
**ASCENSION PARISH
SUBDIVISION CONSTRUCTION SPECIFICATIONS**



**Prepared By:
Ascension Parish Planning Commission**

**Adopted by Council
June 2017 and as amended**

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ORDINANCE HISTORY

Ord. #SR20-01 adopted 7/16/20

Section i

For the purposes of these specifications, Parish Engineer shall be defined as: the Chief Engineer of the department of the Parish Government that has control of regulating and enforcing the applicable subsection of these specifications or the designee of the Chief Engineer, if said designation is made by the Chief Engineer.

SECTION 1 EARTHWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Ascension Parish Subdivision Construction Specifications.
- B. LADOTD standard specifications, 2006 edition unless otherwise specified.

1.2 DESCRIPTION OF WORK

- A. The work covered under this section of the specifications consists of excavating, backfilling, filling, compacting, and grading the site.
- B. "Excavation" consists of removal of material encountered to subgrade elevations and subsequent disposal of materials removed.

1.3 DEFINITIONS

- A. For the purposes of these specifications, the Parish Engineer shall be defined as: the office of the Parish Engineer, the Department of Public Works, or the Engineering Review Agency.
- B. For the purposes of these specifications, the following describe the limits of work:
 - 1. Roadbed: width of roadway, either edge of pavement or edge of pavement; or, back of curb to back of curb, plus five (5) feet on both sides.
 - 2. ROW Transition Area: area between edge of Roadbed and established ROW.
 - 3. Lots: all work outside of the ROW as indicated on the construction plans.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. Native or imported materials within the roadbed to be used for soil cement base course shall stabilize with cement. It shall have a Liquid Limit less than 35, a Plasticity Index of 15 or less and an organic content of 2 percent or less.
- B. Native or imported materials within the ROW Transition Area with a Plasticity Index less than 30 may be used provided it is free of rock or gravel, larger than 2" in any dimension, debris, waste vegetable and other deleterious matter.
- C. A twelve (12) inch thick plastic soil blanket with a Plasticity Index between 11 and 30, a

pH between 5.5 and 8.5 and a minimum organic content of 3 percent of either native or imported materials shall be used.

- D. Native or imported materials for general site fill outside of the ROW shall have a Plasticity Index between 35 and 40 for material up to two (2) feet from finished elevations, and shall have a Plasticity Index less than 35 for all materials within two (2) feet of finished elevations.

PART 3 - EXECUTION

3.2 EXCAVATION

- A. Excavation is unclassified, and includes excavation to subgrade elevations indicated, regardless of character of materials and obstructions encountered.
- B. Prevent surface water and subsurface or groundwater from flowing into excavations and from flooding project site and surrounding area. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations.
- C. Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey rain water and water removed from excavation to collecting or run-off areas. Do not use trench excavations as temporary drainage ditches.
- D. Stockpile satisfactory excavated materials, until required for backfill or fill. Place, grade, and shape stockpiles for proper drainage.
- E. Locate and retain soil materials away from edge of excavations
- F. Dispose of excess soil material and waste materials as approved by the Parish Engineer.
- G. For pavement excavation, cut surface under pavements to comply with cross-sections, elevations and grades as shown.

3.3 FILL AND COMPACTION

- A. For those portions of lots between the building setback lines and lots with more than twelve (12) inches of fill control soil compaction during construction providing minimum percentage of density as indicated hereinafter.
- B. For all public servitudes control soil compaction to meet the compaction of the adjacent soils.
- C. Adequate removal or disking of the existing grass and topsoil to be accomplished before placing fill material. Also before fill may be placed all stumps, tree trunks and limbs shall be removed from the fill site. After testing to determine the in-place natural density of surrounding soils for the overall site, stump holes shall be filled and compacted to a density equal to the surrounding soil.
- D. Fill shall be placed and compacted in maximum 12 inch loose lifts. Each lift shall be compacted to a maximum density of 95 percent (Standard Procter). The moisture content at the time of compaction should be within three percent of the optimum value as defined by ASTM D 698. The moisture content and density of each lift should be maintained until the next lift is begun or the final lift is complete.
- E. It is the Developer/Contractor's responsibility to ensure that all lots are adequately graded

for positive drainage and do not pond or trap water, unless prior written approval has been provided by the Parish Engineer.

- F. Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade, or layer of soil material, to prevent free water appearing on surface during or subsequent to compaction operations.
- G. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by disking, harrowing or pulverizing until moisture content is reduced to a satisfactory value.
- H. Undercutting and Under-grading in the roadbed:
 - 1. Where materials are encountered below the subgrade, which are deemed unsatisfactory by the Parish Engineer for use, either Cut Compaction or Under-grading shall be performed as determined by the Parish Engineer.
 - 2. Cut Compaction. Cut compaction shall include the temporary removal of material to a depth of twelve (12) inches below the bottom of the lowest base course for the full width of the road bed. The exposed material shall be scarified and compacted to a depth of six (6) inches to achieve 95 percent compaction. The removed material shall be replaced in layers not to exceed 8 (eight) inches loose and compacted to achieve 95 percent compaction.
 - 3. Under-grading. If the remaining material exposed by the removal of the twelve (12) inch layer required by cut compaction is deemed to be unsatisfactory by the Parish Engineer, under-grading of the area will be required. Under-grading shall include the removal of earth material to a maximum depth of twenty-four (24) inches and the limits designated by the Parish Engineer. The excavated area shall be backfilled and compacted to 95 percent density in twelve (12) inch lifts with suitable material as described in 2.1.C of this section.

3.4 GRADING

- A. Uniformly grade areas within limits of grading under this section, including adjacent transition areas.
- B. Rough Grading of Site
 - 1. Grade to drain properly. Finished slopes shall be free from irregularities, hollows and depressions.
- C. Finish Grading
 - 1. Backfill and grade areas behind curbs and sidewalks to prevent ponding. Uniformly grade areas within limits of grading under this Section, including adjacent transition areas.
 - 2. Use all means necessary to prevent the erosion of freshly graded areas during construction and until such time as permanent drainage and erosion control measures have been installed.

3.7 FIELD QUALITY CONTROL

- A. Submit to the Parish Engineer from the testing services, test reports on borrow material;

field density test reports; and one optimum moisture-maximum density curve for each type of soil encountered.

