be uniformly transmitted through the casing in a horizontal plane. Welds shall be made to provide a solid firm watertight connection without the use of butt straps.

The casing pipe shall be installed by boring or jacking upgrade from the outlet end. When the carrier pipe to be installed is for gravity flow, the horizontal and vertical alignments of the casing pipe, when in place, shall not vary from those called for on the accepted plans.

If requested by the Authority Engineer, following installation of the carrier pipe, the void between the carrier and the casing shall be filled with concrete or clean sand. Sand or concrete under pressure shall be blown or pumped into the void until the entire void is filled.

3.3.8 WYES AND RISERS FOR SERVICE CONNECTIONS.

Wyes, stubs, and risers shall be placed where shown on the accepted plans. Wyes shall be angled upwards so that the upper invert of a one-eighth (1/8) bend connected to the fitting shall have an elevation equal to or higher than the inside crown of the wastewater main.

3.3.9 TESTING AND INSPECTION.

The Authority shall visually inspect all wastewater lines for cleanliness and accurate alignment. Discrepancies noted during visual inspection shall be corrected prior to further testing. Prior to final acceptance, the Contractor shall conduct, at his own expense, tests herein for all new wastewater line construction. Tests shall be completed under the direction of the Authority Engineer. The Authority Engineer may require that the first two (2) manholes, including the main between them, of all wastewater line projects be tested before further construction to permit initial observation of the quality of construction workmanship. The Authority Engineer may require additional testing during the course of construction if infiltration appears to be excessive or the quality of workmanship is questionable.

All pipelines shall be tested for excessive deflection. Deflection testing shall be performed by pulling a properly sized mandrel through the pipeline.

All pipelines shall be camera tested. The Authority shall be provided copies of all camera test videos for review prior to project acceptance.

Low pressure air testing shall be performed on all wastewater lines. Vacuum testing of manholes is required by the Authority for all new manholes. Air and vacuum testing shall be completed in accordance with ASTM F- 1417 and as described herein. The Authority shall record times and pressure and vacuum readings during the test period. A test section shall not be longer than the length of pipe between adjacent manholes.

The low-pressure air test for wastewater lines and the vacuum test for manholes shall be performed after completion of backfilling and compaction.

A. Air Testing Procedure –

The ends of the sewer pipe being tested shall be plugged and braced and the test section shall be pressurized to four (4) psi. The pressure pump shall be turned off and the air in the pipe allowed to stabilize for a minimum of two (2) minutes. The time shall be monitored as the line either holds pressure or drops no more than one (1) psi (if the ground water is higher than the top of the pipe, the test pressure shall be increased to account for the high groundwater). The pressure shall remain within the allowable limits for the time indicated by using the following formula:

$$T = 0.0237 (L) (D^2)$$

Where: T = time of test (in seconds)
L = length of pipe being tested (in feet)
D = diameter of pipe (in inches)
or as indicated in the following table:

Specified Test Duration for Length of Pipe Indicated (min:sec)

Pipe Diameter	Pipe Length (Feet)						
	0-150	200	250	300	350	400	500
4”	3:46	3:46	3:46	3:46	3:46	3:46	3:46
6”	5:40	5:40	5:40	5:40	5:40	5:42	7:07
8”	7:34	7:34	7:34	7:36	8:52	10:08	12:38
10”	9:26	9:26	9:53	11:52	13:51	15:49	19:45
12”	11:20	11:24	14:15	17:05	19:56	22:47	28:26
15”	14:10	17:48	22:15	26:42	31:09	35:36	44:26

Sections of pipe that fail the air test shall have the defects repaired and the test shall be repeated. Repair and repeat testing shall be continued until the testing requirements are met.

B. Vacuum Testing Manholes -

Manholes shall be tested before the ring and cover and grade adjustment rings have been installed. All pipes entering the manhole shall be plugged and braced and a vacuum of ten inches (10") of mercury shall be drawn. The vacuum pump shall be turned off and the time monitored as the vacuum drops one inch (1"). The vacuum shall not drop more than one inch (1") for the duration of the time indicated in the following table.

Specified Test Duration for Diameter of Manhole

Manhole Diameter (inches)	Test Duration (min:sec)
48	1:00
60	1:15
72	1:30

Manholes that fail the vacuum test shall have the defects located and repaired and the test shall be repeated. Repair and repeat testing shall be continued until the testing requirements are met.

When required, infiltration tests shall be conducted by placing an approved, calibrated V-notch weir in the line and measuring infiltration flow. Successive readings shall be taken until consistent results are attained. Infiltration shall not exceed fifty gallons per inch (50 gpi) of pipeline diameter per mile per day.

When required by the Authority Engineer, exfiltration tests shall be conducted by plugging the section of line to be tested, filling the line and manholes with water to a depth of four feet in the upper manhole. If groundwater is present above the elevation of the pipe, the water level in the upper manhole shall be increased by the height of the groundwater surface above the pipe. The water shall be allowed to stand for a minimum of eight (8) hours to allow absorption to take place in the walls of the manhole and pipe. If required by the Authority, water shall be added to bring the water surface back to a depth of four feet (4') in the upper manhole. The drop in elevation of the water surface in the upper manhole shall be monitored over a sixty (60) minute period, and converted to an exfiltration rate. Exfiltration testing shall not be used if the hydraulic head in the lower part of the test section would exceed twenty-five feet (25'). Exfiltration shall not exceed fifty gallons per inch (50 gpi) of pipeline diameter per mile per day.

3.3.10 WASTEWATER SERVICE LINES.

A. A Wastewater Service Stub In is defined as that portion of wastewater service pipe between the wastewater main and a minimum of five feet (5') outside the right of way. Wastewater service stub-ins are required for all lots and shall become the property of the Authority, up to the right-of-way boundary, upon final acceptance. Wastewater service stubs must be shown on Record Drawings, referencing state plane coordinate within 1'-0" +/- accuracy (NAD 83 State Plane Georgia West FIPS 1002, US Survey Feet).

B. Wastewater Service Lateral is defined as that portion of the wastewater service pipe on private property between the new building and the right-of-way boundary. Wastewater service laterals remain the property of and shall be maintained by the owner of the property being served.

3.3.11 WASTEWATER SERVICE LINE GENERAL REQUIREMENTS.

A. Location and Alignment of Wastewater Services - Wastewater service lines shall be constructed in the shortest and straightest route possible.

B. Wastewater Service Stub-In Connections to Mains - Wastewater service stub-in connections to the wastewater main shall be positioned at either the 2 o'clock or the 10 o'clock position on the circumference of the wastewater main. On new installations, either wye or tee fittings shall be used. When tapping into an existing wastewater main, a saddle connection and approved coring method shall be used. The minimum distance between service connections made along the pipe shall be three feet (3'). The minimum distance from either the bell or spigot end of a pipe shall be three feet (3'). The minimum distance from the center of a manhole to a service connection shall be either five feet (5') or the transition point from the manhole trench to the normal pipe trench, whichever is greater. A maximum of four (4) wastewater service stub in connections shall be allowed per twenty foot (20') length of main.

C. Wastewater Service Stub-ins To Property Line - Wastewater Service stub-ins shall be extended to at least five feet (5') outside of the right of way. The minimum size for service stubs shall be six inches (6"). Stub end locations shall be marked by a minimum 6 foot (6') length of Schedule 40 PVC pipe, painted safety day-glow green per OSHA Spec. 1910.144. Where necessary, wastewater service stub-ins shall be extended past any other utilities such as gas, electric, etc. that have been installed behind the sidewalk. Service stub-ins shall have a minimum depth of five and one-half feet (5-1/2)' at curb and 4' at end of stub-in. Service stub-ins shall have a cleanout installed at the property line. The ends of service stub-ins shall be plugged with a compression stop. Service stub-ins shall have #6 tracer wire with LLDP insulation taped to the pipe at four-foot 4' intervals and shall have marking tape installed twelve to eighteen inches (12" to 18") above the pipe.

D. Wastewater service laterals shall be a minimum of four-inch (4") diameter pipe for residential and six-inch (6") diameter pipe for commercial customers. When four inch (4") pipe is used, a four-inch by six-inch (4"x6") Fernco type coupling (or Authority approved equal) shall be used to join the lateral to the service stub in. A minimum four inch (4") diameter cleanout is required on all wastewater service lines, one within ten feet (10') of the building and one as close to the public right-of-way as practical. Reference Standard Detail D-5. A sewage backflow preventer is required when the building finished floor elevation is equal to or lower than the top of the nearest downstream manhole. Service laterals shall have #6 tracer wire with LLDP insulation taped to the pipe at four foot (4') intervals and shall have marking tape installed twelve to eighteen inches (12" to 18") above the pipe as per Section 2.3.12.

3.4 WASTEWATER LIFT STATIONS

3.4.1 GENERAL.

A. Lift stations may only be permitted when gravity sewer is unavailable to the property. Unavailables hall generally be interpreted to mean more than 5000' down gradient, but this distance can be increased or decreased by the Authority based upon actual field conditions and the size of the project involved. All lift stations must be approved by the JCWSA Board and will only be considered if the following conditions are met; 1) The proposed lift station must serve a sub-basin larger than 2 square miles in area, 2) The lift station must be able to be abandoned with a future gravity sewer line, 3) A pump station will not be allowed to be installed downstream from an existing pump station. The Authority may, at their discretion, require a gravity line be installed to carry flow from the existing pump station to the proposed pump station thus eliminating the existing pump station.

   EXCEPTION: The provisions of Section 3.4.1(A) shall not apply to those parcel numbers specifically listed and depicted on Appendix E, *Excepted Lift Station Policy Parcels* (the "Excepted Parcels"). The Excepted Parcels are parcels rezoned R2, R3, MFR, and PUD as of April 12, 2020, in anticipation of the availability of wastewater lift stations. Where the Excepted Parcels cannot be served by gravity into the existing Authority system, the Authority may approve the construction of a wastewater lift station.

B. The Developer must demonstrate the necessity of installing a lift station/forcemain system in lieu of a gravity sewer. The Developer shall be required to submit a sub-basin (drainage) plan for handling future master planned wastewater flows from surrounding properties if, by the Authority Engineer's determination, the station is the first in the sub- basin. The Owner/Developer's engineer shall provide the Authority with a set of design calculations and drawings for review and acceptance by the Authority. The wastewater lift station shall satisfy all of the requirements of the Georgia EPD and of these Standards.

C. The Authority shall require that the Owner/Developer's engineer prepare a set of "Record" drawings of the wastewater lift station. In cases where the lift station shall require GA EPD review, the Owner/Developer's engineer shall prepare all necessary reports, drawings, and submittals. Upon completion of the lift station, the Contractor shall also provide the Authority with two (2) copies of an Operation and Maintenance Manual for the lift station.

D. Authority will allow privately owned pump station under the following conditions:

a. The private lift station serves a single property and will only be used for non-industrial wastewater. The property authorized by the Authority to be served by the private lift station cannot be subdivided beyond that shown on the plat approved by the Authority for the private lift station. The Authority will require a note stating the restriction on further subdivision be placed on the approved plat of survey.
b. The private lift station will have a single owner who maintains responsibility for the private lift station.

3.4.2 DESIGN APPROACH.

The Owner/Developer shall furnish, install and dedicate to the Authority the entire lift station/forcemain system and associated property. The system shall be designed by the Owner/Developer's engineer (Professional Engineer registered in the State of Georgia). The design must be reviewed and approved by the Authority's Engineer.

The designer shall locate the lift station to drain the largest area possible within the (drainage) sub-basin. The Authority Manager shall investigate the service impact associated with future Jackson County needs within the drainage basin, and review any potential lift station up-sizing as well as review any proposed mains required to serve the drainage basin that shall flow by gravity to the lift station. It shall be the Owner/Developer's responsibility to grant all easements and/or properties, and provide all necessary design accommodations (upgrades) for future access for the wastewater of surrounding and nearby properties in the drainage basin. The Owner/Developer's Engineer shall design and the Authority's Engineer shall approve the design of any wastewater upgrades.

3.4.3 LIFT STATION SUBMITTAL CHECKLISTS.

Prior to submittal of Lift Station Design Packages, the Developer's Engineer shall verify that the design

satisfies the checklist items listed on the following sheets:

A. Pump Station and Forcemain Common Problems List, dated 5/31/06 from the GA EPD.

B. System Application Checklist for Wastewater Lift Stations in Appendix B.

3.4.4 LIFT STATION TYPE AND DESIGN CAPACITY.

A. Pump Stations with design capacity less than seven hundred gallons per minute (700 gpm) shall be of the submersible type. Reference Standard Detail D-7. The Owner/Developer's Engineer shall receive written pre-approval from the Authority Engineer of the proposed pump manufacturer being considered. Pumps shall be manufactured by Flygt, Yeomans, Ebara or ABS. However, other pump manufacturer(s) may be pre-approved at the sole discretion of the Authority.

B. Pump Stations with design capacity greater than seven-hundred gallons per minute (700 gpm) shall be approved by the Authority Board on a case by case basis and shall also require approval by GA EPD. Pump Stations with design capacity greater than 700 gpm shall require, at a minimum, a magnetic or ultrasonic flowmeter with bypass or prefabricated spool or dismantling joint to permit meter removal.

3.4.5 LIFT STATION DESIGN CRITERIA

A. The lift station fenced portion housing the station shall be centered within the site to provide the required twenty-five foot (25') outside buffer on all sides. The Authority, at its sole discretion, may require a larger site or buffer dependent on the proximity of structures, type of development, size of pump station, or other factors which may indicate a need for additional buffer. This buffer is required in residential subdivisions, and shall be indicated on the final plat. In addition, a platted lot, dedicated to the Authority, shall be provided to include the required fenced in area and an additional 15 feet (15') extending beyond the fence on all sides. A permanent twenty-foot (20') access easement, dedicated to the Authority, shall be provided as well. Refer to Standard Detail E-1, Submersible Pump Station Layout.

B. Fill slopes around the pump station shall be stabilized per the GA ES&PC Manual. All fill slopes shall be compacted to not less than 95% of maximum density standard proctor (AASHTO T99). A "Soils Compaction Report" shall be provided to the Authority Engineer prior to final inspection as described in Section 4.1.2 of these Standard Specifications.

C. Driveway

1. All pump station sites shall be provided with a twelve foot (12') wide paved access road in a twenty-foot (20') wide permanent easement dedicated to the Authority and indicated on the Final Plat. Concrete or asphalt paving is required for the access roadway.

2. Standard access driveway to be provided as shown on Standard Detail E-1, Submersible Pump Station Layout. If the access road is over fifty-feet (50') in length, a turnaround shall be required and subject to Authority written approval on a case-by-case basis.

3. Asphalt paved driveways that show permanent deflection, fatigue cracking, thermal cracking or stripping at the end of the initial two (2) year Maintenance Bond period shall be repaired to the satisfaction of the Authority before the lift station shall be accepted by the Authority or the Maintenance Bond renewed.

D. Site plans shall show finished grade contour lines (one-foot intervals) in and around the lift station and access road. Spot elevations shall be provided as needed to show proper drainage.

E. Site plans must show all existing and proposed utilities. All utility meters must be properly and securely mounted outside of the fenced station. If gas service is required, gas piping must be buried underground.

F. A one-inch (1") copper and brass potable water service with an acceptable reduced pressure principle backflow preventer installed in an above grade, heated enclosure ("Hot Box" or equal) is required for all lift stations. A one-inch (1") frost-proof yard hydrant with fifty feet (50') of one inch (1") reinforced rubber hose with brass nozzle is also required. The water meter, provided by the Authority, shall be installed at or near the road right-of -way line. Protection from meter or meter box damage by vehicular traffic may be required by the Authority on a case-by-case basis.

G. Site lighting shall be provided and approved by the Authority on a case by case basis.

H. Fenced areas for all stations are to be a minimum of forty by forty feet (40' x 40')'. Fences are to be installed using eight foot (8') fabric height, #4 chain link wire with top rails and bottom tension wires; three (3) strands of barbed wire at the top on angled extension arms; posts in three feet (3') of concrete spaced ten feet (10') apart. A fourteen-foot (14') wide gate on four inch (4") diameter posts imbedded in three-feet (3') of concrete shall be provided. Reference JCWSA Standard Detail E-2.

I. The entire area within the pump station fence shall be covered with a minimum twelve inch (12") depth of CC 57 crushed stone paving. Crushed stone paving shall be graded to drain away from pump station at a minimum of two percent (2%) in all directions. Reference Detail E-1.

J. The Owner/Developer shall provide a twenty-four (24) month comprehensive warranty, that shall encompass the performance of all manufacturer recommended preventative maintenance, including parts and labor of the pumps, rails, liquid level monitoring and control switchgear. The 24-month period shall begin on the date of Initial Acceptance of the Project by the Authority.

K. Wet well & Check Valve Vault

1. The wet well usable volume shall be sized to prevent excessive cycling of the pumps. Starts shall be limited to one (1) start per fifteen (15) minutes unless otherwise recommended by the pump manufacturer. The wet well dimensions and pump spacing shall be as recommended by the pump manufacturer except that the wet well shall be a minimum of six feet (6') in diameter.

2. Hatch doors shall be sized by the pump supplier to allow adequate clearance to easily remove the pumps. Hatches shall be aluminum with stainless steel hardware suitable for one-hundred-fifty (150) lb. per sq. ft. loading. Hatches shall be vented or a separate vent pipe shall be provided.

3. Check valve vaults for all stations shall be a minimum of six- feet by six- feet (6' x 6') in plan, precast concrete with one (1) forty-eight by forty-eight inch (48" x 48") double leaf aluminum hatch for four-inch (4") and six-inch (6") piping. Vault size shall be a minimum of eight- feet by eight- feet (8' x 8') for piping eight-inches (8") and above.

L. Storage shall be provided above the high-level alarm equal to three (3) hours at design flow. Storage volume is calculated to be that volume between the high-level alarm and the lowest point of overflow (including basement elevations regardless of backflow valves in service lines). Said storage may consist of any combination of line capacity, manhole capacity, and wet well volume.

M. Swing check valves shall be suitable for sewage service and shall be iron body with flanged ends with cushioned closure as manufactured by Val-Matic, GA Industries, APCO/Dezurik, O.A.E. Ball check valves may also be used when allowed by the Authority Engineer.

N. All pump stations shall have a plug valve and capped tee installed on the forcemain to allow for emergency connection by portable pumps. Plug valve shall be no less than three feet (3') outside the pump station. A valve key shall be provided to the Authority.

O. All piping in the wet well and check valve vault shall normally be flange by flange. However, Authority approved dismantling joints shall be provided to facilitate any component replacement. A restrained, solid sleeve type flexible joint shall be installed between the wet well and valve vault. A minimum of 12" of free space shall be provided on all sides of each flange. Any DIP pipe and fittings shall be "Protecto 401" or "Tnemic Series 431 Permasheild PL" lined.

P. Wet well level sensing for pump sequencing is to be accomplished by floats, ultrasonic devices or level sensing probes with critical backup floats. No bubbler systems shall be permitted.

Q. Wet well, forcemain discharge manhole and at least one manhole downstream are to be coated for chemical and corrosion resistance. The coating shall be solvent, VOC, and HAPS free epoxy Wet well systems designed specifically for protection of concrete in municipal wastewater collection and treatment systems; acceptable products are Carboline Plasite 140S, Madewell Mainstay DS-5, Sprayroc Spraywall or Authority approved equal. Prepare subsurface for the paint per manufacturer's recommendation.

R. All pump stations shall comply with NFPA 820.

S. Lift Station Electrical. See general requirements below:

1. Three-phase power shall be provided for all pumps. No phase converters or single-phase power shall be allowed.

2. All conduits shall be galvanized rigid conduit with threaded couplings. No thread- less couplings shall be allowed.

3. All conduits entering the control panel that penetrate the wet well shall be appropriately sealed to prevent the well's corrosive and or explosive gases from entering the panel's insides.

4. No conduit runs or junction boxes are to be installed inside or on top of wet well. Splicing of cables inside the wet well shall not be permitted.

5. When main fused disconnect switch or main circuit breaker is used, it shall meet the following requirements.
    1. Shall be of a type that can be locked in the ON or OFF position.
    2. Shall be U.L. listed for service entrance.
    3. Shall be a weather tight stainless steel enclosure.
    4. Shall be mounted inside the fenced area of the station.

6. Pump stations shall have factory installed six digit non-resettable elapsed time meters to show individual pump running time to the $1/10^{th}$ of an hour. A similar elapsed time meter shall be included to indicate simultaneous operation of pumps to the $1/10^{th}$ of an hour.

7. All control wiring shall be stranded. No solid wire shall be allowed.

8. Pump control panel enclosure shall be NEMA-4X stainless steel.

9. A surge suppressor shall be provided at the power service entrance.
    1. The surge suppressor shall have voltage characteristics to match the power service.
    2. The surge suppressor shall be in NEMA-4X stainless steel enclosure and shall provide line to line, line to neutral, line to ground and neutral to ground protection modes as applicable for the power service.
    3. The surge suppressor shall be provided with a disconnect.

4. The surge suppressor shall be U.L. listed and labeled under UL1449 and UL1283.

T. All pump stations must be provided with back-up power. This back-up power shall be provided by diesel generators.

U. Generator Specifications.

1. The standby generator shall be rated for continuous standby duty for the stations full load demand. The generator shall be sized to run all pumps simultaneously with staggered startups or as indicated in the drawings.
2. The generator and associated appurtenances shall be housed in a weatherproof sound attenuated enclosure. Soundproofing shall be provided to reduce noise to seventy three decibels (73 db.) at a distance of twenty three feet (23') for diesel powered generators.
3. The engine shall be heavy-duty compression-ignition, cold-starting diesel type arranged for direct connection to an alternating current generator. It shall be a current model of a type in a regular production by a manufacturer regularly engaged in building this type of diesel engine. Engine shall have at least a published intermittent brake horsepower rating at specified generator speed required by generator at rated full load output and shall operate without undue heating, vibration, or wear. Engine shall operate satisfactorily on No. 2 diesel fuel.
4. Battery charger shall be automatic, two rate type providing for equalizing charge and continuous taper charging. Output characteristics shall match requirements of battery furnished.
5. The entire standby generator set shall be warranted and maintained (including all manufacturer's recommended scheduled maintenance) for the entire bonding period as described in Section 1.2.5.E.4.
6. Outdoor weather-protective, sound attenuated housing with critical grade exhaust muffler shall be installed. The housing shall have hinged side access doors and a rear control door. All doors shall be lockable. All sheet metal shall be primed for corrosion protection and finish painted with the manufacturer's standard color.
7. Vibration isolators as recommended by the generator set manufacturer shall be provided. The generator must be mounted far enough away from obstructions to allow all doors to be opened ninety degrees (90°). All conduits shall be installed underground.
8. Generator shall be supplied with all auxiliary systems necessary for operation (i.e. batteries, battery charger, block heater, convenience receptacle, enclosure light, motorized dampers etc.).
9. The standby power system shall include an automatic transfer switch according to UL 1008. Transfer switch shall be rated for 100% of full load and shall have short circuit current rating as indicated. Switch shall be provided with indicators for all phases of operation and be equipped with a fully programmable timer for exercising the equipment. The transfer switch shall be provided with an internal manual operator,

with the same transfer speed as the electrical operator.

10. Generator shall be load tested at 100% full load on site for a period of four hours using resistive load banks. The Authority Inspector shall be notified prior to any tests, and a certification letter shall be provided from the manufacturer.
11. Functional transfer tests shall be performed simulating the loss and return of utility power.
12. Two complete sets of O&M manuals and keys shall be provided for generator and automatic transfer switch.
13. Generator control system shall include a programmable control device (exerciser) to allow automatic start-up and test functions. Test functions shall allow for programming for daily, weekly or monthly testing. Connections for remote monitoring of function and failure compatible with the Authority's telemetry system shall be provided.
14. Generators shall be provided with one-hundred (100) gallons minimum fuel storage capacity or twenty-four (24) hour operating time, whichever is greater.
15. Fuel storage shall be accomplished by the use of corrosion-resistant double wall sub-base fuel tank only; no underground storage shall be allowed.
16. A leak detection device shall be provided in the interstitial space for sensing fuel leakage. The device contact shall be connected to the generator control panel terminals for telemetry compatible with the Authority's telemetry system.
17. Generator manufacturers shall be pre-approved in writing by the Authority Engineer. In all cases generator manufacturer approval is at the sole discretion of the Authority.
18. Generator manufacturer or Owner/Developer shall provide a Twenty-four (24)) month comprehensive warranty that also encompasses the performance of all manufacturer recommended preventative maintenance, including parts and labor of the generator and switchgear set, The Twenty-four (24) month period shall begin on date of Initial Acceptance of the Project by the Authority. Maintenance contractor shall visit the site no less than two (2) times per year to check and maintain generator equipment.
19. Transfer switches shall be in NEMA-4 X enclosure and shall be supplied by the generator manufacturer.
20. A generator ground grid must be provided and connected to the pump station grounding system.

V. SCADA / TELEMETRY

Provide and install pump station monitoring using Mission Communications Products, Norcross, Georgia, either the "Mission M-100" or "M-800" unit at the Authority's sole discretion, complete with wireless transceiver, relay interface, antenna, and mounting hardware. Coordinate equipment and installation with the Authority Engineer and the Authority Systems Integrator. Provide and install pump station monitoring using Mission Communications Products, Norcross, Georgia, either the "Mission M-100" or "M-800" unit at the Authority's sole discretion, complete with wireless transceiver, relay interface, antenna, and mounting hardware. Coordinate equipment and installation with the Authority Engineer and the Authority Systems Integrator. Provide pump failure alarms and wet well level monitoring via

Mission Communications telemetry system. After Mission Communications system is running and accepted by the Authority, the Authority shall begin paying monthly telemetry fees.

3.4.6 FORCEMAINS

A. Forcemains shall not be approved to flow downhill into the receiving manhole. After the proposed forcemain passes over the last high point along its route a new gravity sewer line shall be installed to convey the flow downhill to the existing sewer system.

B. A spare air and vacuum relief valve for forcemain shall be provided at the time of installation.

C. Install forcemains and gravity sewer in easements a minimum of twenty feet (20') wide or twice the depth of the pipe, whichever is greater, when outside of road right-of-ways and crossing private property. Install force mains in road Right-Of-Way whenever practicable.

D. Requirements:

1. Minimum size for forcemains shall be 4-inch (4") in diameter.

2. Forcemain shall have 4 feet (4') of cover unless authorized by the Authority Engineer, based on field conditions.

3. HDPE (DR-11 min.) w/ tracer wire shall be used on all forcemains. Pipe class shall be such that the "manufacturers' allowable working pressure" is either a minimum of twice the design working pressure, or one and one half (1-1/2) times the design surge pressure, whichever is the greater.

4. Air Release Valves: Forcemains shall have an air release valve at each high point. Air release valves shall be stainless steel and suitable for sewage service. Reference Standard Detail D-6, Sewage Air Release Valve Manhole.

5. Manholes housing combination air release valves are to be coated for chemical and corrosion resistance. The coating shall be solvent, VOC, and HAPS free epoxy Wet well systems designed specifically for protection of concrete in municipal wastewater collection and treatment systems; acceptable products are Carboline Plasite 140S, Madewell Mainstay DS-5, Sprayroc Spraywall or Authority approved equal. Prepare subsurface for the paint per manufacturer's recommendation.

6. On forcemains exceeding twenty-five-hundred (2500) feet, plug valves may be required by the Authority Engineer to facilitate future repairs.

7. All valves shall be full port eccentric plug valves as manufactured by DeZurik, or Authority approved equal.

SECTION 4: **SITE WORK AND EARTHWORK**

4.0 GENERAL PROVISIONS.

In general, site work requirements within Jackson County are covered by the Jackson County UDC. All work covered under this section shall comply with OSHA 29 CFR Part 1926, Subpart P, latest revision. The requirements of this section are the minimum required for JCWSA Water and Sewer Projects but do not waive any UDC requirements. In the event of a conflict between this Specification Section and any portion of the UDC, the Contractor shall bring this to the attention of the JCWSA prior to commencing construction.

4.0.1 GENERAL.

Site work shall consist of demolition and removal of structures and obstructions; clearing and grubbing; over lot grading; subgrade preparation; removal of topsoil; site preparation; excavation and embankment; excavation, trenching, bedding and backfill of pipelines and service lines; excess excavation; borrow; and restoration and cleanup. All site work and excavation shall comply with the requirements of these Standard Specifications, the Jackson County UDC, and appropriate GDOT Specifications where applicable.

4.0.2 DISPOSAL.

The contractor shall make all necessary arrangements for suitable disposal locations. If disposal shall be at other than established dump sites, the Authority may require the contractor to furnish written permission from the property owner on whose property the materials shall be placed.

4.0.3 COMPACTION TESTING.

Compaction testing shall be performed by a consulting engineering or geotechnical firm at the Contractor's expense. Final soils compaction reports shall be prepared and signed by a Registered Professional Engineer who is registered in the State of Georgia. Reports shall be submitted to the Authority Engineer within one (1) week of testing.

4.1 MATERIALS

4.1.1 PIPE BEDDING MATERIALS.

Bedding material for pipelines shall be as shown in the standard details.

4.1.2 STRUCTURAL FILL AND TRENCH BACKFILL.

Prior to installing structural fill/backfill the subgrade must be observed by the Develop/Owner's engineer (or designated representative). Developer/Owner's engineer shall document that unsuitable material has been removed and that the subgrade is suitable for support of the proposed construction and/or fills.

Fill material must be approved by the Developer/Owner's engineer and by the Authority Engineer. All fill material shall be free of organic matter and debris, with rocks less than six-inches (6") and a liquid limit less than twenty five percent (25%) and a plasticity index less than six percent (6%) with not more than twenty percent (20%) by weight passing a number two-hundred (200) sieve. The total soluble salts shall

not exceed two percent (2%). Unacceptable fill materials include topsoil, lightweight material with a maximum dry density less than 95 PCF, and highly plastic silts and clays. All unsuitable materials excavated shall be properly disposed of by Contractor. Developer/Owner's engineer shall document that suitable fill material, in compliance with these specifications, has been used throughout the project.

In general, native clean sandy fill materials (SC and SM) may be used for structural fill if they are free from deleterious materials, such as organics and debris. Prior to construction, proposed fill materials (on-site and imported) shall be laboratory tested to confirm their suitability for structural fill. Developer/Owner's engineer shall provide laboratory test documents to the Authority Engineer for approval. In areas where native soils do not meet the requirements outlined herein structural fill must be imported.

Grade control shall be maintained throughout fill placement operations. All fill operations shall be observed by the Owner/Developer's engineer to determine that minimum compaction requirements have been met. Owner/Developer's engineer shall submit all compaction reports to the Authority Engineer prior to project completion.

Fill materials shall be placed in lifts not to exceed six inches (6") in loose thickness and moisture conditioned to within +/- three percent (3%) of the optimum moisture content. Fill soils shall be compacted to a minimum of ninety-five percent (95%) of maximum dry density obtained in accordance with ASTM Specification D-698, Standard Proctor Method. The upper one-foot of soils supporting structures, pavements, slab-on-grades, sidewalks, etc. shall be compacted to a minimum of ninety-eight percent (98%) of the maximum density (ASTM D-698). The compaction requirements herein are minimums. More stringent compaction requirements for critical/special areas may be required by the Owner/Developer's engineer or governing agency (JCWSA, GDOT, Jackson County, etc.).

4.1.3 ASPHALT PAVING.

Asphalt pavement shall conform to Section 10 of the Jackson County UDC and applicable GDOT Specifications. The following general installation procedure for utility installations is required as a minimum:

A. Cut pavement with a saw or pneumatic tools to prevent damage to remaining pavement without extra compensation. Where pavement is removed in large pieces, dispose of pieces before proceeding with excavation.

B. No base course shall be placed on a frozen or muddy subgrade.

C. The compacted base shall have sufficient stability to support construction traffic without pumping. Match thickness of the existing compacted base.

D. Apply tack coat.

E. Asphalt Concrete Pavement Patching
    1. Remove and replace defective areas.
    2. Cut-out and fill with fresh, hot asphalt concrete. Match the thickness of existing

pavement.

3. Compact by rolling to specified surface density and smoothness.
4. Remove deficient areas for full depth of course.
5. Cut sides perpendicular and parallel to direction of traffic with edges vertical.

4.2 DEMOLITION AND REMOVAL OF STRUCTURES AND OBSTRUCTIONS.

4.2.1 GENERAL.

Where demolition is required for utility installation, the contractor shall remove, wholly or in part and satisfactorily dispose of all foundations, structures, fences, old pavements, abandoned pipelines, and any other obstructions that are designated for removal. All salvageable material shall be clearly marked by the Authority and shall be removed without unnecessary damage, in sections or pieces that may be readily transported. Materials so removed shall be stored in locations approved by the Authority. Materials to be salvaged may include, but shall not be limited to, manhole frames and covers, fire hydrants, inlet grates, fence material, and appurtenances. The contractor shall be required to replace any materials lost from improper storage methods or damaged by negligence.

Where portions of structures are to be removed, the remaining parts shall be prepared to fit new construction. The work shall be done in accordance with plans and in such a manner that materials to be left in place shall be protected from damage. The contractor at his expense shall repair any damage to portions of structures that are to remain in place. Reinforcing steel, projecting from the remaining structure, shall be cleaned and aligned to provide bond with new extension. Dowels are to be securely grouted with approved grout. Depressions resulting from the removal of structures, footings, and other obstructions, shall be filled and compacted with clean fill materials so as to eliminate hazards of cave-in, accumulation and ponding of water.

Immediately following demolition and removal of rubbish from the site, the contractor shall grade the site by filling, compacting, and leveling the site to existing adjacent grades. All demolished materials shall be disposed of offsite, at the contractors' expense, unless otherwise approved by the Authority.

4.2.2 REMOVAL OF PIPE.

Any temporary water or sewer line put in by the Developer, whether for the Developer or the Authority, for any reason shall be removed after the use of the line is complete. If the developer wishes to leave the line in place they shall need to have the temporary line surveyed and added to the Record Drawings for that area and take sole ownership and responsibility for the temporary line. This may include but is not limited to responding to locate requests by Utilities Protection Center or any other party requesting information on the temporary line.

Where wastewater lines are to be abandoned in place, the ends shall be filled with concrete. The ends of wastewater mains shall be sufficiently filled to prevent future settlement of embankments.

When removing manholes, satisfactory bypass service shall be maintained during such operations for any live wastewater line connected.

4.2.3 REMOVAL OF PAVEMENTS, SIDEWALKS, AND CURBS.

Concrete or asphalt that is to remain shall be cut to straight, true line with a vertical face. Concrete or asphalt shall be cut with a saw. The sawing shall be done carefully, and the contractor at his expense shall repair all damage to the concrete or asphalt that is to remain in place. The minimum depth of saw cuts in concrete shall be two (2) inches.

The contractor shall be responsible for the cost of removal and replacement of all over breakage as determined by the Authority Inspector.

4.3 SITE PREPARATION

4.3.1 GENERAL.

The Contractor shall complete all work necessary to satisfactorily prepare the site as shown on the accepted drawings and as specified herein. Following this preparation, the site shall be in such a condition as to easily continue with the next operation. Site preparation includes clearing, grubbing, grading, tree and shrub removal, and native grass stripping and removing and disposing of all debris. This work shall also include the preservation from injury or defacement of all vegetation and objects not designated for removal.

4.3.2 CLEARING.

All objects, trees, stumps, roots and other objects designated for removal shall be removed to a minimum of two (2) feet below subgrade.

Except in areas to be excavated, stump holes and other holes from which obstructions are removed shall be backfilled with suitable material and compacted.

The Contractor shall strip areas where excavation or embankment is to be made. Stripping shall include the removal of material such as brush, roots, sod, grass, residue of agricultural crops, sawdust, and other vegetable matter from the surface of the ground.

Clearing shall be performed in a careful and orderly manner that protects adjoining property, the public and workmen. Damage to streets, parking lots, utilities, plants, trees, buildings or structures on private property, or to bench marks, survey monuments and construction staking due to clearing operations shall be repaired and restored to its original condition by the Contractor at his expense.

4.3.3 TOPSOIL.

The Contractor shall salvage within the project limits, or acquire when needed, loose friable loam reasonably free of admixtures of subsoil, refuse, stumps, roots, rocks, brush, weeds, heavy clay, toxic substances or other material which would be detrimental to the proper development of vegetative growth.

Topsoil shall not be placed until the areas to be covered have been properly prepared and grading operations in the area have been completed. Topsoil shall be placed and spread at locations and to the thickness shown on the plans and shall be keyed to the underlying material.

4.4 EARTHWORK

4.4.1 GENERAL.

This work shall consist of excavation, fill, backfill, disposal, shaping or compaction of all material encountered within the limits of the project. Work shall be performed to the line and grade indicated on the Authority approved plans. Excavation, dewatering, sheeting, and bracing shall be carried out in such a manner as to eliminate any possibility of undermining or disturbing the foundation of any existing structures or any work previously completed.

The Authority Engineer may require the contractor to provide an earthmoving diagram and haul routes.

4.4.2 DEFINITIONS.

Bedding Material shall mean material that is installed under and around pipelines.

Borrow shall mean backfill or embankment material which must be acquired from designated borrow areas.

Proof Rolling shall mean the application of test loads over a subgrade surface by means of a heavy pneumatic-tired vehicle to locate weak areas in subgrade.

Rock shall mean rock formations that cannot be excavated with a Caterpillar D-9 sized tractor in good repair with a single hydraulic ripper.

Stabilization Material shall mean material that is to be placed in areas of over excavation, of unsuitable insitu material, or in areas of high water table to stabilize the insitu material.

Structure Backfill shall mean earthen material that is installed around and over/under any structure.

Structure Excavation shall mean excavation materials over an area extending three (3) feet out from the outer most bottom edge of a proposed structure, up to existing grade or top of proposed grade.

Suitable Material shall mean any earthen material consisting of on-site or similar nonorganic sands, gravels, clays, silts and mixtures thereof with a maximum rock size of six inches (6”). Bedrock that breaks down to specified soil types and sizes during excavation hauling and placement may be considered suitable material only by the Authority Engineer.

Unclassified Excavation shall mean excavation of all materials encountered.

Unsuitable Material shall mean any earthen material containing vegetable or organic silt, topsoil, frozen materials, trees, stumps, certain man made deposits, or industrial waste, sludge or landfill, or other undesirable materials as determined by the Authority Engineer.

4.4.3 GRADING TOLERANCES.

All earthwork shall be carried out in such a manner that final grades shall conform to those indicated on the approved plans. Final grades shall not vary from the design elevations by more than one-tenth (0.1) feet. In addition, positive surface drainage shall be provided on the entire site so that no depressions or

ponds are formed, regardless of depth. It shall be the contractor's responsibility to insure that all portions of the site drain as shown on the accepted plans.

Grading shall be performed in conjunction with all of the necessary clearing, grubbing, stripping, filling, and compacting operations to the satisfaction of the Authority Engineer.

Grading shall be done by approved means. Areas adjacent to structures and other areas inaccessible to heavy grading equipment shall be graded by manual methods.

4.4.4 EXCAVATION.

A. GENERAL.

Excavated areas shall be graded in a manner that shall permit adequate drainage, shall not disturb material outside the limits of slopes and shall be within the tolerances noted in Section 4.5.3, Grading Tolerances. Suitable material removed from the excavation shall be used for the construction of embankments, for backfilling, and for other approved purposes.

The Contractor shall dispose at his expense all unsuitable or surplus material. Water pumped or drained from the work shall be disposed of in an approved manner.

B. STRUCTURE SUBGRADES.

If the material at or below the depth to which excavation for structures would normally be carried is unsuitable for the required installation, it shall be removed to such widths and depths as directed by the Authority and shall be replaced with stabilization material.

Unauthorized over-excavations shall be refilled (compaction percentage/method as determined by the Authority) to subgrade with Class 57 stone.

If the surface of the subgrade is in an unsuitable condition for proceeding with construction, the contractor shall, remove the unsuitable material and replace it with concrete, structure backfill, or other approved material.

C. PROTECTION OF EXISTING STRUCTURES AND UTILITIES.

Existing poles, pipes, wires, fences, curbs, property line markers, and other structures that must be preserved in place without being temporarily or permanently relocated, shall be carefully supported and protected from damage by the contractor. In case of damage, the contractor shall notify the property owner. Unless property owners wish to make the repairs themselves, the contractor shall repair all damage.

The appropriate utility company shall locate all utility lines well ahead of the work. All such locations shall be plainly marked by coded paint symbols on pavement or by marked stakes in the ground.

All existing utility services shall be supported by suitable means to prevent damage during construction activities. Any damage to any utility shall be the responsibility of the Contractor.

D. EXCAVATED MATERIAL.

Excavated material shall be stockpiled in locations to minimize the impact on traffic, driveways and adjoining properties. Excavated material shall not be deposited on private property unless written consent of the property owner(s) has been filed with the Authority.

Excavated materials shall not be removed from the site or disposed of by the Contractor except as approved by the Authority. Suitable excavated material shall be used as backfill, fill for embankments, or other parts of the work.

Surplus material shall be disposed of as directed by the Authority.

E. PROOF ROLLING.

Proof rolling may be required to determine whether certain areas of subgrade meet compaction requirements. Where required by the Authority, proof rolling shall be carried out as designated, with a heavy rubber tired proof roller with a minimum weight of fifty (50) tons or a single axle dump truck loaded to provide an equivalent wheel loading.

Subgrade found to be unacceptable during proof rolling shall be scarified, and re-compacted at the proper moisture content or remedied as directed by the Authority.

4.4.5 FILLS AND EMBANKMENTS.

A. GENERAL.

Earth fills shall be constructed in accordance with this Section, including placing and compacting of all embankment material, and all related work required to ensure proper bond of materials with previously placed embankment

Material shall not be placed in any section of embankment until the foundation for that section has been cleared, stripped, and dewatered and compacted in accordance with these Standard Specifications.

The suitability of each part of the foundation for placing embankment material thereon and of all materials for use in the embankment construction shall be as determined by the Authority. Materials shall be placed and compacted in approximately horizontal layers of the specified thickness. The thickness of each layer shall not exceed six inches (6”) before compacting.

B. PLACEMENT OF FILL MATERIAL.

After subgrade has satisfactorily been prepared, the fill material shall be placed and compacted thereon and built-up in successive layers until the required elevation is reached. Fill materials shall be a homogenous mixture of stockpiled suitable material. Fill shall be placed within the lines and grades shown on the Authority approved plans.

The Contractor shall maintain the embankment in a manner satisfactory to the Authority until the Authority has given final written acceptance of all work.

Excavated materials too wet for immediate compaction, shall be dried to the proper moisture content.

C. COMPACTION REQUIREMENTS. Refer to Section 4.4.2.

4.4.6 STRUCTURE BACKFILL.

A. MATERIALS.

Structure backfill material shall be used to backfill reinforced concrete structures. Structure backfill shall be as recommended in the geotechnical engineering report.

B. PLACEMENT OF BACKFILL MATERIAL.

Backfilling shall consist of placing materials in horizontal, uniform layers brought up uniformly on all sides of the structure. The thickness of each layer of backfill shall not exceed six inches (6”) before compacting to the required density.

Areas adjacent to structures and other areas inaccessible to mobile compaction equipment shall be compacted with suitable power-drive hand tampers or other acceptable devices.

Backfill material shall not be deposited against the back of concrete abutments, concrete retaining walls, or the outside of cast-in-place concrete structures until the concrete has developed its full twenty-eight (28) day strength.

Unless otherwise indicated on the approved plans, sheeting and bracing used in making the structure excavation shall be removed prior to backfilling.

C. COMPACTION REQUIREMENTS. Refer to Section 4.2.2.

4.4.7 BORROW.

In case an insufficient quantity of material is available on site for completion of the necessary embankment and structure backfill operations, the Contractor shall furnish Authority approved backfill material from off site.

4.5 TRENCHING, BACKFILLING AND COMPACTING.

4.5.1 GENERAL.

This work shall consist of furnishing all labor, materials, tools and equipment for trenching, bedding, backfill and compaction for all underground utilities. Excavations shall be made to lines and grades shown on the approved plans. Except as specifically approved by the Authority, trench excavation shall be made by the open cut method to the depth required to construct the pipelines as shown on the Authority approved plans. All trench excavation shall be unclassified.