An approved testing service shall inspect and approve subgrades and fill layers before further construction work is performed. Field density tests shall be performed on a random selection of 10 percent of the lots in the subdivision. If any test result from the initial testing falls below the required density, then additional testing locations equal to 25% of lots must be tested for compaction. Subsequent testing locations will be chosen by the Parish Engineer. If any result from the subsequent testing falls below the required density, then each individual lot shall be tested. A site plan indicating all testing locations must be submitted to the Parish Engineer.

3.8 MAINTENANCE

- A. Protect newly graded areas from traffic and erosion. Keep free of trash and debris.
- B. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.
- C. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, re-shape, and compact to required density prior to further construction.

3.9 EROSION PROTECTION

- A. Where finished slopes exceed 5:1 the disturbed areas shall be seeded and fertilized according to Section 11 of these specifications.
- B. As soon as excavation is complete at a pond or other erosion sensitive area, slopes are to be final dressed and erosion control methods installed. This work is to be completed before grading proceeds in all other areas.

END OF SECTION

**SECTION 2
BASE COURSE**

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Ascension Parish Subdivision Construction Specifications.
- B. LADOTD standard specifications, 2006 edition unless otherwise specified.

1.2 DESCRIPTION OF WORK

- A. The work covered by this section of the specifications consists of treating subgrade materials in accordance with these specifications. The Developer has the option of treating subgrade materials with hydrated lime, quicklime and Portland cement or combinations thereof when determined to be necessary through laboratory analysis of subgrade materials. Stone per LADOTD Subsection 1003.01 and 1003.03(b) may be used in lieu of soil cement if approved by the Parish Engineer.

1.3 DEFINITIONS

- A. For the purposes of these specifications, the Parish Engineer shall be defined as: the office of the Parish Engineer, the Department of Public Works, or the Engineering Review Agency.
- B. For the purposes of these specifications, the following describe the limits of work:
 - 1. Roadbed: width of roadway, either edge of pavement or edge of pavement; or, back of curb to back of curb, plus five (5) feet on both sides.
 - 2. ROW Transition Area: area between edge of Roadbed and established ROW.
 - 3. Lots: all work outside of the ROW as indicated on the construction plans.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Portland cement shall be from a source listed in the LADOTD QPL and shall conform to AASHTO M 85 except that Type I (B) and I (C) are defined as Type I cement with the following fineness requirements:

	Fineness (sq. m/kg)	
<u>Turbidimeter Test</u>	<u>Type I (B)</u>	<u>Type I (C)</u>
Average Value	200	255
Max. value, any single sample	210	265
<u>Air Permeability Test</u>		
Average Value	360	460
Max. value, any single sample	380	480

Alkali content calculated as sodium oxide equivalent shall not exceed 0.6% by weight.

- B. Lime shall be hydrated lime or quicklime from a source listed and approved for subgrade treatment in the LADOTD QPL. Hydrated lime shall conform to ASTM C 207, Type C, except that the maximum free moisture content shall not exceed 1.5%. Quicklime shall conform to the following chemical requirements:

Minimum CaO + MgO	90% by weight of total material
Maximum MgO	8% by weight of total material

Quicklime shall be protected from contact with moisture prior to application and shall be free flowing and graded so that 100% will pass a 3/8" sieve. When quicklime is used in a slurry the gradation shall be a minimum of 95% passing the 3/4" sieve. Pellet and blended lime may be used provided these products are used by the testing laboratory in establishing the required percentage (see 3.1.A). Water utilized for mixture with Portland Cement and lime may be tested in accordance with AASHTO T 26 to meet the following requirements:

	Percent by Wt. (Mass)(Max.)
Alkali	0.1
Solids (Organic)	0.1
Solids (Inorganic)	0.4
Salt (NaCl)	0.5
Sugar, Oil or Acid	0.0

If water suitable for human consumption is utilized, no testing will be required.

- C. Asphalt prime coat shall conform to LADOTD Standard Specification, Section 505. This shall be used over stone and soil subgrade to prevent water infiltration.
- D. Asphalt curing membrane shall conform to LADOTD Standard Specification, Section 506. This shall be used over soil cement to protect against drying.
- E. Soil cement pavement sections cannot be cut into a road base that has an organic content percentage greater than 2.

PART 3 – EXECUTION

3.1 PROPORTIONING

- A. Hydrated lime and Portland cement shall be added to the subgrade at rates recommended from results of laboratory testing.
- B. Sufficient lime shall be incorporated to reduce the Plastic Index of the soil to approximately 15 and provide laboratory reports. Any recommended percentage less than 8% lime by volume will need to be submitted the Parish Engineer for review and approval.
- C. Sufficient Portland cement shall be incorporated to yield test cylinder breaks of not less

than 250 psi. and provide laboratory reports. Any recommended percentage less than 8% cement by volume will need to be submitted the Parish Engineer for review and approval.

3.2 MIXING AND PULVERIZING

- A. Lime may be placed in either dry form or as a slurry and shall be thoroughly mixed with the materials to be treated. The lime shall be processed in such a manner that lime dust will not be hazardous to workmen or the public. Initial mixing shall be performed the same day that the lime is placed in accordance to LADOTD 304.05 (b) Spreading and Mixing Type C base course. After initial mixing, the section treated shall be shaped, lightly compacted and left undisturbed for a minimum of 48 hours. Following the 48-hour mellowing period, the material shall be thoroughly pulverized. Pulverization shall be considered complete when the tested samples meet Table 304-1 (95% passing ¾" and 50% passing #4) in accordance to LADOTD Section 304.06 Pulverization.
- B. The required percentage of cement will be determined by laboratory testing in conformance with LADOTD TR 432 prior to mixing. Soil shall be combined with cement and water where water is injected through the mixing chamber at the time of initial mixing. A minimum of 70% of the pulverized soil shall pass the No. 4 Sieve after mixing. Cement shall be uniformly placed over the base course. Cement falling outside the limits of the base course shall be swept back onto the base course for mixing.

3.3 COMPACTION AND FINISHING

- A. Upon completion of the mixing of cement, the material shall be compacted to a minimum of 95% of maximum density as based on LADOTD TR 415 or TR 418. The surface shall be kept moist during compaction and finishing.

At places inaccessible to rollers, such as edges adjacent to curb and gutter sections, the mixture shall be compacted using devices that will obtain the specified density without damage to the adjacent structure.

Compaction operations shall be completed within three (3) hours after placement of cement. After three (3) hours only tight blading of the base course shall be performed. Bladed materials shall not be drifted along the base but shall be removed.

An asphalt curing membrane shall be applied within twenty - four (24) hours of completion of the initial mixing of the cement and finishing operations. The finished base course shall have a closely knit surface free from laminations or loose material.

Upon completion of the final finishing the base shall be protected against rapid drying for at least seven (7) days by applying an emulsified asphalt curing membrane at the minimum rate of 0.10 gallons per square yard. When diluted with water the rate of application shall be increased accordingly. No paving shall be permitted during this time.

Base course defects shall be corrected by removing and replacing the full depth of base course in defective areas with asphaltic concrete mix or a low strength flowable fill material approved by the Parish Engineer. Additional subgrade material shall be removed if said subgrade is deemed defective after removing the full depth of defective base course. Portland cement concrete used for replacement of in-place base course will not be permitted unless approved by the Parish Engineer prior to installation.

3.4 TESTING

- A. Testing of the organic content within roadway base to have soil cement incorporated shall be done prior to any mixing of cement.
- B. After the treated subgrade has cured for a minimum of three (3) days for lime stabilization

and, a proof roll shall be conducted. The Parish Engineer must be notified 24 hours in advance and be present when proof rolling occurs. After lime stabilization, the proof roll shall utilize an empty tandem axle dump truck or approved equal. Any evidence of deflection of the treated subgrade shall constitute a failure and the full extent of the failure shall be repaired as specified hereinbefore.

- C. After the treated subgrade has cured for a minimum of seven (7) days for soil cement a proof roll shall be conducted. The Parish Engineer must be notified 24 hours in advance and be present when proof rolling occurs. After soil cement application, the proof roll shall utilize a fully loaded tandem axle dump truck or approved equal with sand or approved equal. Any evidence of deflection of the treated subgrade shall constitute a failure and the full extent of the failure shall be repaired as specified hereinbefore.
- D. Sampling and testing for acceptance shall be performed by an approved testing laboratory at the developer's expense.

END OF SECTION

SECTION 3 ASPHALTIC CONCRETE PAVEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Ascension Parish Subdivision Construction Specifications.
- B. LADOTD standard specifications, 2006 edition unless otherwise specified.

1.2 DESCRIPTION OF WORK

- A. Work covered by this section of the specifications includes the construction of asphaltic concrete pavement, complete and in strict conformance to these specifications.
- B. Provide asphaltic concrete mix certification from a LADOTD certified hot mix plant.

DEFINITIONS

- C. For the purposes of these specifications, the Parish Engineer shall be defined as: the office of the Parish Engineer, the Department of Public Works, or the Engineering Review Agency.
- D. For the purposes of these specifications, the following describe the limits of work:
 - 1. Roadbed: width of roadway, either edge of pavement or edge of pavement; or, back of curb to back of curb, plus five (5) feet on both sides.
 - 2. ROW Transition Area: area between edge of Roadbed and established ROW.
 - 3. Lots: all work outside of the ROW as indicated on the construction plans.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. The asphaltic concrete mix shall be Level A Superpave asphaltic concrete conforming to LADOTD Standard Specifications, Section 502 and stone aggregate shall not contain oolitic limestone. Asphalt cement AC-30 or PG 64-22 may be used in lieu of PG 70-22m.
- B. Asphalt tack coat shall conform to LADOTD Standard Specification, Section 504.

PART 3 - EXECUTION

3.1 ASPHALTIC CONCRETE EQUIPMENT AND PROCESSES.

- A. All plant operations and paving equipment used in producing, placing, and compacting asphaltic concrete mixtures, and including methods and equipment for handling and storing materials and transporting asphaltic concrete to the project site shall be in conformance with LADOTD Standard Specifications excluding subsection 503.10. Material transfer vehicle requirements as per Subsection 503.15 will not be required. An inertial profiler as per Subsection 502.10(i) will not be required.

3.2 PAVEMENT PLACEMENT

- A. The wearing course lift thickness shall not exceed 2". Tack coat to be applied between lifts in accordance with LADOTD Standard Specification.
- B. All surface preparation for asphaltic concrete pavements shall be performed in accordance with LADOTD Standard Specification.

3.3 TESTING

- A. The longitudinal surface tolerance described in Subsection 502.11(b) will not be enforced. Contractor shall provide a ten (10) foot static metal straightedge to be used for surface tolerance testing. The longitudinal surface shall not exceed ¼" based on the 10' measurement. All corrections needed shall be done by diamond grinding and applying a light tack coat, or removing and replacing the unacceptable area as determined by the Parish Engineer at the expense of the developer.
- B. Core in-place, compacted asphaltic concrete at 500 ft. intervals. Core holes to be 4" in diameter and shall be patched by contractor with newly mixed material. Cold patch will not be permitted.
- C. Asphalt cores shall be measured by the testing lab and rounded to the nearest ¼".
- D. Under thickness shall not exceed ¼ inch. When grade adjustments are permitted, areas with under thickness in excess of ¼ inch shall be corrected to plan thickness by furnishing and placing additional mixture. When grade adjustments do not permit, the deficient under thickness area shall be removed and replaced as determined by the Parish Engineer at the expense of the developer.

END OF SECTION

SECTION 4
PORTLAND CEMENT CONCRETE PAVEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Ascension Parish Subdivision Construction Specifications.
- B. LADOTD standard specifications, 2006 edition unless otherwise specified.
- C. CRSI Manual of Standard Practice.

1.2 DESCRIPTION OF WORK

- A. The work covered by this section of the specifications consists of the construction of Portland cement concrete pavement, complete and in strict conformance with these Specifications.

1.3 DEFINITIONS

- A. For the purposes of these specifications, the Parish Engineer shall be defined as: the office of the Parish Engineer, the Department of Public Works, or the Engineering Review Agency.
- B. For the purposes of these specifications, the following describe the limits of work:
 - 1. Roadbed: width of roadway, either edge of pavement or edge of pavement; or, back of curb to back of curb, plus five (5) feet on both sides.
 - 2. ROW Transition Area: area between edge of Roadbed and established ROW.
 - 3. Lots: all work outside of the ROW as indicated on the construction plans.