Surface materials such as concrete and asphalt shall be disposed of separately from the underlying soil; base course and gravels that are to be salvaged shall be stockpiled and protected from contamination. Unsuitable materials shall be disposed of in accordance with these Standard Specifications.

Excavated material that meets the requirements for backfill material shall be stockpiled in a safe manner, at a sufficient distance from the excavated banks to avoid sloughing or cave-ins.

Excavation shall not be permitted to advance more than one hundred fifty (150) feet ahead of pipe laying and two hundred (200) feet in advance of the backfill operations. Trenches shall not be left open overnight.

4.5.2 CONNECTIONS TO EXISTING FACILITIES.

Prior to the connection of a new utility line to an existing facility, the Contractor shall expose the existing facility at the point of connection to verify the elevation, materials and sizes of construction. The Authority shall be notified a minimum of two (2) working days before such an investigation is performed. The Contractor shall also expose existing utilities that cross new construction to allow for verification of elevation and materials of construction.

4.5.3 TRENCH EXCAVATION FOR PIPELINES AND SERVICE LINES.

Trenches shall comply with the requirements of the Occupational Safety and Health Administration (OSHA) “Safety and Health Regulations for Construction”. Sheeting and shoring shall be utilized where required to prevent any excessive widening or sloughing of the trench.

Excavated material shall not be placed nearer than two (2) feet from the sides of the trench. Heavy equipment shall not be used or placed near the sides of the trench unless the trench is adequately braced.

The width of the trench shall comply with the requirements set forth in these Standard Specifications and shall permit the pipe to be laid and joined properly. The allowable trench width at the top of the pipe shall not exceed the outside diameter of the pipe barrel plus twenty-four inches (24”), nor be less than the outside diameter of the pipe barrel plus twelve inches (12”).

If the width of the lower portion of the trench exceeds the maximum width herein stated, the Contractor, at his expense, shall furnish and install special pipe embedment or concrete encasement to protect the pipe from the additional loading. The pipe manufacturer shall determine the type and quantities of special pipe embedment, using trench-loading criteria based upon saturated backfill weighing one-hundred-twenty (120) pounds per cubic foot and allowance for truck and other superimposed live loads.

4.5.4 REMOVAL OF WATER.

The contractor shall provide and maintain at all times ample means and devices with which to remove and properly dispose of all water entering the trench excavation. Water shall be disposed of in a suitable manner without damage to adjacent property and in accordance with erosion and sedimentation control requirements of the State of Georgia. Water level in the trench shall be maintained a minimum of six inches (6”) below the pipe.

Well points, sumping or any other acceptable methods that shall insure a dewatered trench shall be used to accomplish dewatering. All dewatering methods shall be subject to the approval of the Authority.

4.5.5 PREPARATION OF FOUNDATION FOR PIPE LAYING.

When the excavation is in firm earth, care shall be taken to avoid excavation below the established

grade plus the required specified over depth to accommodate the pipe bedding material.

When soft or otherwise unsuitable foundation material is encountered in the bottom of the trench, the unsuitable material shall be removed and replaced with stabilization material to provide a suitable foundation for the pipe.

Stabilization material shall meet the gradation of "No. 4 Coarse Aggregate" as specified in Section 703.02 of the GDOT "Standard Specifications for Road and Bridge Construction".

4.5.6 BEDDING FOR PIPELINES AND SERVICE LINES.

Bedding material shall be placed to uniformly support the entire pipe barrel. Bedding material shall be placed as shown in the Standard Details.

4.5.7 BACKFILL FOR PIPELINES AND SERVICE LINES.

Trench backfill shall be placed in loose six-inch (6") lifts and each lift thoroughly consolidated by tamping or vibrating. Mechanical compaction is required for each lift.

Hydro hammers shall not be used until the trench backfill has been placed and compacted to within three (3) feet of the finished grade by the lift method. Large rollers, tractor drawn equipment or hydro hammers, shall not be used within eighteen (18) inches of the pipe.

Flooding or jetting of trenches shall not be permitted.

Bracing or shoring installed to prevent cave-ins shall be withdrawn in a manner that shall maintain the desired support during the backfill operations. Driven sheet pilings shall be cut off at or above the top of pipe, and the portion below the cut-off line shall be left in the ground.

Oversaturated backfill material (muck) shall not be allowed to be used as backfill for pipelines or service lines.

4.5.8 COMPACTION.

Refer to Section 4.1.2.

4.5.9 COMPACTION TESTING.

A. Within road right-of-ways, trench backfill shall be tested at a rate of at least one (1) test per two-hundred (200) cubic yards of backfill material, but not less than one (1) test per two-hundred-fifty (250) feet of trench. The testing shall be performed at various depths and locations. Additional testing shall be performed around items such as structures, manholes and valve boxes (a minimum of four (4) tests shall be required for each manhole and one (1) test for each valve box). One compaction test shall also be performed for each four (4) service lines. Compaction reports shall be submitted to the Authority Engineer along with written requests for inspection.

B. Outside of road right-of-ways, trench backfill shall be tested at a rate of at least one (1) test per four-hundred (400) cubic yards of backfill material, but not less than one (1) test per five-hundred (500) feet of trench. The testing shall be done at various depths and locations. Additional testing shall be performed around items such as structures, manholes, and valve boxes (a minimum of two (2) tests shall be required for each manhole and one (1) test for every two (2) valve boxes). Also, one (1) compaction test shall be performed for each two (2) service lines. Compaction reports shall be submitted to the Authority Engineer along with written request for inspection.

4.5.10 MAINTENANCE OF BACKFILL.

Backfill shall at all times during construction be maintained to the satisfaction of the Authority. Access across trenches for driveways and streets shall be maintained free of hazards to traffic or pedestrians.

4.5.11 PAVEMENT REPLACEMENT.

Pavement cuts shall be repaired using an-approved hot mix asphalt concrete. If a permanent patch cannot be installed within twenty-four (24) hours, the contractor shall place a temporary, cold mix, asphalt patch immediately after completing backfill and compaction.

4.6 SITE RESTORATION

4.6.1 RESTORATION.

Notwithstanding the requirements of any approved Landscaping Plans, as a minimum the surface grade and condition of all un-surfaced areas disturbed by construction activities shall be restored immediately following construction. The Contractor shall replace all sod, trees, shrubbery, sprinkler systems, fences, mailboxes and any other items disturbed by construction activities. All other areas disturbed during construction grading operations shall re-vegetated with native grasses. Seeding shall be performed immediately upon completion construction. The Contractor shall maintain all planted materials or seeding until its growth is established as determined by the Authority.

All roadway surfacing, curbing, sidewalks, and gutters shall be restored or replaced to a condition equal to that before the work began.

All restoration shall conform to the requirements of the Georgia Soil and Water Conservation Commission.

SECTION 5: **CONCRETE WORK**

5.0 APPLICABILITY.

This section applies to concrete work performed on Authority infrastructure only. Roadway paving, curb and gutter concrete, etc. requirements within Jackson County are covered by the Jackson County UDC and fall under the authority of Jackson County Public Development.

5.0.1 GENERAL.

This section covers concrete work performed on Authority water and wastewater systems. Engineering, plans, licenses, permits, inspection, warranties and acceptance shall be as detailed in these applicable Standard Specifications. The Authority Engineer may request special concrete specifications and procedures in addition to these specifications.

5.0.2 STANDARDS.

All concrete work shall meet the requirements of ACI 301, "Specification for Structural Concrete for Buildings", and ACI 347, "Recommended Practice for Concrete Formwork", ACI 350, "Code Requirements for Environmental Engineering Concrete Structures", ACI 306 "Guide to Cold Weather Concreting", ACI 305, Guide to Hot Weather Concreting" and the International Building Code, latest Edition.

5.0.3 SUBMITTALS.

A. The Contractor shall submit the following items for Authority approval:

B. Concrete mix design.

C. Expansion/contraction joint design.

D. Cold joint design and waterstops.

E. Reinforcing shop drawings and bar schedules.

F. Batch tickets from each concrete truck showing the following information:

1. Weight and type of cement.
2. Weights of fine and coarse aggregates.
3. Weight (in gallons) of water including surface water on aggregates.
4. Quantity (cubic yards) per batch
5. Times of batching and discharging of concrete.
6. Name of batch plant.
7. Name of contractor.
8. Type.
9. Name and amount of admixture.
10. Date and truck number.

5.1 DESIGN CRITERIA.

5.1.1 MIX DESIGN.

Concrete shall conform to the following requirements:

Concrete Requirements

Minimum Compressive Strength	4000 psi (3000 psi allowed only for thrust blocks and collars)
Minimum Cement	6 sacks/cubic yard
Maximum Water/Cement Ratio	0.45 by weight
Slump	2-4 inches
Air Entrainment	4-8 % by Volume

NOTE: Pump pads require special mix design by structural engineer.

5.1.2 REINFORCEMENT CLEARANCES.

Unless otherwise shown on the plans,

Minimum Clear Cover for Reinforcing Bar

Location	Minimum Clear Cover
Bottom bars in soil bearing foundations and slabs 3 inches	3 inches
Bars adjacent to surfaces exposed to weather on earth backfill:	
For bars more than ¾" in diameter 2 inches	2 inches
For bars ¾" or less in diameter 1-1/2 inches	1 ½ inches
Interior Surfaces:	
Slabs, walls, joints with 1-3/8" diameter or smaller	¾ inches

5.2 MATERIALS

5.2.1 GENERAL.

Concrete shall be composed of Portland cement, aggregate, and water, and shall be reinforced with steel bars or steel wire fabric where required. No admixture other than air-entraining agents and water reducing agents shall be used without written permission of the Authority Engineer.

5.2.2 CEMENT.

All cement used in concrete work shall be Portland cement conforming to the requirements of ASTM C-l50, II or IIA.

5.2.3 PORTLAND CEMENT CONRETE PAVEMENT—MATERIALS

Pavement requirements within Jackson County are covered by the Jackson County UDC and fall under the authority of Jackson County Public Development. Where required by the Authority, the following minimum requirements shall apply for concrete pavements on JCWSA facilities where concrete pavement is specifically indicated:

A. Fine Aggregate for Concrete shall conform to the requirements of the AASHTO M 6, latest edition. The amount of deleterious substances removable by elutriation shall not exceed three percent (3%) by dry weight of fine aggregate when tested in accordance with AASHTO T 11 176 shall be eighty (80) unless otherwise specified. The fineness modules shall not be less than 2.50 or greater than 3.50 unless otherwise approved by the Authority Engineer.

B. Coarse aggregate for concrete shall conform to the requirement of AASHTO M 80, latest edition, except that the percentage of wear shall not exceed forty-five (45) when tested in accordance with AASHTO T 96. Coarse aggregate shall conform to the grading in Table 6.75.01 for the grading specified in Table 6.77.04. Sized 357 and 467 shall each be furnished in two separate sizes and combined in the plant in the proportions necessary to conform to the grading requirements. Size 357 is a combination of No. 3, No. 57, and Size No. 467 is a combination of No. 4 and No. 67.

C. Portland Cement shall conform to the requirements of the following specifications for the type specified or permitted:

Portland Cement

Type	Specifications
Portland Cement	ASTM C 150
Types I, II, and III	AASHTO M 85
Air-entraining Portland Cement	AASHTO M 134
Masonry Cement	AASHTO M 150

In general, Type II cement shall be used in concrete which shall be in contact with the soil, unless otherwise allowed or directed by the Authority Engineer. Unless otherwise permitted by the Authority Engineer, the product of only one mill of any one brand and type of Portland cement shall be used on the project. The contractor shall provide suitable means of storing and protecting the cement against dampness. Cement which for any reason has become partially set or which contains lumps of caked cement shall be rejected. Cement salvages from discarded or used bags shall not be used.

5.2.4 FLY ASH.

Fly ash, under certain circumstances, may be substituted for a portion of the cement. Fly ash shall conform to the requirements of ASTM C 618.F.

Fly ash for concrete, when permitted by the Authority Engineer, shall conform to the requirements of ASTM C 618, Table 1-a, latest edition, for Class C or Class F. (The pozzolanic activity index shall be 85 for

Class C and Class F, Fly Ash.) Class C fly ash shall not be permitted where sulfate-resistant cement is required.

5.2.5 WATER.

Water used in mixing or curing shall be clean and free of oil, salt, acid alkali, sugar, or other substance injurious to the finished product. Water shall be tested in accordance with, and shall meet, the suggested requirements of AASHTO T 26, latest edition. Water from an Authority known to be of potable quality may be used without testing.

5.2.6 ADMIXTURES.

Air-entraining admixtures shall conform to the requirements of ASTM C-260. Chemical admixtures, if permitted by the Engineer for concrete, shall conform to the requirements of AASHTO M 194, latest edition.

5.2.7 FINE AGGREGATE.

Fine aggregate shall be composed of clean, hard, durable, uncoated pSections of sand, free from injurious amounts of clay, dust, soft or flaky pSections, loam, shale, alkali, organic matter, or other deleterious matter. Fine aggregate shall be well graded from course to fine and when tested by means of laboratory sieves shall meet the following grading requirements:

Fine Aggregate

Sieve Size	Percent Passing
3/8”	100
#4	95-100
#8	80-100
#16	45-80
#30	25-60
#50	10-30
#100	2-10

NOTE: Fine aggregates for concrete shall conform to the requirements of ASTM C-33.

5.2.8 COARSE AGGREGATE.

Coarse aggregate shall consist of broken stone or gravel composed of clean, hard, tough and durable stone and shall be free from soft, thin, elongated or laminated pieces, disintegrated stone, clay, loam, vegetable, or other deleterious matter. Coarse aggregate shall be well graded and when tested by means of laboratory sieves shall meet the following grading requirements:

Course Aggregate

Sieve Size	Percent Passing
2”	100
1-1/2”	95 - 100
¾”	35 - 70
3/8”	10 - 30
#4	0 – 5

NOTE: Coarse aggregates for concrete shall conform to the requirements of ASTM C-33.

5.2.9 MIXING.

Concrete shall be continuously mixed or agitated from the time the water is added until the time of use and shall be completely discharged from the truck mixer or truck agitator within one and one-half (l-l/2) hours after batching. Dry concrete mix shall not be allowed for thrust blocks; all thrust blocks must be thoroughly mixed, moist concrete.

5.2.10 REINFORCING STEEL.

Reinforcing bars shall conform to ASTM A615, Grade 60. Welded wire fabric shall comply with “Specifications for Welded Steel Wire Fabric for Concrete Reinforcement” (ASTM A-l85) or “Specification for Welded Deformed Steel Wire Fabric for Concrete Reinforcement” (ASTM A-497).

5.2.11 JOINT FILLER MATERIAL.

Joint materials shall conform to AASHTO Specifications according to type as follows:

Joint Material Specifications

Concrete joint sealer, hot-poured elastic	M l73
Preformed expansion joint filler (Bituminous Type)	M 33
Preformed sponge rubber and cork expansion joint fillers	M l53
Preformed expansion joint fillers-nonextruding & resilient bitum.	M 2l3

5.3 CONCRETE CONSTRUCTION

5.3.1 FORMWORK.

Forms shall be used to confine the concrete and shape it to the required lines. Forms shall have sufficient strength to withstand the pressure resulting from placement and vibration of the concrete. Forms shall be constructed so that the finished concrete shall conform to the shapes, lines, grades and dimensions indicated on the plans. Forms shall be made from plywood, coated plywood or steel.

Forms shall not be disturbed until the concrete has hardened sufficiently to permit their removal without damaging the concrete or until the forms are not required to protect the concrete from mechanical damage. Minimum time before removal of forms after placing concrete shall be one (1) day for vertical formed surfaces. Forms supporting the underside of beams and slabs shall not be removed until the concrete has attained the specified twenty-eight (28) day strength.

5.3.2 REINFORCING STEEL.

Before being positioned, all reinforcing steel shall be thoroughly cleaned of mill and rust scale and of coatings that shall destroy or reduce the bond. Where there is delay in depositing concrete, reinforcement shall be re-inspected and, if necessary, cleaned.

Reinforcing steel shall be accurately placed and secured against displacement by using suitable tie wire or clips at bar intersections. Reinforcing steel shall be supported by metal chairs or spacers, precast mortar blocks or metal hangers capable of supporting the weight of the workers walking on mat. Splicing of bars shall conform to ACI 318, Chapters 12 and 21.

5.3.3 PLACING CONCRETE.

Before depositing concrete, debris shall be removed from the space to be occupied by the concrete. Concrete shall not be placed until all forms and reinforcing steel have been inspected and accepted by the Authority.

Concrete shall be handled from the mixer to the place of final deposit as rapidly as possible by methods which prevent separation or loss of ingredients. The concrete shall be deposited in the forms as nearly as practicable in its final position. Concrete shall be placed in a manner that shall avoid segregation and shall not be dropped freely more than five feet (5’).

Concrete shall be compacted by internal vibration. Vibrators shall not be used to move or spread the concrete.

5.3.4 JOINTS.

Non-bituminous isolation joint filler and contraction joints shall be placed at the spacing shown on the accepted plans. Bituminous type shall be used for concrete paving where joint sealers are not specified. Construction joints shall be designed and submitted to the Authority Engineer for approval.

5.3.5 FINISHING.

Exposed faces of curbs and sidewalks shall be finished to true-line and grade as shown on the plans. Surface shall be floated to a smooth finish. Sidewalk and curb shall be broomed. After completion of

brooming and before concrete has taken its initial set, all edges in contact with the forms shall be tooled with an edger having a three-eighths inch (3/8") radius.

No dusting or topping of the surface or sprinkling with water to facilitate finishing shall be permitted.

Immediately following the removal of the forms, all fins and irregular projections shall be removed from all surfaces. Surface defects, including tie holes shall be patched. The surface shall be left sound, smooth, even, and uniform in color.

5.3.6 CURING.

Fresh concrete shall be adequately protected from weather damage and mechanical injury during the curing periods. The curing process shall be started as soon as possible after concrete placement and finishing and shall continue for a minimum of seven days. The following curing procedures may be used:

1. Ponding (for slabs or footings).
2. Spraying with a membrane curing compound.
3. Wet burlap, earth, or cotton mats.
4. Waterproof paper or polyethylene plastic cover.

5.3.7 COLD WEATHER CONCRETING.

Concrete placement during cold weather shall conform to the requirements of ACI 306, "Recommended Practice for Cold Weather Concreting".

Concrete placed in cold weather shall be protected from extreme temperatures as follows:

1. A temperature of at least 50 degrees F shall be maintained for the first seventy-two (72) hours after placement.
2. After the first seventy-two (72) hours and until the concrete is seven (7) days old, it shall be protected from freezing temperatures.
3. Concrete adjacent to heaters shall be insulated from direct heat of the unit that may dry it out prior to being properly cured.
4. Temperatures shall be measured by maximum and minimum thermometers furnished by the Contractor and installed adjacent to the concrete.

Concrete slabs shall not be placed, regardless of temperature conditions, if the supporting ground is frozen or contains frost.

5.3.8 HOT WEATHER CONCRETING.

The placement of concrete in hot weather shall comply with ACI 305, "Recommended Practice for Hot Weather Concreting".

5.3.9 BACKFILLING.

Backfill shall not be place against concrete structures until the concrete has attained its specified twenty-eight (28) day strength.

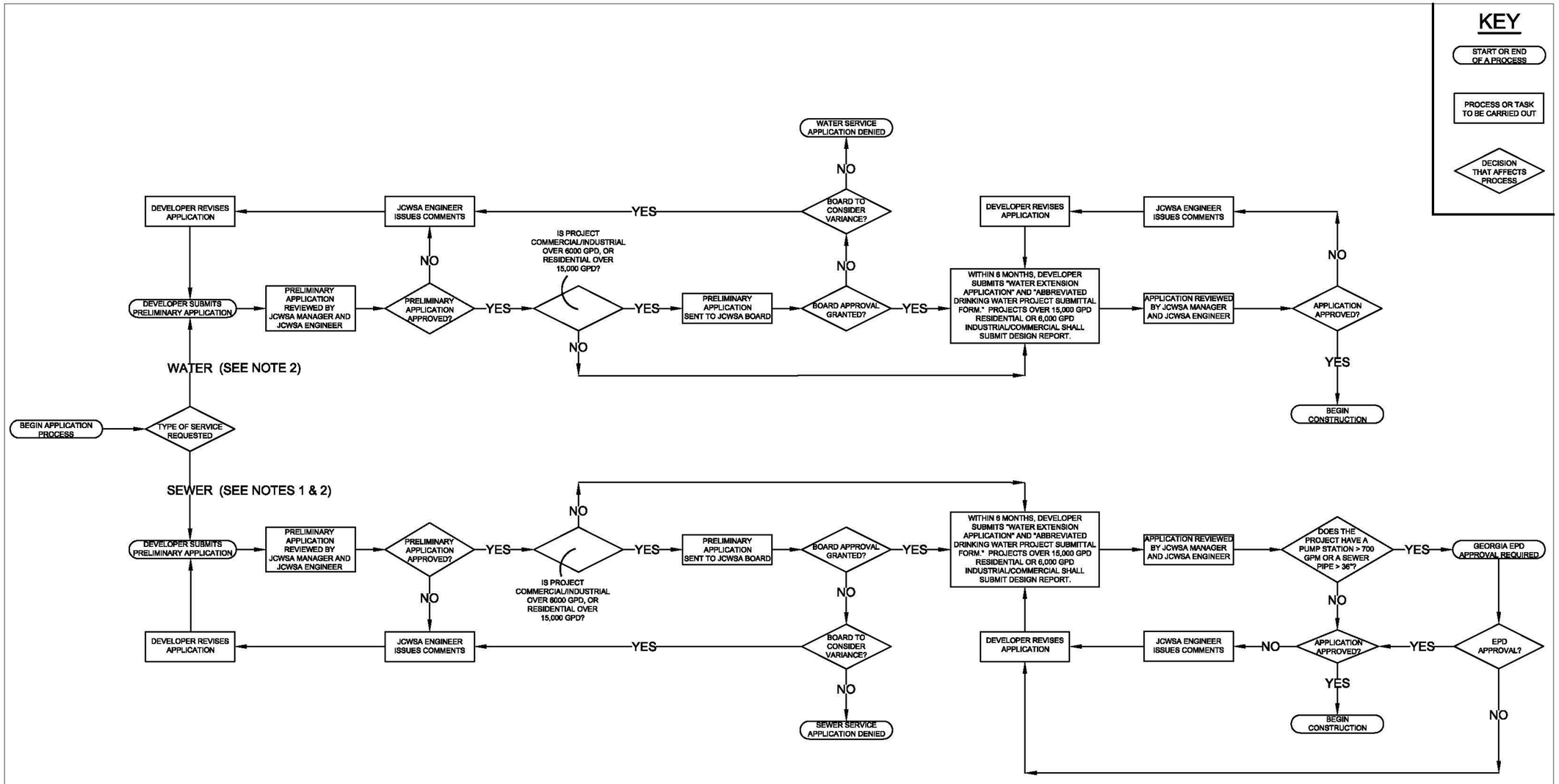
5.3.10 TESTING.

All concrete used on Authority structures shall be sampled and tested by an approved testing agency. Test reports shall include the exact location of the work at which the batch represented by a test was deposited. The report of the strength test shall include detailed information on storage and curing of specimen prior to testing, field measured slump and air, the project number, and the location of the concrete. All test reports shall bear the seal and signature of a Professional Engineer registered in the State of Georgia and competent in the field of concrete testing. Testing is not required for thrust blocks, however Authority may provide testing at the Authority's own expense.

One series of strength tests shall be taken per fifty (50) cubic yards (or fraction thereof) of the concrete placed per day. Slump tests, air tests, and unit weight tests shall be performed on each truckload of concrete.

SECTION 6: **APPENDIX – A: APPLICATION PROCESS**

6.0 JCWSA DEVELOPER PERMIT PROCESS FLOWCHART



NOTE 1: PER JCWSA STANDARDS, SEWER SERVICE WILL NOT BE GRANTED UNLESS WATER SERVICE IS ALSO BEING PROVIDED BY JCWSA

NOTE 2: ALL PROJECTS, INCLUDING SUBDIVISIONS AND ADDITIONAL SUBDIVISION PHASES, MAY ONLY CONNECT TO WATER AND SEWER LINES OWNED BY THE AUTHORITY.

JCWSA DEVELOPER PERMIT PROCESS FLOWCHART

APPLICATION PROCESS FOR ALL PROJECTS REQUESTING WATER SERVICE AND/OR SANITARY SEWER SERVICE

6.1 WATER AND/OR WASTEWATER EXTENSION PRELIMINARY APPLICATION

Owner/Developer:_____ Date:_____

Proposed Development Name:_____

Development Contact Person:_____ Contact Person Tel:_____

Contact Person Email Address:_____

Engineer's Email address:_____

Proposed Development Type (residential, commercial, industrial):_____

This is an extension of: Water_____ Sewer_____ Water & Sewer_____

Proposed number of lots:_____ Pump/Lift Station for Sewer? Yes / No

Location of Proposed Project (include nearest intersecting roads)_____

Parcel number: _____

Zoning of the proposed development:_____

Amount of water needed (flow in gpd):_____

Instantaneous Peak Flow (flow in gpm):_____

Projected Daily Sewerage Flow (flow in gpd):_____

Peak Factor (ref Sect 3):_____

Strength of Wastewater (mg/L BOD5):_____

Anticipated date the proposed development shall be on-line:_____

Please include the following with this completed application:

- One (1) hard copy and one (1) digital copy of preliminary plans showing the type of development, location and general plan for sewer/water lines and other appurtenances. *The minimum finished floor elevation must be indicated on each lot.*
- Calculations for Amount of water needed, Instantaneous Peak Flow, and Projected Daily Sewerage Flow. Reference Section 2.1.1.

NOTE: Payment of the $100.00 for water, $100 for sewer, and $100 for a lift station with this completed application locks in the sewer tap fee rate for a period of three (3) years, provided a completed "Wastewater Extension Engineering Application" with all plans/documents/review fees is submitted to the JCWSA within six (6) months.

6.2 WATER/WASTEWATER EXTENSION SYSTEM ENGINEERING APPLICATION

Owner/Developer:_____ Date:_____

Proposed Development Name:_____

Project Contact Person:_____ Contact Person Tel:_____

Engineer's Email: _____

Engineer's Phone Number:_____

Subject Property Parcel Number(s):_____

Proposed Development Type (residential, commercial, industrial):_____

Proposed number of units:_____

Please include the following with the completed application:

1. One (1) hard copy and one (1) digital copy of construction plans carrying the stamp of a registered engineer licensed in the State of Georgia.
2. Signed and sealed statement by a professional engineer that this project is not being constructed on a landfill.
3. All other required items as specified in the JCWSA Construction Standards
4. Check or Money Order for approval process/review fee: $500.00 for up to 25 ERU's, $40.00 for each additional ERU thereafter, and $600.00 for each pump station included in the project (if applicable). Resubmittal fees are $300.00 **for water, $300 for sewer, and $300 for a lift station** .

6.3 WASTEWATER APPLICATION PROCESS AND PAYMENT POLICY

The Board of the Jackson County Water & Sewerage Authority adopted the following policy to govern the wastewater application process and the reservation and payment for taps reserved under that process. This policy went into effect on adoption, and the board further directed that this policy be distributed with all preliminary applications for wastewater service. At the time of submission of the Preliminary Application, the Applicant shall sign a statement certifying that they are aware of this policy and further certifying that they are bound by its terms.

"The Board of Jackson County Water & Sewerage Authority hereby establishes a uniform application process under which all requests for wastewater service shall be considered for projected wastewater flows over six thousand (6,000) GPD for commercial/industrial projects and fifteen-thousand (15,000) GPD for residential projects. The purpose of this process is to allow the JCWSA to make a proper consideration of the applicant's wastewater needs, the JCWSA's ability to meet those needs, and the legal and technical requirements that must be satisfied before wastewater treatment can be provided".

6.3.1 THE PROCESS FOR APPLYING FOR WASTEWATER SERVICE IS AS FOLLOWS:

6.3.2 PRELIMINARY APPLICATION.

The Applicant shall complete the attached Preliminary Application. The Preliminary Application shall be considered complete upon the submission of *all* of the following:

1. A completed Preliminary Application form. Note that the form must be completed in its entirety. A Preliminary Application form shall not be considered complete if it lacks any of the requested information.
2. One (1) hard copy and one (1) digital copy of preliminary plan showing the type of development, location and general plan for sewer lines and other appurtenances. The minimum finished floor elevation must be indicated on each lot.
3. An industrial questionnaire must be completed if the contemplated use for the property is commercial or industrial.
4. Payment of the Application Fee. Note that rejection of said payment for insufficient funds shall render the Preliminary Application incomplete.
5. Identification of Applicant, Developer and Property. The Preliminary Application shall be considered only upon the submission of the name of the applicant and developer, as well as the proper identification of the property in question. Any subsequent approvals shall be limited to those parties and properties and may not be applied to additional developments or projects of the applicant or owner/developer.

6.3.3 STAFF REVIEW.

The Preliminary Application shall be reviewed by the JCWSA staff for completeness, compliance with the JCWSA's rules and regulations, compliance with the JCWSA's master plan and for the availability of the requested service. If the Preliminary Application indicates it shall generate more than six thousand (6,000) GPD for commercial/industrial projects and fifteen-thousand (15,000) GPD for residential projects and is approved by the JCWSA Staff, it shall be submitted for board approval at the next regularly scheduled meeting of the JCWSA Board. If the Staff rejects the Preliminary Application, the applicant shall receive a statement of the reasons for rejection and shall have thirty (30) days to resubmit its Preliminary Application.

6.3.4 JCWSA BOARD APPROVAL.

As previously stated, the JCWSA Board shall vote on all Preliminary Applications approved by the JCWSA Staff where the project shall generate greater than six thousand (6,000) GPD for commercial/industrial projects and fifteen-thousand (15,000) GPD for residential projects. The JCWSA Board reserves the right to approve or deny a Preliminary Application based on its compliance with the applicable rules, regulations, and master plan, as well as the availability of the requested capacity. The JCWSA Board further reserves the right to affix reasonable conditions to the approval of a Preliminary Application. If the JCWSA Board approves the Preliminary Application, the Applicant shall then be entitled to submit an Engineering application, which must be submitted within six (6) months. Failure to submit an Engineering Application within said period shall result in the invalidation of the approval of the Preliminary Application, with the Applicant being required to submit a new Preliminary Application.

6.3.5 ENGINEERING APPLICATION.

The applicant shall complete the attached Engineering Application. The Engineering Application shall be considered complete upon the submission of *all* of the following:

1. One (1) hard copy and one (1) digital copy of construction plans carrying the stamp of a registered engineer licensed and authorized to practice in the State of Georgia
2. All other required items as specified in 2.0 of these Standards.
3. Check or Money Order for the Connection fee (Amount determined by the Authority)
4. Check or Money Order for approval process fee. ($500.00 for up to 25 ERUs, plus $40.00 per each ERU over 25)
5. If the proposed system requires or contemplates a pump station, an additional payment of $600.00 approval process fee per pump station is required.

6.3.6 DESIGN REVIEW.

The Engineering Application is subject to approval by the JCWSA Engineer. If the Engineering Application is approved by the JCWSA Engineer, they shall be notified by the JCWSA Engineer. If the JCWSA Engineer rejects the Engineering Application, the Applicant shall receive a statement of the reasons for rejection and shall have thirty (30) days to resubmit its Engineering Application. Said resubmittal shall only be accepted upon the payment of an additional $300 fee.

6.3.7 WASTEWATER APPLICATION AND PAYMENT POLICY RECEIVED BY:

_____ _____

Signature of Owner/Developer Date Received

_____

Printed Name of Developer and Company

Name_____

Exact Location of Proposed Development

_____

6.4 INDUSTRIAL QUESTIONNAIRE

6.4.1 SECTION A, GENERAL INFORMATION

1. Applicant Business
   Name_____
2. Address of Premise Discharging Wastewater
   Street_____
   City_____State_____Zip_____
3. Business Address
   Street or P.O. Box
   No._____
   City_____State_____Zip_____
4. Name and Title of Signing Official
   Name_____
   Title_____
5. Person to be contacted about this application.
   Name_____Title_____Phone_____
6. Person to be contacted in case of emergency.
   Name_____ Day Phone_____ Night
   Phone_____

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Date_____ Signature_____

NOTE to signing Official: In accordance with Title 40 of the Code of Federal Regulations Part 403 Section 403.14, information and data provided in this questionnaire which identified the nature and frequency if discharge shall be available to the public without restriction. Requests for confidential treatment of information shall be governed by procedures specified in 40 CFR Part 2

6.4.2 SECTION B, PRODUCT OR SERVICE INFORMATION

B1. Provide a brief narrative of manufacturing or service activity at premise address: (Include principal raw materials, catalysts, intermediates, products)

B2. List the Standard Industrial Classification (SIC) Codes for principal products or services:

PRODUCTS OR SERVICES | SIC CODE (4 digit) | PERCENTAGE OF PRODUCTION

B3. Substances Discharged - Give common and technical names of each raw material and product that may be discharged to the sewer. Briefly described the physical and chemical properties of each substance and produce.

COMMON/TECHNICAL PRODUCT OR SERVICE INFORMATION | PHYSICAL AND CHEMICAL PROPERTIES

B4. What potentially hazardous, corrosive, flammable, explosive, or toxic substances are handled at your plant? Identify those which could possibly be discharged to a sewer

B5. Describe all wastewater generating operations (including processes and clean-ups).

B6. Identify information entitled to protection as a trade secret.

Section | Reason

B7. Is your facility subject to a Federal Categorical Pretreatment Standard and if so which one?

6.4.3 SECTION C, PLANT OPERATIONAL CHARACTERISTICS

C1. Are major processes batch or continuous?_____

If batch, average number of batches per 24 hour day:_____

C2. Variation of Operation

Indicate whether the business activity is:

a._____ Continuous through the year, or

_____ Seasonal- Circle the months of the year during which operations occur:

J F M A M J J A S O N D Peak month(s) of operation is (are) _____

_____

b._____Continuous throughout the week, or

_____Circle the days of the week during which operations occur: S M T W T F S Peak day(s) of operation is (are) _____

c._____Are there any scheduled shutdowns? Yes_____ No_____ When?_____

_____

Reason:_____

_____

_____

C3. Wastewater Discharge Periods

a. Discharge occurs daily: from_____ to_____

Circle the days of the week that discharge occurs: S M T W T F S

Peak day(s) of discharge is (are)_____

b. Clean-up discharge daily: from_____to_____

Circle the days of the week that discharge occurs due to clean-up:

S M T W T F S

C4. Shift Information:

Total Number of Employees_____

OFFICE

PRODUCTION (number of employees per shift)

No. Hours	Day Shift No. Hours	P.M. Shift No. Hours	A.M. Shift No. Hours
WEEKDAY	*to*	*to*	*to*
SATURDAY	to	to	to
SUNDAY	to	to	to
SEASONAL	to	to	to

C5. Describe any wastewater treatment equipment or processes in use (includes sediment traps and grease traps):

C6. Describe any raw water treatment process utilized:

C7. Describe any water recycling processes utilized:

C8. List the type and volume of liquid waste or sludges removed from the premises by means other than community sewers.

DESCRIPTION VOLUME (gals/mo) REMOVED BY

(Name & Address)

C9. Is there a Spill Prevention Control and Countermeasure Plan in effect for this plant?

Yes_____ No _____

If Yes, describe briefly or attach copy to questionnaire.

C10. Are there any Backflow Preventers in your system?

Yes_____ No_____

C11. Have you checked your system regarding Cross Connection Prevention or Control at this plant?

Yes_____ No_____

If yes, describe briefly or attach copy to questionnaire.

6.4.4 SECTION D, WATER USE AND DISCHARGE INFORMATION

D1. List each raw water source (city, county, well, other), account number (if applicable), designated use (fire service, production, lawn sprinkler, etc. and average monthly consumption (indicate units) :

Source Account Number Use Consumption

D2. Indicate water use categories, distribution of water used and the means of wastewater disposal (sanitary sewer, storm sewer, waste hauler, other):

Water Used For	Water Supply Percentage of Total	Discharged to:
Sanitary		
Process		
Boiler		
Cooling		
Other *		
In Product		

Measured_____ Estimated_____

*Describe other water uses(s):_____

D3. List plant sewer outlets, size and flow: (assign sequential reference number to each sewer starting with No. 1).

Reference No.	Sewer Size (inches)	Descriptive location of sewer connection or discharge point	Avg. Flow (GPD)

D4. Attached a drawing (to scale) of each building on the premises. Show location of all water meters, storm drains, streams, sampling points, pretreatment facilities and each side sewer connected to the community sewer. Number each sewer as referenced in D3. A simple line drawing is sufficient.

6.4.5 SECTION E, PRIORITY POLLUTANT SURVEY

E1. Indicate to the best of your ability, the known presence or known absence of the materials listed in E2. It is not necessary to undertake a sampling program to complete this section. Respond by checking the appropriate column indicating which of the following description is applicable.

Check Column A if the compound is not used as a raw material, stored on site, transported or produced whether as a product or by-product.

Check Column B if the compound is used as a raw material, stored on site, transported or produced whether as a product or by-product, but is not in wastewater discharge.

Check Column C if the compound is used as a raw material, stored on site, transported or produced whether as a product or by-product, and may be in wastewater discharge.

Check Column D if the compound is known to be in wastewater.

E2. PRIORITY POLLUTANTS

No.	DESCRIPTION	A. KNOWN ABSENT	B. SUSPECTED ABSENT	C. SUSPECTED PRESENT	D. KNOWN PRESENT
	VOLATILES				
1	Acrolein				
2	Acrylonitrile				
3	Benzene				
4	Carbon Tetrachloride				
5	Chlorobenzene				
6	1,2-Dichloroethane				
7	1,1,1-Trichloroethane				
8	1,1-Dichloroethane				
9	1,1,2-Trichloroethane				
10	1,1,2,2-Tetrachloroethane				
11	Chloroethane				

No.	DESCRIPTION	A. KNOWN ABSENT	B. SUSPECTED ABSENT	C. SUSPECTED PRESENT	D. KNOWN PRESENT
13	1,1-Dichloroethylene				
14	1,2-Trans-Dichloroethylene				
15	1,2-Dichloropropane				
16	1,2-Dichloropropylene (1,3-Dichloropropene)				
17	Ethlbenzene				
18	Methylene Chloride (Dichloromethane)				
19	Methyl Chloride (Chloromethane)				
20	Methyl Bromide (Bromomethane)				
21	Bromoform (Tribromomethane)				
22	Dichlorobromomethane				
23	Trichlorofluoromethane				
24	Dichlorodifluromethane				
25	Chlorodibromomethane				
26	Tetrachloroethylene				
27	Toluene				
28	Trichloroethylene				
29	Vinyl Chloride (Chloroethylene)				
	ACIDS				
30	2,4,6-Trichlorophenol				

31	Parachlorometa Cresol				
No.	DESCRIPTION	A. KNOWN ABSENT	B. SUSPECTED ABSENT	C. SUSPECTED PRESENT	D. KNOWN PRESENT
32	2-Chlorophenol				
33	2,4-Dichlorophenol				
34	2,4-Dimethylphenol				
35	2-Nitrophenol				
36	4-Nitrophenol				
37	2,4-Dinitrophenol				
38	4,6-Dinitro-o-Cresol				
39	Pentachlorophenol				
40	Phenol				
	BASE/NEUTRALS				
41	Acenapthene				
42	Benzidine				
43	1,2,4-Trichlorobenzene				
44	Hexachlorobenzene				
45	Hexachloroethane				
46	Bis (Chloromethyl) Ether				
47	Bis (2-Chloroethyl) Ether				
48	2-Chloroethyl Vinyl Ether				
49	2-Chloronaphthalene				
50	1,2-Dichlorobenzene				
51	1,3-Dichlorobenzene				

52	1,4-Dichlorobenzene				
No.	DESCRIPTION	A. KNOWN ABSENT	B. SUSPECTED ABSENT	C. SUSPECTED PRESENT	D. KNOWN PRESENT
53	3,3-Dichlorobenzidine				
54	2,4-Dinitrotoluene				
55	2,6-Dinitrotoluene				
56	1,2-Diphenylhydrazine				
57	Fluoranthene				
58	4-Chlorophenyl Phenyl Ether				
59	4-Bromophrnyl Phenyl Ether				
60	Bis (2-Chloroisopropyl) Ether				
61	Bis (2-Chloroethoxy) Methane				
62	Hexachlorobutadiene				
63	Hexachlorocyclopentadiene				
64	Isophorone				
65	Naphthalene				
66	Nitrobenzene				
67	N-Nitrosodimethylamine				
68	N-Nitrosodiphenylamine				
69	N-Nitrosodi-n-Propylamine				
70	Bis (2-Ethylhexy 1) Phthalate				
71	Butyl Benzyl Phthalate				
72	Di-n-Butyl Phthalate				
73	Di-n-Octyl Phthalate				

74	**Diethyl Phthalate**				
No.	**DESCRIPTION**	**A. KNOWN ABSENT**	**B. SUSPECTED ABSENT**	**C. SUSPECTED PRESENT**	**D. KNOWN PRESENT**
75	**Dimethyl Phthalate**				
76	**Benzo (a) Anthracene (1,2-Benzanthracene)**				
77	**Benzo (a) Pyrene (3,4-Benzopyrene)**				
78	**3,4-Benzofluoranthene**				
79	**Benzo (k) Fluoranthene (11,12-Benzofluoranthene)**				
80	**Chrysene**				
81	**Acenaphthylene**				
82	**Anthracene**				
83	**Benzo (ghi)**				
84	**Perylene (1,12-Benzoperylene)**				
85	**Fluorene**				
86	**Phenanthrene**				
87	**Dibenzo (a,h) Anthracene (1,2,5,6-Dibenzanthracene)**				
88	**Indeno (1,2,3-cd) Pyrene (2,3-o-Phebyleneoyrene)**				
89	**Pyrene**				
	PESTICIDES				
90	**Aldrin**				
91	**Dieldrin**				

92	**Chlordane (technical mixture & Metabolites)**				
No.	**DESCRIPTION**	**A. KNOWN ABSENT**	**B. SUSPECTED ABSENT**	**C. SUSPECTED PRESENT**	**D. KNOWN PRESENT**
93	**4,4-DDT**				
94	**4,4-DDE (p,p-DDX)**				
95	**4,4-DDD (p,p-TDE)**				
96	**a-Endosulfan-Alpha**				
97	**b-Endosulfan-Beta**				
98	**Endosulfan Sulfate**				
99	**Endrin**				
100	**Endrin Aldehyde**				
101	**Heptachlor**				
102	**Heptachlor Epoxide**				
103	**a-BHC-Alpha**				
104	**b-BHC-Beta**				
105	**4-BHC (Lindane)-Gamma**				
106	**g-BHC-Delta**				
107	**PCB-1242 (Arochlor 1242)**				
108	**PCB-1254 (Arochlor 1254)**				
109	**PCB-1221 (Arochlor 1221)**				
110	**PCB-1232 (Arochlor 1232)**				
111	**PCB-1248 (Arochlor 1248)**				
112	**PCB-1260 (Arochlor 1260)**				

113	PCB-1016 (Arochlor 1016)				
114	Toxaphene				
No.	DESCRIPTION	A. KNOWN ABSENT	B. SUSPECTED ABSENT	C. SUSPECTED PRESENT	D. KNOWN PRESENT
115	2,3,7,8-Tetrachlorodi-benzo-				
116	p-Dioxin (TCDD)				
	METALS				
117	Antimony (total)				
118	Arsenic (total)				
119	Beryllium (total)				
120	Cadmium (total)				
121	Chromium (total)				
122	Copper (total)				
123	Lead (total)				
124	Mercury (total)				
125	Nickel (total)				
126	Silver (total)				
127	Zinc (total)				
	OTHERS				
128	Asbestos (Fibrous)				
129	Cyanide (total)				

PRETREATMENT

Is this plant subject to an existing Federal Pretreatment Standard?_____

If so, are pretreatment standards being met on a consistent basis?_____

If no, list any schedule of additional pretreatment facility construction or increased operation and maintenance required to achieve consistent compliance.