1.4 SUBMITTALS

- A. Submit two (2) copies of concrete mix design, reinforcing supports, curing materials and isolation and expansion joint materials to the Parish Engineer for review and approval.

PART 2 - PRODUCTS

2.1 STEEL REINFORCEMENT

- A. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed.
- B. Plain Steel Wire: ASTM A 82.
- C. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening steel reinforcement. Manufacture bar supports according to CRSI's "Manual of Standard Practice."

2.2 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type I or II.
- B. Aggregate: ASTM C 33, uniformly graded, from a single source.
- C. Water: ASTM C 94.
- D. Admixtures: Certified by manufacturer to contain no more than 0.1 percent water-soluble chloride ions by mass of cement and to be compatible with other admixtures, as follows:
 - 1. Air-Entraining Admixture: ASTM C 260.
 - 2. Water-Reducing Admixture: ASTM C 494, Type A.
 - 3. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.
 - 4. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.
 - 5. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.
- E. Curing Materials:
 - 1. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry.
 - 2. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
 - 3. Water: Potable.
 - 4. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
 - 5. Clear Solvent-Borne Liquid-Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.

2.3 CONCRETE MIXES AND MIXING

- A. Concrete Mixes: Prepare design mixes, proportioned according to ACI 211.1 and ACI 301, with the following properties:
 - 1. Compressive Strength (28 Days): 4,000 p.s.i.
 - 2. Maximum Water-Cementitious Materials Ratio: 0.50.
 - 3. Slump Limit: 4 inches maximum prior to addition of plasticizers.
 - 4. Air Content: 4.5 to 7.5 percent.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Surface Preparation: Remove loose material from surface.
- B. Forms: Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations.

- C. Reinforcement: Accurately position and support reinforcement, and secure against displacement. Set wire ties with ends directed into concrete.
 - 1. Install welded wire fabric in lengths as long as practicable; lap at least one full mesh, and lace splices with wire.
- D. Joints: Locate and install construction, isolation, contraction, and expansion joints as indicated. Maximum dimensions of any single street paving panel shall be twelve (12) feet wide and twenty (20) feet long.
- E. Concrete Placement: Comply with recommendations in ACI 304R for measuring, mixing, transporting, and placing concrete. Place concrete in a continuous operation within planned joints or sections.
 - 1. Moisten subbase to provide a uniform dampened condition at time concrete is placed.
 - 2. Consolidate concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping according to recommendations in ACI 309R.
 - 3. Screed and initial-float concrete surfaces with darby or bull float before excess moisture or bleed water appears on the surface.
 - 4. Protect concrete from cold or hot weather during mixing, placing, and curing.
- F. Evaporation Retarder: Apply to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x hr. before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- G. The Slip Form Paving Method shall be in compliance with the 2006 LADOTD Standard Specifications.

3.2 FINISHES AND CURING

- A. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and the concrete surface has stiffened sufficiently to permit operations. Float surfaces to true planes with gaps below 10-foot- long, unlevelled straightedge not to exceed 1/4 inch. Cut down high spots, and fill low spots. Refloat surface immediately to uniform granular texture.
 - 1. Medium-to-Fine-Textured Broom Finish: Draw a soft bristle broom across float-finished concrete surface, perpendicular to line of traffic, to provide a uniform, fine-line texture.
- B. Curing: Begin curing after finishing concrete, but not before free water has disappeared from concrete surface. Cure concrete by one or a combination of the following methods:
 - 1. Moisture cure concrete by water, continuous fog spray, continuously wet absorptive cover, or by moisture-retaining-cover curing. Keep surfaces continuously moist for not less than seven days.
 - 2. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.3 REPAIRS AND PROTECTION

- A. Remove and replace concrete pavement that is broken, damaged, or defective, or does not meet requirements in this Section.
- B. Protect concrete from damage. Exclude traffic from pavement until the concrete has reached a compressive strength of 3,000 psi as confirmed by laboratory test results.
- C. Sweep concrete pavement not more than two days before date scheduled for final inspections.
- D. At the expiration of the maintenance bond the Developer/Contractor shall inspect and seal all cracks having a horizontal width of one-quarter (1/4) inch or greater.
- E. At the expiration of the maintenance bond any pavement having a crack with a vertical displacement of one-quarter (1/4) inch or greater shall be rejected, removed and replaced.

3.4 TESTING

- A. The Owner/Developer shall be responsible for providing materials and services of a testing laboratory to make, test, and provide written reports of concrete cylinder compressive strength tests.
- B. One set of three cylinders shall be made, tested and a report submitted for each unit of Portland cement concrete pavement placed. A unit is comprised of 100 cubic yards. If the total area of Portland cement concrete placed is less than 100 cubic yards then a minimum of three cylinders shall be made, tested and reported.
- C. Thickness of pavements will be determined from hardened concrete cores in accordance with LADOTD TR 225. Each unit will be divided into 5 equal segments and 1 core will be obtained from each segment.
 - 1. Average thickness of the pavement lot shall not be less than the specified thickness. If the thickness of a sample core is deficient by more than 1", the core shall be discarded and the segment re-cored. If the thickness of the second core is deficient by more than 1", the pavement segment shall be removed and replaced.
 - 2. Core holes shall be patched by the contractor using an approved mixture. Surface of the patch shall be finished to match surrounding pavement.

END OF SECTION

SECTION 5
CONCRETE CURBS, WALKS, DRIVES AND INCIDENTAL PAVING
(Within Public Right of Way)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Ascension Parish Subdivision Construction Specifications.
- B. LADOTD standard specifications, 2006 edition unless otherwise specified
- C. CRSI Manual of Standard Practice

1.2 DESCRIPTION OF WORK

- A. The work covered by these specifications consists of the construction of Portland cement concrete curbs, walks, drives and incidental paving, complete and in strict conformance to the specifications.

1.5 DEFINITIONS

- A. For the purposes of these specifications, the Parish Engineer shall be defined as: the office of the Parish Engineer, the Department of Public Works, or the Engineering Review Agency.
- B. For the purposes of these specifications, the following describe the limits of work:
 - 1. Roadbed: width of roadway, either edge of pavement or edge of pavement; or, back of curb to back of curb, plus five (5) feet on both sides.
 - 2. ROW Transition Area: area between edge of Roadbed and established ROW.
 - 3. Lots: all work outside of the ROW as indicated on the construction plans.

PART 2 – PRODUCTS

2.1 STEEL REINFORCEMENT

- A. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed.
- B. Plain Steel Wire: ASTM A 82.
- C. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening steel reinforcement. Manufacture bar supports according to CRSI's "Manual of Standard Practice.

2.2 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type I or II.
- B. Aggregate: ASTM C 33, uniformly graded, from a single source.
- C. Water: ASTM C 94.

- D. Admixtures: Certified by manufacturer to contain no more than 0.1 percent water-soluble chloride ions by mass of cement and to be compatible with other admixtures, as follows:
1. Air-Entraining Admixture: ASTM C 260.
 2. Water-Reducing Admixture: ASTM C 494, Type A.
 3. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.
 4. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.
 5. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.
- E. Curing Materials:
1. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry.
 2. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
 3. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
 4. Clear Solvent-Borne Liquid-Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.
- F. Related Materials:
1. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork.

2.3 CONCRETE MIXES AND MIXING

- A. Concrete Mixes: Prepare design mixes, proportioned according to ACI 211.1 and ACI 301, with the following properties:
1. Compressive Strength (28 Days): 3,500 p.s.i..
 2. Maximum Water-Cementitious Materials Ratio: 0.50.
 3. Slump Limit: 2 - 5 inches maximum prior to addition of plasticizers. 1-2 inches if concrete is to be slip formed.
 4. Air Content: 4.5 to 7.5 percent.

PART – 3 EXECUTION

3.1 SUBGRADE

- A. The subgrade shall be shaped and compacted to a firm, even surface. When possible, the subgrade shall be shaped and compacted at the same time and in the same manner as the subgrade for the pavement. Unstable material shall be removed and replaced with approved material at no direct pay.

3.2 FORMS

- A. Forms shall be of either wood or metal, and shall be such that forms remain in position during concreting.
- B. Concrete may be placed by slip-form methods. Slip-formed concrete shall be placed with

an extrusion machine designed to spread, consolidate and finish concrete in 1 pass of the machine such that minimum hand finishing is necessary. Sliding forms shall be rigidly held together to prevent spreading of forms. After passing of forms there shall be no noticeable slumping of concrete. Finished concrete shall be free from voids. Any additional finishing required shall be performed immediately after placement.

3.3 INTEGRAL CURB

- A. Curb forms shall be fastened to slab forms immediately after completion of pavement finishing. Concrete curbing shall be placed within 30 minutes after pavement has been finished. Integral curb may be placed after pavement has hardened, provided deformed reinforcing dowel bars of specified size, type and spacing are inserted in concrete immediately after pavement has been finished.
- B. Concrete for curb shall be spaded or vibrated sufficiently to eliminate voids, tamped to bring mortar to surface, floated smooth, and brush finished to a gritty texture. Edges shall be tooled to specified radius.
- C. Curb joints shall match those of pavement and shall extend entirely through curb. Joints shall be filled with same filler used in the pavement, and curb edges at joints shall be tooled to a 1/4-inch radius.

3.4 COMBINATION CURB AND GUTTER

- A. Concrete shall be struck off, spaded or vibrated to eliminate voids, tamped to bring mortar to surface, floated smooth, and brush finished to a gritty texture. Curb and gutter shall be scored 3" deep at 20-foot intervals.
- B. Expansion joints shall be placed in curb and gutter at 100-foot intervals and at beginning and end of curvature at street intersections.
- C. Premolded 1/2-inch-thick expansion joint filler shall extend for entire width and depth of curb and gutter, and joint edges shall be tooled to a 1/2-inch radius.

3.5 WALKS, HANDICAPPED RAMPS, DRIVES AND INCIDENTAL PAVING

- A. Concrete shall be struck off, consolidated, tamped to bring mortar to surface, floated smooth, and brush finished to a gritty texture.
 - 1. Walks shall be scored one third of the thickness (1/3t) deep at intervals equal to width of walk, and expansion joints shall be placed in walks at 100-foot intervals and at junctions with curbs, drives and other walks. Expansion joints shall consist of 1/2" thick pre-molded joint filler extending for full width and depth of walk. Construction joints shall be formed around manholes, utility poles, etc., extending into paving and 1/4" thick preformed expansion joint filler shall be installed in these joints.
 - 2. Handicapped Ramps shall be constructed at locations per LADOTD Standard Plan PED-01. Materials and installation requirements per LADOTD Standard Specifications. Color of truncated dome insert shall be Rust or matching existing, if present.
 - 3. Drives: Drives wider than 16 feet shall be longitudinally scored one third of the thickness (1/3t) deep at intervals of not more than 16 feet, and drives longer than 20 feet shall be scored one third of the thickness (1/3t) transversely at intervals of not more than 16 feet. Expansion joints shall be placed at junctions with curbs and concrete pavements. Expansion joints shall consist of one half (1/2) inch thick pre-molded joint filler extending for full width and depth of drive. Construction joints

shall be formed around manholes, utility poles, etc., extending into paving and ¼" thick preformed expansion joint filler shall be installed in these joints.

4. Incidental Paving: Paving shall be scored one third of the thickness (1/3t) deep at intervals of not more than 20 feet in any direction. Paving adjacent to jointed concrete shall be jointed to match adjacent concrete.

3.6 FINISHES AND CURING

- A. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and the concrete surface has stiffened sufficiently to permit operations. Float surfaces to true planes with gaps below 10-foot- long, unlevelled straightedge not to exceed 1/4 inch. Cut down high spots, and fill low spots. Refloat surface immediately to uniform granular texture.
 1. Medium-to-Fine-Textured Broom Finish: Draw a soft bristle broom across float-finished concrete surface, perpendicular to line of traffic, to provide a uniform, fine-line texture.
- B. Curing: Begin curing after finishing concrete, but not before free water has disappeared from concrete surface. Cure concrete by one or a combination of the following methods:
 1. Moisture cure concrete by water, continuous fog spray, continuously wet absorptive cover, or by moisture-retaining-cover curing. Keep surfaces continuously moist for not less than seven days.
 2. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.7 REPAIRS AND PROTECTION

- A. Remove and replace concrete pavement that is broken, damaged, or defective, or does not meet requirements in this Section.
- B. Protect concrete from damage. Exclude traffic from pavement until the concrete has reached a compressive strength of 3,000 psi as confirmed by laboratory test results.
- C. Sweep concrete pavement not more than two days before date scheduled for final inspections.
- D. At the expiration of the maintenance bond the Developer/Contractor shall inspect and seal all cracks having a width of one-quarter (1/4) inch or greater.