6.4.6 SECTION F, PRIMARY POLLUTANT SURVEY

F1. Indicate to the best of your ability, the presence or absence of the materials listed below. These parameters shall not receive pretreatment standards beyond that necessary to prevent interference of the sewerage treatment plant. The Authority is either limited in the discharge of these components by conditions in its NPDES permit or has historically had some problem handling the particular wastewater component. These components (except lint and dyes) are present in most waters. Therefore, check Known Present unless laboratory results exist showing their absence.

Primary Pollutants

No.	DESCRIPTION	A. KNOWN ABSENT	B. SUSPECTED ABSENT	C. SUSPECTED PRESENT	D. KNOWN PRESENT
1	BOD (5) mg/l				
2	COD mg/l				
3	Nitrogen mg/l				
4	Phosphorus mg/l				
5	Suspended Solids mg/l				
6	Oil & Grease mg/l				
7	Lint or other filamentous material				
8	Dyes				
9	pH (Std. Units)				
10	Temperature EC				

6.5 MODULAR PLANT WASTEWATESERVICES CONTRACT

This Contract made and entered into by the Jackson County Water and Sewerage Authority, hereinafter referred to as the "Authority" and _____, hereinafter referred to as the "Developer".

1. Developer is the owner of a tract of land located in Jackson County, hereinafter referred to as the "Tract" as more particularly described on Exhibit "A" attached hereto and incorporated herein as part of this Contract by reference.

2. Developer intends to design and construct a wastewater treatment plant to service the Tract described in Exhibit "A" and attached hereto. Said wastewater treatment plant shall be designed and constructed in accordance with Authority's Modular Plant Policy ("Policy"), as adopted at its April 20, 2006 meeting, and as subsequently amended. The terms of the Policy are incorporated herein by reference. Should a conflict arise between the terms of this Contract and the Policy, the terms of the Policy shall govern. A copy of the Policy shall be available on request at the Authority's offices.

3. Developer shall pay all costs associated with the design, permitting and construction of the entire facility, including obtaining an N.P.D.E.S. Permit if required. The Developer shall be responsible for the costs of review of the plant design and observation of construction by the Authority consultant. The costs for Authority design review and construction observation are described in Exhibit "B" and attached hereto as part of this contract.

4. The Authority has approved a portion of sewer tap fees within the Tract to be applied toward the capital cost of the wastewater plant. The portion of the sewer tap fees applied to this cost shall is calculated and described in Exhibit "C" attached hereto, with the remaining balance of the tap fees, if any to be paid to the Authority pursuant to that Wastewater Treatment Services Contract between the Authority and the Developer.

5. Pursuant to the Policy, and as a condition of this Contract, the Developer has obtained a bond equal to 100% of the estimated cost of the wastewater plant to ensure proper construction, operation and maintenance of the plant until acceptance by the Authority. The estimated cost has been determined based on a review of the plant design plans by the Authority consultant. A copy of said bond has been attached hereto as Exhibit "D."

6. The Developer has attached a copy of the conceptual drawings of the treatment plant as Exhibit "D." Developer has also attached a completed "Wastewater Treatment Plant Design Form", and any related facilities as approved by the Georgia Environmental Protection Division and the consultant for the Authority, and is labeled as Exhibit "E" and attached hereto as part of this contract.

7. The Developer shall be responsible for the costs of operation and maintenance of the plant until the Authority takes ownership. Appropriately certified operators must perform all operations and maintenance, and all activities are to be accurately recorded and made available to the Authority upon request. The Developer agrees that ownership of the treatment plant is to be conveyed to the Authority subject to satisfying, at a minimum, the following conditions:

   a. No manufacturer warranty issues exist
   b. No Georgia Environmental Protection Division violations, or violations from any other governmental entity, exist

c. No material or contractor liens exist
d. No unresolved litigation or potential litigation exists as it relates to the treatment plant, plant effluent disposal or the development as a whole
e. Payment representing _____ percent of the initial design flow to the plant to be paid to the Authority monthly at an amount calculated from the Authority's sewer billing rate structure in effect at the signing of this Contract.
f. Complete documentation for the transfer of ownership to the Authority of all required land and improvements.

Additional ownership conditions not listed but are specific to this project are described in Exhibit "F" and attached hereto as part of this contract.

The Authority shall not take ownership of the treatment plant until all standards and conditions are met and accepted by the Authority board at a regularly scheduled Authority board meeting.

8. The developer has sole responsibility to construct all wastewater infrastructures inside the boundary of its Tract in strict accordance with Authority standards of construction. Such wastewater infrastructures must receive approval of the Georgia Environmental Protection Division, if required.

9. Upon accepting ownership, the Authority shall operate the wastewater plant in a reasonable and customary manner; however, the parties acknowledge that interruptions of service may occur, in which event the Authority shall take all reasonable means to restore the wastewater system's operation as soon as possible in accordance with good engineering practice.

10. Neither party may assign its rights, duties, obligations or interests under and in this Contract without the non-assigning party's prior written consent. Any purported assignment without such consent shall be null and void.

11. The terms and conditions of this Contract are binding on, and shall inure to the benefit of the successors and permitted assigns of the parties.

12. For purposes of this Contract, the term "force majeure" means any event or circumstance which (i) is beyond the reasonable control of the Party affected ("Affected Party"), (ii) occurs or exists without fault or negligence on the part of the Affected Party, and (iii) prevents, wholly or in part, the Affected Party from performing its duties and obligations under this Contract (other than obligations of the Affected Party to pay or expend monies for or in connection with its performance under this Contract). Force majeure includes, but is not limited to, act of God, fires, floods, droughts, earthquakes, windstorms, hurricanes, strikes, lockouts, explosions, riots, insurrections, acts of a public enemy, wars, acts of sabotage, actions or orders of governmental authorities, (civil or military), and breakage of or damage to pipelines, machinery, or equipment. Force majeure also includes any delay by the Environmental Protection Division of the Georgia Department of Natural Resources to issue required permits and approve any plans submitted by either Party for the construction of the modular wastewater plant.

Notwithstanding any other provision of this Contract, a delay or failure on the part of the Affected Party in performing its duties and obligations under this Contract shall be excused if, and to the extent, such delay or failure in performance is caused by force majeure but only during the continuance of such force majeure; provided, however, that written notice of such force majeure and the reason(s) therefore shall be promptly given by the Affected Party to the other Party; and provided further that the Affected Party shall act diligently in attempting to remove or eliminate such force majeure. In such event, neither Party shall be liable to the other Party for any loss or damage caused by such force majeure.

13. This Contract shall be construed and performed in accordance with the laws of the State of Georgia.

14. This Contract supersedes all prior contracts, negotiations and representations of the Parties and no term or condition not set forth herein shall be binding on the Party.

IN WITNESS WHEREOF, the parties have executed this Contract by its duly authorized officers under hand and seal this _____ day of _____, 200__.

Signed, sealed and delivered

In the presence of:

JACKSON COUNTY WATER AND SEWERAGE AUTHORITY

_____ By: _____

Witness Eric Klerk, Authority Manager

_____

Notary Public

Signed, sealed and delivered

In the presence of:

DEVELOPER

_____ _____

Witness

_____ _____

Notary Public

6.6 JCWSA CONSTRUCTION PLANS SUBMISSION CHECKLIST

All items on this checklist to be complete for plans submission/resubmission. Mark each selection with an X if complete. Mark N/A if not applicable.

___ One hard copy and one digital copy of the plans provided. Digital copy shall be no larger than 40MB. Erosion control plans are not needed until the final submission of approved plans.

___ If this is a resubmission, include written responses to all JCWSA comments.

___ If this is a resubmission, revisions are clearly clouded or noted by keynotes on all plans

___ Each lot has its own water meter and service line. Bullnose services are not allowed.

___ Plans review fee included. Contacted Donna Anthony at JCWSA to obtain all current and applicable fees to be submitted.

___ Pre-treatment questionnaire submitted (check if currently or previously submitted).

___ Design report provided.

___ Construction plans including the following sheets at 1:60 scale max: Cover, Site, Grading, Storm Profiles, Water, Sewer, Sewer profiles, Water and Sewer Details.

___ Plans shall be 24”x36” or smaller (36”x42” are not allowed for plans submitted after July 1st 2022).

___ Actual printed text on plans is 1/12” maximum height.

___ Plan sheets are legible with existing and proposed improvements easily distinguished.

___ Water and sewer overview sheets provided as needed for larger projects (larger scales allowed for these sheets).

___ Water and sewer plan view sheets at 60 scale max.

___ Water, sewer, and stormwater lines are shown on each utility sheet for water or sewer.

___ Sewer manhole numbers and stormwater junction box numbers are shown on water and sewer plans.

___ Station numbering provided on water plans.

___ Water mainline and stormwater mainline are on opposite sides of the road.

___ Stormwater junction box numbers are shown on sewer plans.

___ Sewer plan-over-profile view provided for each sewer line. All utility crossings are shown in sewer and stormwater profiles.

___ Sewer manhole name and elevations (rim and inverts) are shown on each sewer plan view.

___ Min sewer slope = 0.7% for 8” sewer. Sewer line length, slope and material are labeled.

___ Lot numbers are displayed on utility sheets.

___ JCWSA standard notes are included on utility sheets.

___ JCWSA Plan Approval Certification Statement added to Cover Sheet.

___ If plans require GDOT permitting, include cross-sections for all sewer crossings with depth to sewer at midpoint of roadway and at ditches. Show bore pit locations related to right-of-way lines and edge of pavement. Clearly label right-of-way width and speed limit.

___ Plans are stamped and dated with the current date by GA Professional Engineer.

___ In addition to the checklist above, I have carefully read and included all items described in JCWSA Standards and Specifications following sections:

1) Section 1.4, Plans and Specifications
2) Section 1.0.13, Design Report
3) Section 2.0.3, Water Supply Construction Plans
4) 3.0.3, Construction Plans
5) 3.0.4, Lift Station Construction Plans

Project Name:_____

Engineer’s Name:_____

Engineer’s Signature: _____

Date:_____

Note: Excluding any item on the checklist above will result in plans being immediately rejected and returned back to Engineer. Plan review fees will not be returned and must be submitted again with the next submittal.

SECTION 7: **APPENDIX - B: INSURANCE & CONFLICT RESOLUTION**

7.0 INSURANCE REQUIREMENTS

Contractor shall purchase the insurance outlined below and name the Jackson County Water and Sewerage Authority (JCWSA) as **additional insured** on a primary and non-contributory basis with regard to any other liability insurance, which may be available to the JCWSA to fully insure the indemnity obligations, contractual or otherwise, made herein and in any other portion of the Contract. Such insurance shall include Contractual Liability protection. To the extent any of this provision is found to be in violation or inconsistent with applicable law, the remainder of the provision shall remain in full force and effect.

7.0.1 INSURANCE:

The Contractor, at its own expense, shall obtain and maintain in full force and effect, without interruption during the term of the agreement, the following minimum levels of insurance:

A. Worker's Compensation insurance,

covering the legal liability of the Contractor and its subcontractors under applicable worker's compensation or occupational disease law of the State of Georgia/Federal Government for claims of personal injuries or death resulting therefrom to the Contractor and its subcontractor's employees. The Subcontractor shall also obtain a minimum of **$500,000** of Employers' Liability insurance. Certificate of Insurance must include a waiver of subrogation in favor of the JCWSA.

B. Commercial General Liability insurance,

covering the legal liability (including liability assumed contractually, whether incidental or not) of the Contractor who may be engaged in the services, for claims for personal injuries (including death) and property damage resulting therefrom arising out of the services to be performed by Contractor, in an amount no less than **$1,000,000** for any one occurrence, **$2,000,000** General Aggregate (subject to a per project general aggregate provision), **$2,000,000** products/completed operations aggregate limit. Commercial General Liability insurance shall be obtained which shall include broad form contractual liability coverage, products/completed operations, cross liability, severability of interest and broad form property damage (if required), and as well as its directors, officers, and employees shall be named as additional insured on such Commercial General Liability policy regarding liability arising out of operations performed under this agreement. **Form CG 20 10 01 and CG 20 37 10 01** must be shown on the certification of insurance or its equivalent.

C. Automobile Liability insurance,

covering the legal liability (including liability assumed contractually, whether incidental or not) of the Contractor who may be engaged in the services, for claims for personal injuries and death resulting therefrom and for property belonging to others than the Contractor who may be engaged in the services, for claims for personal injuries and death resulting therefrom and for property belonging to others than the Contractor caused by highway licensed vehicles of or used by the Contractor in an

amount no less than: (i) **$1,000,000** for any one person; (ii) **$1,000,000** for bodily injury for any one occurrence; and (iii) **$1,000,000** for property damage for any one occurrence. Automobile Liability insurance shall provide coverage for owned, hired or non-owned automotive equipment and shall be named as an additional insured on such policy.

D. The Contractor's insurance coverage,

shall be primary insurance as respect to work on this project for the JCWSA, its Board, officers and employees. Any insurance or self-insurance maintained by JCWSA, shall be in excess of the Contractor's insurance and shall not contribute with it. The Contractor, in its agreements with subcontractors, shall require subcontractors to obtain insurance, meeting the minimum limits and incorporating the contractual requirements that are prescribed in this section. The Contractor hereby waives and relinquishes any right of subrogation against JCWSA and its agents, representatives, employees, and affiliates they might possess for any policy of insurance provided under this section or under any State or Federal Worker's Compensation or Employer's Liability Act. Contractor shall require its insurer to notify JCWSA thirty (30) days prior to the effective date of any cancellation or material change in any of the required policies. To the extent that the Contractor utilizes deductibles in conjunction with the insurance required by this agreement, all deductible expenses shall be assumed by the Contractor and shall be considered as the Contractor's expenses and not part of the normal expenses associated with this agreement. Insurance shall be placed with insurers with a Best's rating of no less than A- or better.

7.0.2 INDEMNIFICATION

To the fullest extent permitted by law, the Contractor shall fully indemnify, defend, and hold harmless the JCWSA and all employees and agents of any of them, from and against any and all suits, claims, actions, judgments, damages, losses and expenses (including but not limited to attorneys' fees and litigation expenses) arising directly or indirectly out of, or in connection with, the obligations herein undertaken, or resulting out of, or in connection with operations performed by or conducted by (or in the work area of) the Contractor, the Contractor's subcontractors, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, provided that such claims, loss, damage, or expense is attributable to bodily injury (including sickness, disease or death to third parties and employees of the Contractor, Subcontractor or anyone directly or indirectly employed by them or anyone whose acts they may be liable) and property damage (including injury to or destruction of property and the loss of use thereof). To the fullest extents permitted by law, ALL OF CONTRACTOR'S INDEMNITY OBLIGATIONS AGREED TO HEREIN SHALL BE BINDING ON CONTRACTOR WITHOUT REGARD TO WHETHER SUCH CLAIM, DAMADE, LOSS OR EXPENSE IS CAUSED IN WHOLE OR IN PART BY JCWSA. Such obligations shall not negate, abridge or otherwise reduce other rights or obligations of indemnity or agreements to procure insurance which otherwise exist as to a party or person described in the paragraph.

Acknowledged:

Date: _____ JCWSA: _____

Contractor: _____

7.1 CONFLICT RESOLUTION

7.1.1 MEDIATION

-In an effort to resolve any conflicts that arise during the Project or following the completing of the Project, the Owner and the Consultant agree that all disputes between them arising during the term of this Agreement or the Project shall be submitted to nonbinding mediation.

The owner and the Consultant further agree to include a similar mediation provision in all agreements with independent contractors and consultants retained for the Project and to require all independent contractors and consultants also to include a similar mediation provision in all agreements with their subcontractors, sub-consultants, suppliers and fabricators, thereby providing for mediation as the primary method for conflict resolution among the parties to all those agreements.

7.1.2 ARBITRATION

In the event the parties to this Agreement are unable to reach a settlement of any conflict involving an amount of less than $200,000.00, arising during the term of this Agreement or related to the services under this agreement, in accordance with Paragraph A (Mediation), then such conflicts shall be settled by binding arbitration in accordance with the rules of the Construction Industry Arbitration Rules of the American Arbitration Association effective at the Effective Date of the Agreement, subject to the limitations and restrictions stated in Paragraphs 7.1.2.1, 7.1.2.2, 7.1.2.3 and 7.1.2.4 below.

1. Notice of the demand for arbitration must be filed in writing with the other party to the Agreement with the American Arbitration Association. The demand must be made within a reasonable time after the Conflict has arisen. In no event may the demand for arbitration be made after the date when institution of legal or equitable proceedings based on such Conflict would be barred by the applicable statute of limitations.
2. All demands for arbitration and all answering statements thereto which include any monetary claims must contain a statement that the total sum or value in controversy as alleged by the party making such demand or answering statement in not more than $200,000 exclusive of interest and costs. The arbitrators shall not have jurisdiction, power, or authority to consider, or make findings (except in denial of their own jurisdiction) concerning any Conflict if the amount in controversy in such Conflict is more than $200,000 (exclusive of interest and costs), or to render a monetary award in response thereto against any party which totals more than $200,000 (exclusive of interest and costs).
3. The award rendered by the arbitrators shall be final, and judgment may be entered upon it in any court having jurisdiction thereof.
4. If a Conflict in question between Owner and Consultant involves the work of a Contractor, subcontractor, or consultants to the Owner or Consultant (each a “Joinable Party”), either Owner or Consultant may join each Joinable Party as a party to the arbitration between Owner and Consultant hereunder, and Consultant or Owner, as appropriate, shall include in each contract with each such Joinable Party a specific provision whereby such Joinable Party consents to being joined in an arbitration between Owner and Consultant involving the work of such Joinable Party. Nothing in this paragraph 9.1.B.4 nor in the provision of such contract

consenting to joiner shall create any claim, right, or cause of action in favor of the Joinable Party and against Owner or Consultant that does not otherwise exist.

7.1.3 ANY LITIGATION OF A DISPUTE,

arising during the term of this Agreement or arising as a result of services rendered by Consultant under this Agreement, and involving an amount in excess of $200,000 (exclusive of interest and costs), shall be conducted in the appropriate court of law. Any claims brought against the Owner shall be filed in the Superior Court of Jackson County, subject to the applicable choice of law and subject matter jurisdiction requirements. Additionally, the mandatory mediation requirements of Paragraph 9.1.A shall apply, though such mediation may be had after the filing of any lawsuit.

7.2 OWNERSHIP RIGHTS

Drawings, specifications and any other documents prepared by the Consultant shall become and remain the property of the Owner whether the Agreement for which they are made is built or not upon payment by the Owner for the Consultant's Services. Any re-use of such documents and instruments without the written Agreement of the Consultant shall be at the Owner's sole risk and without liability or legal exposure to the Consultant. The Consultant shall be permitted to retain copies including reproducible copies of drawings and specifications for information and reference. The Consultant shall retain its statutory and common law copyright in the documents to the extent that the documents would be used with any construction, Agreement, resale of the documents, or other use not directly related to this Agreement. The Owner's rights to use the documents in a manner related to this Agreement, including any modifications, alterations, repairs, additions, renovations or expansions of the Agreement is unlimited. The Owner shall have no right to use the documents for any construction not related to this Agreement or to resell the documents to a third party. If CADD technology is used by the Consultant in connection with this Agreement, Consultant shall retain all right, title and interest in the CADD programs in such portions of electronic tapes, discs, and databases related to the CADD program and technology, but shall not be the owner of any drawings as stored or reproduced by said CADD technology. If Owner wishes to obtain a copy of any electronic media containing portions of the Consultant's copyrighted databases pertaining to this Agreement then Consultant shall prepare electronic media and deliver same to Owner. Consultant shall grant Owner limited license to make a derivative work of the database for the purpose of recreating and producing copies of the plans and any other construction drawings or information contained on the disk. Owner shall not reproduce or distribute or use the disk except as agreed. Owner's rights to use the data for creating copies of the plans and drawings and other documents owned by the Owner is unlimited. Owner shall assume all responsibility for and agrees to indemnify, hold harmless and defend Consultant from any and all liability, loss or damage, including reasonable attorney fees, for any use by Owner of such data except as agreed or arising under the Agreement.

SECTION 8: **APPENDIX - C: POLICY & ORDINANCE**

8.0 GREASE TRAP ORDINANCE

The requirements of this section shall not apply to private living quarters or dwelling units.

8.0.1 FACILITIES OTHER THAN EATING ESTABLISHMENTS

A. DESIGN CRITERIA.

All sand and oil/grease inceptors used in conjunction with facilities other than eating establishments shall have a capacity that shall provide not less than ten minutes nor more than 30 minutes retention time at the peak eight-hour flow rate. Flow-through velocities shall not exceed one foot per second at the peak eight-hour flow rate.

B. COMPLIANCE WITH PLUMBING CODE.

All sand oil/grease inceptors shall be sized, located and constructed in accordance with the provisions of the duly adopted plumbing code where such parameters have not been otherwise set forth in this article.

8.0.2 RESTAURANT GREASE REMOVAL SYSTEMS.

A. REQUIRED.

Food service establishments discharging to the WRF shall install, operate, clean and maintain a sufficiently sized oil and grease separator (called a grease trap in this article) necessary to achieve compliance with requirements set forth under this section.

B. DESIGN CRITERIA.

All oil and grease, water and solids separators (grease traps) required in this section shall have a capacity and design in compliance with the following equations:

1. Restaurants:

$$S \times 20 \times \frac{HR}{12} \times LF = Capacity\ in\ gallons$$

$$S = \text{number of seats in dining area}$$

$$HR = \text{number of hours open Unloa ding factor.}$$

1.25 Interstate highways

1.00 Other freeways

1.00 Recreational areas

0.80 Main Highways

0.50 Other Highways

2. Hospitals, nursing homes, other types of commercial kitchens with varied seating capacity:

$$M \times 5 \times LF = Capacity\ in\ gallons$$
$$M = \text{meals per day}$$
$$LF = \text{Loading factor}$$

1.00 With Dishwasher

0.50 Without Dishwasher

Except that no grease trap shall be smaller than 1,500 gallons, no single separator shall be larger than 3,000 gallons and where requirements exceed 3,000 gallons multiple units shall be used. In cases of certain fast food restaurants or establishments with potential to discharge large quantities of grease and oil, capacity requirements greater than 25 gallons per seat may be required. Prepackaged or manufactured grease traps may be approved by the Manager with proper engineering and application review.

C. ADDITIVES.

The use of any additives, such as enzymes, chemicals or bacteria, as a substitute for grease traps or grease trap maintenance is prohibited. The use of additive as a supplement to grease trap or sewer line maintenance maybe authorized by the Authority after proper documentation and efficiency review. This authorization shall be obtained from the Authority Manager or Authority Engineer.

D. GREASE TRAP MAINTENANCE.

1. PUMPING.

All grease traps shall be maintained by the user at the user's expense. Maintenance shall include the complete removal of all of the contents, including floating materials, wastewater and bottom sludges and solids. Decanting or discharging of removed waste back into the trap from which the waste was removed or to any other grease trap or sanitary sewer connection for the purpose of reducing the volume to be hauled is prohibited.

2. PUMPING FREQUENCY.

All grease traps shall be completely pumped out at a minimum of once every three months, or more frequently as required by the Authority.

E. MONITORING, INSPECTION AND ENTRY.

3. MONITORING.

When required by the Authority, the user shall install a suitable manhole on the discharge sewer to allow observation, sampling and measurement of waste waters. This manhole shall be installed as to be safe and accessible at all times.

4. INSPECTION AND ENTRY.

Any authorized representative of the Authority bearing proper credentials and identification shall be permitted to enter and inspect all properties without prior notification. This right of inspection shall, include the right to measure, observe, sample, test, record, review and make copies of all pertinent documents, in accordance with this section.

F. ADMINISTRATION

1. PERMIT.

It shall be unlawful for any food service establishment to discharge process wastewaters into any Authority WRF without authorization from the Authority. Permits issued by the Authority shall have a duration of not more than five years.

2. MANIFEST.

All waste pumped from grease traps must be tracked by a manifest which confirms pumping, hauling and disposal of wastes. This manifest shall contain the following information:

a. Generator information, including name, address, volume pumped, date and time of pumping and signature of the generator verifying the information.

b. Transporter information, including company name, address, license plate number, permit number and driver's name and signature verifying transporter information.

c. Receiving information, including company name, address, date and time of receiving, EPD number and signature verifying receipt of the waste.

3. MAINTENANCE LOG.

A log indicating each pumping for the previous 12 months shall be maintained by each food service establishment. This log shall be kept in a conspicuous location where it can be inspected by the health department and Authority personnel.

4. REPORTING.

The information required in the maintenance log must be submitted to the Authority annually. The period shall be from January 1 to December 31 of each calendar year. The report must be submitted to the office of the JCWSA Engineer, within 30 days of the end of the reporting period.

8.1 SEWER EASEMENTS & CAPACITY UPGRADE POLICY

RESIDENTIAL SEWER EASEMENT, EASEMENT SEWER LINE, & SEWER CAPACITY UPGRADE POLICY

At the regularly scheduled JCWSA Board meeting on July 13th, 2006, three (3) policies relating to proposed developments involving connection to the Jackson County Water and Sewerage Authority's sewerage system were adopted for inclusion into the Authority's sanitary sewer construction standards and specifications, Section 2.1.1.

8.1.1 EASEMENT.

At the time an owner or authorized representative submits the completed Authority's "Preliminary Application", the preliminary plans must clearly indicate a proposed easement for access for future use by adjacent property owners that lie within the drainage basin. The location of the easement shall be located to maximize the connectivity of adjoining properties within the drainage basin of the proposed development or in accordance with the Authority's "Sewer Service Master Plan". The easement shall extend to the proposed development's property boundary line. Approval of the easement's location by the Authority shall be during the Authority's review of the "Preliminary Application" and plans. If the "Preliminary Application" is approved by the JCWSA Board, the proposed easement shall be conveyed to the Jackson County Water and Sewerage Authority at the time payment is received for review of the "System Engineering Application" and accompanying plans. Said easement shall be free of any encumbrances, to include existing deeds to secure debt or other liens. The engineering application and plans shall be considered incomplete and not be reviewed without a perpetual, unencumbered forty (40') foot wide easement conveyed to the Jackson County Water and Sewerage Authority.

8.1.2 EASEMENT SEWER LINE.

The owner or authorized representative of the proposed development requiring an easement for sewer access for serving additional areas of the drainage basin shall also be required to install a sewer line within said easement; the sewer line's termination shall be located at the proposed development's property boundary. The proposed line size shall be of adequate capacity to accommodate all anticipated wastewater flows that may eventually be generated from the drainage basin and be in compliance with the Authority's anticipated needs in the vicinity of the project. The proposed easement line shall be shown on the preliminary plan with the "Preliminary Application" or the Authority shall consider the application incomplete and the review process shall not continue. The cost of the required sewer line design and construction which is within an easement and terminated at the development's boundary shall be paid for by the proposed development's owner/representative.

8.1.3 CAPACITY UPGRADE.

Owners or developers wishing to access the Jackson County Water and Sewerage Authority's wastewater collection system through an existing development must adhere to the following guidelines:

A. For gravity systems, owner/developer shall indicate the required line upgrades (if any) in the existing development necessary to accommodate the increased flow through the proposed development, as well as other potential developments that may contribute wastewater from that drainage basin. Line sizing shall be in compliance with the latest version of the Authority's "Sewer Service Master Plan".

B. If the existing development has a wastewater pump station which shall receive flow from the proposed development, including other potential developments that may contribute wastewater from that drainage basin, all upgrades required (if any) shall include: (1) increased wet well capacity (2) increased pump capacities (3) additional pumps (4) increased force main capacity. All calculations must be shown (see d.)

C. All costs associated to upgrade capacity in sewer lines, pump stations and force mains dictated by the Authority or its "Sewer Service Master Plan" shall be paid for by the owners/developers requiring additional wastewater capacity for their proposed development(s). The Jackson County Water and Sewerage Authority shall not contribute to any costs incurred for capacity upgrades in any way. The Authority shall not cost share, offer sewer tap discounts, or offer sewer tap rebates to any owner, development, or developer. The Authority shall not collect any additional revenues from any proposed or existing development for present or future disbursement to any owner, development, or developer.

D. Submittals for capacity upgrades shall follow the procedures specified in the Authority's "Sewer Construction Standards", Section 1.C; making certain as a first step the Authority's Water and Sewer "Preliminary Application" and "Preliminary Application Checklist" are completed in their entirety. Capacity upgrades not included with proposed development(s) shall include separate review fees of $50.00 for the preliminary application and plans and $250.00 for the review of the "Engineering Application" and construction plans.

No part of this policy is intended to guarantee or infer sewer capacity availability at any of the Jackson County Water and Sewerage Authority's Water Reclamation Facilities.

8.2 MODULAR PLANT POLICY

Adopted by the JCWSA Board April 20, 2006

For the purposes of this policy, a modular plant is one that is isolated based on topography and access to Authority-owned sewer lines. The JCWSA Board reserves the right to modify, approve or disapprove any modular plant based on current or anticipated sewerage accessibility conditions in the area surrounding the proposed plant, including consideration of whether the proposed plant complies with the JCWSA "Master Sewer Service Plan".

A Developer seeking to construct a wastewater treatment plant to provide sewer service in an area of the County not currently served by sewer shall enter into an agreement with the JCWSA. As a minimum, the agreement shall address the General Requirements listed below:

8.2.1 GENERAL REQUIREMENTS

Guidelines for JCWSA Board approval of a modular system are as follows:

1. The proposed plant shall be sized to accommodate the flows of each phase of the development. The design shall demonstrate the plant's ability to efficiently and effectively operate during minimum and maximum flows. The plant shall be designed to meet 100% of the treatment needs of the project(s) to be served at 80% of the plant capacity. The JCWSA reserves the right to use the remaining 20% of the capacity for contingency or as it determines.

2. All costs associated with the design, permitting and construction of the entire facility shall be borne by the Developer, including obtaining an N.P.D.E.S. Permit if required. The Developer shall be responsible for the costs of review of the plant design and observation of construction by the JCWSA consultant.

3. Should a "Wasteload Allocation" from Georgia's Environmental Protection Division be required, the Developer shall make application for such and, if all conditions set forth by the JCWSA are met; the JCWSA shall assist the Developer in obtaining the "Wasteload Allocation".

4. A Developer proposing any land application of the proposed plant's effluent shall be responsible for acquiring all land necessary for disposal of such through the project's projected life. Developer must provide the JCWSA with adequate proof that the land in question shall be available for effluent disposal for the entire term of the proposed plant's projected life.

5. No proposed plant shall be approved unless it services a minimum of 400 lots or 120,000 gallons per day equivalent. If the proposed development shall not provide the minimum flow, the Developer shall permit parcels outside the development to connect to the plant at least until the minimum capacity of 120,000 gallons per day is satisfied. In the event the Authority is expected to obtain ownership and operations of the plant at less than the

minimum committed capacity, the Authority shall expect the Developer to have a contractual obligation with property owners inside or outside the development for treatment of wastewater at the proposed plant up to at least 120,000gpd.

6. No proposed plant shall be approved if any portion of the proposed development's boundaries is closer than 10,000 feet to an existing JCWSA sewer line.

7. No proposed plant shall be approved if access to a JCWSA sewer line, by either gravity line or pump station and force main, is to be available within the foreseeable future, as determined by the JCWSA Board.

8. The Developer shall agree that the proposed plant is to be conveyed to the JCWSA at a time to be designated by the JCWSA Board and upon the satisfaction of those standards and conditions set by the JCWSA Board. Said conveyance shall include the transfer of all plant equipment, a quit claim deed for the property upon which the plant equipment is located, as well as the conveyance of all easements and access rights necessary for the operation and maintenance of the plant. In the event the JCWSA determines that the plant is to be abandoned, upon abandonment the JCWSA shall deed the plant's property back to the developer or homeowner's association to be used as greenspace.

9. The Developer shall provide a bond equal to 100% of the estimated cost of the plant to ensure proper construction, operation, and maintenance of the plant until acceptance by the JCWSA. The estimated cost shall be determined by the JCWSA or its consultant based on a review of the design plans.

10. The JCWSA reserves the right to establish and charge usage fees for reuse water upon acceptance of the plant.

11. The Authority shall not take ownership of any plant until all standards and conditions are met and accepted by the JCWSA Board at a regularly scheduled JCWSA board meeting. The Board reserves the right to delay taking ownership of any plant for reasons including, but not limited to: (a) manufacturer warranty issues (b) Georgia Environmental Protection Division violations (c) material/contractor liens, or (d) unresolved litigation or potential litigation as it relates to the plant or development as a whole. The Developer is responsible for the costs of operation and maintenance of the plant until the Authority takes ownership. All operations and maintenance must be performed by operators that have been duly certified by the State of Georgia.

12. The JCWSA Board shall, on a case-by-case basis, decide the percentage of the future sewer tap fees to be applied toward the capital cost of the proposed plant. Factors for calculating percentages include:

    a) The ability to readily expand the proposed plant and absorb additional or potential wastewater customers for the Authority in the general area.

b) The type of proposed plant including the technology employed its estimated energy consumption, its estimated staffing requirements, its permitted effluent guidelines, its method of effluent disposal and its treatable capacity at the project's proposed build-out.

c) The usable life of the proposed plant which the JCWSA and its consultant shall assess.

13. The JCWSA shall approve the type of plant, equipment selection, location, and method of wastewater disposal on a case-by-case basis. Issues that may be considered by JCWSA in evaluating a proposed plant include, but are not limited to:

a) Operations costs

b) Reliability

c) Treatment efficiency

d) Equipment considerations include:

i) Efficiency

ii) Maintenance requirements

iii) Performance history

iv) Warranties

e) Useful life of the plant

8.3 CASH IN LIEU OF MAINTENANCE BOND

JACKSON COUNTY WATER AND SEWERAGE AUTHORITY

RESOLUTION AMENDING STANDARD SPECIFICATIONS TO PROVIDE

FOR PAYMENT OF CASH IN LIEU OF MAINTENANCE BOND.

WHEREAS, the Jackson County Water and Sewerage Authority ("Authority") is a political subdivision of the State of Georgia, providing water and sewerage services to the citizens of Jackson County;

WHEREAS, on February 12, 2015, the Authority adopted revised Standard Specifications, which are on file with the Authority;

WHEREAS, Section 1.2.5.E of said Standard Specifications, entitled "Policy: Accepting Water and Wastewater Improvements," governs the acceptance of water and wastewater infrastructure from a Developer;

WHEREAS, since the adoption of the revised Standard Specifications, the Authority has become aware of developers who cannot provide the maintenance bonds required in Section 1.2.5.E due to legal and regulatory impediments; and

WHEREAS, in light of this limitation, the Authority has decided to provide an alternative to maintenance bonds in the form of a cash payment into a specially created account maintained by the Authority.

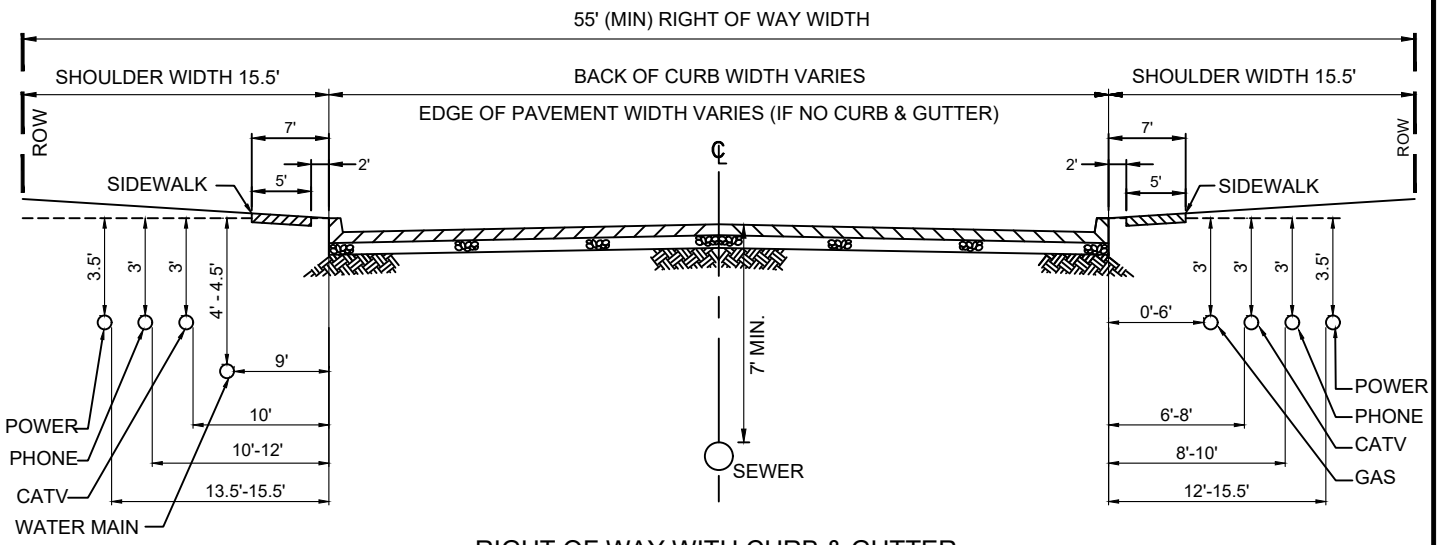
NOW THEREFORE, BE IT RESOLVED, that the Jackson County Water and Sewerage Authority, by and through its Board, directs as follows:

1. Amendment: Commencing on the date of this resolution, Paragraph 1.2.5.E. of the Standard Specifications shall be amended to add the following provision, to be known as Paragraph 1.2.5.E.6:

"6. Cash Maintenance. As an alternative to the maintenance bond required under Section 1.2.5.E.4 the Authority may accept the payment of an equivalent amount in United States Dollars, to be held in an account created, maintained, and controlled by the Authority. Said cash funds are to be held until the later of two years or when Certificates of Occupancy have been issued on 75 percent of the principal buildings on the lots shown on the project's final plat. The required amount of the cash funds shall be the same as required for Maintenance Bonds pursuant to Paragraph 1.2.5.E.5. The Authority shall prepare a form Agreement For The Deposit Of Cash Security Funds To Insure Correction Of Defective Water/Sanitary Sewer Improvements to govern and direct the receipt, management, and control of the cash funds and account, said form to be approved by the Authority Board ("Cash Maintenance Agreement"). The Authority Manager is authorized to execute all Cash Maintenance Agreements with the Developer."

Cash in Lieu of Maintenance Bond, Revision 0, 12-Feb-2015

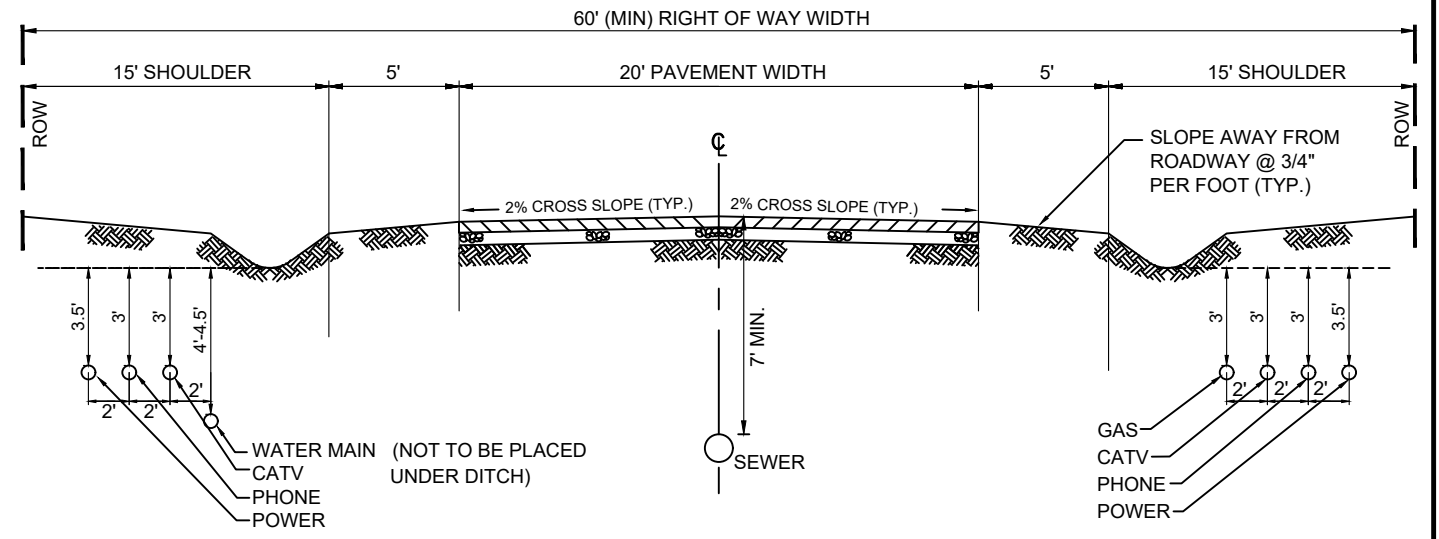
SECTION 9: **APPENDIX – D: DETAIL DRAWINGS**



RIGHT OF WAY WITH CURB & GUTTER

NOTES:

1. CURB AND/OR STREET MUST BE COMPLETE BEFORE UTILITIES CAN BE INSTALLED (EXCLUDING SEWER).
2. MEASURE UTILITY LOCATION FROM BACK OF CURB.
3. LOCATE WATER ON NORTH OR WEST SIDE OF STREET. LOCATE GAS ON SOUTH OR EAST SIDE OF STREET. RECOMMENDED PLACEMENT IS BACK EDGE OF CORRIDOR TO MINIMIZE DAMAGE TO SIDEWALKS.



RIGHT OF WAY WITHOUT CURB & GUTTER

NOTES:

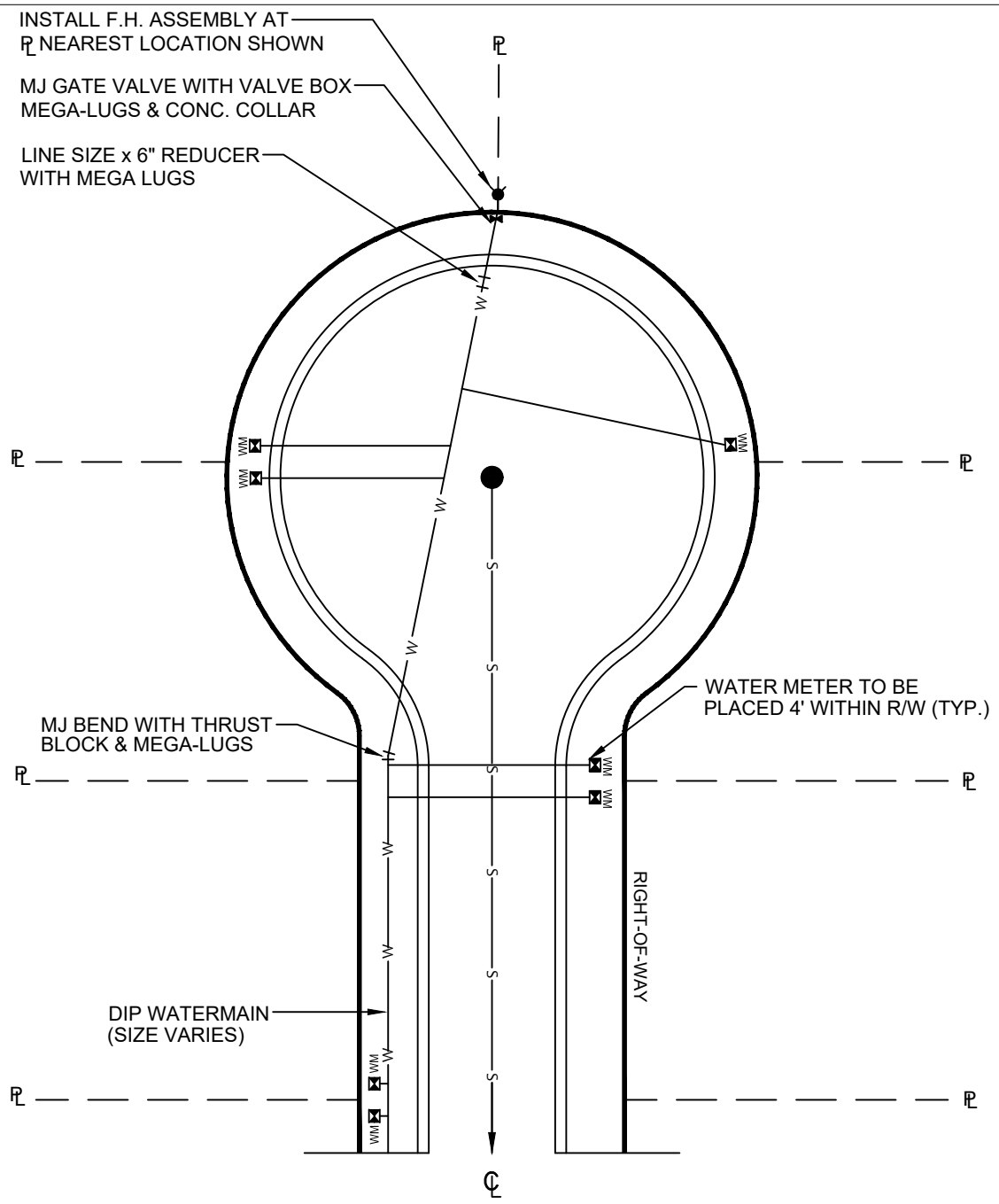
1. CURB AND/OR STREET MUST BE COMPLETE BEFORE UTILITIES CAN BE INSTALLED.
2. MEASURE UTILITY LOCATION FROM OUTSIDE EDGE OF DITCH (SEE ILLUSTRATION).
3. LOCATE WATER ON NORTH OR WEST SIDE OF STREET. LOCATE GAS ON SOUTH OR EAST SIDE OF STREET.

JCWSA STANDARD DETAIL C-1
UTILITY PLACEMENT

SCALE: NTS

DATE: 08/23

JCWSA
WATER & SEWERAGE AUTHORITY



PLAN

LEGEND:

WM	WATER METER
S	SANITARY SEWER (S.S.)
	S.S. MANHOLE
W	POTABLE WATERMAIN
℄	PROPERTY LINE

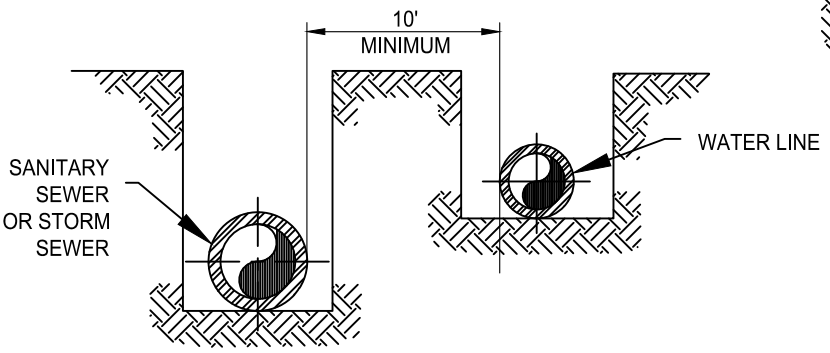
NOTES:

1. DETAIL IS NOT APPLICABLE WHERE LOOPING OR FUTURE. CONTINUATION OF MAIN IS REQUIRED.
2. LIMIT DEAD-ENDS OF WATER MAIN WHENEVER POSSIBLE. REFER TO JCWSA SPECIFICATIONS.
3. WATER METERS TO BE PLACED 4' WITHIN THE RIGHT-OF-WAY (TYP.)

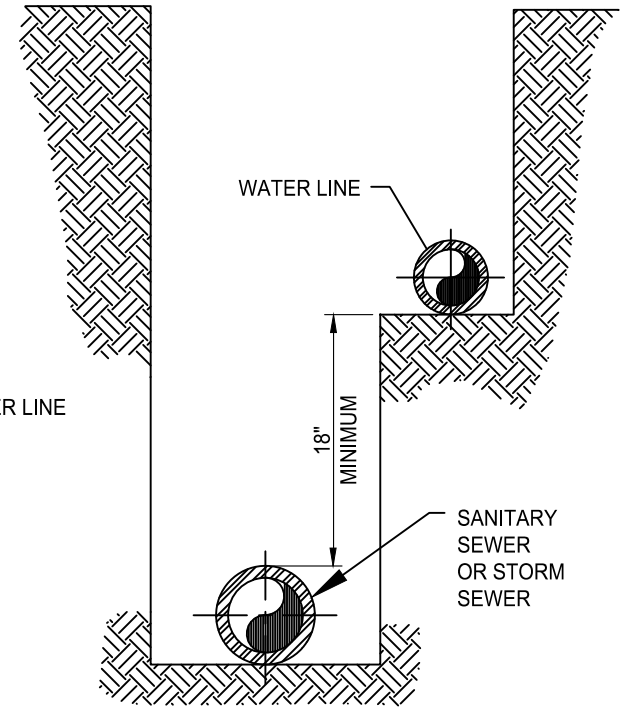
JCWSA STANDARD DETAIL C-2
WATERLINE LOCATION IN CUL DE SAC

SCALE: NTS
DATE: 08/23

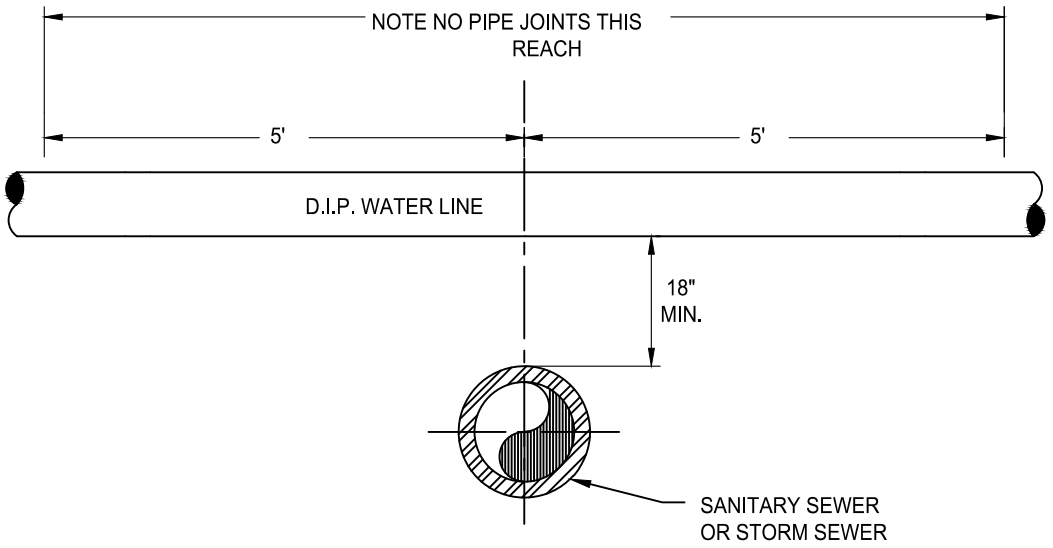
JCWSA
WATER & SEWERAGE AUTHORITY



HORIZONTAL SEPARATION



VERTICAL SEPARATION



SEPARATION AT CROSSINGS

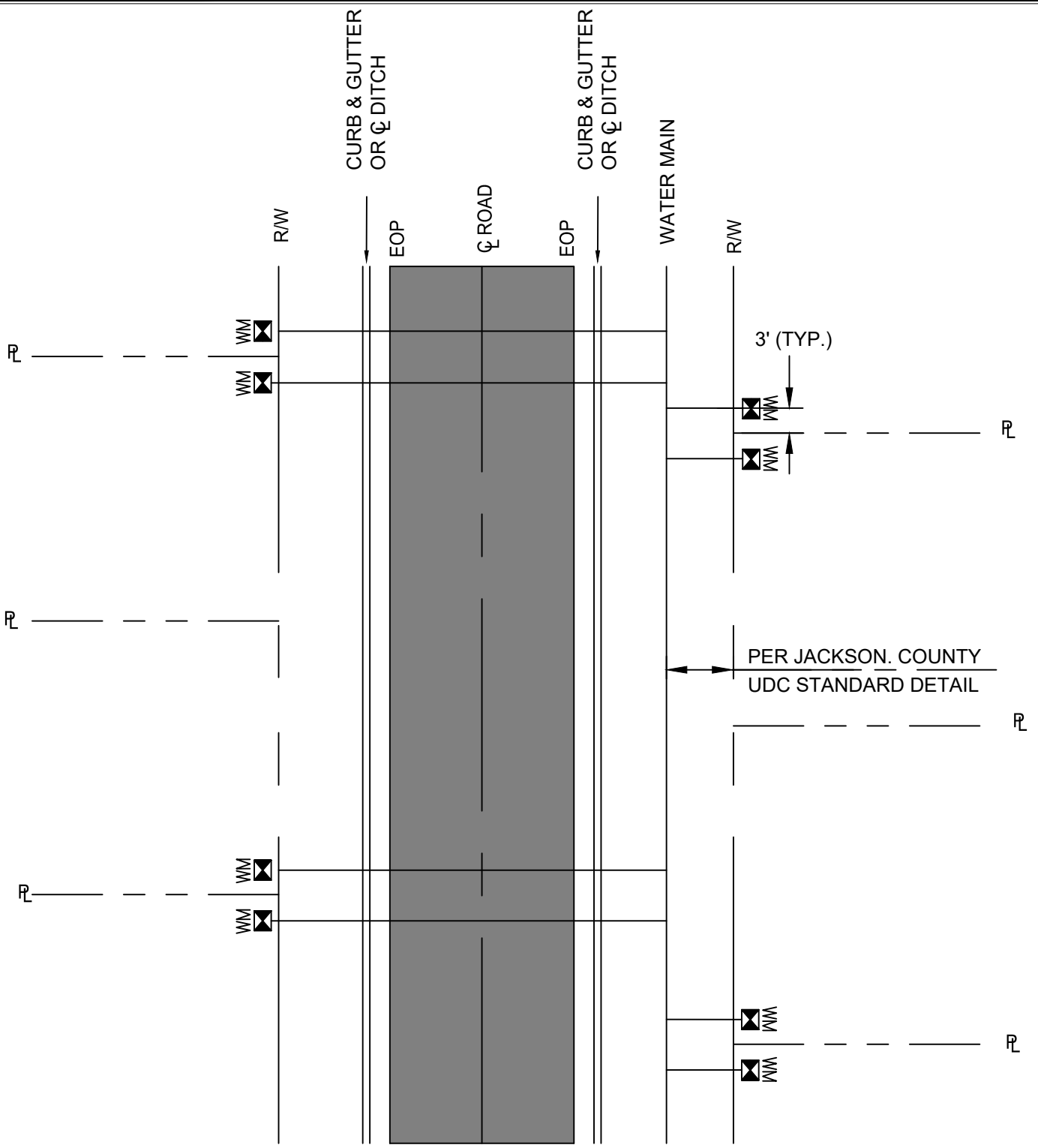
NOTES:

1. WHERE MINIMUM CLEARANCES CANNOT BE MAINTAINED, ALTERNATE PROCEDURES ARE REQUIRED. REFERENCE AUTHORITY STANDARDS AND CONTACT AUTHORITY ENGINEER WHEREVER CLEARANCES SHOWN CANNOT BE MET.

JCWSA STANDARD DETAIL C-3
WATER & SEWER CLEARANCE

SCALE: NTS
DATE: 08/23

JCWSA
WATER & SEWERAGE AUTHORITY



NOTES:

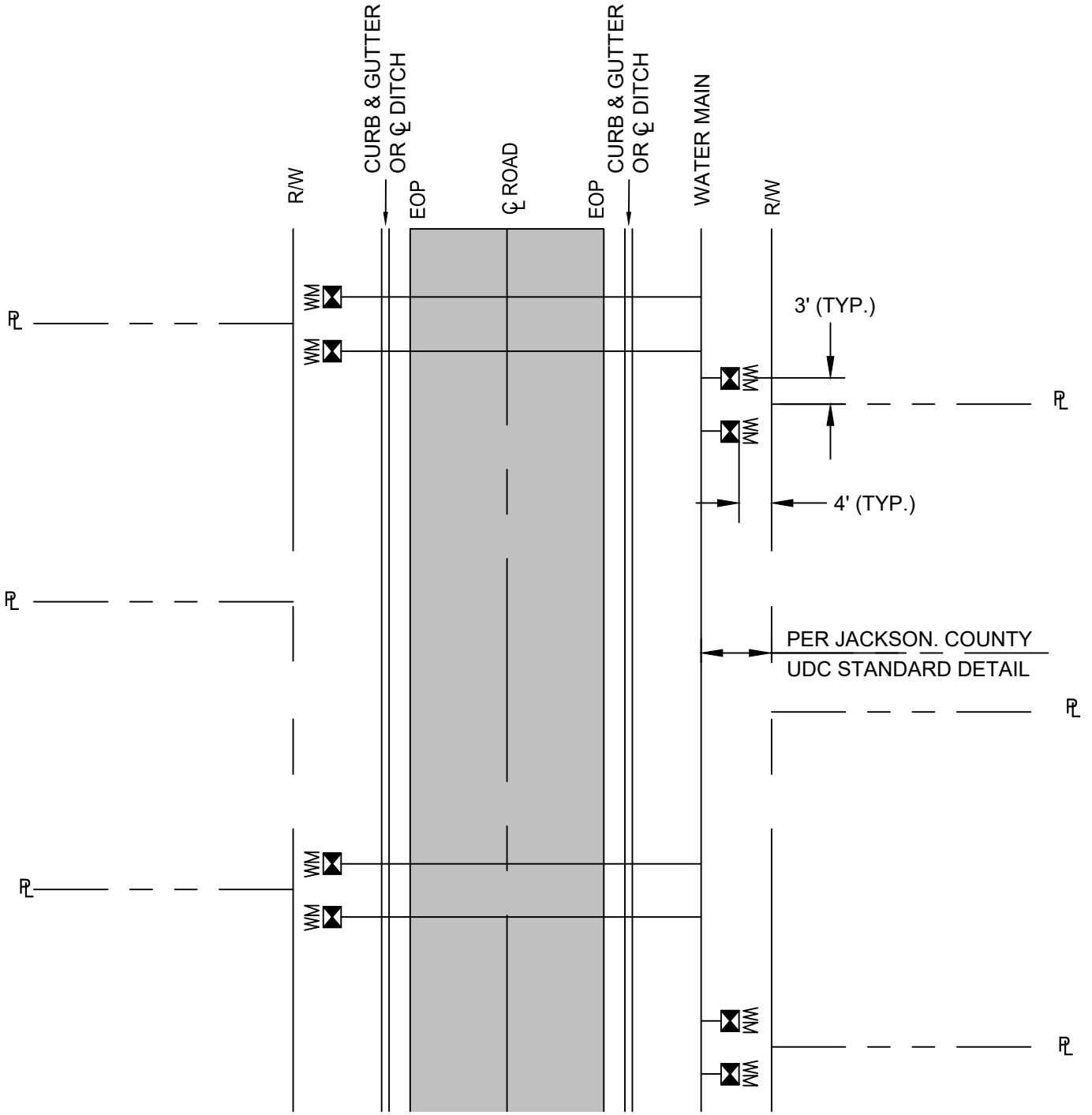
(1) USE CONTINUOUS PIECE OF COPPER TUBING FROM WATER MAIN TO EACH WATER METER CONNECTION. NO SPLICES OR JOINTS UNDER ROADWAY ALLOWED IN COPPER TUBING.

(2) RUN COPPER LINES STRAIGHT ACROSS ROADWAY, AS SHOWN ON PLAN, IN TWO SEPARATE TRENCHES.

JCWSA STANDARD DETAIL C-4
TYPICAL METER PLACEMENT

SCALE: NTS
DATE: 08/23

JCWSA
WATER & SEWERAGE AUTHORITY



NOTES:

(1) USE CONTINUOUS PIECE OF COPPER TUBING FROM WATER MAIN TO EACH WATER METER CONNECTION. NO SPLICES OR JOINTS UNDER ROADWAY ALLOWED IN COPPER TUBING.

(2) RUN COPPER LINES STRAIGHT ACROSS ROADWAY, AS SHOWN ON PLAN, IN TWO SEPARATE TRENCHES.

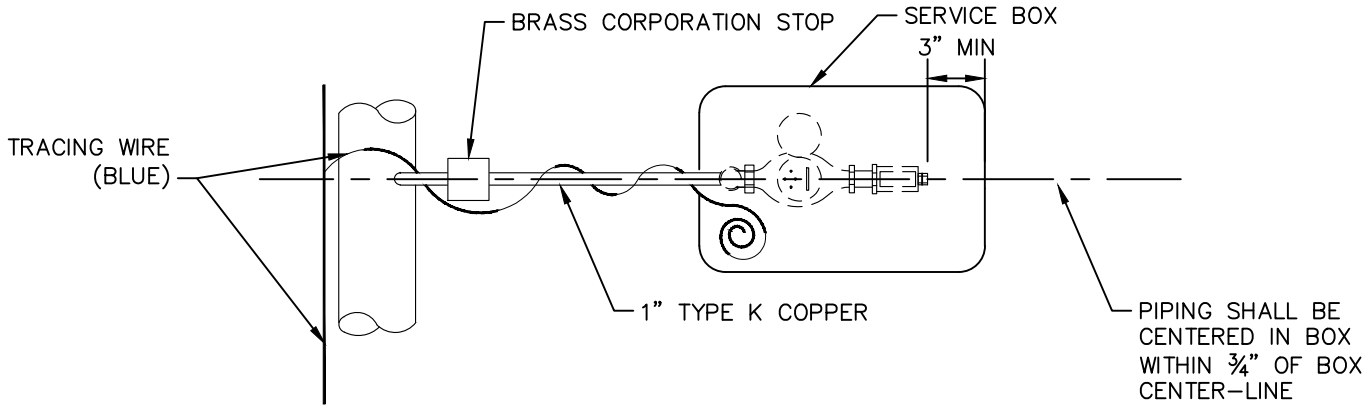
(3) WATER METERS TO BE PLACED 4' WITHIN THE RIGHT-OF-WAY & 3' OFF OF THE PROPERTY LINE (TYP.).

JCWSA STANDARD DETAIL C-4A
TYPICAL SUBDIVISION METER PLACEMENT

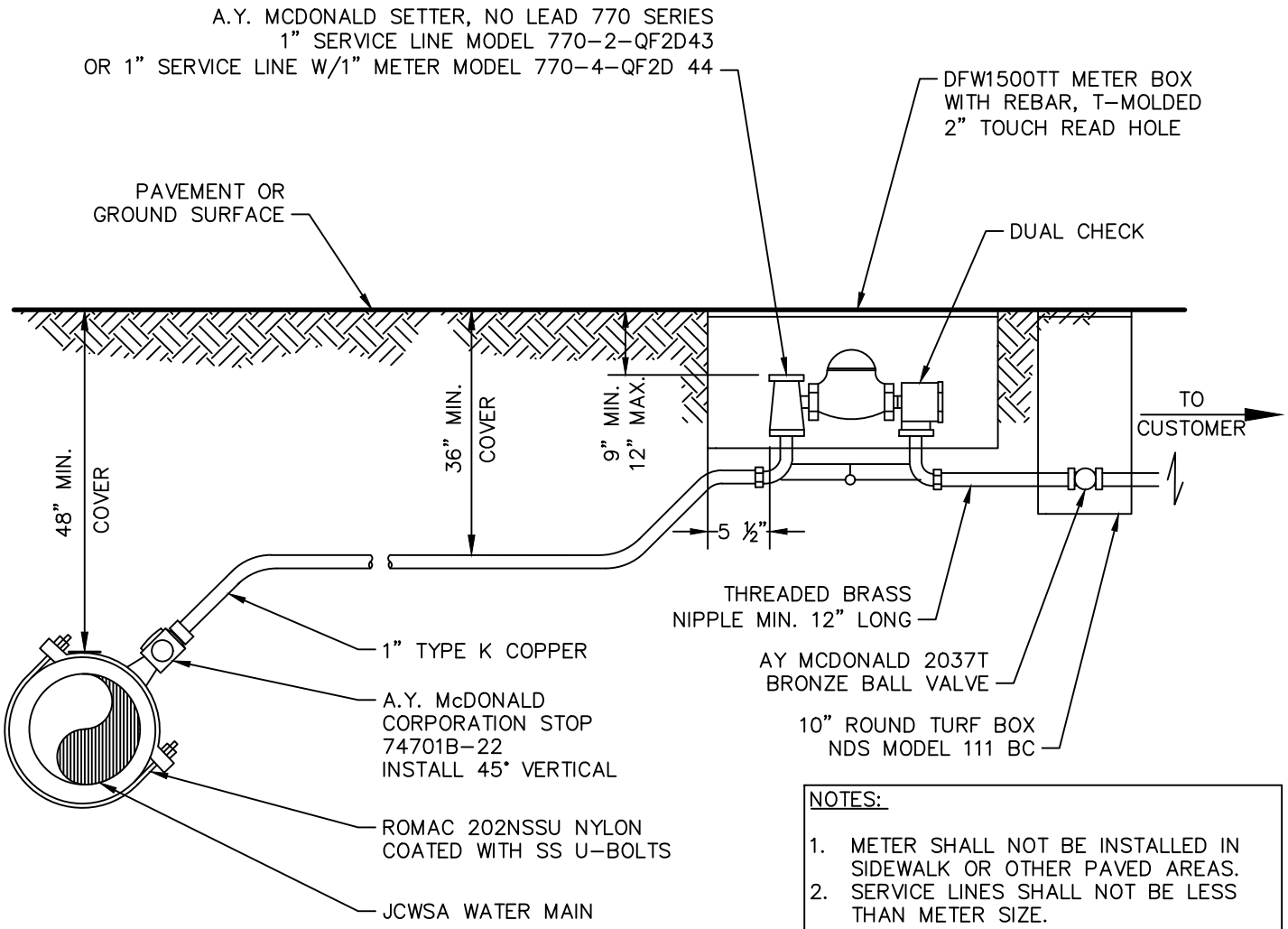
SCALE: NTS

DATE: 08/23

JCWSA
WATER & SEWERAGE AUTHORITY



PLAN VIEW



PROFILE VIEW

NOTES:

1. METER SHALL NOT BE INSTALLED IN SIDEWALK OR OTHER PAVED AREAS.
2. SERVICE LINES SHALL NOT BE LESS THAN METER SIZE.
3. SERVICE BOX SHALL HAVE CHAMFERED RIM TO SELF SUPPORT SOILS.
4. SETTER TO BE CENTERED IN BOX TO WITHIN ± ¾"

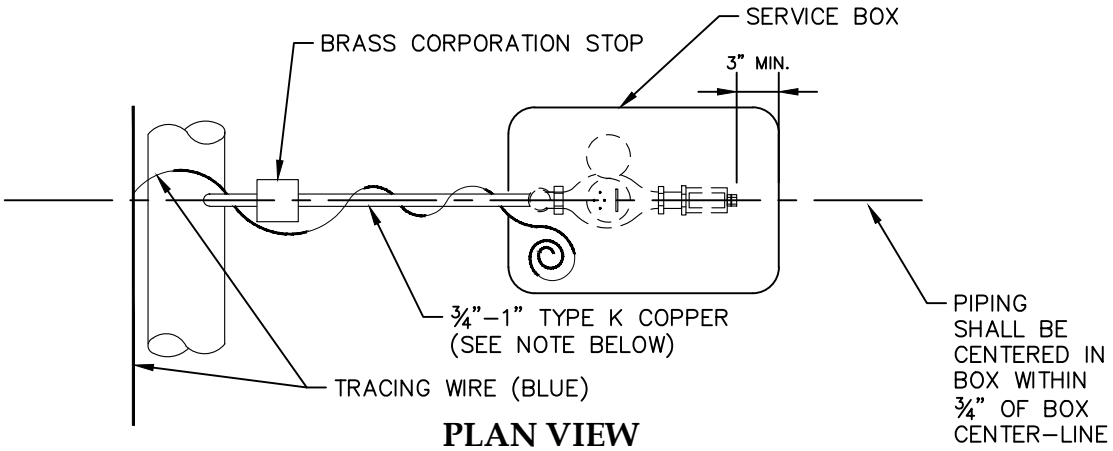
JCWSA STANDARD DETAIL C-5

¾" & 1" RESIDENTIAL METER DETAIL

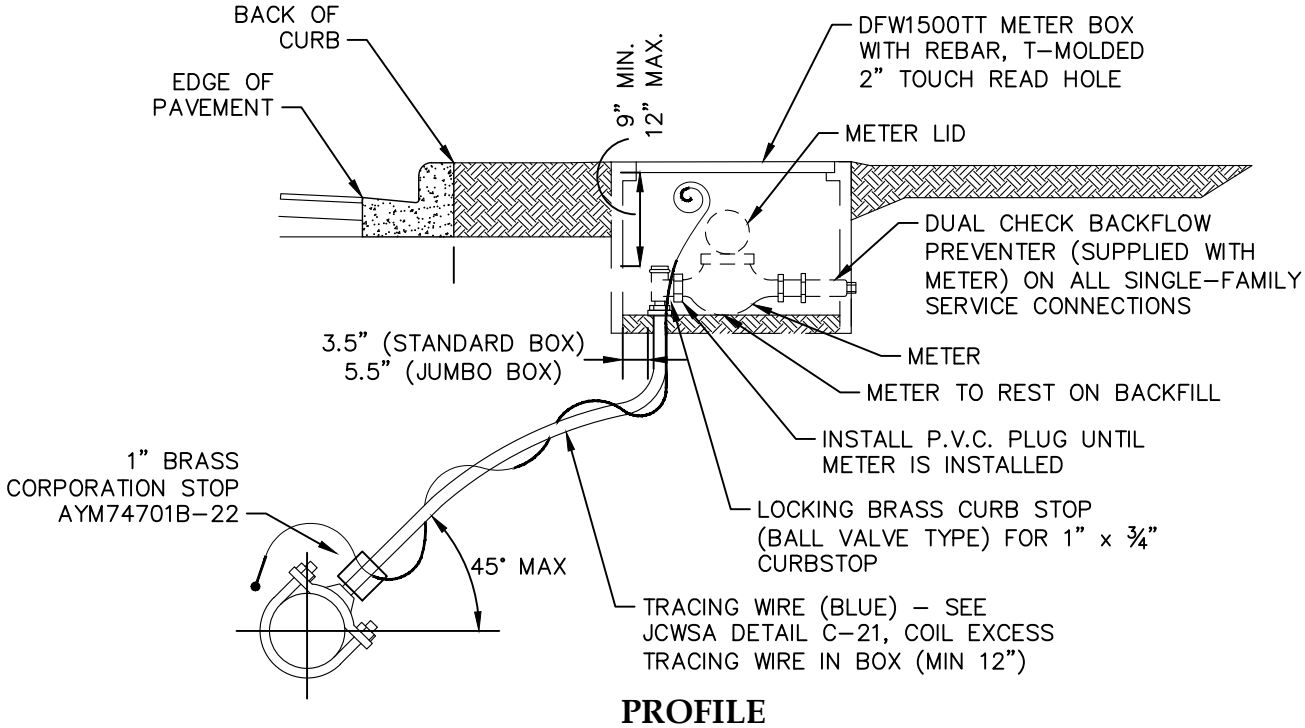
SCALE: NTS

DATE: 08-23

JCWSA
WATER & SEWERAGE AUTHORITY



PLAN VIEW



PROFILE

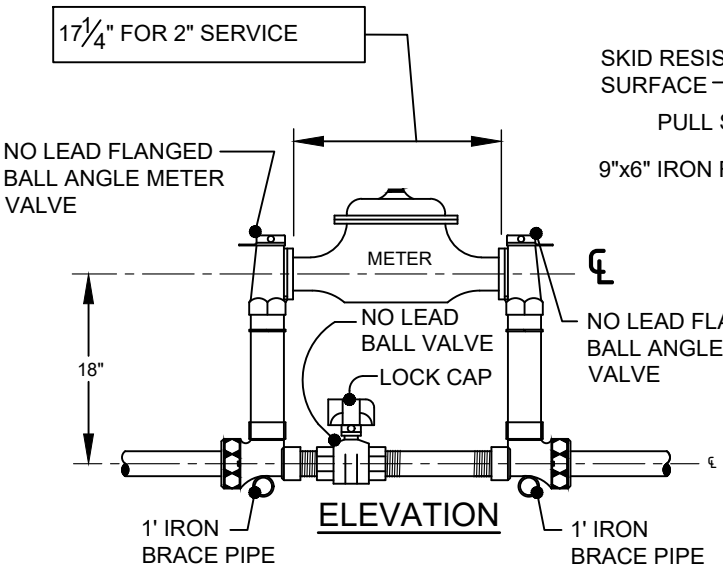
NOTES:

1. THIS DETAIL ONLY APPLIES TO OLDER SUBDIVISIONS WHERE SERVICE STUBS HAVE ALREADY BEEN INSTALLED. USE JACKSON COUNTY WATER & SEWER AUTHORITY DETAIL C5 FOR ALL NEWLY INSTALLED CONNECTIONS.
2. JACKSON COUNTY WATER & SEWER AUTHORITY SUPPLIES & INSTALLS THE METER & DUAL CHECK VALVE(S) IN THE SERVICE BOX.
3. METER SHALL NOT BE INSTALLED IN SIDEWALK OR OTHER PAVED AREAS.
4. SERVICE LINES SHALL NOT BE LESS THAN METER SIZE.
5. SERVICE BOX SHALL HAVE CHAMFERED RIM TO SELF SUPPORT SOILS' SIDE PRESSURE.

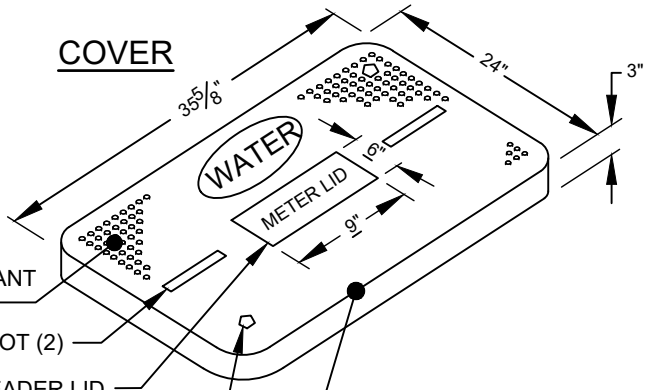
JCWSA STANDARD DETAIL C-5A
¾" RESIDENTIAL METER DETAIL -CURB STOP WITHOUT SETTER

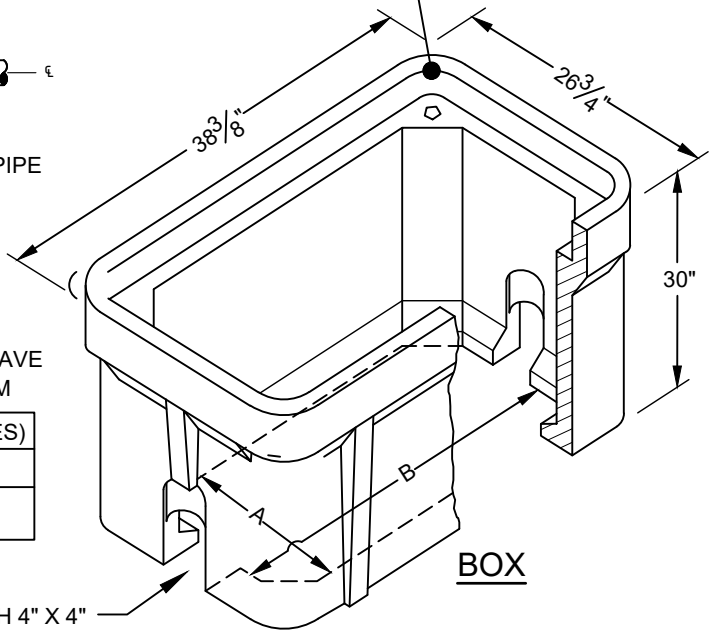
SCALE: NTS - DATE: 08-23

JCWSA
WATER & SEWERAGE AUTHORITY



ELEVATION





BOX

NOTE:
THE VAULT SHALL HAVE AN OPEN BOTTOM

DIMENSIONS(INCHES)	
A	B
18¾"	30⅜"

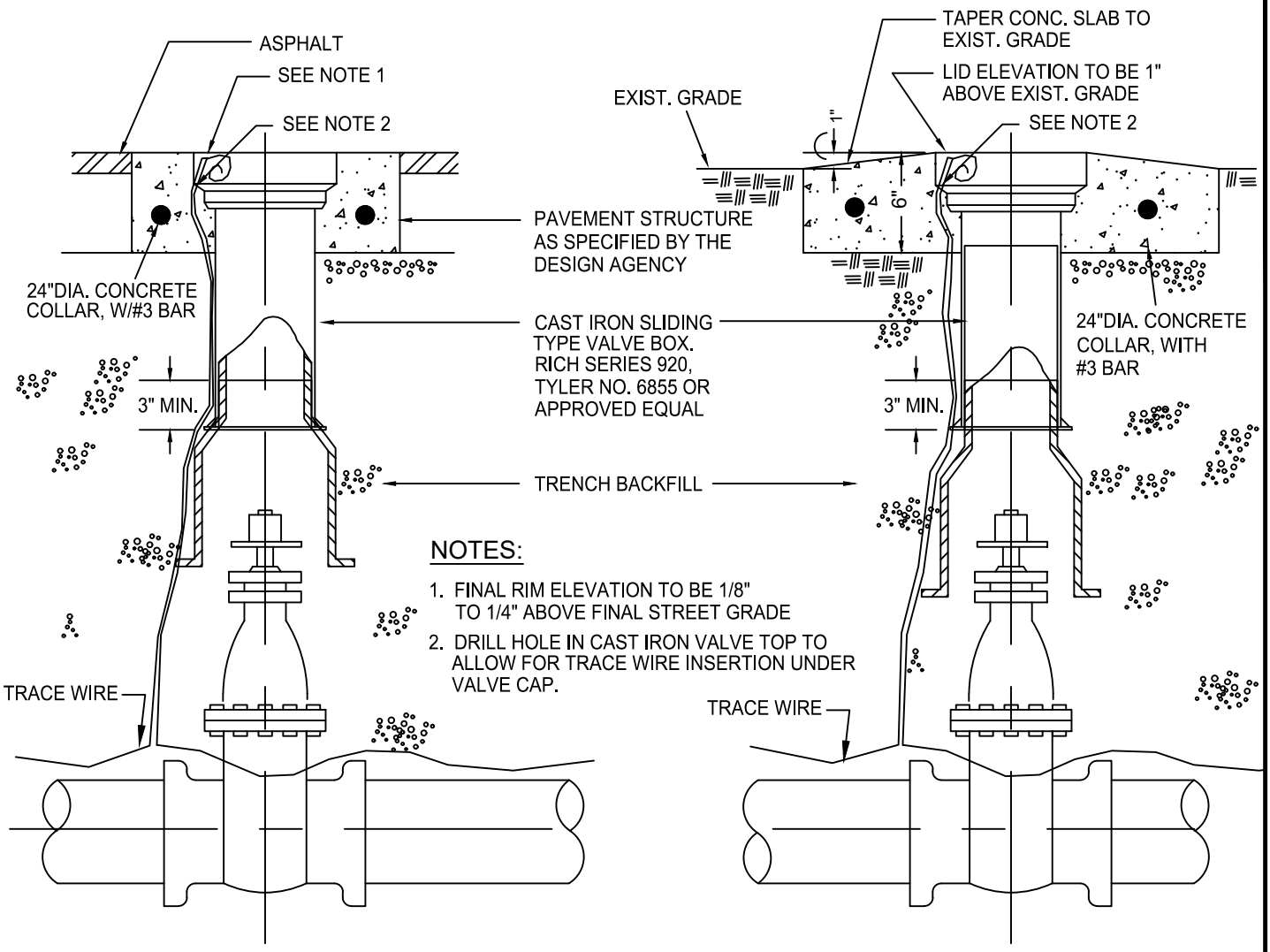
MOUSE HOLES (2)
4" X 4" OPENING WITH 4" X 4" KNOCKOUT ABOVE OPENING

NOTES:
1) PIPING TO BE 'NO LEAD' BRASS AND COPPER TUBING. METER INLET AND OUTLET TO BE EQUIPPED WITH FLANGED BALL ANGLE METER VALVES.
2) CUSTOM SETTERS SHALL BE EQUIPPED WITH STANDARD LOW BYPASS WITH BALL VALVE AND PADLOCK WINGS.
3) CUSTOM SETTERS SHALL BE AS MANUFACTURED BY MUELLER, FORD, AY MCDONALD, OR APPROVED EQUAL.
4) ALL BRASS COMPONENTS SHALL BE 'NO LEAD' BRASS MEETING UNS C89833 AS PER ASTM B584.
5) ALL COMMERCIAL APPLICATIONS REQUIRE A SEPARATE TESTABLE BACKFLOW PREVENTER OR RPZ.
6) CUSTOM SETTER SHALL BE INSTALLED SUCH THAT METER REGISTER IS LOCATED 5 TO 8 INCHES BELOW METER BOX COVER.
7) INSTALL BOX FLUSH WITH GROUND LEVEL.

JCWSA STANDARD DETAIL C-6
2" METER DETAIL

SCALE: NTS
DATE: 08/23

JCWSA
WATER & SEWERAGE AUTHORITY

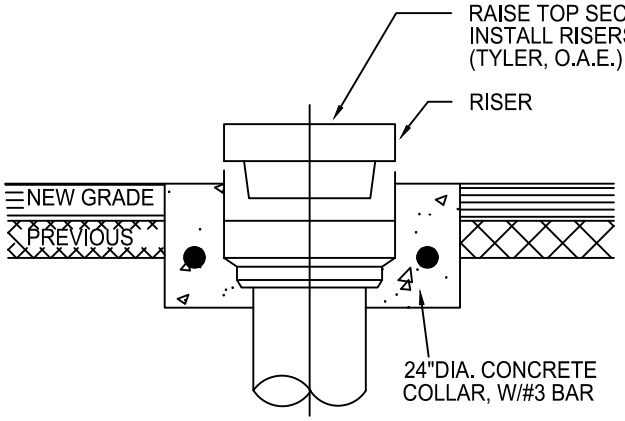


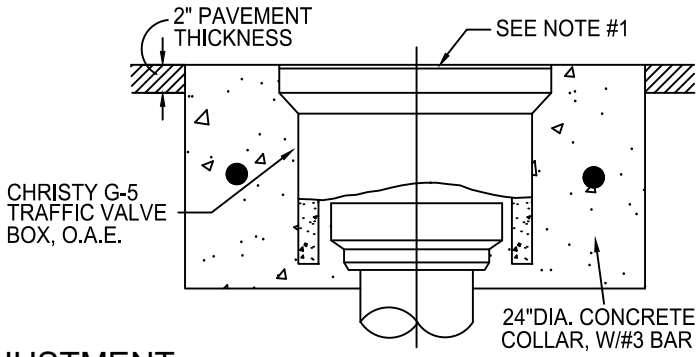
NOTES:

1. FINAL RIM ELEVATION TO BE 1/8" TO 1/4" ABOVE FINAL STREET GRADE
2. DRILL HOLE IN CAST IRON VALVE TOP TO ALLOW FOR TRACE WIRE INSERTION UNDER VALVE CAP.