3.8 TESTING

- A. The Owner/Developer shall be responsible for providing materials and services of a testing laboratory to make, test, and provide written reports of concrete cylinder compressive strength tests.
- B. One set of three cylinders shall be made, tested and a report submitted for each 50 cubic yards (or any portion thereof if total quantity is less than 50 cubic yards) of concrete placed.

END OF SECTION

SECTION 6 PAVEMENT JOINT SEALANTS

PART1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Ascension Parish Subdivision Construction Specifications.
- B. LADOTD standard specifications, 2006 edition unless otherwise specified.

1.2 DESCRIPTION OF WORK

- A. The work covered by this section of the specifications includes the following:
 - 1. Expansion and contraction joints within cement concrete pavement.
 - 2. Joints between cement concrete and asphalt pavement.
- B. Related Sections from these specifications include the following:
 - 1. Asphaltic Concrete Pavement.
 - 2. Portland Cement Concrete Pavement.

1.3 DEFINITIONS

- A. For the purposes of these specifications, the Parish Engineer shall be defined as: the office of the Parish Engineer, the Department of Public Works, or the Engineering Review Agency.
- B. For the purposes of these specifications, the following describe the limits of work:
 - 1. Roadbed: width of roadway, either edge of pavement or edge of pavement; or, back of curb to back of curb, plus five (5) feet on both sides.
 - 2. ROW Transition Area: area between edge of Roadbed and established ROW.
 - 3. Lots: all work outside of the ROW as indicated on the construction plans.

1.4 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Manufacturer's installation guidelines.

1.5 QUALITY ASSURANCE

- A. Install to Manufacturer's Installation guidelines.
- B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time, and mixing instructions for multicomponent materials.
- B. Store and handle materials to comply with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.7 PROJECT CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer.
 - 2. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40-degree F (4.4-degree C).
 - 3. When joint substrates are wet or covered with frost.
 - 4. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 - 5. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. **Compatibility:** Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer based on testing and field experience.
- B. Colors of Exposed Joint Sealants shall be black for concrete and asphalt pavements.

2.2 HOT-APPLIED JOINT SEALANTS

- A. Sealant for Concrete and Asphalt: Single-component formulation complying with ASTM D 3405.

2.3 JOINT-SEALANT BACKER MATERIALS

- A. **General:** Provide joint-sealant backer materials that are non-staining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by joint-sealant manufacturer based on field experience and laboratory testing.
- B. **Round Backer Rods for Cold- and Hot-Applied Sealants:** ASTM D 5249, Type 1, of diameter and density required to control sealant depth and prevent bottom-side adhesion of sealant.

2.4 PRIMERS

- A. **Primers:** Product recommended by joint-sealant manufacturer where required for adhesion

of sealant to joint substrates indicated, as determined from preconstruction joint- sealant- substrate tests and field tests.

2.5 PREFORMED JOINT FILLERS

- A. Preformed joint fillers shall be of the bituminous, asphalt ribbon, closed cell polyethylene or rubber types in accordance with Section 1005.01 of the LADOTD Standard Specifications for Roads and Bridges.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.
- B. Joint Priming: Prime joint substrates where indicated or where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install backer materials of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of backer materials.
 - 2. Do not stretch, twist, puncture, or tear backer materials.
 - 3. Remove absorbent backer materials that have become wet before sealant application and replace them with dry materials.
- D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses provided for each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that

allow optimum sealant movement capability.

- E. Provide joint configuration to comply with joint-sealant manufacturer's written instructions, unless otherwise indicated.

3.4 CLEANING

- A. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of final inspection. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately and replace with joint sealant so installations with repaired areas are indistinguishable from the original work.

END OF SECTION

SECTION 7 TRAFFIC SIGNS AND DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Ascension Parish Subdivision Construction Specifications.
- B. LADOTD standard specifications, 2006 edition unless otherwise specified.

1.2 DESCRIPTION OF WORK

- A. The work covered by this section of the specifications consists of the furnishing and the installation of permanent roadside and subdivision entrance signs.

1.3 DEFINITIONS

- A. For the purposes of these specifications, the Parish Engineer shall be defined as: the office of the Parish Engineer, the Department of Public Works, or the Engineering Review Agency.
- B. For the purposes of these specifications, the following describe the limits of work:
 - 1. Roadbed: width of roadway, either edge of pavement or edge of pavement; or, back of curb to back of curb, plus five (5) feet on both sides.
 - 2. ROW Transition Area: area between edge of Roadbed and established ROW.
 - 3. Lots: all work outside of the ROW as indicated on the construction plans.

PART 2 - PRODUCTS

2.1 SIGN MATERIALS

- A. Entry Signs: Sheeting material of directional signs at the entrance to a development must meet ASTM D4956-13 Type VIII standards of reflectivity.
- B. Interior Signs: Sheeting material for signs within a development shall meet ASTM D4956-13 Type IV standards of reflectivity.
- C. Street signs shall include the address of the sign as determined by Ascension Parish Government. The sign is to include the words "NO OUTLET" if indeed there is no other outlet.
- D. Street signs for public roadways shall be nine inch (9") .080 aluminum double faced "green" engineer grade blank with six inch (6") upper/lower case white engineer grade letters and a half inch (½") white border.
- E. Street signs for private lanes shall be nine inch (9") .080 aluminum double faced "blue" engineer grade blank with six inch (6") upper/lower case white engineer grade letters and a half inch (½") white border.

2.2 POSTS

- A. LADOTD Standard Plan for Square Tube Posts with Direct Drive Anchor shall be used.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Posts: The contractor shall determine length of post required at each sign location. Posts shall be driven vertical by methods that will not damage posts. Minimum ground penetration shall be 2 feet for delineator and object marker signs, and 3 feet for other signs. Ornamental posts may be allowed. Brochures and specifications for posts must be submitted to the Parish Engineer for approval prior to installation.
- B. Sign Faces: The minimum height to the bottom edge of the sign measured vertically from the pavement edge shall be 7 feet, except that a secondary sign below another sign shall be mounted 4 feet vertically from pavement edge to bottom of sign. Signs shall have a lateral clearance of 2 feet from pavement edge (or face of curb) to edge of sign, except that delineators and object markers on open ditch sections shall have a lateral clearance of 2 feet from shoulder edge to sign. Sign face shall be oriented at a 93° angle from roadway centerline to avoid specular glare.
- C. Removal of existing signs shall be coordinated with new sign construction to provide adequate signing at all times.