IMPROVED STREET INSTALLATION

UNIMPROVED INSTALLATION



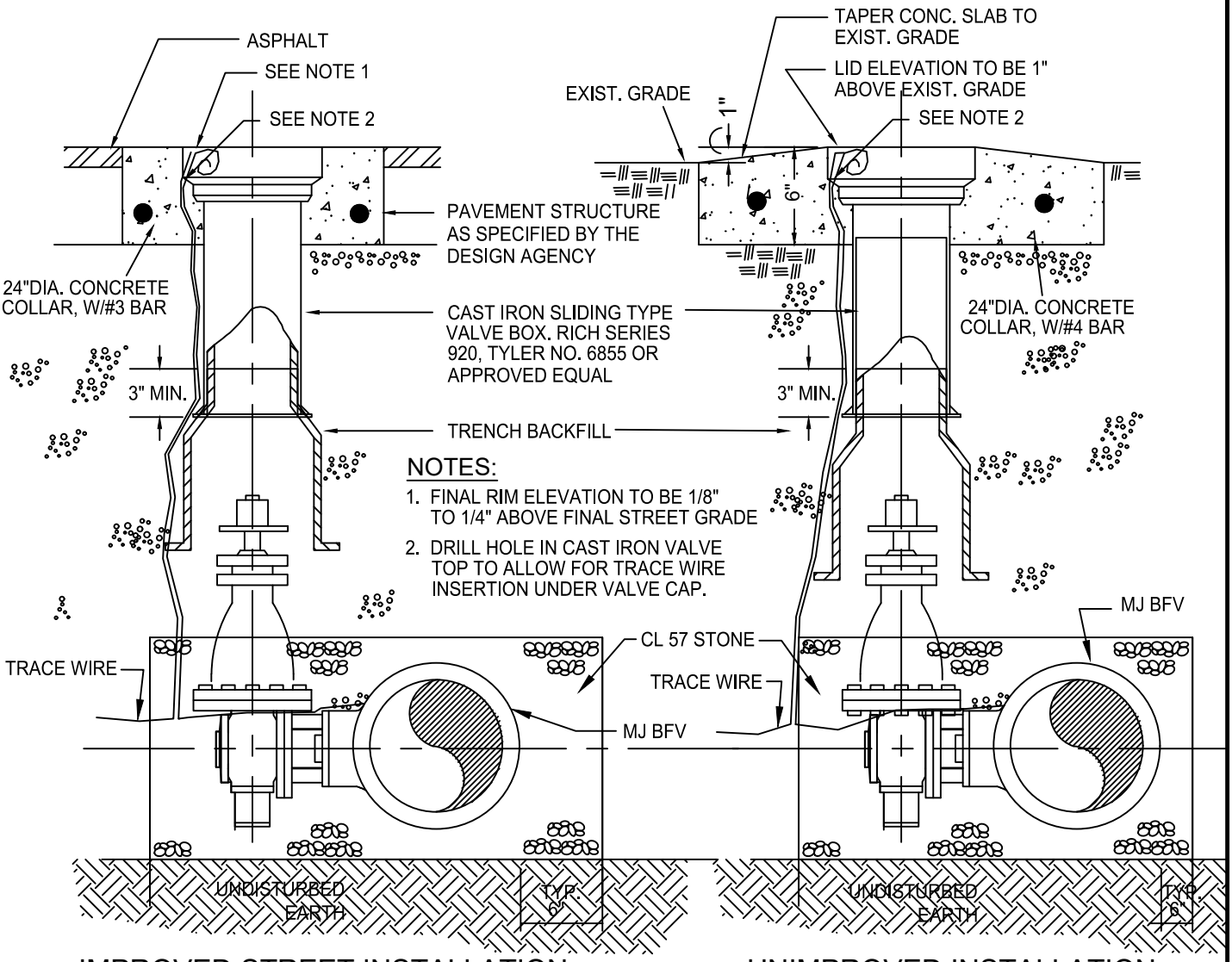


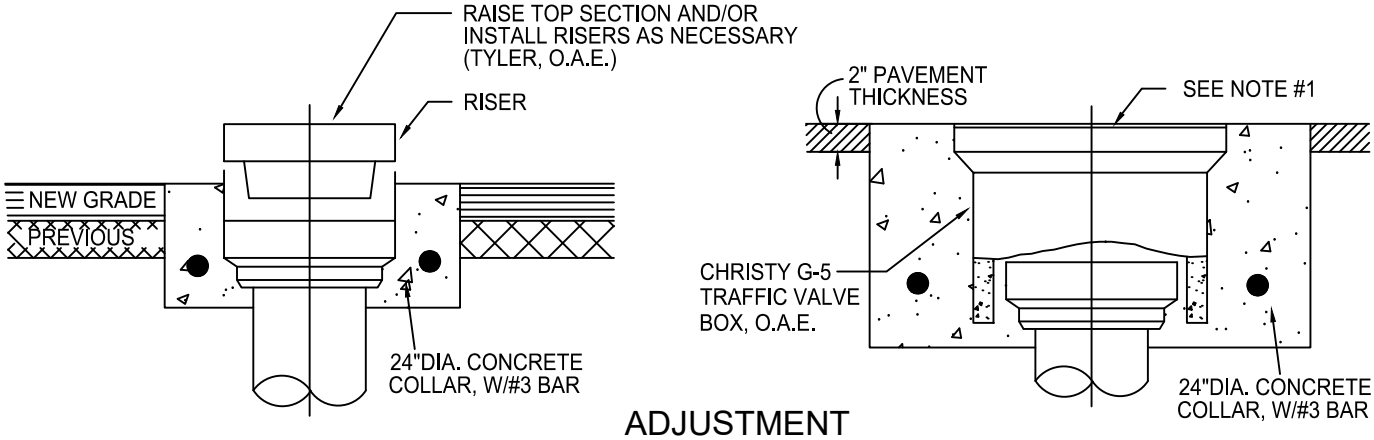
ADJUSTMENT

JCWSA STANDARD DETAIL C-7
BURIED GATE VALVE

SCALE: NTS
DATE: 08/23

JCWSA
WATER & SEWERAGE AUTHORITY





ADJUSTMENT

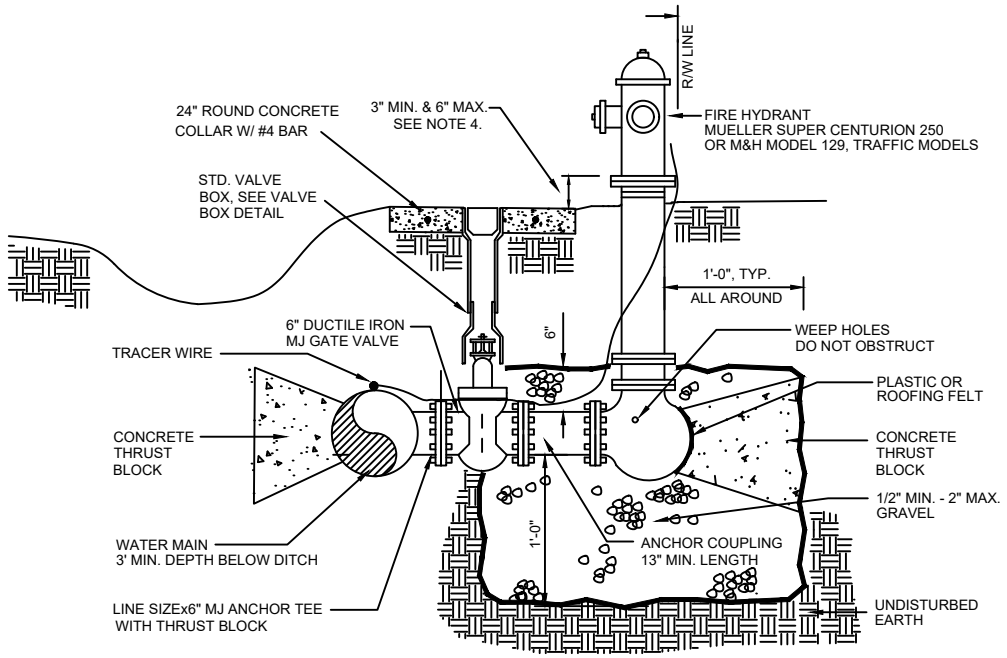
JCWSA STANDARD DETAIL C-8
BURIED BUTTERFLY VALVE

SCALE: NTS
DATE: 08/23

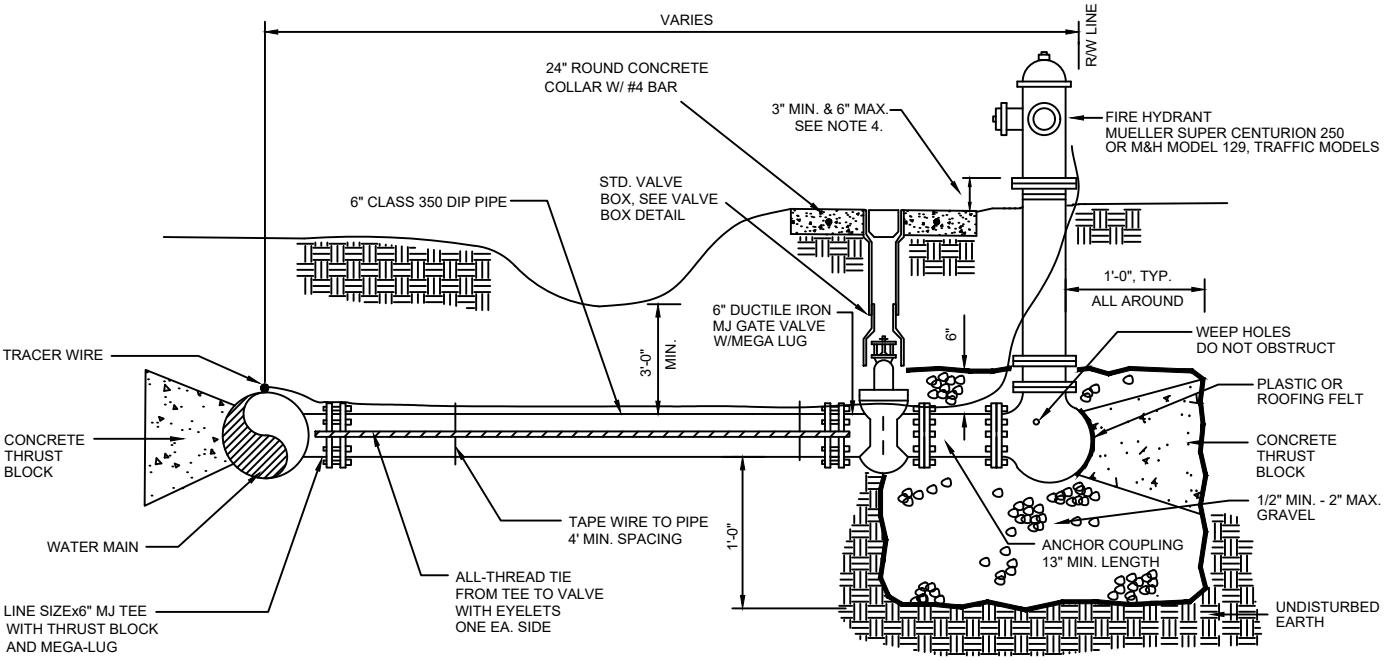
JCWSA
WATER & SEWERAGE AUTHORITY

TYPICAL NOTES:

1. HYRANT SHALL BE DELIVERED SILVER (REFLECTIVE) IN COLOR FROM THE FACTORY.
2. HYDRANT SHALL MEET AWWA C502, RATED 250 PSI OR GREATER.
3. MAIN VALVE SIZE SHALL BE 4 1/2". MAIN PUMPER NOZZLE SHALL BE 4 1/2". DUAL HOSE NOZZLES SHALL BE 2 1/2".
3. INSTALL PROPER HEIGHT RISER TO ACCOMMODATE REQUIRED HEIGHT (3" MIN., 6" MAX.). NO "DISHING" ALLOWED AROUND HYDRANT TO MEET DIMENSION REQUIREMENT.
4. MAINTAIN 3' DIA. CLEAR CIRCLE AROUND HYDRANT NUT.
5. RESTRAIN ALL PIPE AND FITTINGS SHOWN ON DETAIL.



TYPICAL HYDRANT DETAIL



ALTERNATE TYP. HYDRANT DETAIL

USE THIS DETAIL ONLY WHEN MAIN LINE CAN NOT BE INSTALLED AT BACK OF RIGHT-OF-WAY

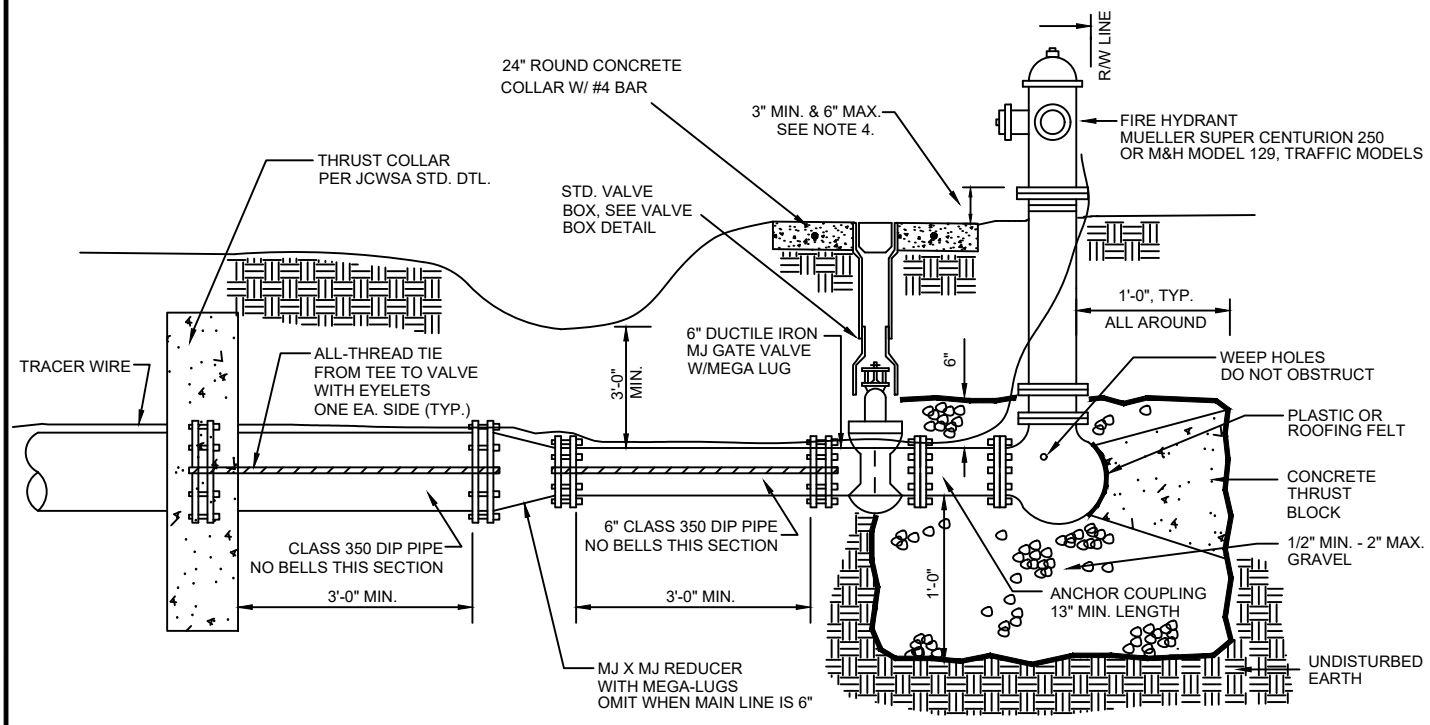
JCWSA STANDARD DETAIL C-9
FIRE HYDRANT ASSEMBLY

SCALE: NTS
DATE: 08/23

JCWSA
WATER & SEWERAGE AUTHORITY

TYPICAL NOTES:

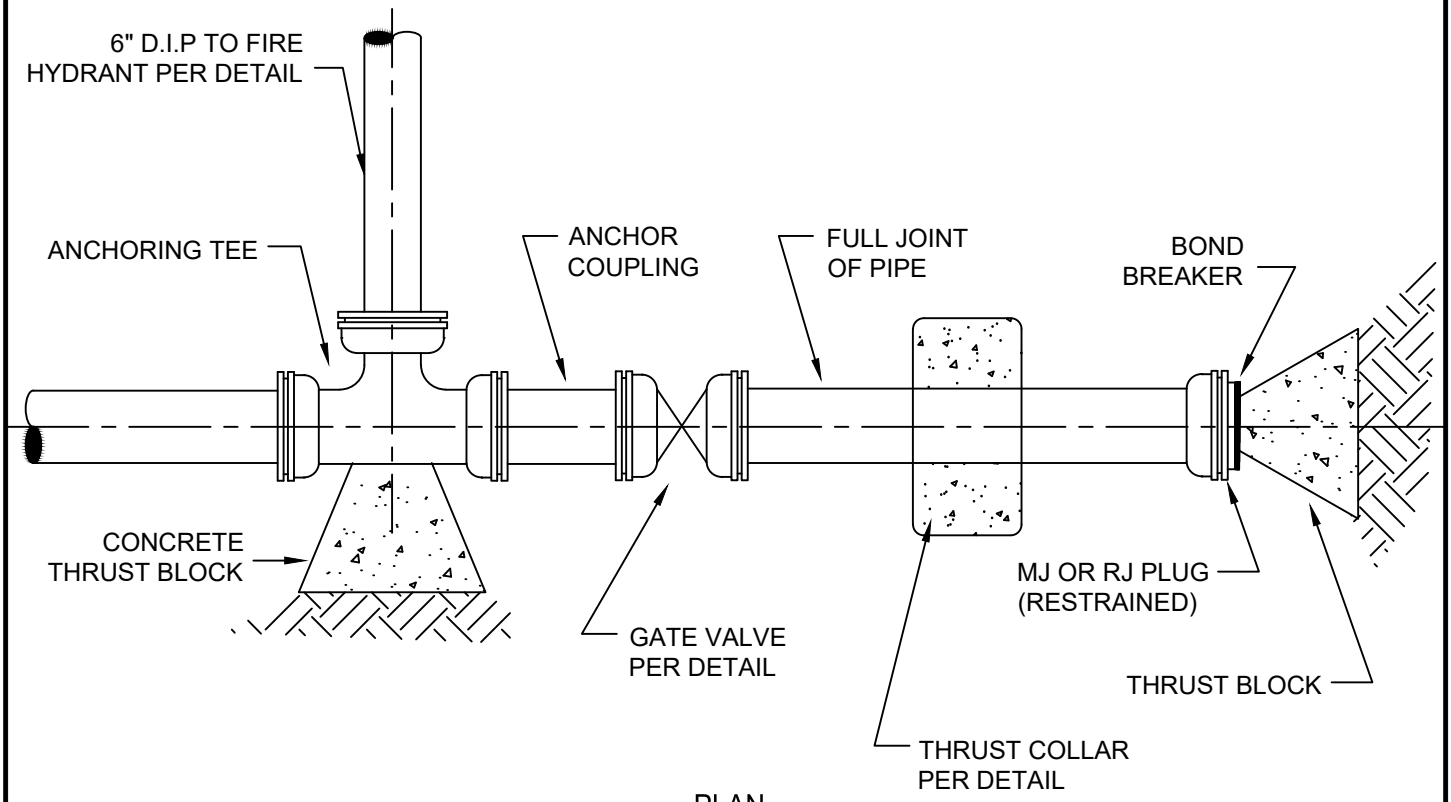
1. HYRANT SHALL BE DELIVERED SILVER (REFLECTIVE) IN COLOR FROM THE FACTORY.
2. HYDRANT SHALL MEET AWWA C502, RATED 250 PSI OR GREATER.
3. MAIN VALVE SIZE SHALL BE 4 1/2". MAIN PUMPER NOZZLE SHALL BE 4 1/2". DUAL HOSE NOZZLES SHALL BE 2 1/2".
3. INSTALL PROPER HEIGHT RISER TO ACCOMMODATE REQUIRED HEIGHT (3" MIN., 6" MAX.). NO "DISHING" ALLOWED AROUND HYDRANT TO MEET DIMENSION REQUIREMENT.
4. MAINTAIN 3' DIA. CLEAR CIRCLE AROUND HYDRANT NUT.
5. RESTRAIN ALL PIPE AND FITTINGS SHOWN ON DETAIL.



JCWSA STANDARD DETAIL C-10
DEAD END FIRE HYDRANT ASSEMBLY

SCALE: NTS
DATE: 08/23

JCWSA
WATER & SEWERAGE AUTHORITY



PLAN

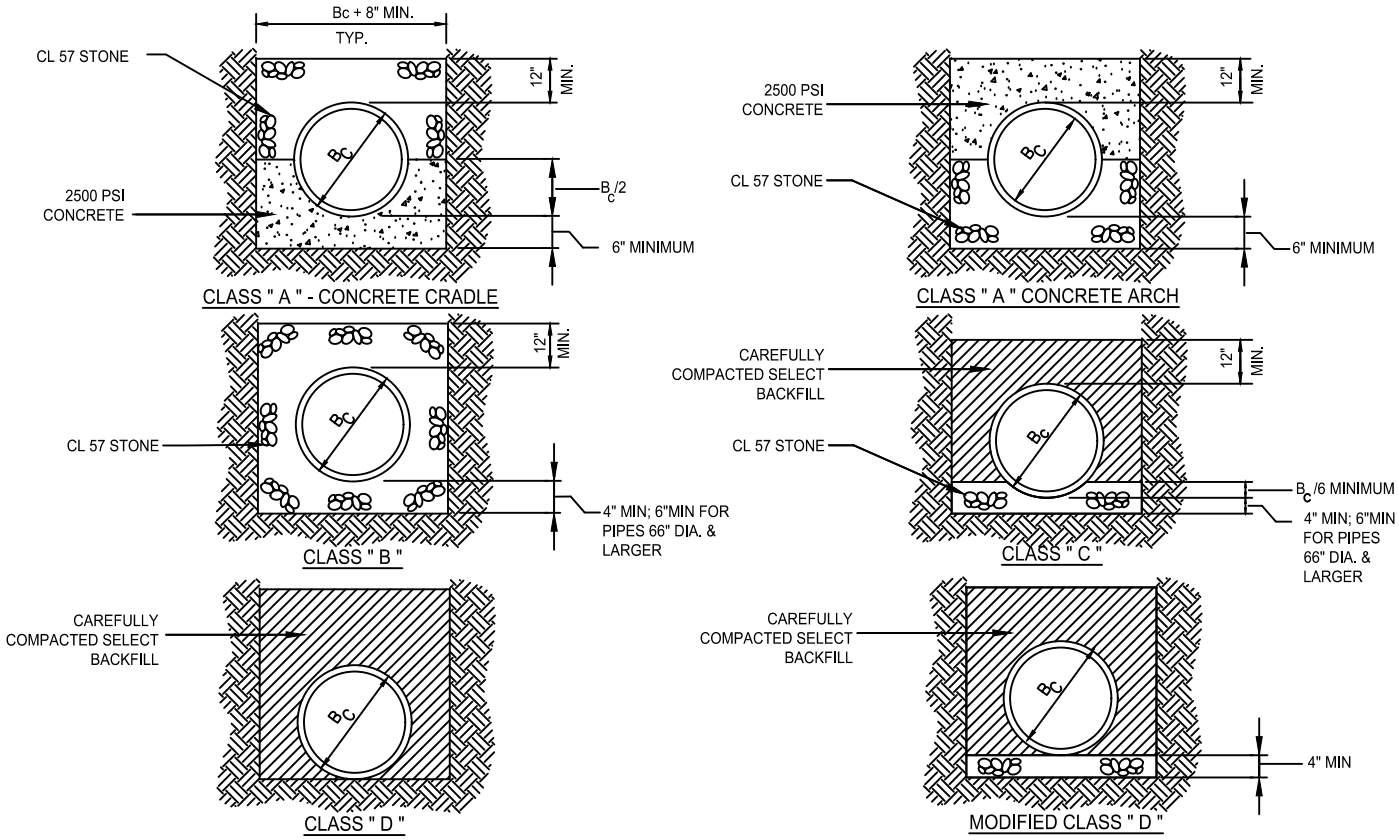
NOTES:

1. RESTRAIN ALL PIPE & FITTINGS SHOWN THIS SHEET.
2. WRAP AND TAPE FITTINGS IN POLYETHYLENE PRIOR TO POURING THRUST BLOCKS.

JCWSA STANDARD DETAIL C-11
STUB & PLUG FOR FUTURE CONNECTION

SCALE: NTS
DATE: 08/23

JCWSA
WATER & SEWERAGE AUTHORITY



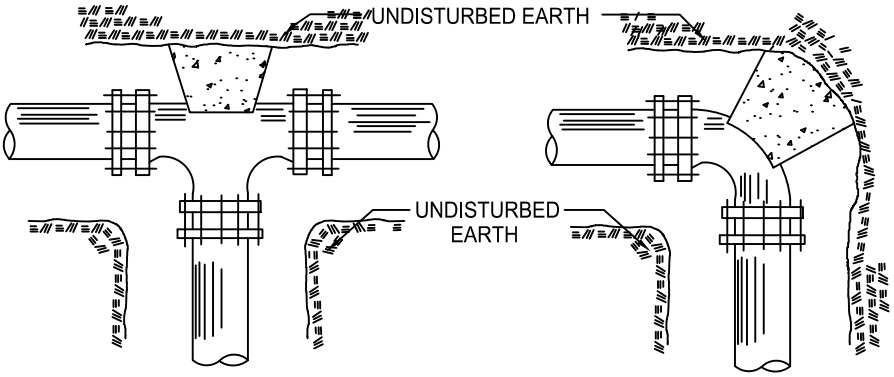
NOTES:

1. COMPACTION: BACKFILL SHALL BE BUILT UP IN LAYERS AND EACH LAYER SHALL BE THOROUGHLY COMPACTED BEFORE BEGINNING ANOTHER LAYER. LAYERS SHALL BE NO MORE THAN 6" IN DEPTH (SEE JCWSA SPECIFICATION SECTION 4.1.2). PUDDLING WILL NOT BE PERMITTED, FROZEN OR WET MATERIAL SHALL NOT BE PLACED IN TRENCHES.
2. COMPACTION STANDARDS: ALL BACKFILL MATERIALS USED SHALL CONTAIN A SUFFICIENT AMOUNT OF MOISTURE FOR PROPER COMPACTION AND THESE MATERIALS SHALL BE COMPACTED AT NOT LESS THAN 95% OF THEIR OPTIMUM CLASSIFICATION (98% FOR THE TOP FOOT OF SOILS SUPPORTING STRUCTURES) AS DETERMINED BY THE STANDARD PROCTOR TEST, AASHTO T99 (ASTM D698).
3. REQUIRED COMPACTION TESTS: WITHIN ROAD R/Ws AT LEAST ONE TEST PER 200 CUBIC YARDS OF BACKFILL MATERIAL (AT VARIOUS DEPTHS), BUT NOT LESS THAN ONE (1) TEST PER 250 FEET OF TRENCH. TESTING SHALL BE PERFORMED AROUND ITEMS SUCH AS STRUCTURES, MANHOLES, AND VALVE BOXES (A MINIMUM OF 4 TESTS SHALL BE REQUIRED FOR EACH MANHOLE AND ONE TEST FOR EACH VALVE BOX). ONE ADDITIONAL COMPACTION TEST SHALL ALSO BE PERFORMED FOR EACH 4 SERVICE LINES (OUTSIDE ROAD R/Ws TESTING REQUIREMENTS ARE REDUCED BY ONE-HALF THE NUMBER OF REQ'D TESTS (SEE JCWSA SPEC. SEC. 4.5.9).
4. FOR EXCAVATION IN POOR SOIL OR ROCK: REMOVE UNSUITABLE MATERIAL WIDTH AND DEPTH DIRECTED BEFORE PIPE IS LAID. THE SUBGRADE SHALL BE BACKFILLED WITH AN APPROVED MATERIAL IN 6" LAYERS. EACH LAYER SHALL BE THOROUGHLY TAMPED TO 95% COMPACTION (ASTM D698).
5. NO BOULDERS OR LOOSE ROCKS PERMITTED IN THE BACKFILL FROM BOTTOM OF PIPE TRENCH TO 2'-0" ABOVE PIPE.
6. COMPACTION WITHIN GDOT, JACKSON COUNTY AND CITY RIGHT-OF-WAYS MUST MEET THE REQUIREMENTS OF THOSE AGENCIES.
7. THIS DETAIL APPLIES TO THE INSTALLATION OF ALL SERVICE LATERIALS. TRENCH WIDTH MINIMUMS DO NO APPLY TO LATERALS LESS THAN 4".
8. IF PROFILE DRAWING OF PIPE IS PROVIDED, THE COVER SHALL BE SHOWN ON PROFILE SHEET.
9. TRENCH SIDE SLOPES AND.OR SHORING SHALL COMPLY WITH OSHA STANDARDS.
10. CONTRACTOR SHALL REPAIR ANY TRENCH SETTLEMENT FOR A PERIOD OF ONE-YEAR BEYOND COMPLETION.
11. REFER TO DETAIL C-21 FOR TRACER WIRE REQUIREMENTS.
12. REMOVE AND SEPARATE TOP ORGANIC LAYER. TOPSOIL AND ORGANICS MAY NOT BE USED TO FILL TRENCH, OTHER THAN THE VERY TOP LAYER.
13. WHEN SOFT OR UNSTABLE PIPE FOUNDATION MATERIAL IS ENCOUNTERED IN THE BOTTOM OF TRENCH REFER TO JCWSA STD. SEC. 4.5.5.
14. ALL PVC SEWER SHALL BE INSTALLED WITH CLASS B BEDDING.
15. ALL DIP SEWER SHALL BE INSTALLED WITH CLASS B BEDDING WITH THE EXCEPTION THAT THE GRAVEL BEDDING WILL ONLY BE REQUIRED TO COVER UP TO THE TOP OF THE PIPE.

JCWSA STANDARD DETAIL C-12
PIPE BEDDING DETAILS

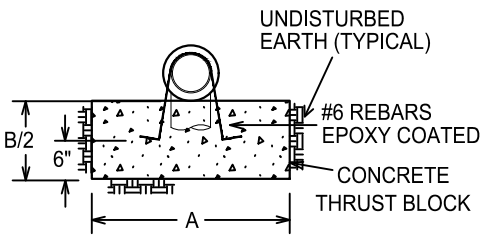
SCALE: NTS
DATE: 08/23

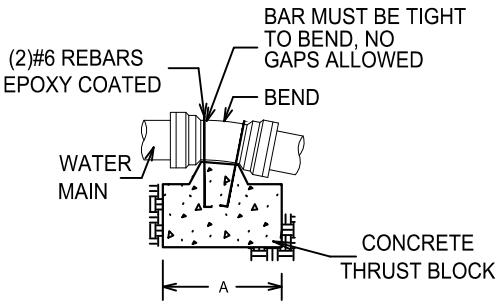
JCWSA
WATER & SEWERAGE AUTHORITY



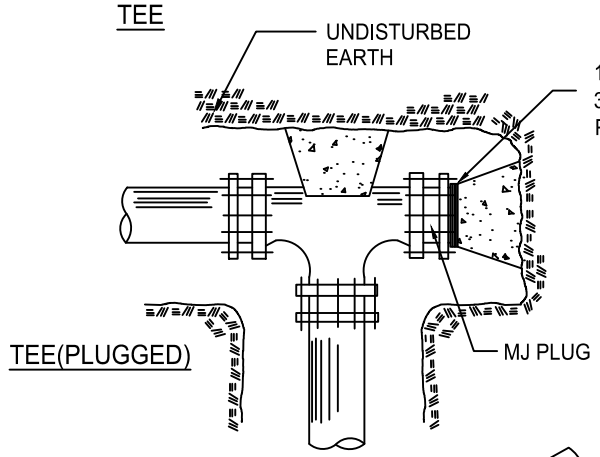
TEE

BENDS

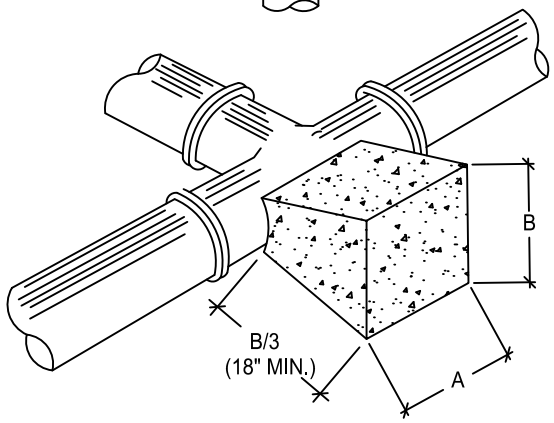




TYP. VERTICAL BEND



TEE(PLUGGED)



NOTES:

1. FOR TEE, PROVIDE THRUST BLOCKING FOR BRANCH SIZE.

2. PLACE 10 MIL. POLYETHYLENE FILM BETWEEN CONCRETE AND FITTING.

3. ALL M.J. CONNECTIONS ARE TO BE ADDITIONALLY RESTRAINED WITH MEGA-LUGS.

4. BEARING SURFACE AREAS SHOWN IN THE CHART ARE MINIMUM. IF SOIL BEARING CAPACITY IS LESS THAN 2000 P.S.F. A SPECIAL DESIGN WILL BE REQUIRED FOR THE INSTALLATION.

6. THRUST BLOCK MUST BEAR ON UNDISTURBED EARTH AND MAY NOT COVER ANY NUT AND BOLT ACCESSORIES.

7. ALL CONCRETE SHALL BE CLASS "C" 3000 P.S.I. MINIMUM 28 DAYS COMPRESSIVE STRENGTH.

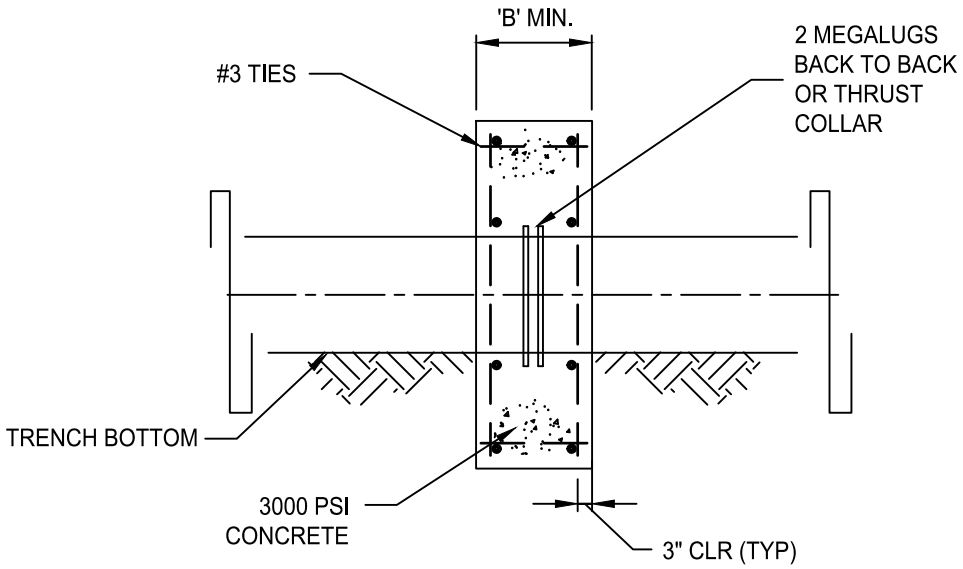
8. WRAP ALL FITTINGS WITH 10 MIL POLY PIPE WRAP PLASTIC AND 10 MIL PIPE WRAP TAPE.

FITTING SIZE	TEES AND PLUGS		90° BENDS		45° BENDS & "Y"		22 1/2° BENDS		11 1/4° BENDS	
	A	B	A	B	A	B	A	B	A	B
4"	1'-9"	0'-9"	1'-9"	1'-0"	1'-3"	0'-9"	1'-0"	0'-6"	0'-6"	0'-6"
6"	2'-3"	1'-3"	2'-9"	1'-6'	2'-3"	1'-0"	1'-6"	0'-9"	1'-0"	0'-6"
8"	2'-9"	1'-9"	3'-6"	2'-0"	2'-6"	1'-6"	2'-0"	1'-0"	1'-0"	1'-0"
10"	3'-6"	2'-3"	4'-5"	2'-6"	3'-0"	2'-0"	2'-0"	1'-6"	1'-6"	1'-0"
12"	4'-0"	3'-10"	4'-8"	4'-8"	3'-8"	3'-3"	2'-0"	1'-6"	2'-0"	1'-0"
14"	5'-5"	3'-10"	6'-6"	5'-0"	4'-9"	3'-5"	3'-5"	2'-5"	2'-0"	1'-6"
16"	5'-0"	4'-6"	6'-6"	5'-3"	5'-0"	3'-8"	3'-6"	2'-8"	3'-0"	1'-8"
18"	5'-0"	4'-10"	6'-6"	5'-6"	5'-0"	3'-10"	3'-6"	2'-10"	3'-0"	1'-10"
20"	5'-0"	5'-0"	6'-0"	6'-0"	5'-0"	4'-0"	3'-6"	3'-0"	3'-0"	2'-0"
24"	6'-0"	6'-0"	7'-0"	7'-0"	5'-0"	5'-0"	4'-6"	3'-0"	3'-0"	3'-0"
30"	7'-6"	7'-6"	8'-0"	8'-0"	6'-3"	6'-3"	4'-9"	4'-6"	3'-3"	3'-3"

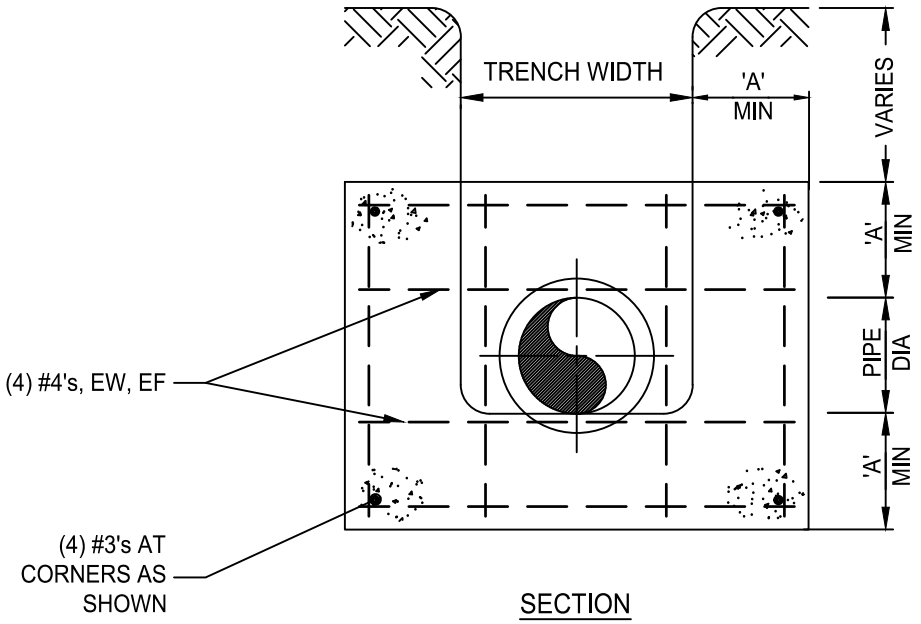
JCWSA STANDARD DETAIL C-13
THRUST BLOCKS

SCALE: NTS
DATE: 08/23

JCWSA
WATER & SEWERAGE AUTHORITY



ELEVATION



SECTION

PIPE DIAMETER	'A' DIMENSION	'B' DIMENSION
6" - 12"	1' - 4"	1' - 6"
14" AND GREATER	*	*

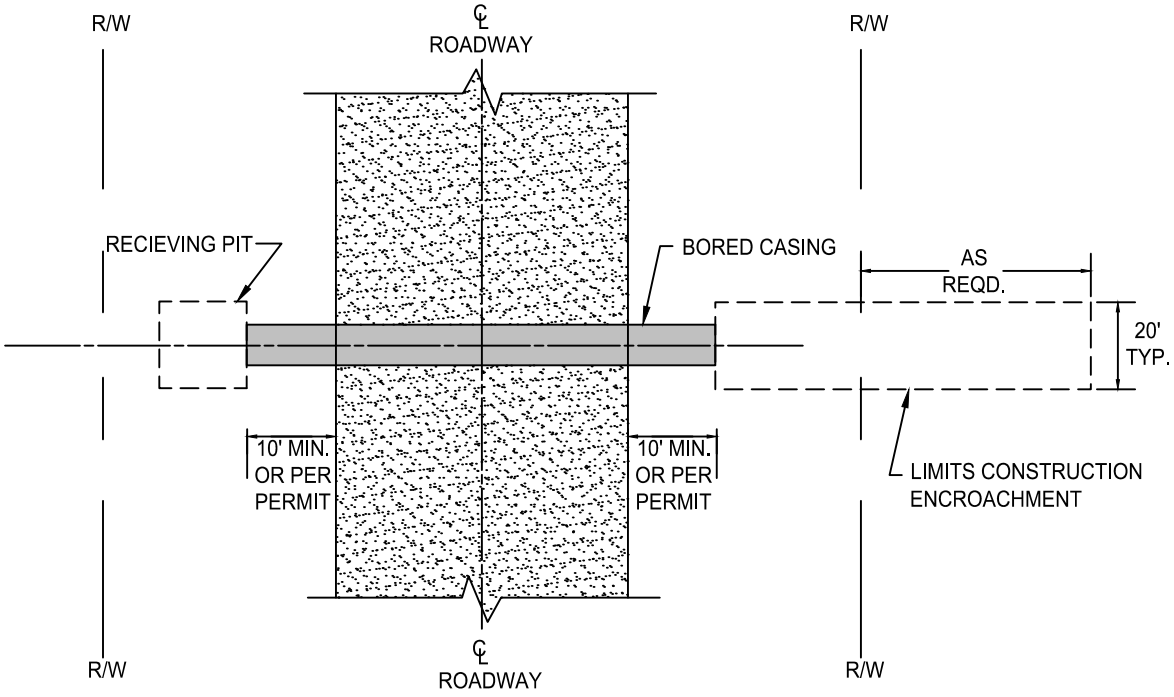
* SPECIAL DESIGN TO BE COMPLETED OWNER/DEVELOPER'S ENGINEER

NOTE: 'A' DIMENSION MUST BEAR ON UNDISTURBED EARTH

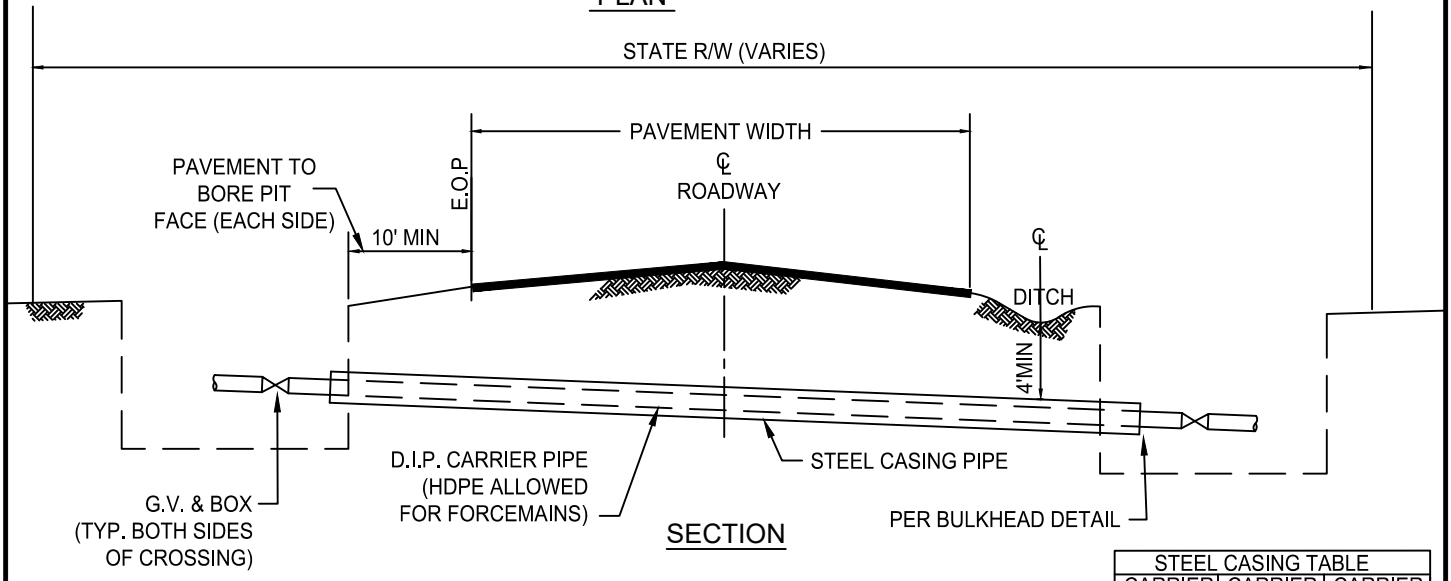
JCWSA STANDARD DETAIL C-14
THRUST COLLAR

SCALE: NTS
DATE: 08/23

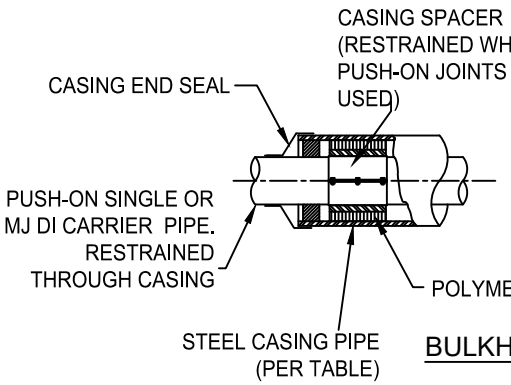
JCWSA
WATER & SEWERAGE AUTHORITY

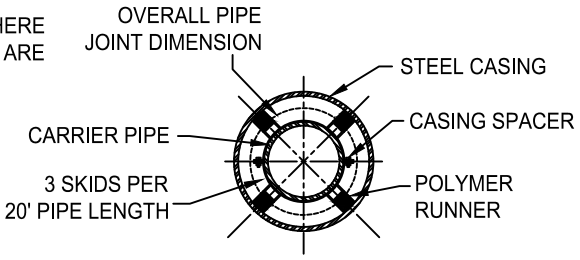


PLAN



SECTION





BULKHEAD AND CASING DETAILS

STEEL CASING TABLE		
CARRIER PIPE SIZE	CARRIER PIPE SIZE	CARRIER PIPE WALL(IN.)
6"	14"	0.25"
8"	16"	0.25"
12"	20"	0.25"
16"	24"	0.25"

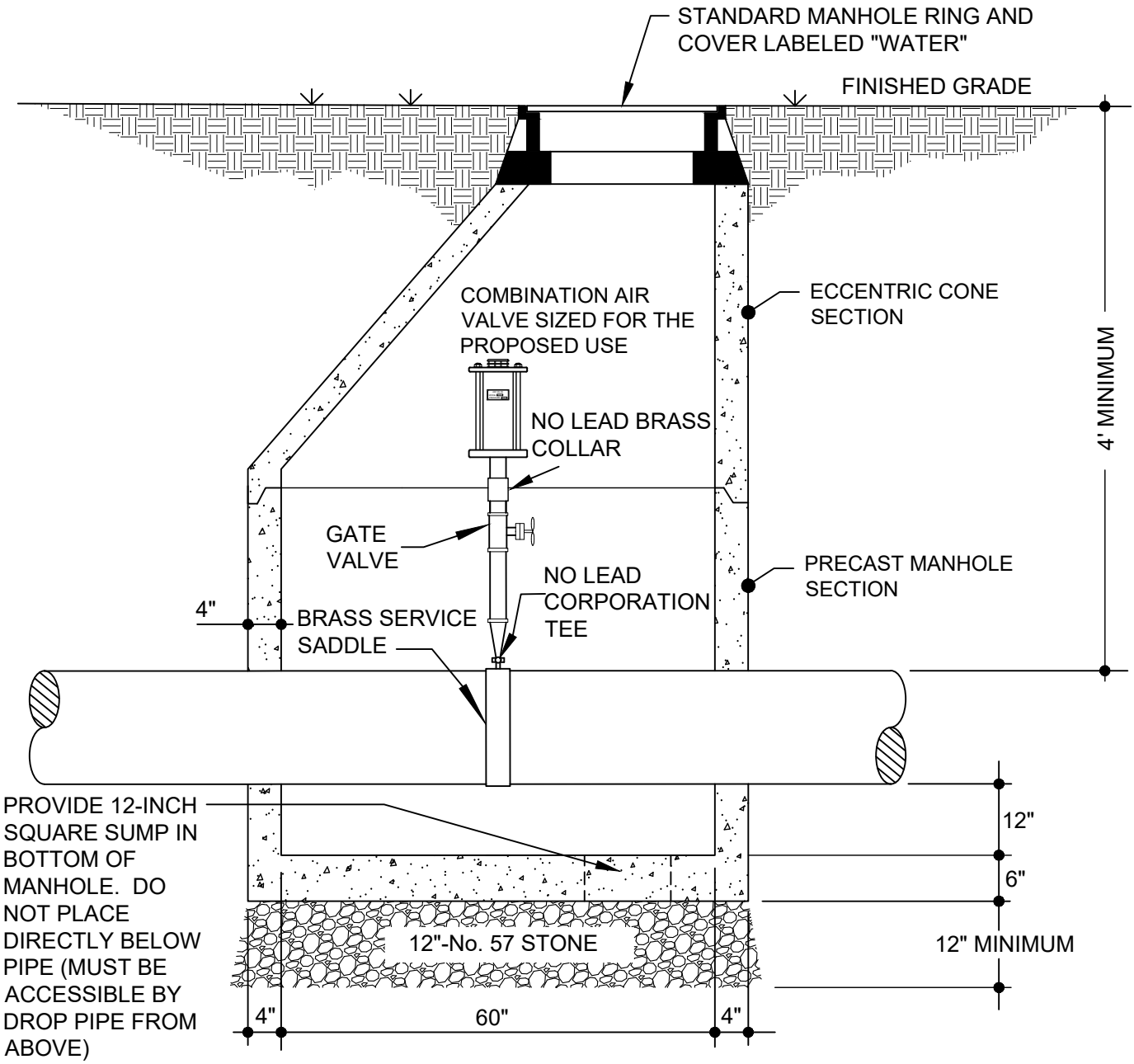
NOTES:

1. CASING PIPE TO MEET ASTM A-139, GRADE B.
2. CASING PIPE TO HAVE BITUMINOUS COATING.

JCWSA STANDARD DETAIL C-15
BORED HIGHWAY CROSSING

SCALE: NTS
DATE: 08/23

JCWSA
WATER & SEWERAGE AUTHORITY



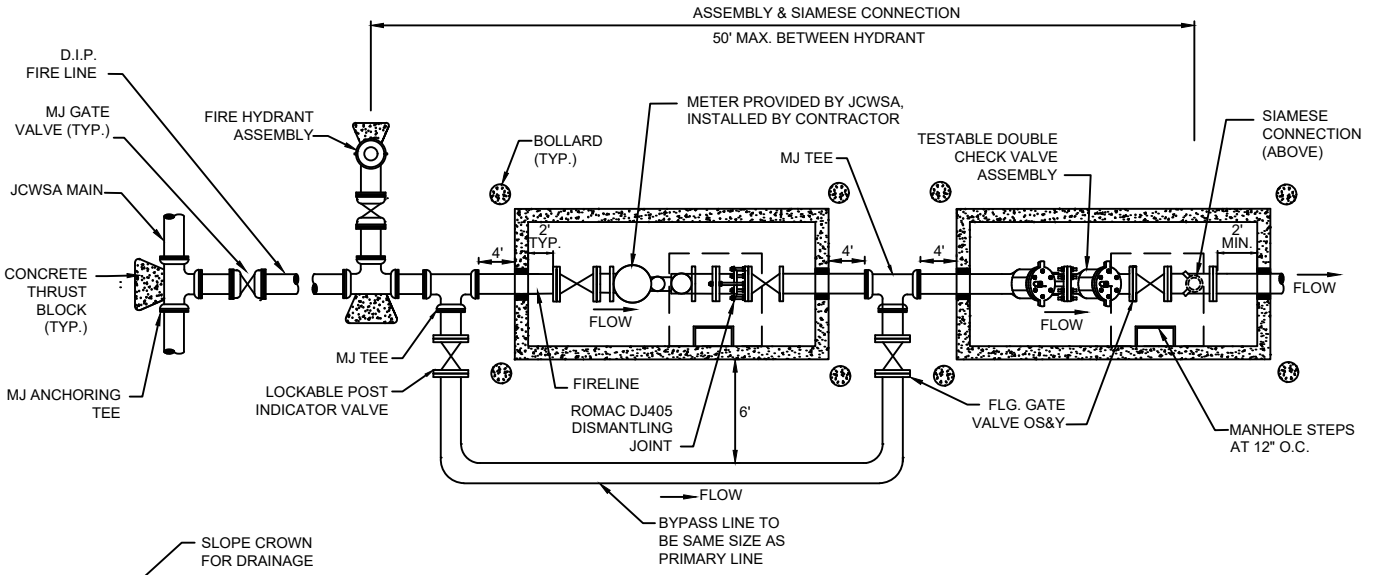
NOTES:

1. TAP SIZE AND ISOLATION VALVE TO BE SAME SIZE AS AIR VALVE
2. ALL PIPING AND FITTINGS, IN THE MANHOLE, SHALL BE 'NO LEAD' BRASS OR BRONZE UNLESS NOTED
3. MANHOLE STEPS SHALL BE PLACED 16" O.C.
4. CONCENTRIC CONES MAY BE USED FOR AIR VALVE MANHOLES LESS THAN 5' IN DEPTH
5. AIR/VAC VALVES TO BE SIZED BY DESIGN ENGINEER. BASIS FOR SIZING MUST BE SUBMITTED TO AUTHORITY ENGINEER FOR REVIEW.
6. PROVIDE 1'-0" CLEARANCE AROUND ENTIRE VALVE ASSEMBLY.