END OF SECTION

SECTION 8 DRAINAGE PIPE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Ascension Parish Subdivision Construction Specifications.
- B. LADOTD standard specifications, 2006 edition unless otherwise specified.

1.2 MATERIALS AND WORKMANSHIP

- A. All materials and apparatus required for the work, except as specified otherwise, shall be new, of first class quality, and shall be furnished, delivered, erected, and connected, and finished in every detail, and shall be so selected and arranged as to fit properly.
- B. All materials shall be installed in accordance with the recommendations of the manufacturer.
- C. For subsurface drainage pipe, the maximum length of pipe that can be laid without access for cleaning, manhole or catch basin, shall be 350'.

1.3 SUBSTITUTION OF MATERIALS

- A. Substitution of materials may be allowed under special circumstances with prior written approval by the Parish Engineer.
- B. Should a substitution be accepted and the substitute prove defective or otherwise unsatisfactory for the service intended and within the guaranty period, this material or equipment shall be replaced with the new material or equipment specified by name.
- C. The Parish Engineer reserves the right to require box culverts be used in lieu of pipe when three or more barrels of pipe are required.

1.4 DEFINITIONS

- A. For the purposes of these specifications, the Parish Engineer shall be defined as: the office of the Parish Engineer, the Department of Public Works, or the Engineering Review Agency.
- B. For the purposes of these specifications, the following describe the limits of work:
 - 1. Roadbed: width of roadway, either edge of pavement or edge of pavement; or, back of curb to back of curb, plus five (5) feet on both sides.
 - 2. ROW Transition Area: area between edge of Roadbed and established ROW.
 - 3. Lots: all work outside of the ROW as indicated on the construction plans.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Approved Cross Drain pipe products are:

1. Reinforced Concrete Pipe meeting the requirements of ASTM C 76, Class III, Wall B. Gaskets for reinforced concrete pipe shall meet the requirements of ASTM C 443. Joints are to be wrapped securely with geotextile fabric meeting Class A requirements as per LADOTD Section 1019.

B. Approved Side and Rear Drain pipe products are:

1. Reinforced Concrete Pipe meeting the requirements of ASTM C 76, Class III, Wall B. Gaskets for reinforced concrete pipe shall meet the requirements of ASTM C 443. Joints are to be wrapped securely with geotextile fabric meeting Class A requirements as per LADOTD Section 1019.
2. Solid wall PVC in sizes 12" through 15" shall be DR35 (dimension ratio 35) conforming to ANSI/ASTM D 3034 except with the additional requirement that the basic material shall be only Cell Class 12454-B and additionally shall comply with PVC 1120 with a long-term 2000 psi hydrostatic design stress as listed by PPI.
3. Solid wall PVC pipes in sizes 18" through 27" shall have a uniform solid wall and a minimum Pipe Stiffness of 46 psi with wall thickness T-1 (DR 35) unless designated otherwise, in compliance with ASTM F679, except that the basic material shall be only Cell Class 12454 B with the additional requirements that it shall comply PVC 1120 with a long-term 2000 psi hydrostatic design stress.
4. PVC profile wall pipe, "Ultra-Rib" in sizes 12" – 30", meeting the requirements of ASTM F 794.
5. PVC corrugated pipe, "A-2000" in sizes 12" – 36" or ULTRA-CORR in sizes 24" – 36", meeting the requirements of ASTM F 949.
6. Corrugated polyethylene pipe, for use in side and rear drains only, in sizes 12" – 36" meeting the requirements of AASHTO M 294 and in sizes 42" – 48" meeting the requirements of AASHTO MP6 except that the corrugations shall be factory perforated to allow entrance of ground water to help resist flotation. Corrugated HDPE pipe shall be manufactured from virgin resins.

(Ord #20-01, 7/16/20)

C. Approved drainage outfall pipe products are:

1. The last segment of drain pipe comprising the drainage outfall, from a box or approved transition, having minimum and maximum lengths of twenty (20) and forty (40) feet respectively shall be:
 - a. Reinforced Concrete Pipe meeting the requirements of ASTM C 76, Class III, Wall B. Gaskets for reinforced concrete pipe meeting the requirements of ASTM C 443 may be used provided that the outfall is a non-flowing waterway and the pipe is laid within one (1) foot of the bottom.
 - b. PVC corrugated pipe, "A-2000" in sizes 12" to 36" or ULTRA-FLOW in sizes 24" to 36" or approved equal meeting the requirements of ASTM F949 if the top of the pipe is at least 1 foot below normal pool of the receiving pond. Material specifications provided by the Manufacturer shall determine the pH limits in the soils surrounding the pipe.

- D. Bedding material shall be a 65% - 35% sand-aggregate mixture or stone conforming to LADOTD Subsection 1003.10. Aggregate in mixture shall be gravel, stone or crushed concrete. The mixture shall be free of foreign matter. Provide certified gradation test report meeting LADOTD Subsection 1003.08 for bedding material for approval by the Parish Engineer. This shall occur at the beginning of the project.
- E. Profile and corrugated wall PVC pipe shall have a minimum pipe stiffness at 5 percent deflection of 46 pounds per square inch in accordance with ASTM D2412. Pipe shall be homogeneous, smooth interior. Exterior ribs shall be perpendicular to the axis of the pipe.
- F. All PVC pipe installation shall be in accordance with the recommended practices per UNIBELL UNI-B-5 and ASTM D2321.
- G. PVC pipe shall be flexible gasket, "push-on" type joints, conforming to ASTM D-3212.
- H. Joints for concrete pipe shall be rubber-gasket tongue and groove joints.