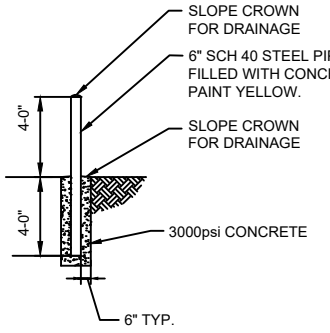
JCWSA STANDARD DETAIL C-16
AIR RELEASE VALVE MANHOLE

SCALE: NTS
DATE: 08/23

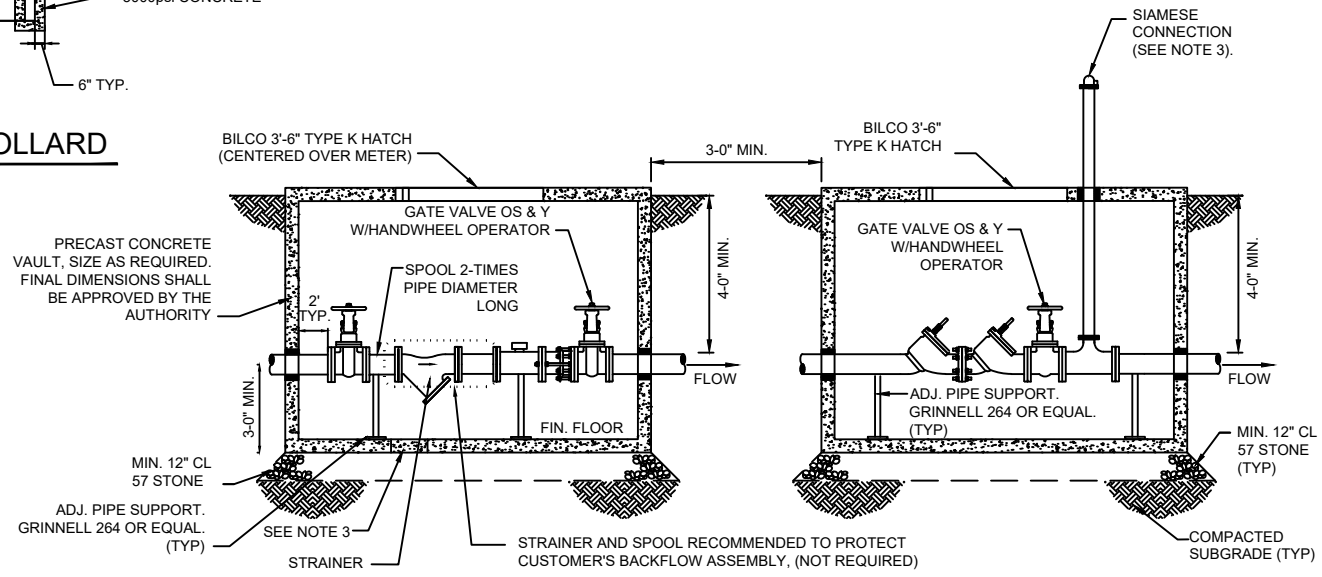
JCWSA
WATER & SEWERAGE AUTHORITY



PLAN



BOLLARD



SECTION

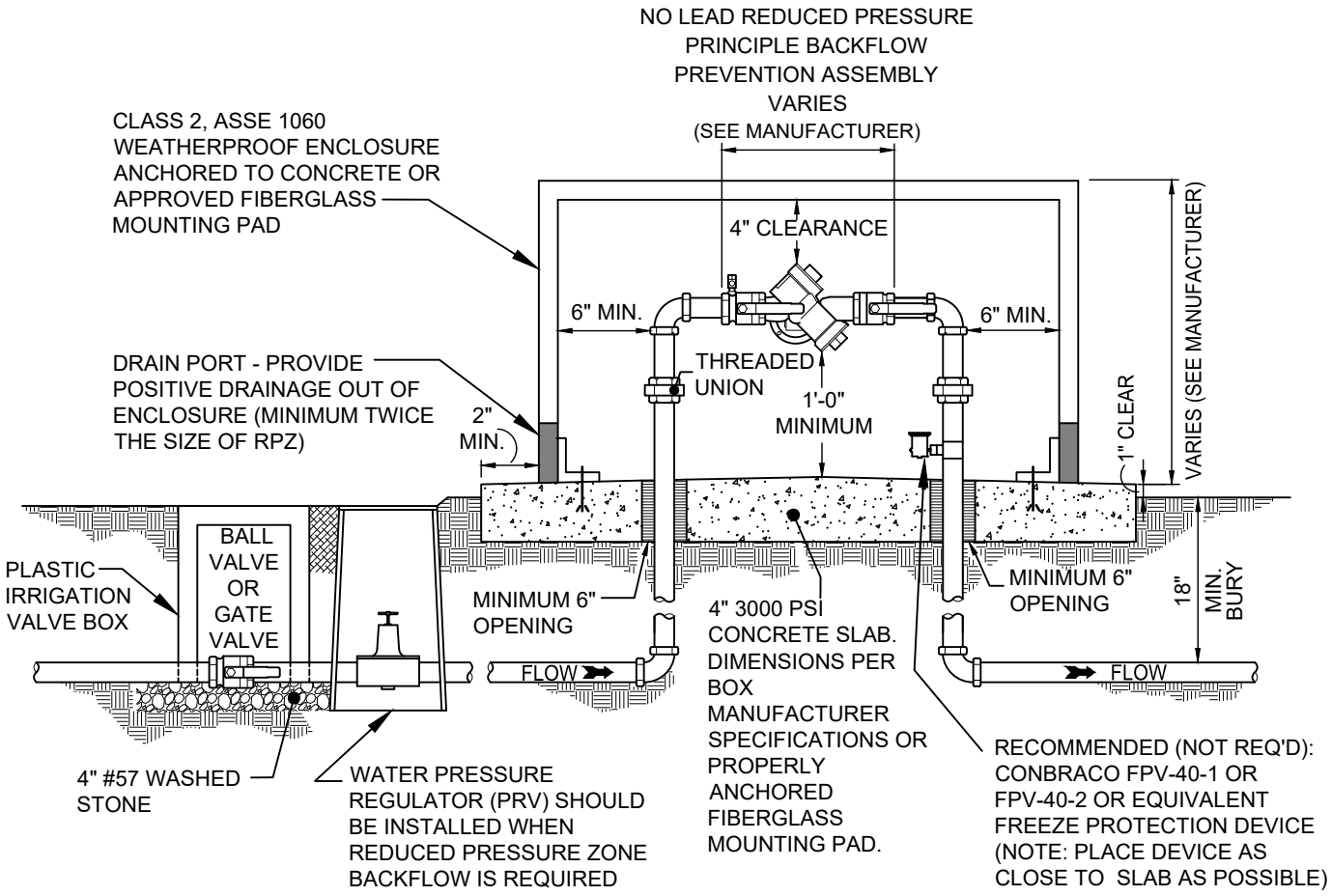
NOTES:

1. RESTRAIN ALL PIPE & FITTINGS SHOWN THIS SHEET.
2. EXPOSED PIPE AND FITTINGS TO BE FLANGED DUCTILE IRON.
3. PROVIDE 1'-0" SQUARE SUMP IN BOTTOM OF STRUCTURE. DO NOT PLACE. DIRECTLY BELOW PIPE. SUMP MUST BE ACCESSIBLE BY DROP PIPE FROM ABOVE.
4. OMIT SIAMESE CONNECTION WHEREVER BUILDING IS SERVED BY A PUMPED FIRE SUPPRESSION SYSTEM.
5. CONSULT LOCAL FIRE OFFICIAL TO DETERMINE LOCATION REQUIREMENTS FOR SIAMESE CONNECTIONS.
6. VAULT & LID MUST BE RATED FOR AASHTO H20 LOADING. PRE-CAST & CAST-IN-PLACE VAULTS MUST BE DESIGNED AND CERTIFIED FOR H20 LOADING BY A PROFESSIONAL ENGINEER.
7. VAULT LID TO BE CENTERED OVER METER.
8. ROMAC DJ405 TO BE INSTALLED AT NOMINAL LENGTH, PER THE MANUFACTURERS SPECIFICATIONS.
9. PROVIDE 12" MINIMUM OF FREE SPACE ON EACH SIDE OF EVERY FLANGE.
10. PROVIDE 12" OF CLEARANCE BETWEEN BOLLARDS AND VAULTS .

JCWSA STANDARD DETAIL C-17
LARGE METER / DOUBLE CHECK VAULT

SCALE: NTS
DATE: 08-23

JCWSA WATER & SEWERAGE AUTHORITY



NOTES:

1) REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY SHALL COMPLY WITH ASSE 1013 & AWWA C511.
2) BACKFLOW PREVENTION ASSEMBLY SHALL BE INSTALLED WITHIN 5-FT OF THE IRRIGATION METER.
3) BACKFLOW ASSEMBLY SHALL BE CENTERED ON CONCRETE OR OTHER APPROVED MOUNTING PAD AND CENTERED WITHIN ENCLOSURE.
4) MINIMUM NON-HEATED, INSULATED CLASS II, ASSE 1060 WEATHERPROOF ENCLOSURE REQUIRED.
5) PIPE MATERIAL SHALL BE PVC (SCH. 80 OR BETTER), COPPER (TYPE K), OR 'NO LEAD' BRASS (UNS C89833 PER ASTM B584).
6) GALVANIZED PIPING WILL NOT BE ALLOWED
7) IRRIGATION ASSEMBLIES TO BE DRAINED DURING WINTER MONTHS BY PROPERTY OWNER.
8) INSTALLATION SHALL BE IN COMPLIANCE WITH ALL APPLICABLE JCWSA STANDARDS AND SPECIFICATIONS IN ADDITION TO THE GEORGIA EPD REQUIREMENTS.
9) PROPERTY OWNER SHALL BE RESPONSIBLE FOR MAINTENANCE AND OPERATION OF BACKFLOW PREVENTION ASSEMBLY AND COMPLIANCE WITH REPORTING AND TESTING REQUIREMENTS.
10) ALL BRASS COMPONENTS SHALL BE 'NO LEAD' BRASS MEETING UNS C89833 AS PER ASTM B584.

JCWSA STANDARD DETAIL C-18
RPZ BACKFLOW PREVENTER

SCALE: NTS
DATE: 08/23

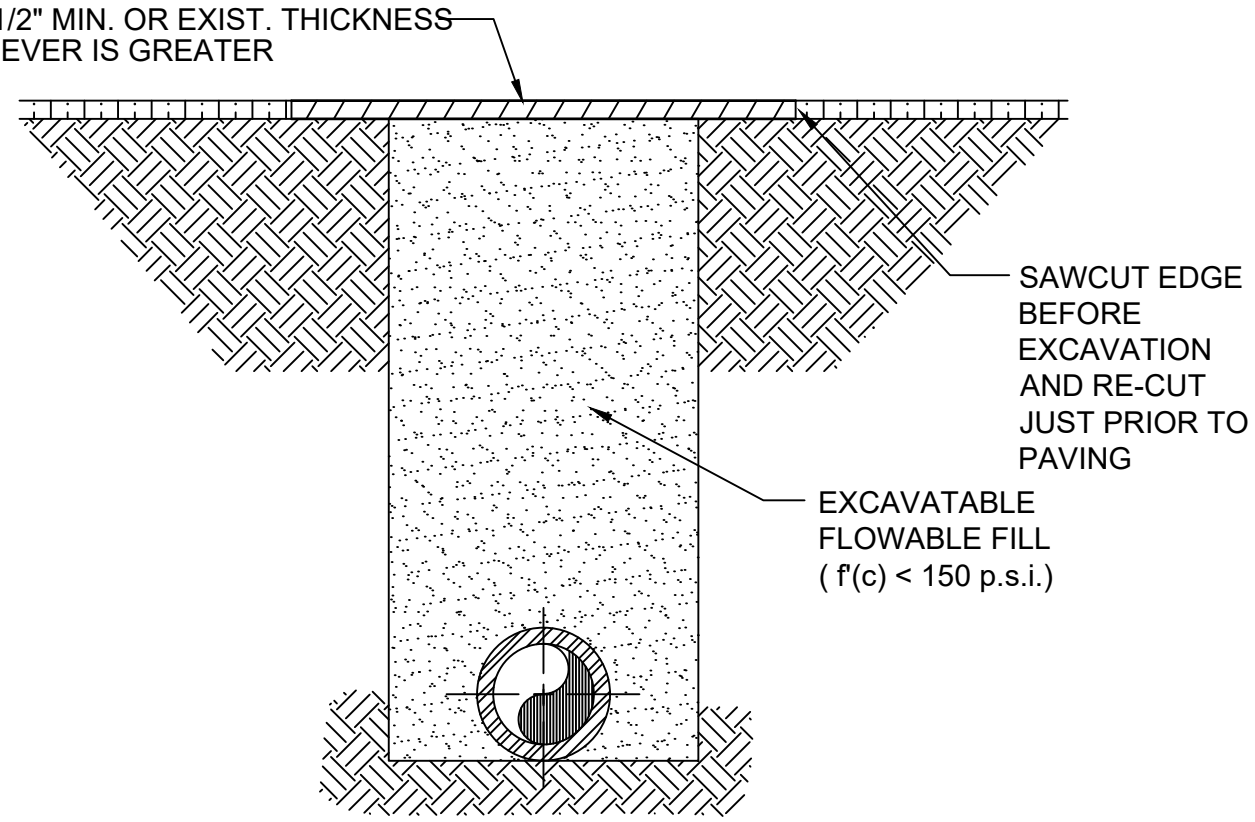
JCWSA
WATER & SEWERAGE AUTHORITY

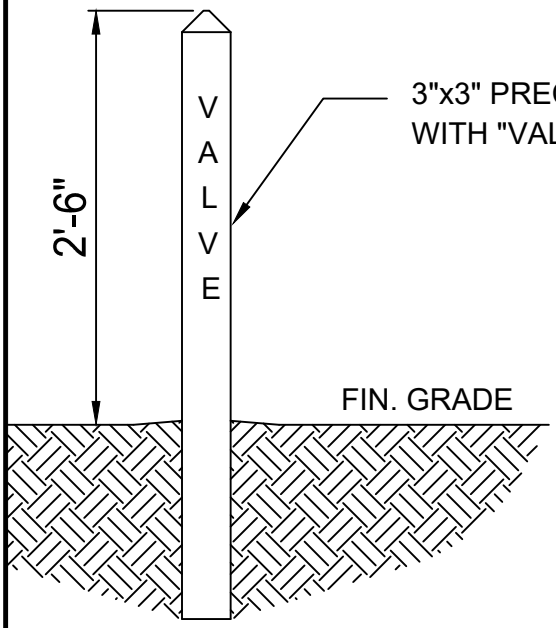
DETAIL NO LONGER USED

JCWSA STANDARD DETAIL C-19
FILL VALVE ASSEMBLY

SCALE: NTS
DATE: 08/23

JCWSA
WATER & SEWERAGE AUTHORITY





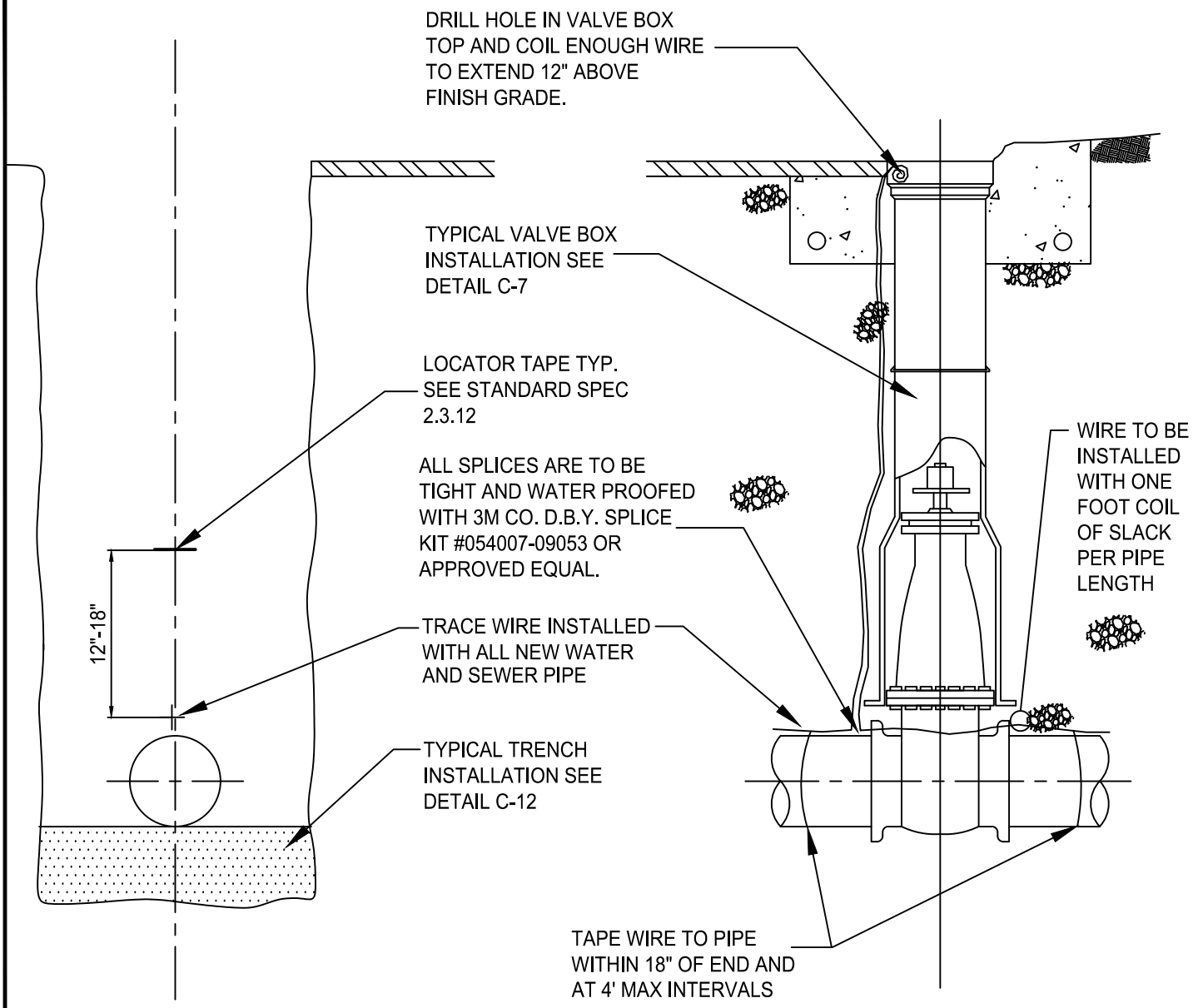
NOTES:

1. ON LONGITUDINAL CUTS EXCEEDING 150 FEET IN LENGTH THE ENTIRE WIDTH OF THE ROADWAY SHALL BE RESURFACED WITH ASPHALT TOPPING COURSE AS DIRECTED BY THE ROAD AGENCY ENGINEER.
2. REFER TO DETAIL C-12 FOR COMPACTION SPECIFICATIONS. MEET ALL COMPACTION REQUIREMENTS OF ROADWAY AGENCIES.

JCWSA STANDARD DETAIL C-20
PAVEMENT PATCH AND VALVE MARKER

SCALE: NTS
DATE: 08/23

JCWSA
WATER & SEWERAGE AUTHORITY



NOTES

1. TRACE WIRE TO BE 12 DIRECT BURY AWG OR LARGER SOLID COPPER INSULATED LLDP WIRE. (BARE COPPER WIRE PROHIBITED).
2. WIRE IS TO BE INSTALLED WITH SLACK, ONE FOOT COIL PER LENGTH.
3. WIRE IS TO BE ATTACHED TO ALL WATER APPURTENANCES.
4. WIRE IS TO BE INSTALLED WITH ALL NEW WATER AND SEWER LINES, METAL AND NON-METAL.
5. CONTINUITY TEST TO BE PERFORMED BY COINTRACTOR AT ALL ACCESS POINTS PRIOR TO FINAL ACCEPTANCE.

JCWSA STANDARD DETAIL C-21
TRACE WIRE DETAILS

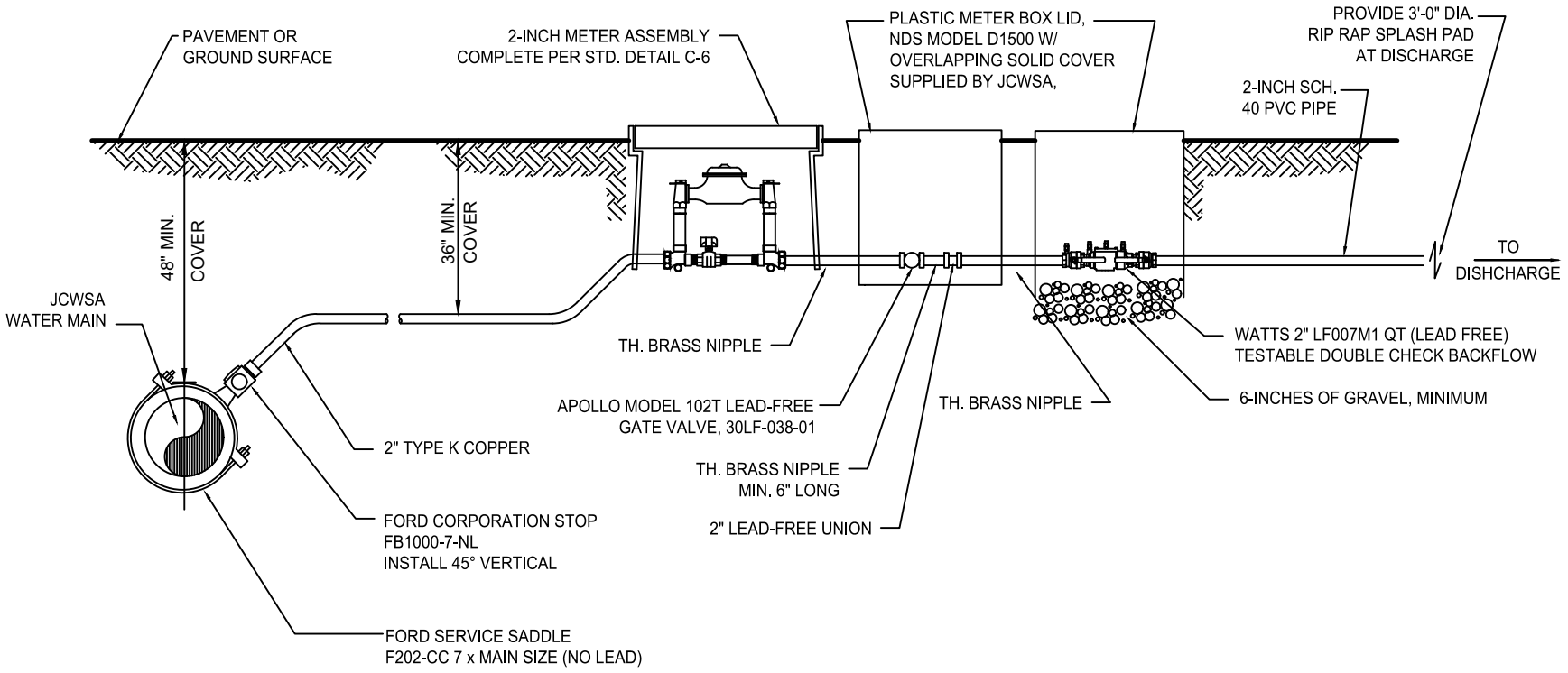
SCALE: NTS
DATE: 08/23

JCWSA
WATER & SEWERAGE AUTHORITY

JCWSA
WATER & SEWERAGE AUTHORITY
POST OFFICE BOX 869 • JEFFERSON, GEORGIA 30549
PH: 706.367.1741 • FAX: 706.367.1759 • www.jcwsa.com

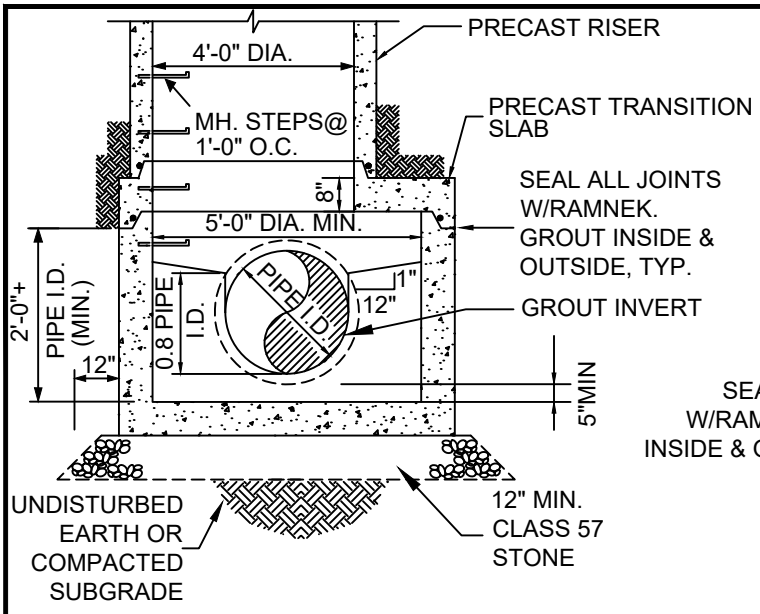
JCWSA STANDARD DETAIL C-22
TYPICAL FLUSH STATION

SCALE: NTS
DATE: 08/23

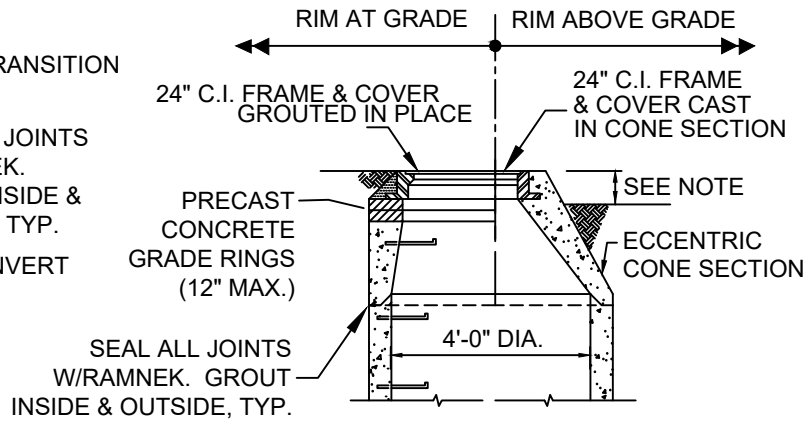


NOTES:

1. PIPING TO BE "NO LEAD" BRASS AND COPPER TUBING OR PVC.
2. METER INLET AND OUTLET TO BE EQUIPPED WITH FLANGED BALL ANGLE METER VALVES.
3. INSTALL BOXES 1-INCH ABOVE GROUND LEVEL.

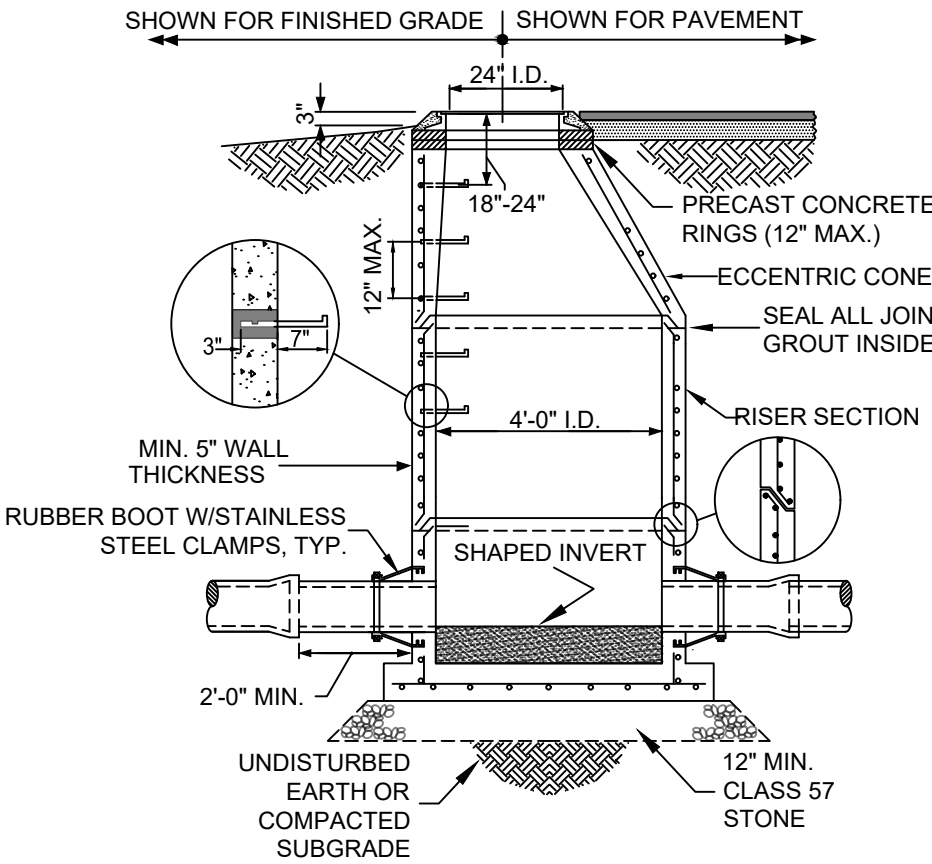


MANHOLE BASE DETAIL FOR 5'-0" DIA. OR LARGER BASES



NOTE:
SET RIM ELEVATION 3' ABOVE GRADE IN FLOOD-PRONE OR SWAMPY AREAS OR WHERE DIRECTED BY THE AUTHORITY.

MANHOLE CONE DETAILS



STANDARD PRECAST CONCRETE MANHOLE

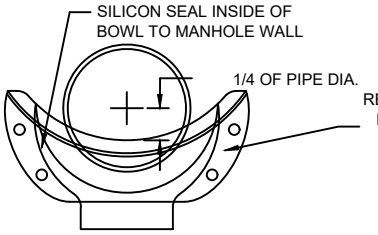
NOTES:

1. SEE JCWSA STANDARDS SECTION 3.2.6 FOR FRAME AND COVER REQUIREMENTS.
2. STD. MANHOLE COVERS SHALL BE FURNISHED WITH TWO (2) ¾" VENT HOLES.
3. MANHOLE COVERS IN 100-YR FLOOD PLAIN SHALL BE WATERTIGHT, BOLT DOWN CONSTRUCTION, OR "EJ REVOLUTION" GASKETED WATERTIGHT.
4. "EJ REVOLUTION" M.H. COVERS OR PRE-APPROVED EQUAL ARE REQ'D WHERE ELEVATION OF THE COVER IS 12-INCHES OR MORE ABOVE GRADE.

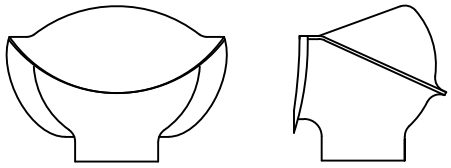
JCWSA STANDARD DETAIL D-1
MANHOLE DETAILS

SCALE: NTS
DATE: 08/23

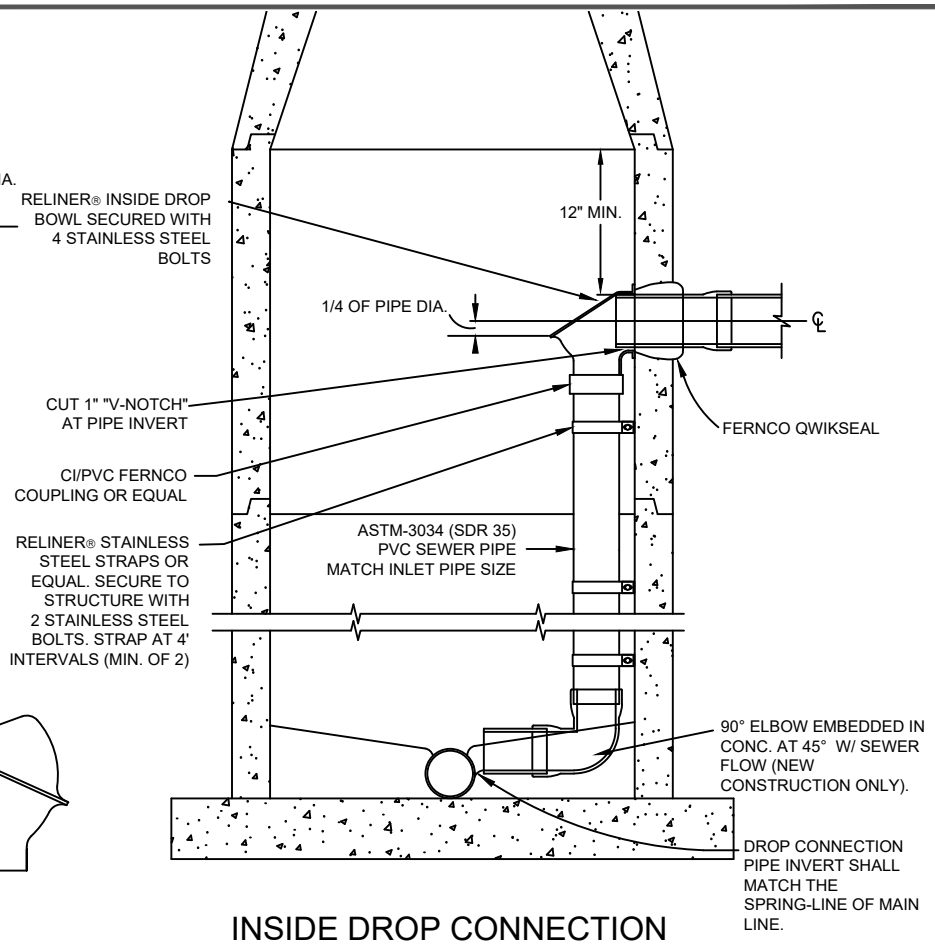
JCWSA
WATER & SEWERAGE AUTHORITY



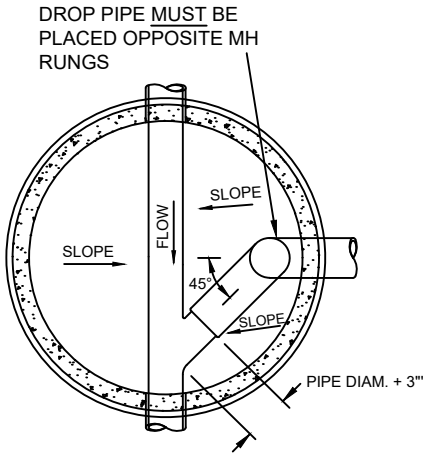
DROP BOWL MOUNTING POSITION



DROP BOWL W/ FORCE LINE HOOD



INSIDE DROP CONNECTION



INSIDE DROP - PLAN

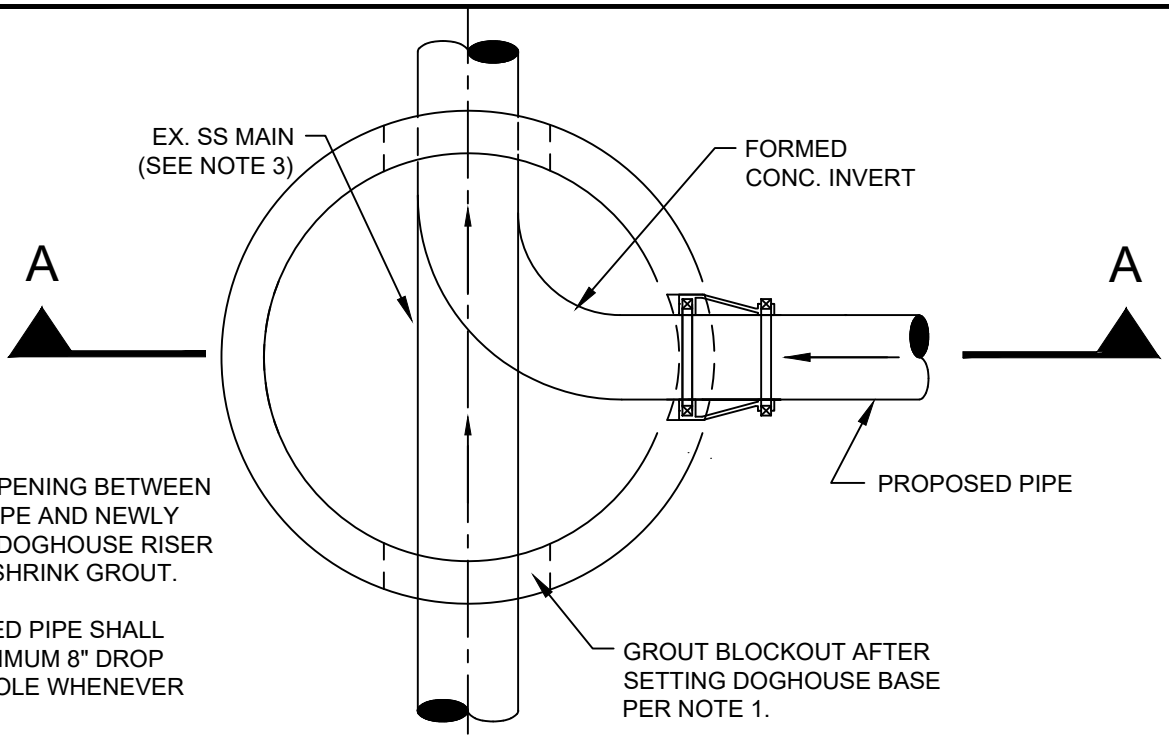
NOTES:

1. ALL INSIDE DROP CONNECTIONS FOR SERVICES AND COLLECTOR SEWERS SHALL USE THE "DROP BOWL" OR EQUAL PRODUCED BY: RELINER-DURAN, INC. (860)434-0277 FAX: (860)434-3195
2. DROP BOWL MODEL "A-4" SHALL BE USED FOR ALL LINES UP THROUGH FULL 6" INLETS. DROP BOWL MODEL "A-6" SHALL BE USED FOR ALL 8" INLETS. DROP BOWL MODEL "B-8" SHALL BE USED FOR ALL 10" INLETS.
3. THE FORCE LINE HOOD SHALL BE ATTACHED ON MODELS "A-4" & "A-6" WHEN THE INCOMING LINE IS A FORCE MAIN OR THE SLOPE OF A GRAVITY LINE IS 6% OR GREATER.
4. SECURE DROP PIPE TO MANHOLE WALL WITH RELINER-DURAN, INC STAINLESS STEEL ADJUSTABLE CLAMPING BRACKETS OR EQUAL.
5. ATTACH THE DROP BOWL & EACH CLAMPING BRACKET TO THE MANHOLE WALL WITH 3/8" X 3 3/4" RAMSET/RED HEAD BOLTS HELD IN PLACE WITH 2 STAGE EPOXY PASTE. EPOXY PASTE SHALL BE A TWO COMPONENT, 100% SOLID SYSTEM. SIKADUR 31 HI-MOD GEL BY SIKA CORPORATION OR EQUAL. (PHONE 592/941-0231)

JCWSA STANDARD DETAIL D-1-A
INSIDE DROP MANHOLE DETAILS

SCALE: NTS
DATE: 08/23

JCWSA
WATER & SEWERAGE AUTHORITY



PLAN

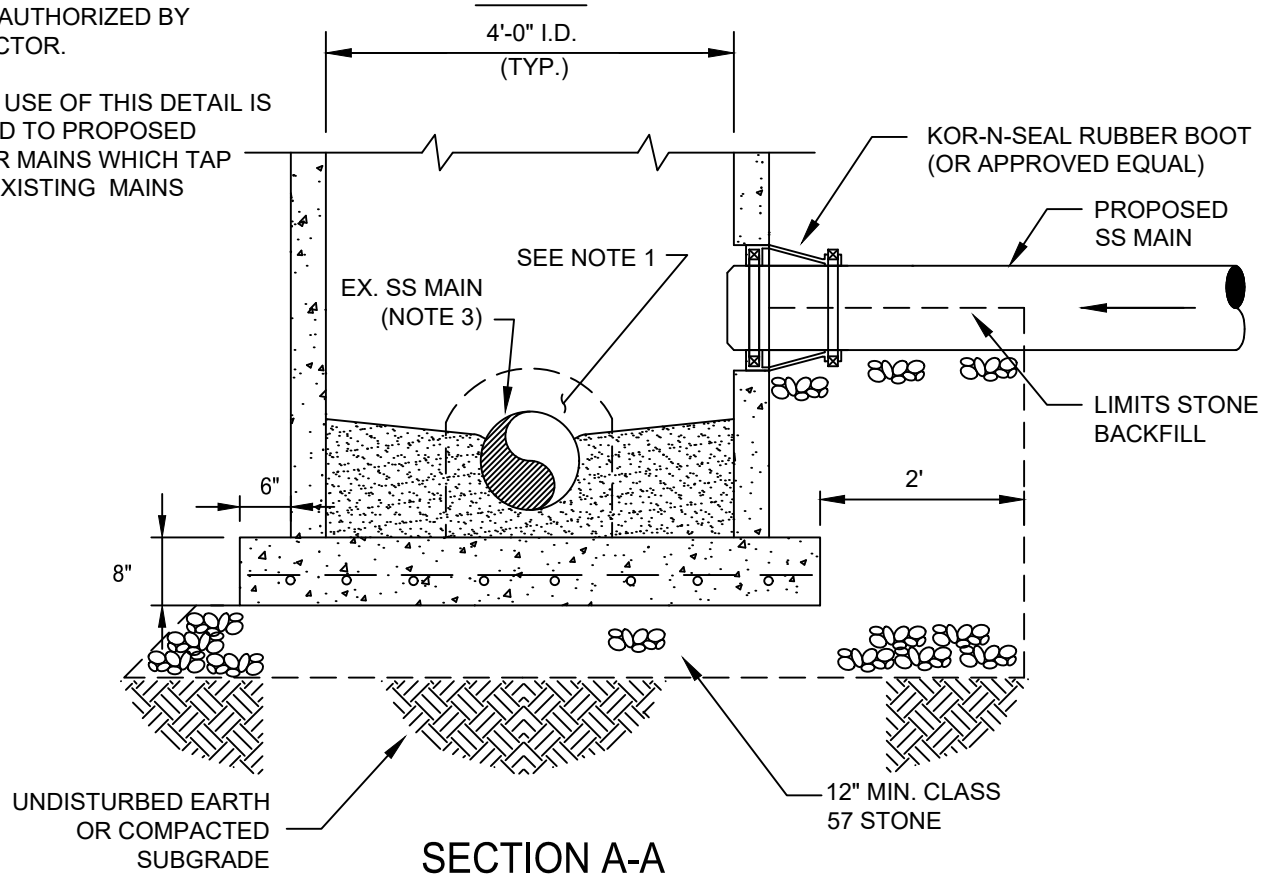
NOTES

1. GROUT OPENING BETWEEN EXISTING PIPE AND NEWLY INSTALLED DOGHOUSE RISER WITH NON-SHRINK GROUT.

2. PROPOSED PIPE SHALL HAVE A MINIMUM 8" DROP INTO MANHOLE WHENEVER POSSIBLE.

3. TOP PORTION OF EXISTING PIPE SHALL NOT BE REMOVED UNTIL AUTHORIZED BY INSPECTOR.

4. THE USE OF THIS DETAIL IS LIMITED TO PROPOSED SEWER MAINS WHICH TAP INTO EXISTING MAINS

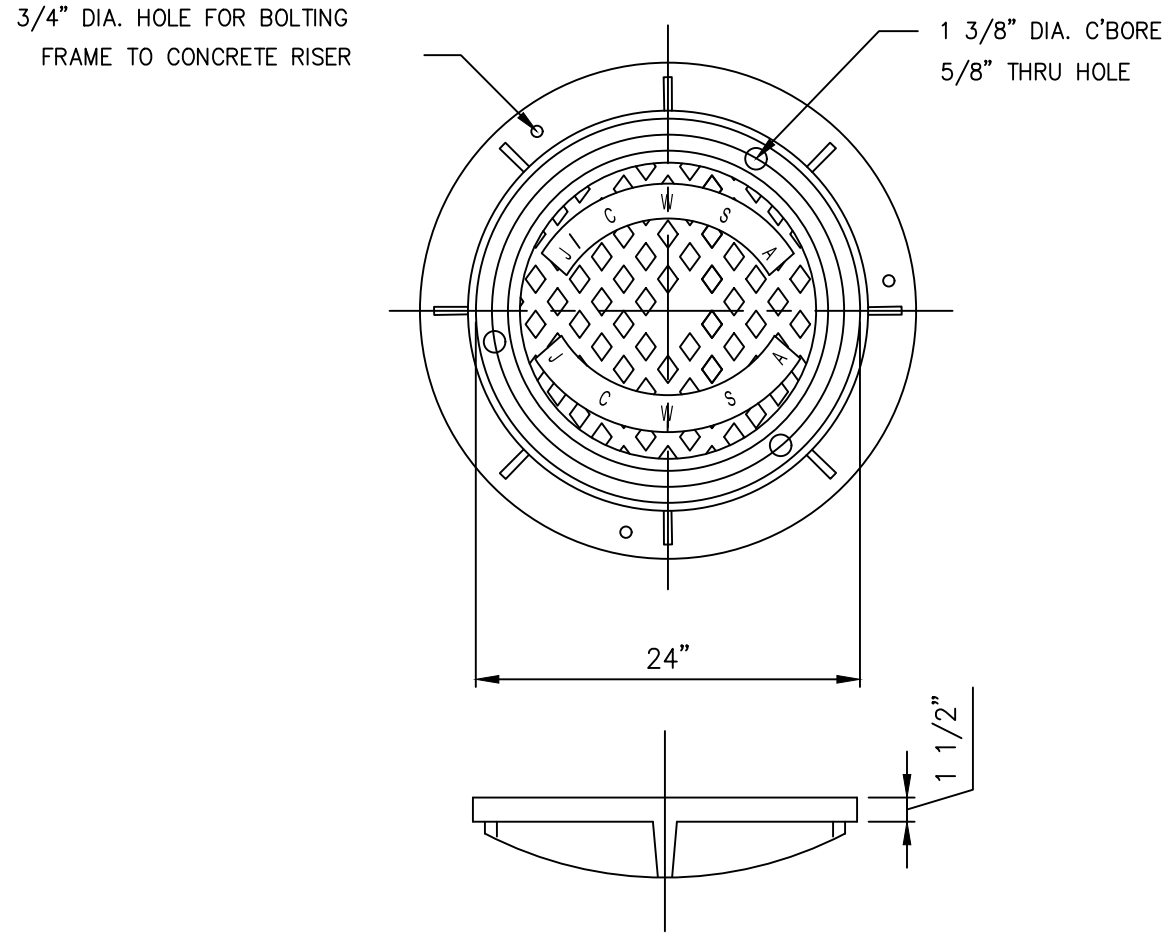


SECTION A-A

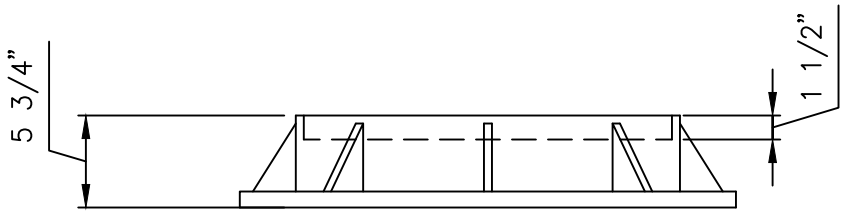
JCWSA STANDARD DETAIL D-2
DOGHOUSE MANHOLE

SCALE: NTS
DATE: 08/23

JCWSA
WATER & SEWERAGE AUTHORITY



MANHOLE COVER



MANHOLE FRAME

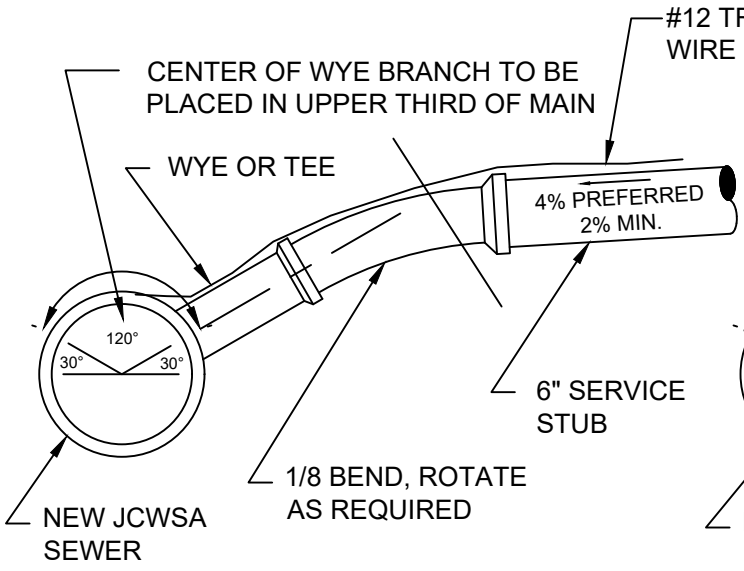
NOTES:

1. SEE JCWSA STANDARDS SECTION 3.2.6 FOR FRAME AND COVER REQUIREMENTS.
2. STD. MANHOLE COVERS SHALL BE FURNISHE3D WITH TWO (2) ¾" VENT HOLES.
3. MANHOLE COVERS IN JURISDICTIONAL WETLANDS, AREAS PRONE TO FLOODING OR AREAS IN 100–YR FLOOD PLAIN SHALL BE WATERTIGHT, BOLT DOWN CONSTRUCTION, OR "EJ REVOLUTION" GASKETED WATERTIGHT.
4. "EJ REVOLUTION" M.H. COVERS OR PRE–APPROVED EQUAL ARE REQUIRED WHERE ELEVATION OF THE COVER IS 12–INCHES OR MORE ABOVE GRADE.
5. HEAVY DUTY CAST IRON FRAME AND COVER TO BE RATED FOR H–20 LOADING WITH LETTERING ON COVER AS SHOWN.

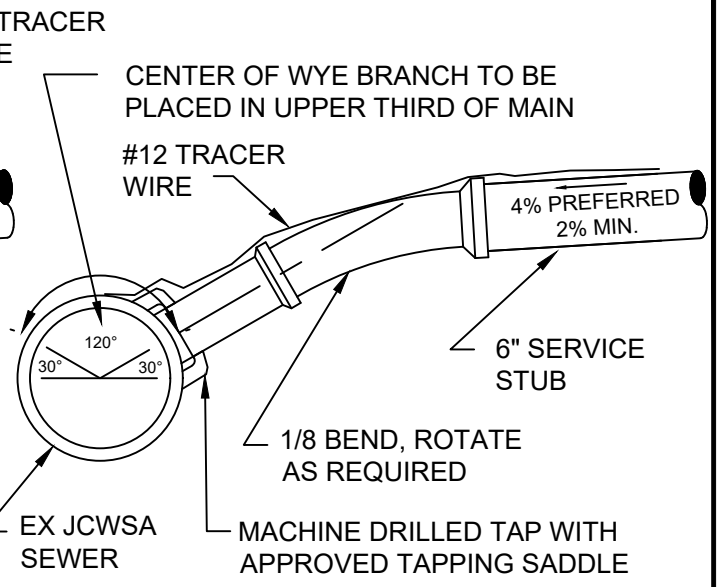
JCWSA STANDARD DETAIL D-3
24" MANHOLE RING AND COVER

SCALE: NTS
DATE: 08/23

JCWSA
WATER & SEWERAGE AUTHORITY



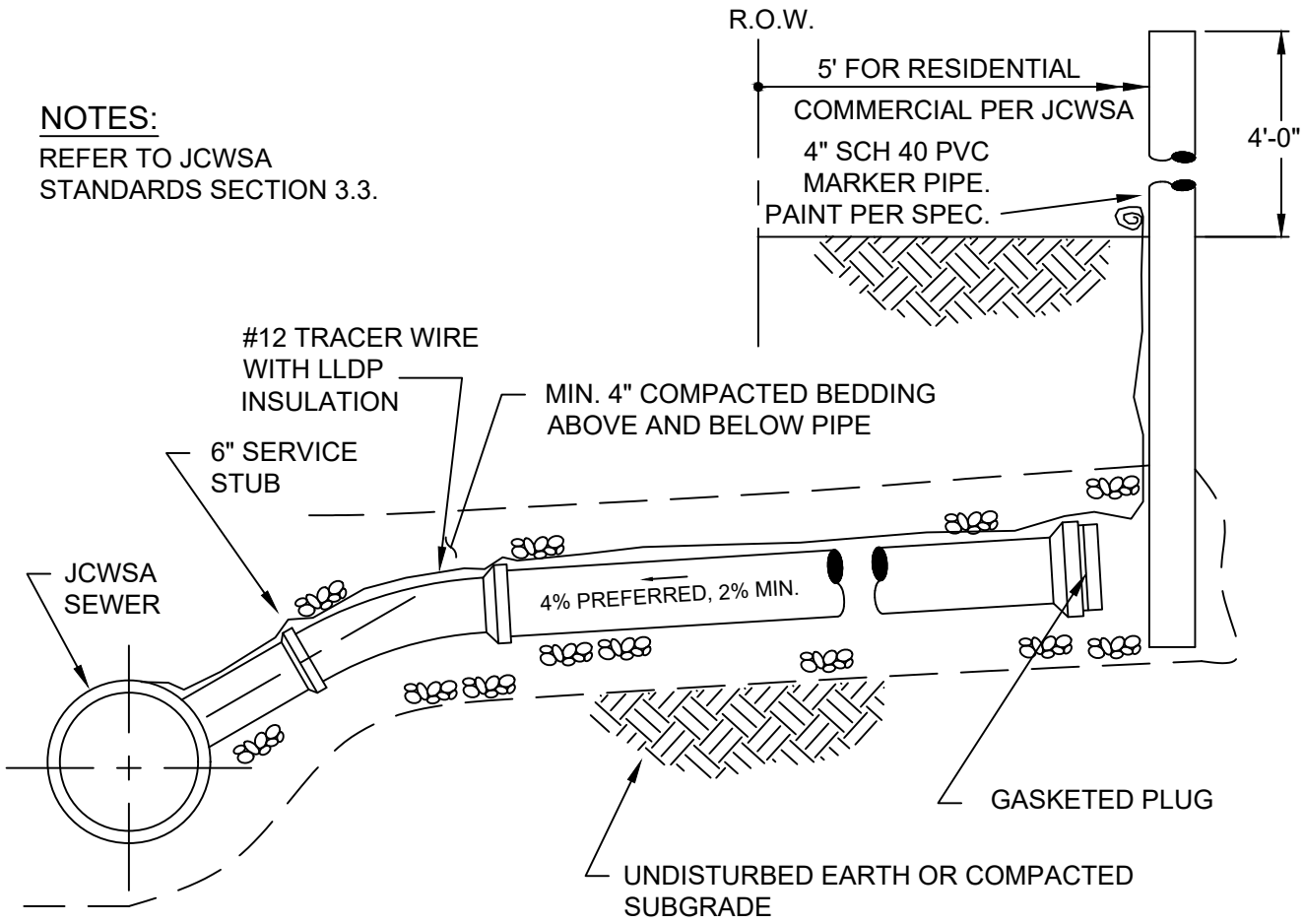
6" SERVICE STUB ON NEW MAIN



6" SERVICE STUB ON EXISTING MAIN

NOTES:

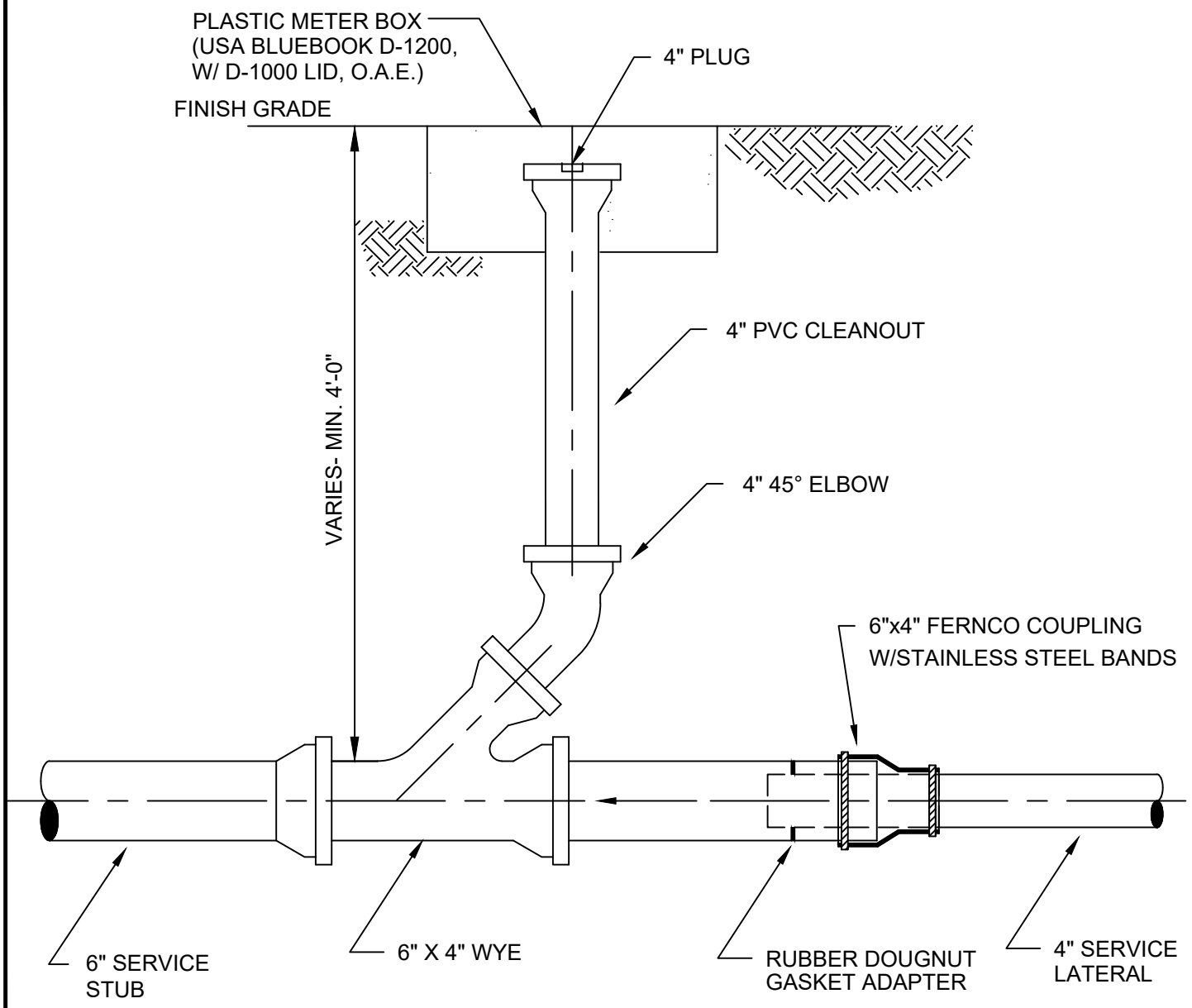
REFER TO JCWSA STANDARDS SECTION 3.3.



JCWSA STANDARD DETAIL D-4
SEWER SERVICE STUB

SCALE: NTS
DATE: 08/23

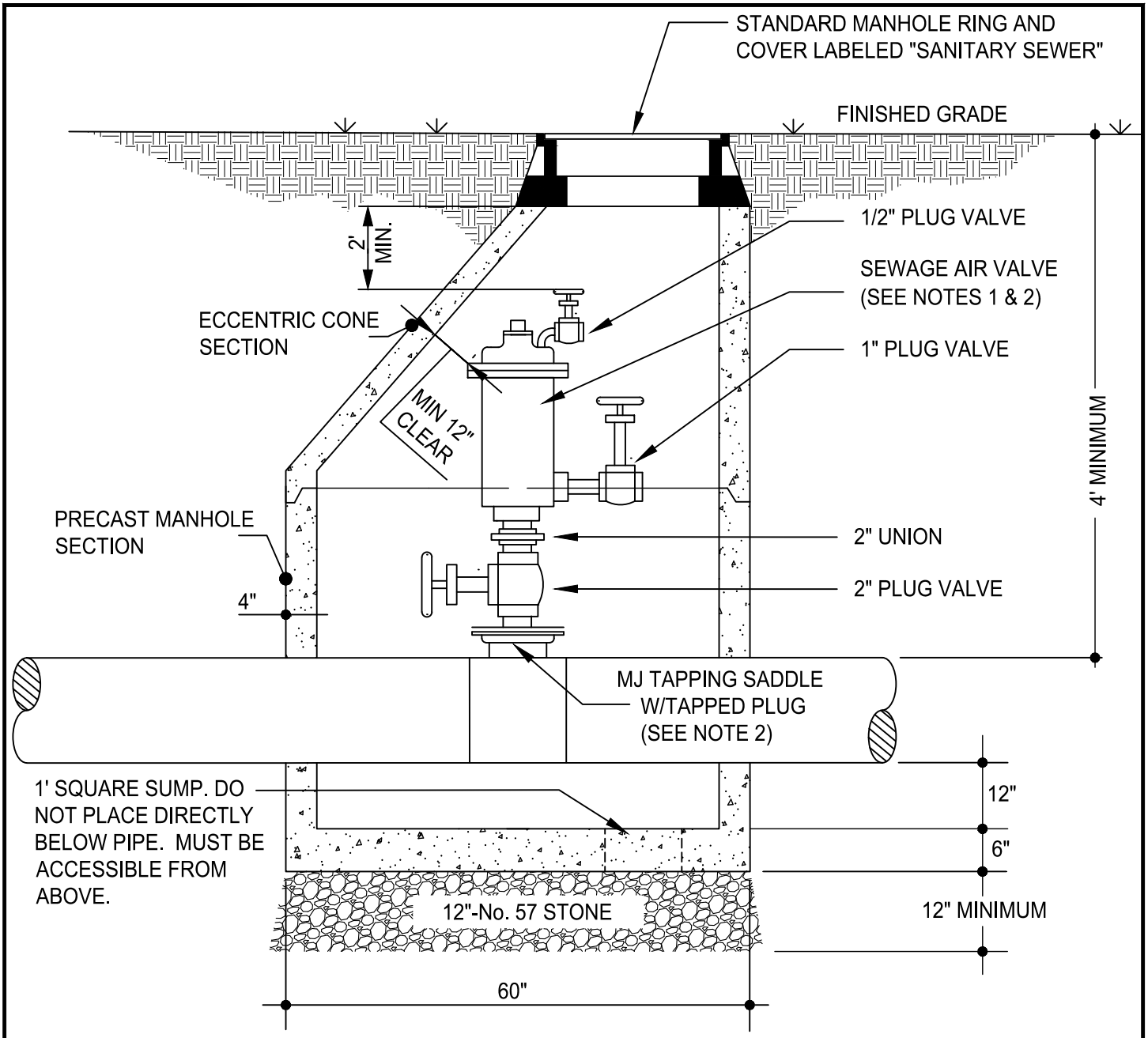
JCWSA WATER & SEWERAGE AUTHORITY



JCWSA STANDARD DETAIL D-5
SEWER LATERAL CONNECTION

SCALE: NTS
DATE: 08/23

JCWSA
WATER & SEWERAGE AUTHORITY



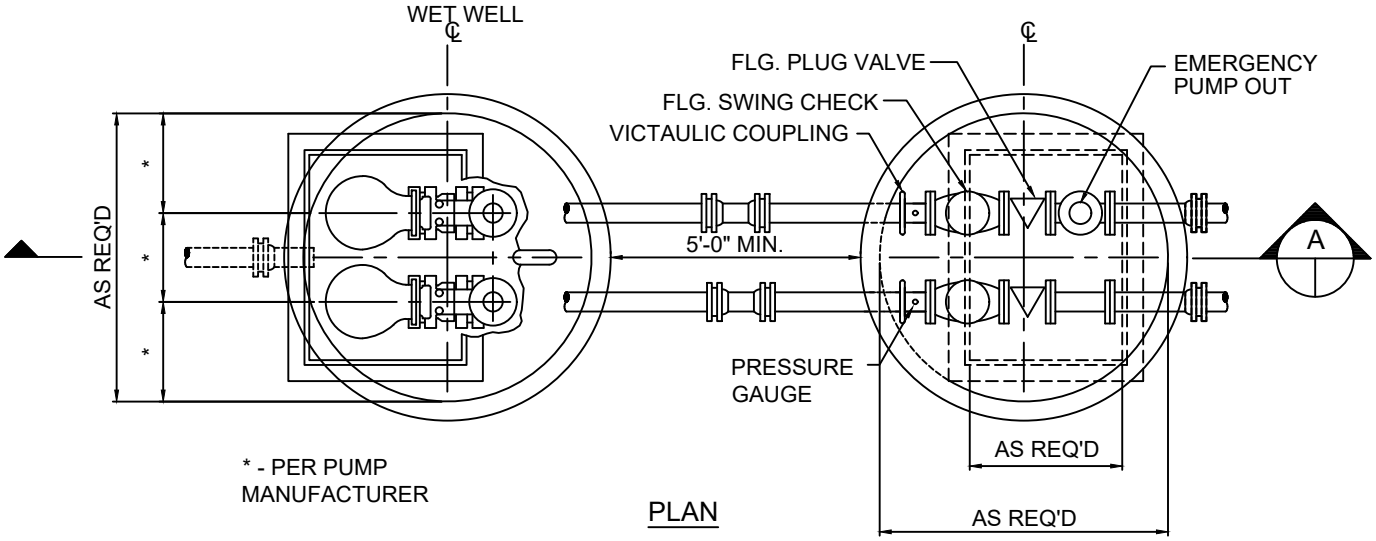
NOTES:

1. TAP SIZE AND ISOLATION VALVE TO BE SAME SIZE AS AIR VALVE
2. PREFERRED SEWAGE AIR VALVE IS TO BE BERMAD MODEL C50-N. IF UNAVAILABLE PRATT SERIES WWCV IS ACCEPTABLE.
3. TAPPING SADDLE SHALL BE ROMAC SST III, O.A.E.
4. ALL PIPING AND FITTINGS, IN THE MANHOLE, SHALL BE 'NO LEAD' BRASS OR BRONZE UNLESS NOTED
5. MANHOLE STEPS SHALL BE PLACED 12" O.C. PLACED IN ORDER TO ALLOW EASY ACCESS
6. CONCENTRIC CONES MAY BE USED FOR AIR VALVE MANHOLES LESS THAN 5' IN DEPTH
7. PROVIDE 1'-0" MIN. CLEARANCE AROUND ENTIRE VALVE ASSEMBLY
8. MANHOLE TO BE COATED PER JCWSA STANDARDS & SPECIFICATIONS.

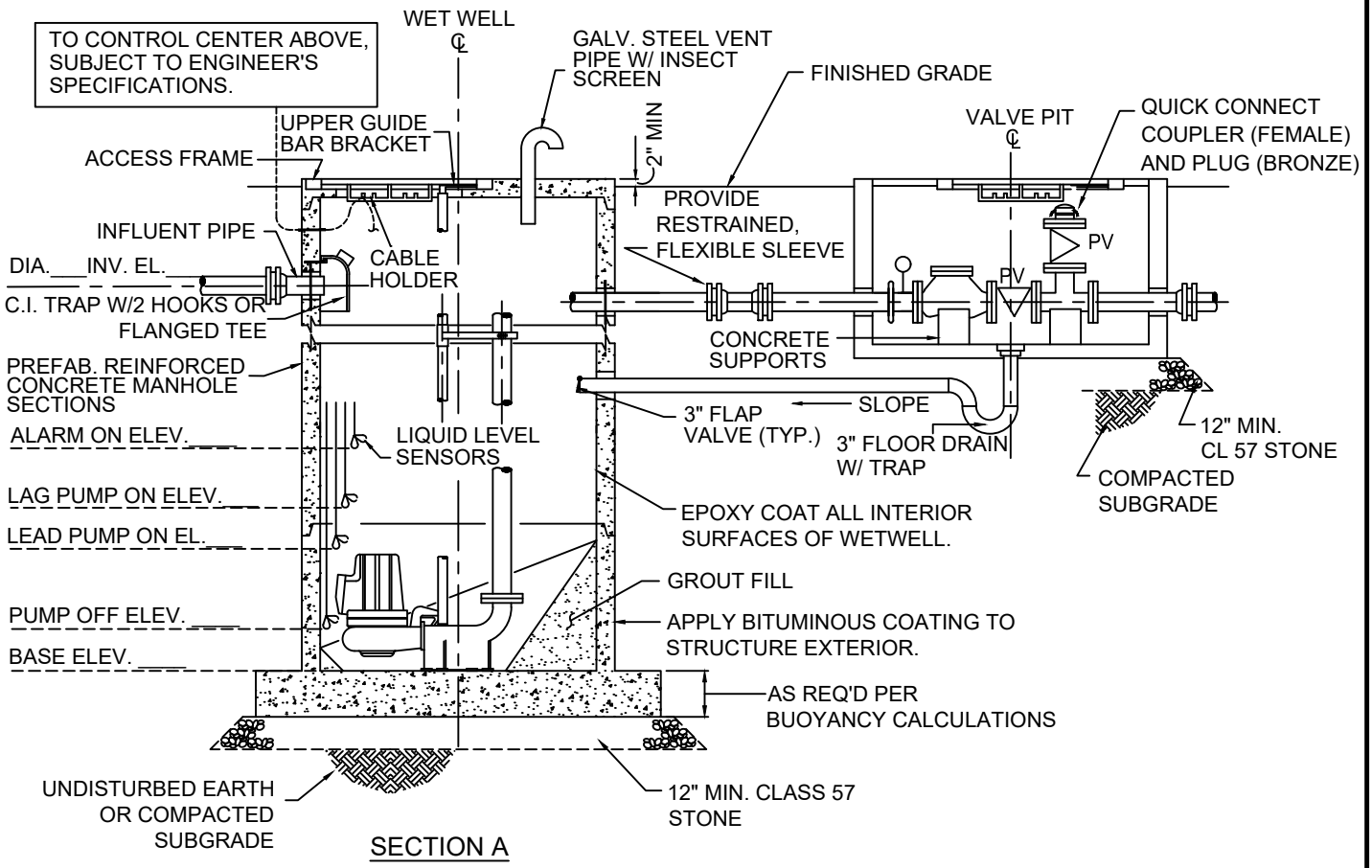
JCWSA STANDARD DETAIL D-6
SEWER AIR RELEASE VALVE MANHOLE

SCALE: NTS
DATE: 08/23

JCWSA
WATER & SEWERAGE AUTHORITY



PLAN



SECTION A

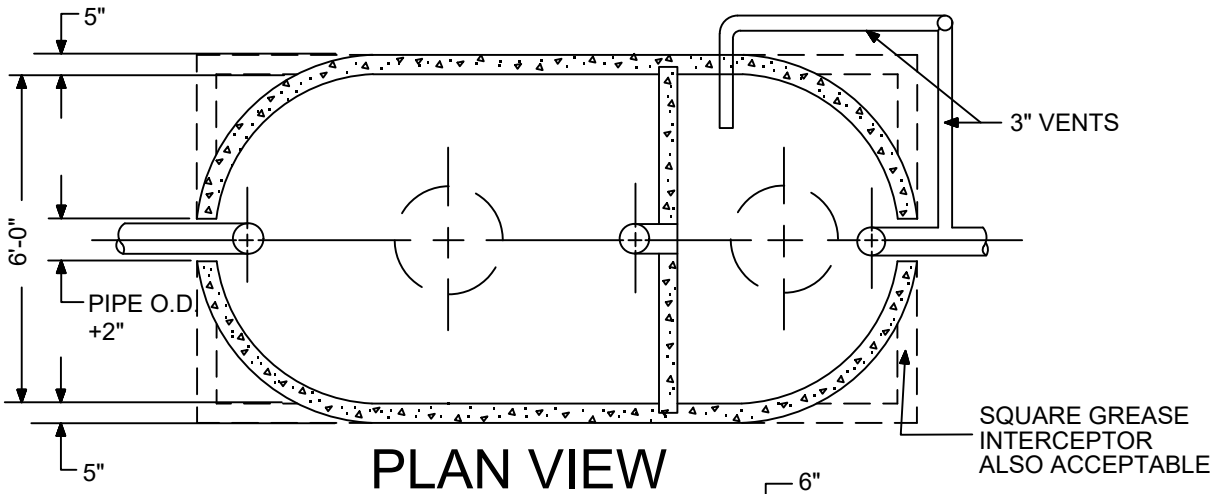
NOTES:

1. RESTRAIN ALL PIPE AND FITTINGS SHOWN THIS SHEET.
2. ALL EXPOSED PIPE & FITTINGS ARE FLANGED OR GROOVED.
3. ALL BURIED FITTINGS ARE RJ OR MJ WITH MEGALUGS.
4. DESIGN SHOWN IS CONCEPTUAL ONLY. FINAL DESIGN IS SUBJECT TO FULL REVIEW BY THE AUTHORITY ENGINEER.

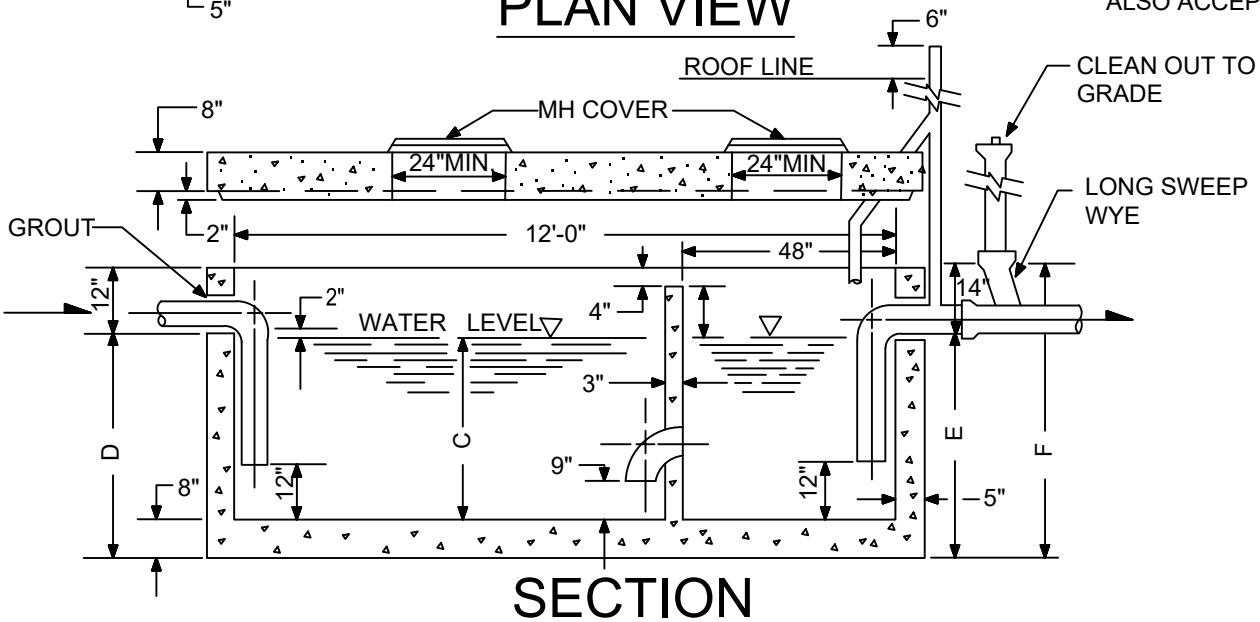
JCWSA STANDARD DETAIL D-7
SUBMERSIBLE SEWAGE PUMP STATION

SCALE: NTS
DATE: 08/23

JCWSA
WATER & SEWERAGE AUTHORITY



PLAN VIEW



SECTION

NOTES:

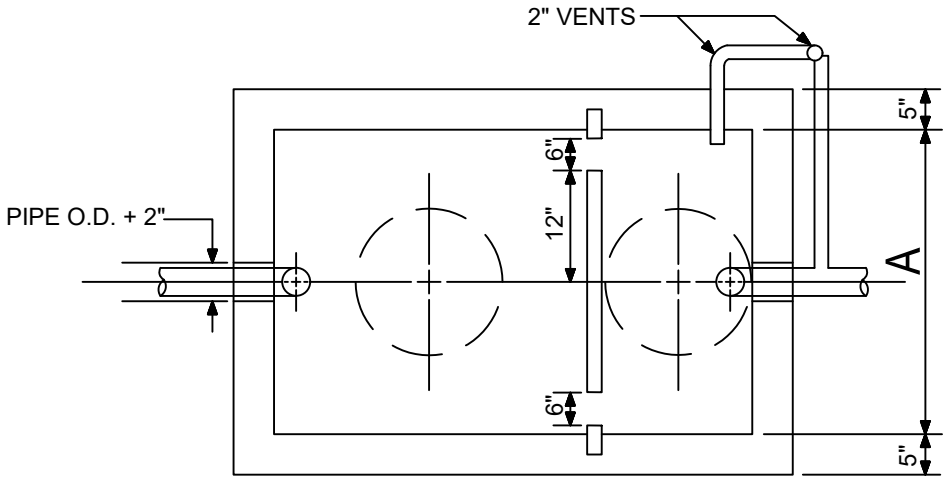
1. SECONDARY COMPARTMENT HAS VOLUME EQUAL TO 1/3 OF TOTAL CAPACITY.
2. PIPE AND FITTINGS SHALL BE CAST IRON MIN. 3" DIA.
3. WALLS AND BOTTOM REINFORCED THROUGHOUT WITH MIN. 2 X 16 6/10 REMESH
4. COVERS SHALL BE REINFORCED LONGITUDINALLY WITH NO. 6 REBAR ON 6" CENTERS, NO. 4 REBAR ON 6" CENTERS WIDTHWISE, AND NO. 8 REBAR DIAGONALLY AROUND ACCESS HOLES.
5. CLEAN OUT SHALL BE AN IRON BODY FERRULE WITH BRASS SCREW PLUG.
6. VENT PIPE (WHEN REQ'D) SHALL BE CAST IRON TO A POINT 6" ABOVE THE GROUND LEVEL.
7. MANHOLE RING AND COVER SHALL BE AUTHORITY STANDARD, H-20 RATED.
8. NO BOLT DOWN COVERS ALLOWED WITHOUT PERMISSION FROM THE AUTHORITY.
9. GREASE CAPACITY RATED FOR LARGE COMPARTMENT ONLY.
10. CHECK WITH SUPPLIER FOR EXACT DIMENSIONS.

Water Capacity (Approx. Gallons)	Grease Capacity (Approx. Cubic Ft.)	DIMENSIONS INCHES			
		C	D	E	F
1565	100	40	50	48	62
1800	121	46	56	54	68
2035	143	52	62	60	74
2505	186	64	74	72	86
2975	229	76	86	84	98
3210	250	82	92	90	104
3445	271	88	98	96	110

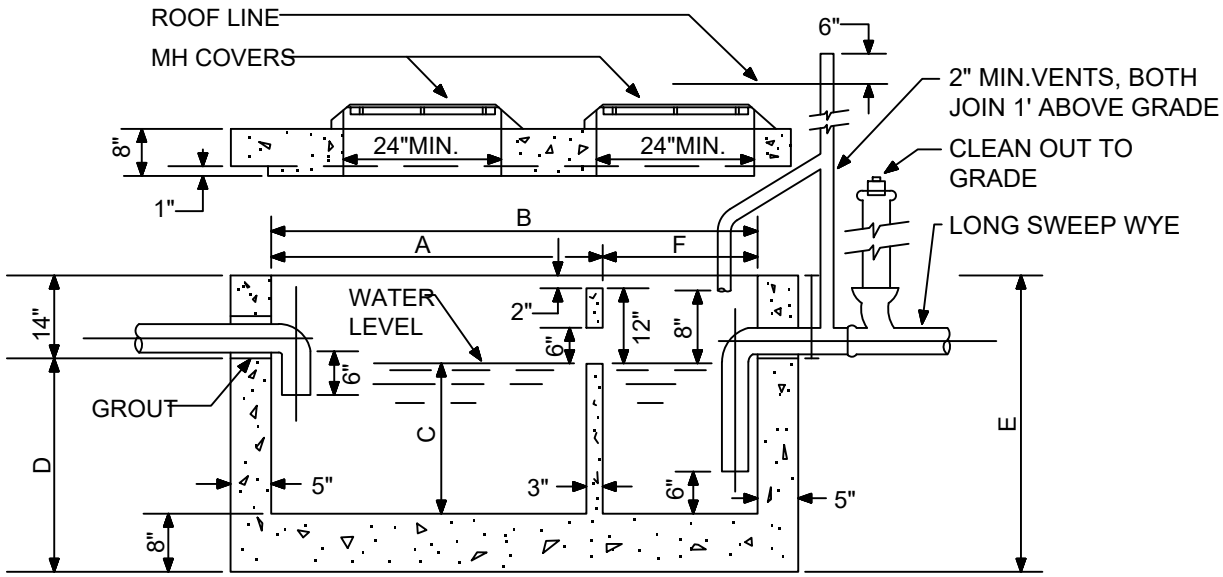
JCWSA STANDARD DETAIL D-8
GREASE INTERCEPTOR

SCALE: NTS
DATE: 08/23

JCWSA
WATER & SEWERAGE AUTHORITY



PLAN VIEW



SECTION

NOTES:

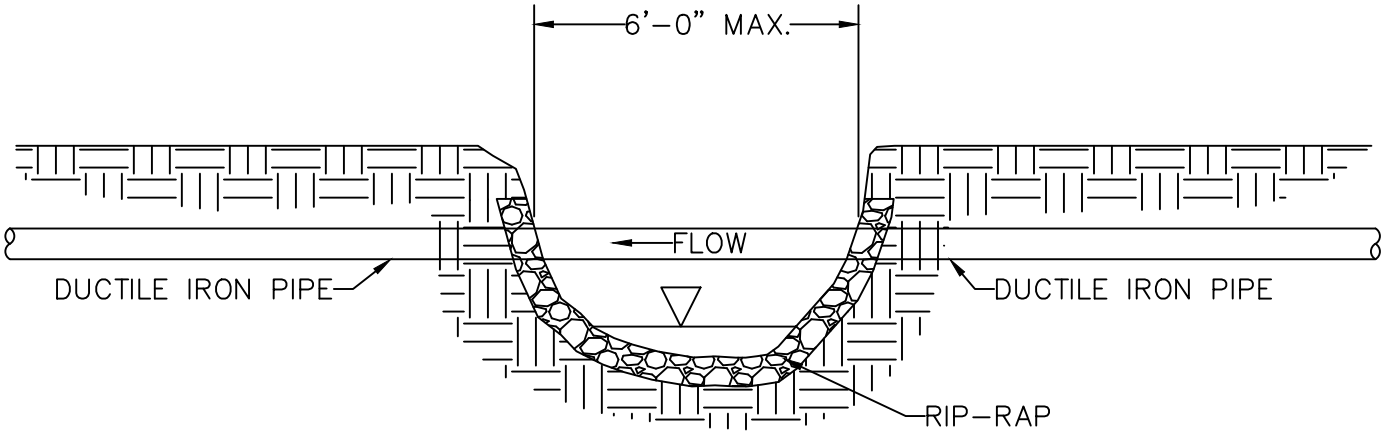
1. PIPE AND FITTINGS SHALL BE CAST OR DUCTILE IRON, MINIMUM 3" DIAMETER.
2. SMALL COMPARTMENT HAS 1/3 TOTAL CAPACITY.
3. WALLS AND BOTTOM REINFORCED THROUGHOUT WITH 2 x 6 6/10 REMESH.
4. COVERS SHALL BE REINFORCED LONGITUDINALLY WITH NO.6 REBAR ON 6" CENTERS, NO.4 REBAR ON 6" CENTERS WIDTHWISE, AND NO.8 REBAR DIAGONALLY AROUND ACCESS HOLES.
5. CLEAN OUT SHALL BE AN IRON BODY FERRULE WITH BRASS SCREW PLUG.
6. VENT PIPE SHALL BE DUCTILE IRON TO A POINT 6" ABOVE GROUND.
7. MANHOLE RING AND COVER SHALL BE AUTHORITY STANDARD.
8. CHECK WITH SUPPLIER FOR EXACT DIMENSIONS.
9. NO BOLT DOWN COVERS ALLOWED WITHOUT APPROVAL FROM THE AUTHORITY.
10. FOR CAPACITIES OTHER THAN SHOWN SEE AUTHORITY ENGINEER.

WATER CAPACITY APPROX. GALLONS	DIMENSIONS TWO COMPARTMENT TANK INCHES					
	A	B	C	D	E	F
320	48	72	22	30	44	24
500	48	72	36	46	44	24
780	48	96	40	48	62	32
1060	72	102	34	42	56	34

JCWSA STANDARD DETAIL D-9
SAND AND OIL INTERCEPTOR

SCALE: NTS
DATE: 08/23

JCWSA
WATER & SEWERAGE AUTHORITY



NOTES:

1. D.I.P. JOINTS SHALL BE RESTRAINED A MINIMUM OF 10-FEET BEYOND THE 100 YEAR FLOOD LINE.

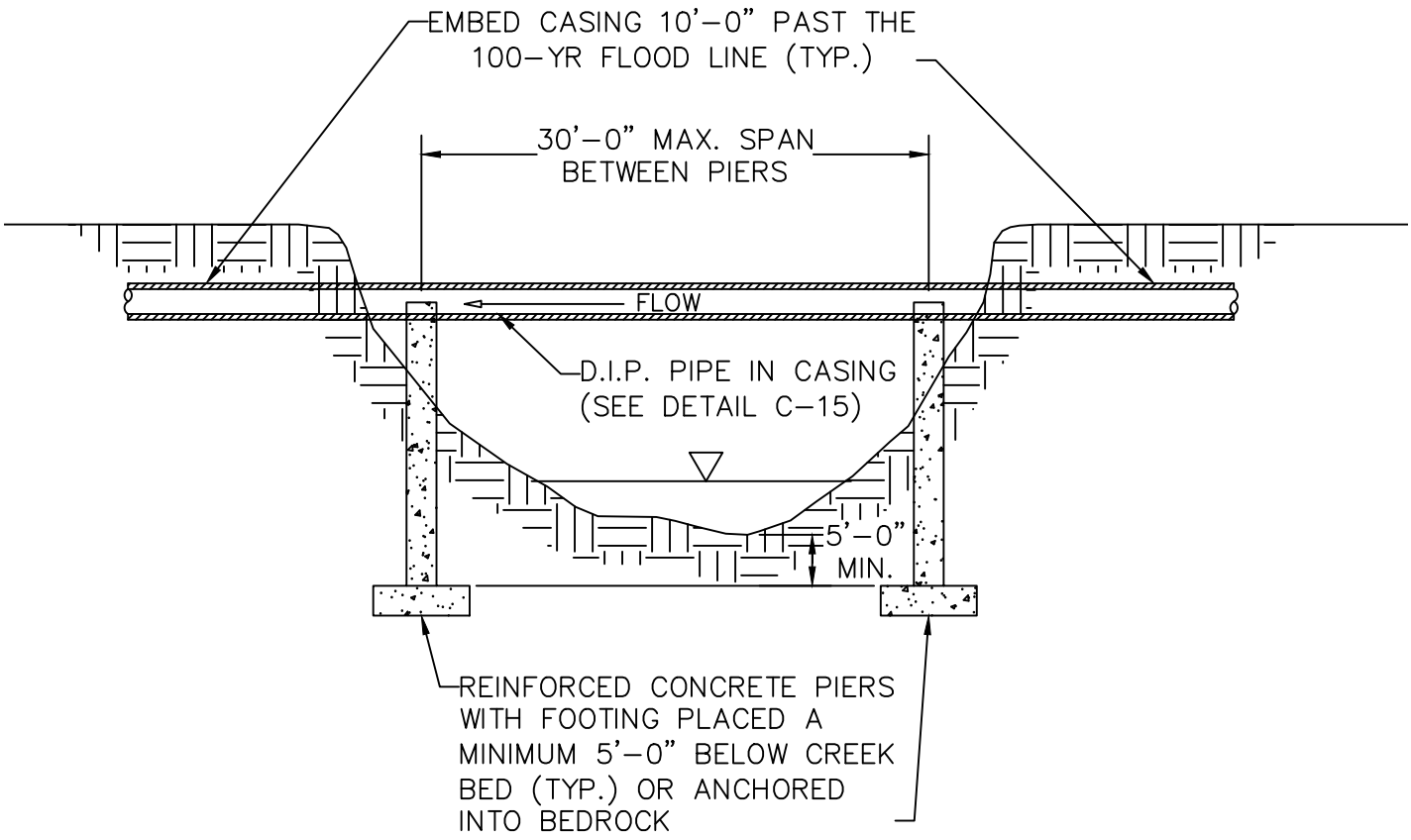
2. ALL AERIAL SEWERS SHALL SUBMIT TO JCWSA STRUCTURAL DESIGNS FOR SPAN & FLOOD WATER FORCES.

3. THIS DETAIL MAY ONLY BE ALLOWED IN SPECIAL CIRCUMSTANCES, ON A CASE-BY-CASE BASIS. USAGE OF THIS DETAIL IS STRICTLY LIMITED TO AREAS WITH LIMITED FLOOD POTENTIAL & LIMITED POTENTIAL FOR DEBRIS IMPACT. PRIOR TO USAGE OF THIS DETAIL, APPROVAL MUST BE RECEIVED IN WRITING FROM THE AUTHORITY ENGINEER.

JCWSA STANDARD DETAIL D-10
NON-PIER AERIAL D.I.P. SEWER LINE

SCALE: NTS
DATE: 08/23

JCWSA
WATER & SEWERAGE AUTHORITY



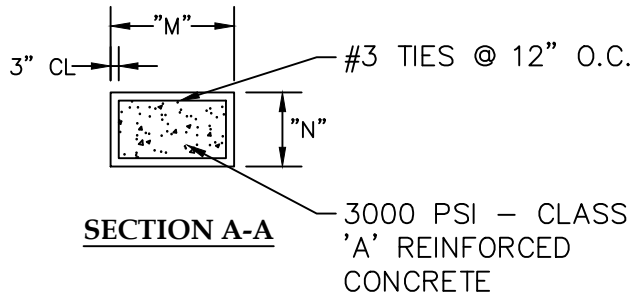
NOTES:

1. PIERS NOT REQUIRED UNLESS AERIAL SPAN IS OVER 20'–0" IN LENGTH.
2. WHENEVER POSSIBLE NO PIERS SHALL BE PLACED IN NORMAL FLOWS OF CREEK.
3. ALL AERIAL CROSSING DESIGNS MUST BE APPROVED BY JCWSA.
4. ALL AERIAL SEWERS SHALL SUBMIT STRUCTURAL DESIGNS FOR SPAN & FLOOD WATER FORCES.
5. ALL AERIAL CROSSINGS MUST HAVE STEEL CASING PIPE & PROTECTO 401 COATED RESTRAINED D.I.P. CARRIER PIPE. SEE DETAIL C–15 FOR CASING SPACERS, END SEALS, MINIMUM CASING SIZES & OTHER CASING REQUIREMENTS.
6. ALL PIER FOUNDATIONS SHALL BE DESIGNED & SUBMITTED TO JCWSA BY A REGISTERED GA PROFESSIONAL ENGINEER.

JCWSA STANDARD DETAIL D-11
AERIAL D.I.P. PIPE CROSSING

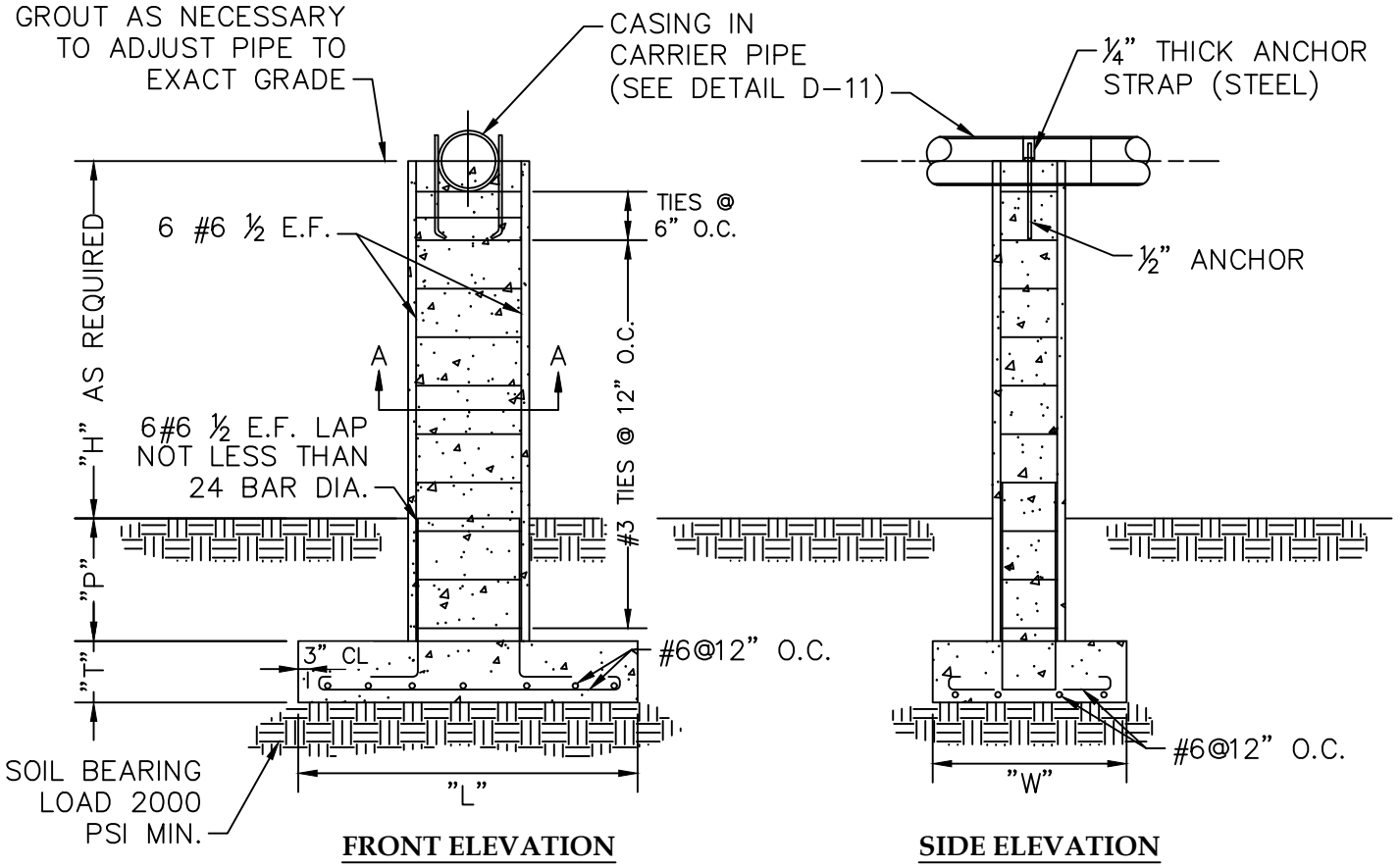
SCALE: NTS
DATE: 08/23

JCWSA
WATER & SEWERAGE AUTHORITY



SECTION A-A

"H"=	0'–5'	5'–10'	10'–15'	15'–20'
"W"=	3'	4'	5'	6'
"L"=	4'	5'	7'	10'
"T"=	1'	1'	1.5'	2'
"N"=	1'	1'	1.5'	1.5'
"M"=	2'	3'	4'	5'
"M" SHALL BE CASING DIA. PLUS 1' MIN.				
"P"=	2'	3'	4'	5'
SEE NOTE #3 BELOW FOR MORE INFO				



FRONT ELEVATION

SIDE ELEVATION

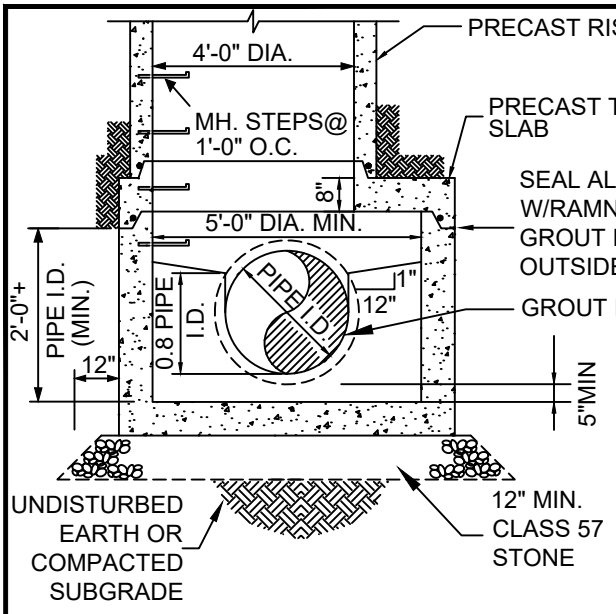
NOTES:

1. ABOVE DETAIL IS THE MINIMUM ACCEPTABLE.
2. ALL PIER FOUNDATIONS SHALL BE DESIGNED & SUBMITTED TO JCWSA BY A REGISTERED GEORGIA PROFESSIONAL ENGINEER.
3. ADJUST "P" TO PROVIDE MINIMUM 5'–0" BELOW CREEK BED (TYP.) OR ANCHOR INTO BEDROCK.
4. GEOTECHNICAL ENGINEER SHALL PROVIDE COMPACTION TEST RESULTS UNDER ALL FOOTINGS & CERTIFY A MINIMUM BEARING CAPACITY OF 2,000 p.s.i. MINIMUM. ENGINEERED BACKFILL MAY BE REQUIRED UNDER FOOTINGS.

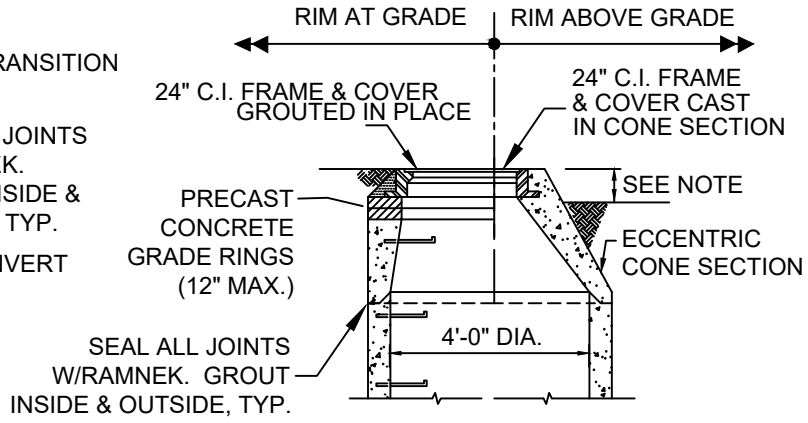
JCWSA STANDARD DETAIL D-12
CONCRETE PIER & FOOTING

SCALE: NTS
DATE: 08/23

JCWSA
WATER & SEWERAGE AUTHORITY

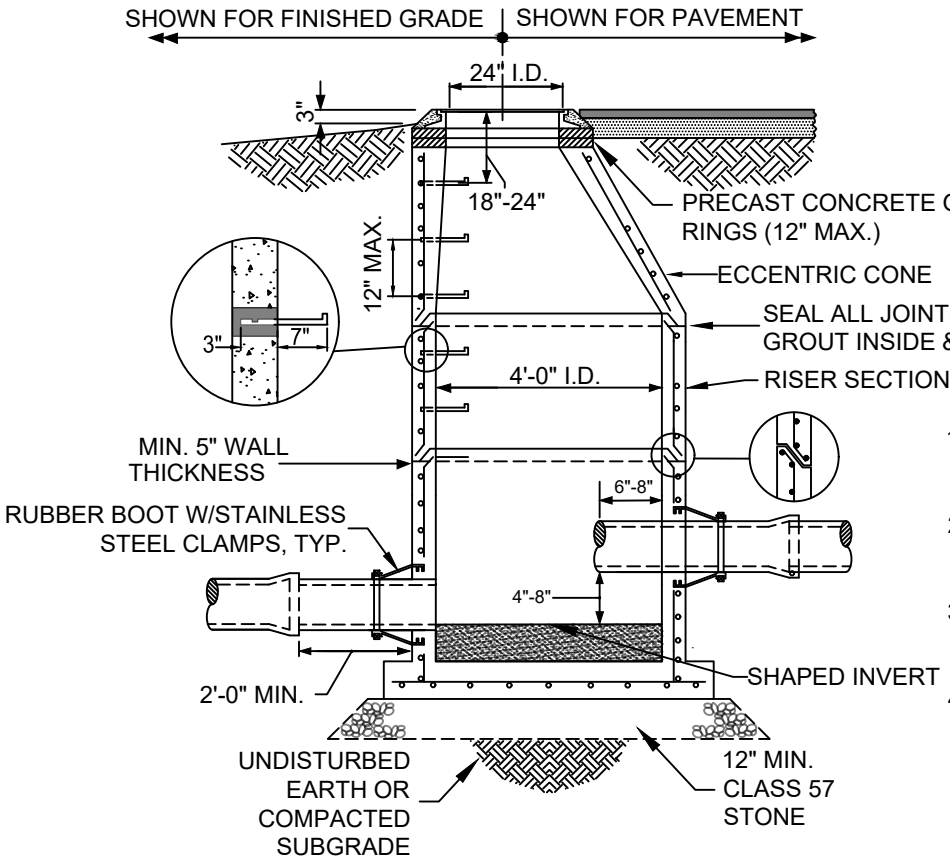


MANHOLE BASE DETAIL FOR 5'-0" DIA. OR LARGER BASES



NOTE:
SET RIM ELEVATION 3' ABOVE GRADE IN FLOOD-PRONE OR SWAMPY AREAS OR WHERE DIRECTED BY THE AUTHORITY.

MANHOLE CONE DETAILS



STANDARD PRECAST CONCRETE MANHOLE

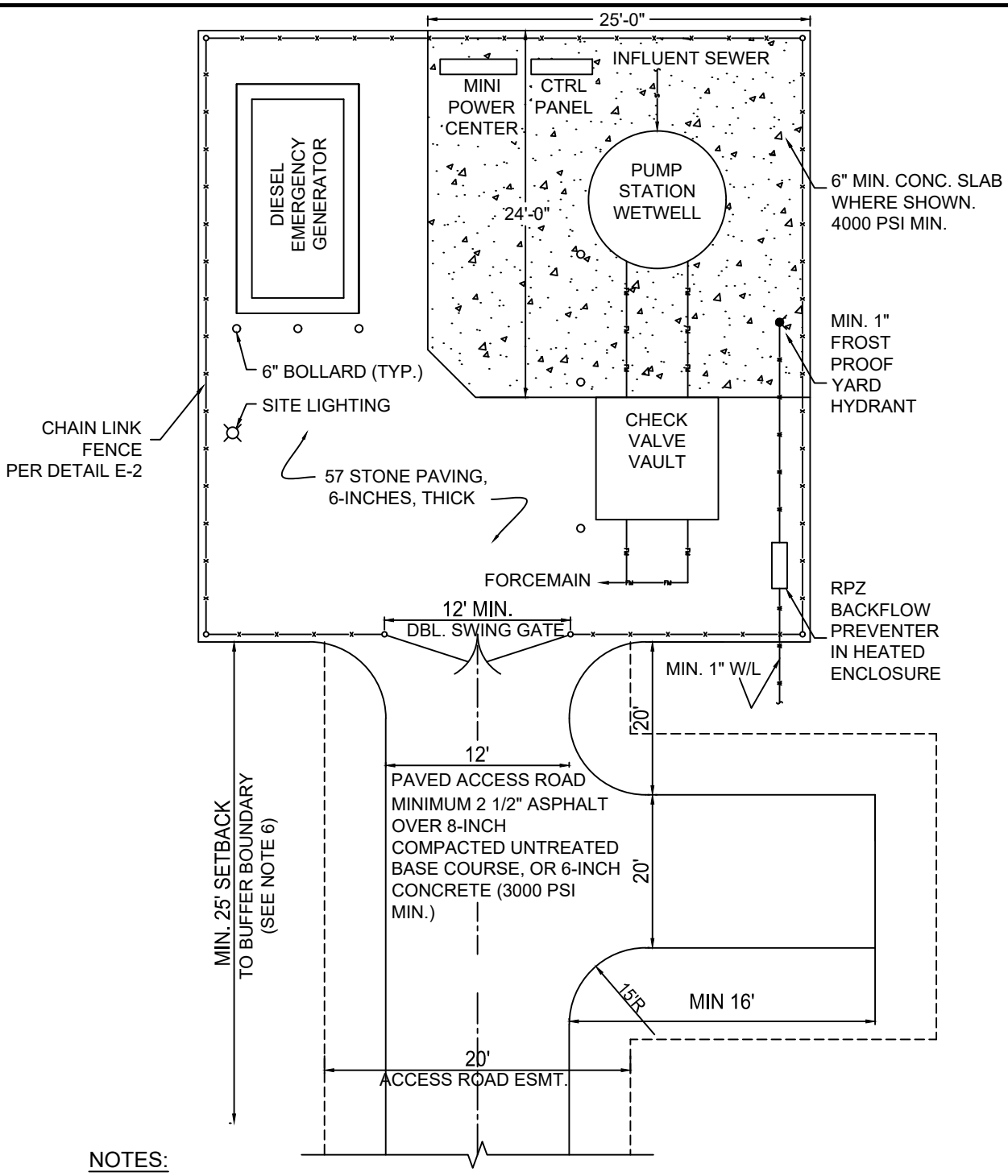
NOTES:

1. THE DOMESTIC SEWER SHALL BE TIED-IN DOWNSTREAM OF THE SAMPLING MANHOLE.
2. SEE JCWSA STANDARDS SECTION 3.2.6 FOR FRAME AND COVER REQUIREMENTS.
3. STD. MANHOLE COVERS SHALL BE FURNISHED WITH TWO (2) ¾" VENT HOLES.
4. MANHOLE COVERS IN 100-YR FLOOD PLAIN SHALL BE WATERTIGHT, BOLT DOWN CONSTRUCTION, OR "EJ REVOLUTION" GASKETED WATERTIGHT.
5. "EJ REVOLUTION" M.H. COVERS OR PRE-APPROVED EQUAL ARE REQ'D WHERE ELEVATION OF THE COVER IS 12-INCHES OR MORE ABOVE GRADE.

JCWSA STANDARD DETAIL D-13
SAMPLING MANHOLE

SCALE: NTS
DATE: 08/23

JCWSA
WATER & SEWERAGE AUTHORITY



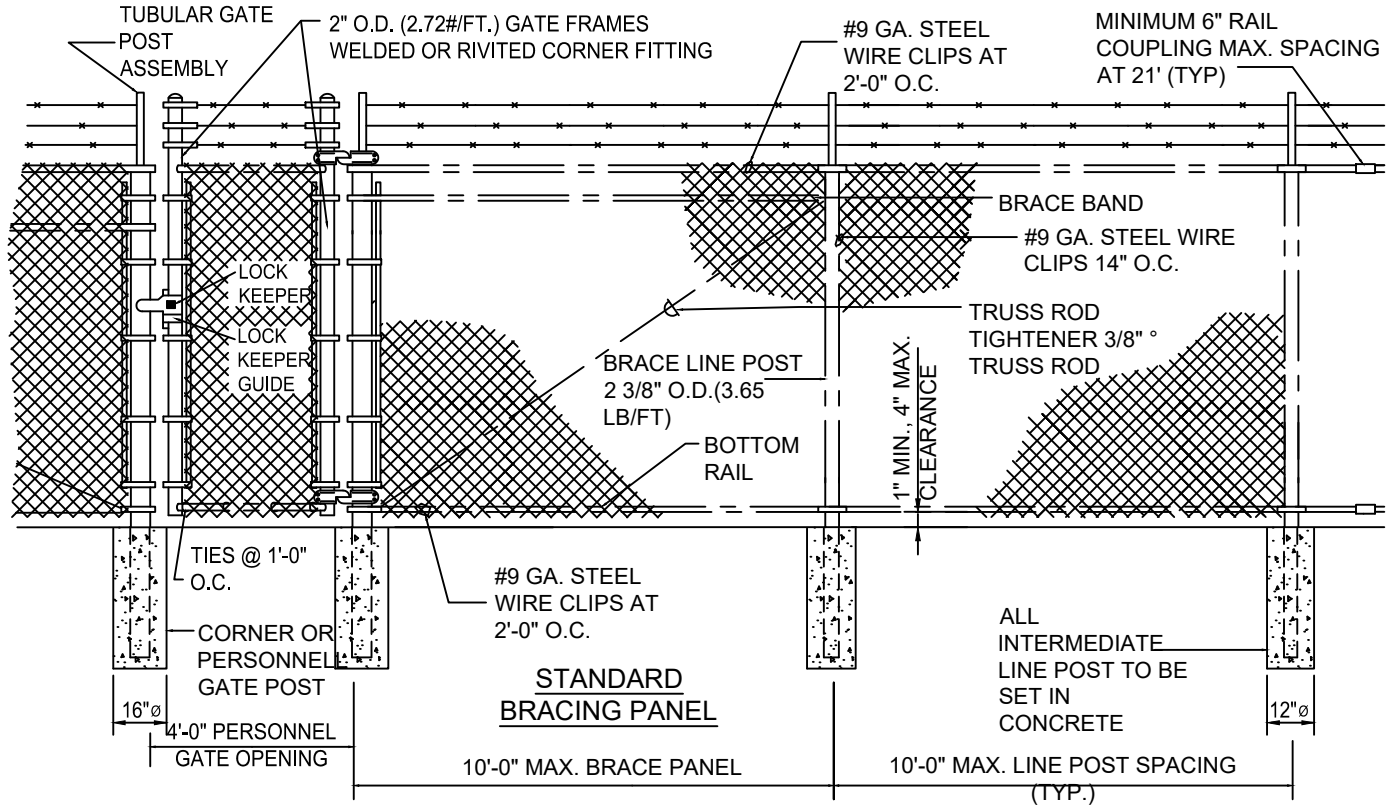
NOTES:

1. LAYOUT SHOWN IS FOR REFERENCE ONLY, DO NOT SCALE. DESIGN ENGINEER TO VERIFY FINAL LAYOUT PER SITE CONDITIONS. DESIGN IS CONCEPTUAL ONLY. FINAL DESIGN TO UNDERGO COMPLETE REVIEW BY THE AUTHORITY ENGINEER.
2. REFERENCE DETAIL D-7 FOR ADDITIONAL DETAIL.
3. FINAL LAYOUT MUST BE APPROVED BY AUTHORITY ENGINEER.
4. PROVIDE COMPLETE SITE AND GRADING PLAN (SCALE: 1"=20') ON DESIGN DRAWINGS INCLUDING SPOT ELEVATIONS THROUGHOUT.
5. PROVIDE RECORDED EASEMENT, DEDICATED TO JCWSA IN A FORM ACCEPTABLE TO THE AUTHORITY, FOR ACCESS ROAD AND BUFFER BOUNDARY.
6. BUFFER BOUNDARY SHALL BE A MINIMUM OF 25 FEET IN ALL DIRECTIONS FROM THE FENCED AREA.

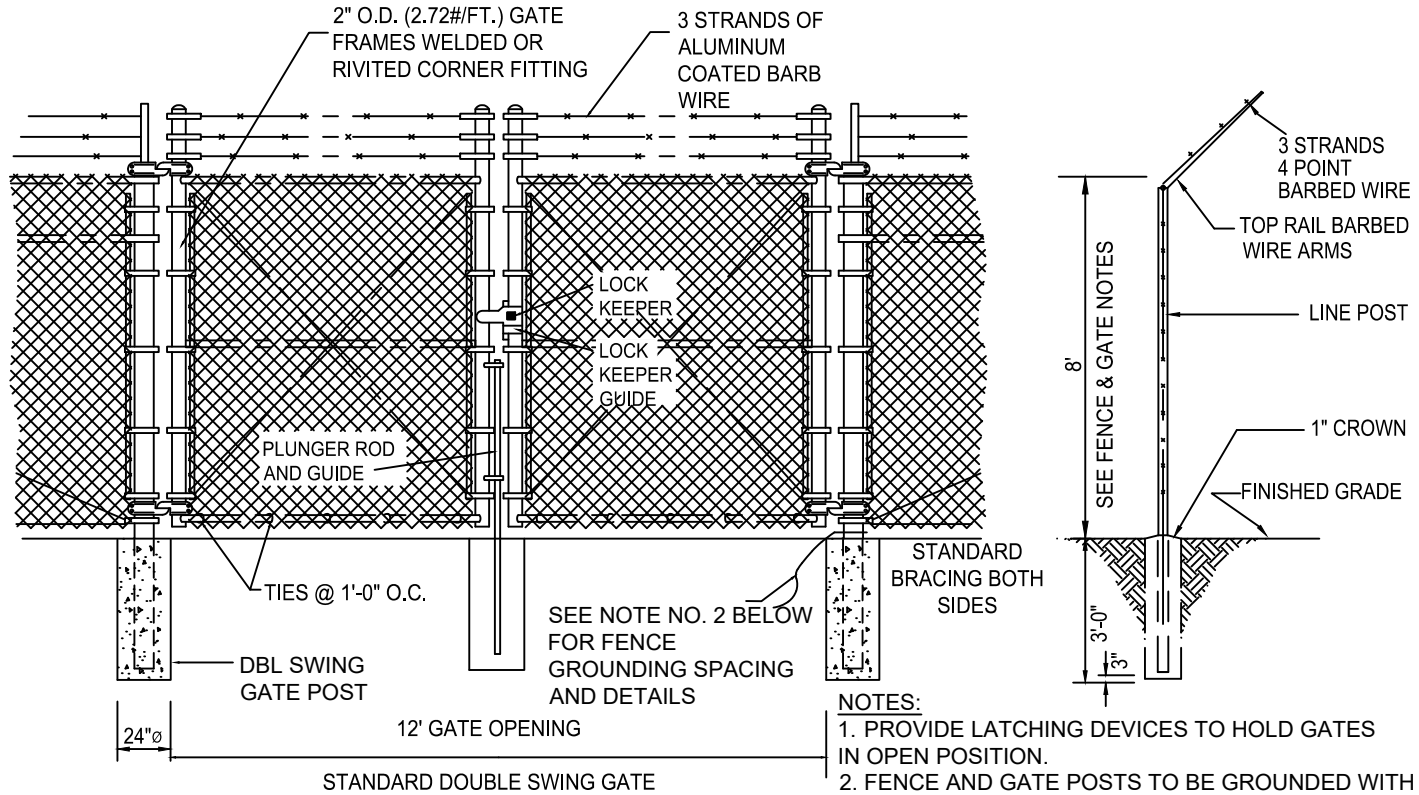
JCWSA STANDARD DETAIL E-1
SUBMERSIBLE PUMP STATION SITE LAYOUT

SCALE: NTS
DATE: 08/23

JCWSA
WATER & SEWERAGE AUTHORITY



STANDARD BRACING PANEL



SWING GATE ELEVATION

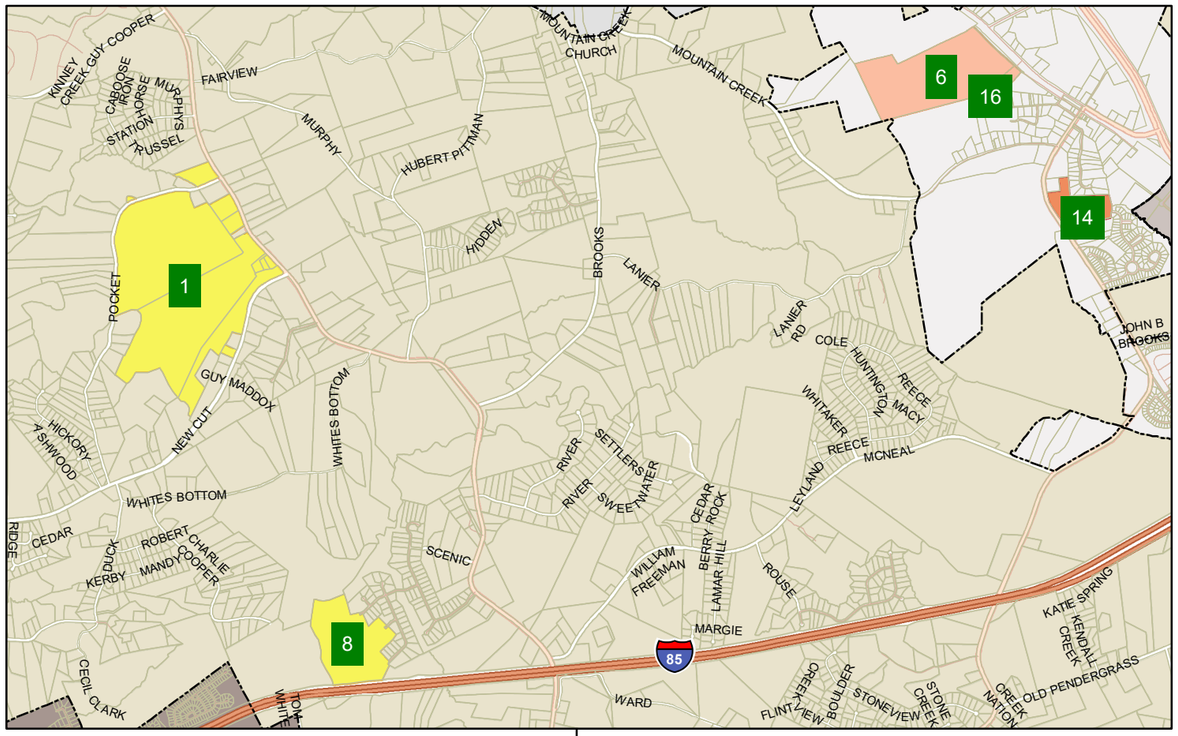
NOTES:
1. PROVIDE LATCHING DEVICES TO HOLD GATES IN OPEN POSITION.
2. FENCE AND GATE POSTS TO BE GROUNDED WITH 8' X 5/8"Ø COPPER CLAD ROD @ 500' INTERVAL AND A BRAIDED COPPER GROUND AT ALL TIMES.

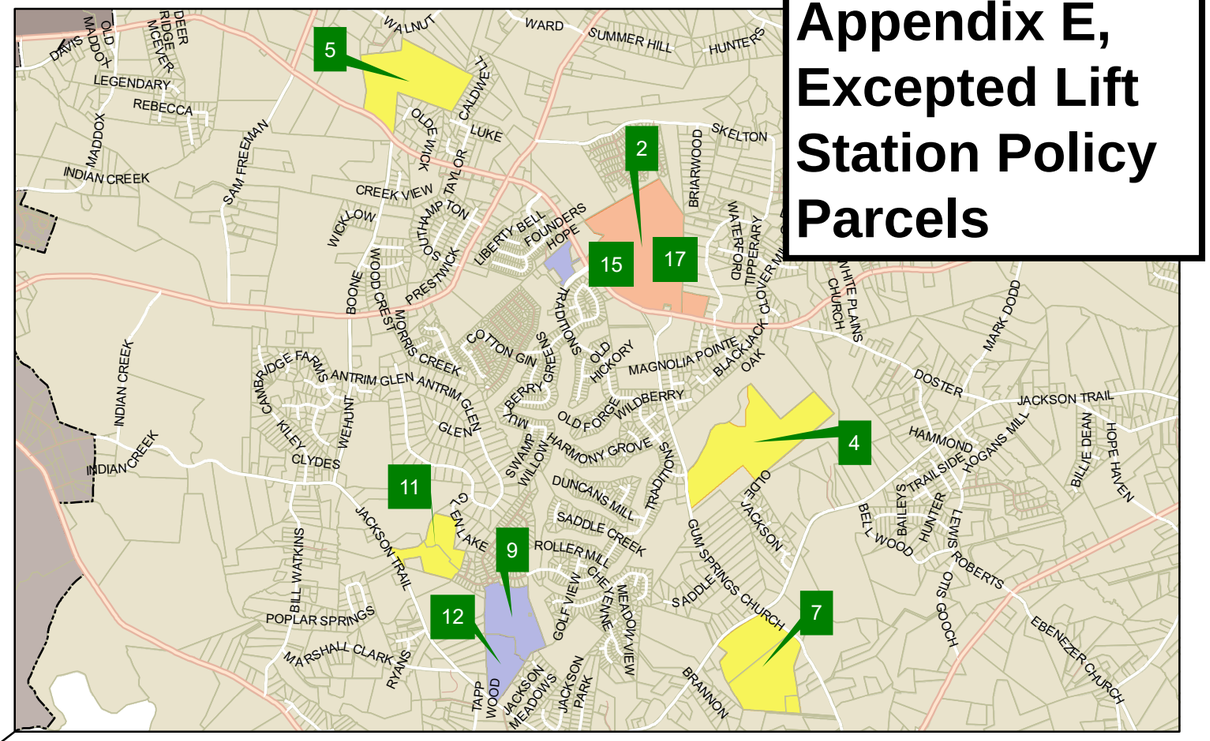
JCWSA STANDARD DETAIL E-2
SITE FENCING

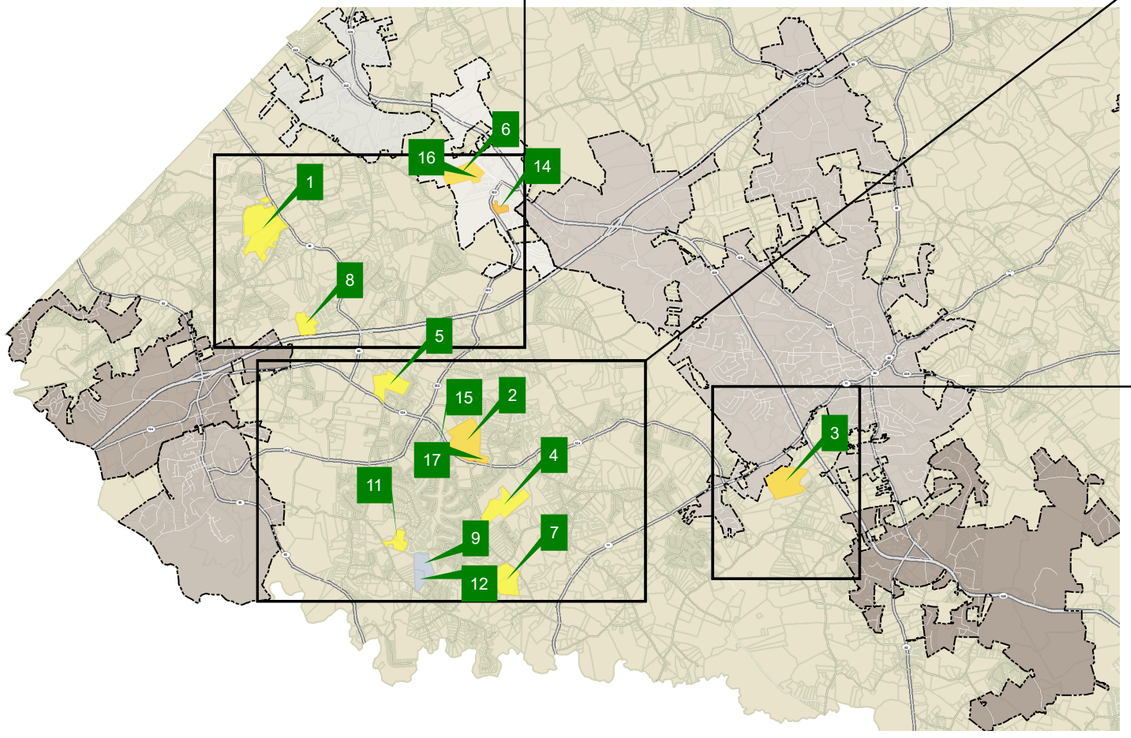
SCALE: NTS
DATE: 08/23

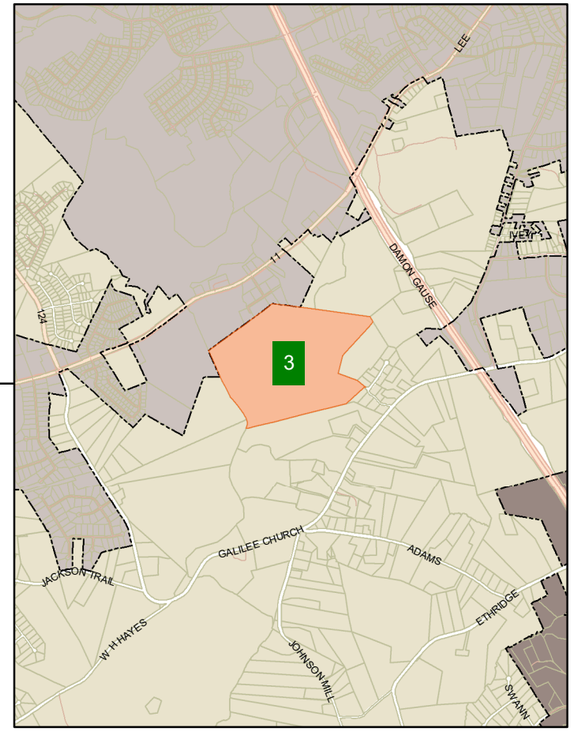
JCWSA
WATER & SEWERAGE AUTHORITY

Appendix E, Excepted Lift Station Policy Parcels









Key	Description - Tax ID	Zoning	Notes	Acres
1	N.E. Developers - 110 033	R2	Rezoned 2006	271.1
2	The Grand - 105-005	R3	Rezoned 2016	172.5
3	Galilee Church Rd- 082 030B	R3	JCWSA Property	156.2
4	Gum Springs Church Rd - 105 021	R2	Rezoned 2019	130.2
5	Bentwater - 112 038	R2	Rezoned 2017	102.3
6	Pendergrass - Walnut Grove 102D 001	R3	Rezoned 2007	93.0
7	Lake Preserve @ Jackson Tr.- 106 008H	R2	Rezoned 2006	61.6
8	Scenic Falls Phase 2 - 111 019	R2	Rezoned 2005	58.8
9	Traditions Pod N - 105 019N	PUD	-	54.7
11	Traditions - 105 019N	R-2	Rezoned 2017	43.9
12	Jackson Trail Rd 106-013	PUD	-	32.7
14	Pendergrass - MFR - 102 025	MFR	Rezoned 2020	21.3
15	Traditions Pod M - 105 019M	PUD	-	13.3
16	Pendergrass - Walnut Grove- 102 022A	R3	Rezoned 2007	11.3
17	Hwy 124 Active Adult - 105 007A	R3	Rezoned 2016	10.2

Pendergrass Zoning District Standards

Dimensional Requirements	R-3	R-4	M F R
Max DU / Acre	2.0	4.0	8.0
Max Acres / DU	0.5	0.25	0.125
Minimum Lot Width	85'	75'	75'