(Ord #20-01, 7/16/20)

PART 3 - EXECUTION

3.1 TRENCHING AND FORMING PIPE BED

- A. Excavation shall include the removal, handling, re-handling, refill or backfilling, and disposal of any and all material encountered in the work, and shall include all pumping, bailing, drainage and sheeting and bracing.
- B. The work of excavation shall also include the responsibility of added expenses or other liability that may arise from quicksand, obstacles or conditions, which may be encountered in the work. It includes the clearing and removal of pavements, curbs, sidewalks, shrubbery, and other obstructions not otherwise provided for in the plans.
- C. The width of the trench shall be a minimum of the pipe outside diameter plus 36", 18" each side of the outside edge of pipe, so as to permit thorough tamping of the backfill under the haunches and around the pipe.
- D. For all pipe except concrete pipe: Where the pipe falls, in whole or in part, under the roadbed, the 65% - 35% bedding material shall be carried to the top of the pipe and approved backfill from the top of the pipe to the bottom of the roadway base. Sand will not be permitted.
- E. All pipe not under or within the roadbed shall have 65% - 35% bedding material placed to the top of the pipe and mechanically compacted. Backfill above this point shall be useable soils with a Plasticity Index (PI) less than 25 and a maximum organic content of 5 percent, free of large stones

and cobbles, replaced and compacted in layers not to exceed 12 inches in thickness to 95% Standard Procter density.
- F. Concrete pipe, not under or within 2 feet roadways, shall be placed on a minimum 4" foundation. Backfill above the foundations may be native excavated soils, free of large stones and cobbles, placed and compacted in layers necessary to achieve 85% Standard Procter density. Where concrete pipe falls, in whole or in part, under or within 2' of roadway surface (back of curb where applicable) the 65% - 35% bedding material shall be carried to the top of the pipe and approved on-site material from the top of the pipe to the bottom

of the roadway base.

- G. Provide compaction reports for backfill at roadway trenches. For pipe runs falling within the right of way, or under improved surfaces, compacting testing shall be done for each 100 ft of piping or a minimum of 1 between structures if spacing between structures is less than 100 ft. Compaction testing will be done at top of bedding, at 12 inch lifts, and at the top of trench. For all other locations, compaction testing at mid and top lifts and the bedding material for pipes between all structures/outfalls at least 20 ft of separation. Compaction testing shall verify compliance with LADOTD Specifications Section 701.08.
- H. Where firm foundation is not encountered at the grade established, due to soft, spongy or other unstable soil conditions, such unstable soil shall be removed and replaced with a foundation fill consisting of gravel or other suitable approved material properly compacted to provide adequate support for the pipe.
- I. All pipe shall be carefully laid to the lines and grades shown on the plans. Any pipe not true in alignment or which shows settlement after laying, shall be removed and re-laid at the Contractor's expense.
- J. Pipe laying shall begin at the downstream end of the line. Before being set in place each section of pipe shall be thoroughly cleaned, and free of dirt. All bells shall be laid on the upstream end.
- K. The lower segment of the pipe barrel shall be supported by the earth foundation or bedding for the full length of the barrel. Bell holes where required shall be carefully excavated to provide uniform bearing for the pipe barrel.
- L. Lifting holes in reinforced concrete pipe shall be patched with a cement plug capped with mortar and filter cloth.
- M. Prior to backfilling concrete pipe shall have each joint wrapped in a nonwoven geotextile filter fabric equal to Synthetic Industries Series 451. The filter fabric shall extend one (1) foot either side of the pipe joint with a minimum 8" overlap at the joint. The filter fabric shall conform to ASTM D 4623 and shall have the following physical properties:

Grab Tensile Strength	135 lbs.
Grab Elongation	60 lbs.
Puncture Strength	75 lbs.
Mullen Burst	330 psi
Trapezoidal Tear	60 lbs.
- N. Minimum cover for any pipe type and size shall be 18", unless approved otherwise in the construction plans.

END OF SECTION

SECTION 9 DRAINAGE STRUCTURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Ascension Parish Subdivision Construction Specifications.
- B. LADOTD standard specifications, 2006 edition unless otherwise specified.

1.2 DESCRIPTION OF WORK

- A. The work covered by this section of the specifications consists of furnishing and the construction of precast or cast-in-place concrete storm sewer grate inlets, catch basins and junction boxes, complete and in conformance to these specifications. The work shall include furnishing and transportation of material, excavation, foundation preparation, installing, piping connections, backfill and surface cleanup.
- B. Minor details not usually shown or specified, but necessary for the proper installation and operation, shall be included in the work, the same as if herein specified or shown.

1.3 DEFINITIONS

- A. For the purposes of these specifications, the Parish Engineer shall be defined as: the office of the Parish Engineer, the Department of Public Works, or the Engineering Review Agency.
- B. For the purposes of these specifications, the following describe the limits of work:
 - 1. Roadbed: width of roadway, either edge of pavement or edge of pavement; or, back of curb to back of curb, plus five (5) feet on both sides.
 - 2. ROW Transition Area: area between edge of Roadbed and established ROW.
 - 3. Lots: all work outside of the ROW as indicated on the construction plans.

1.4 MATERIALS AND WORKMANSHIP

- A. All materials and apparatus required for the work, except as specified otherwise, shall be new, of first class quality, and shall be furnished, delivered, erected, and connected, and finished in every detail, and shall be so selected and arranged as to fit properly.

1.5 SUBSTITUTION OF MATERIALS

- A. Substitution of materials shall be in accordance with the provisions of these specifications.
- B. Should a substitution be accepted and should the substitute material prove defective or otherwise unsatisfactory for the service intended and within the warranty period, this material shall be replaced with the material specified by name.
- C. Brick drainage structures may not be used.

PART 2 - PRODUCTS

2.1 REINFORCED CONCRETE DRAINAGE STRUCTURES AND APPURTENANCES

- A. Reinforced precast concrete drainage structures shall comply with ASTM C 478 and ASTM C 913. Lifting inserts shall be embedded in structure walls. Where through wall holes are provided for lifting the holes shall be patched with a cement plug capped with mortar and filter cloth.
- B. Where the shortest structure span exceeds six (6) feet the design of the structure shall be included in the construction plans. These structures shall be constructed in accordance with LADOTD Standards. For design purposes concrete shall be a 6 bag, 4000 psi mix utilizing type I, I(B) or II cement and Grade A (size 57) aggregate. Reinforcing steel shall be deformed grade 60.
- C. Grate, frame and top castings shall be true to pattern in form and dimensions and free from pouring faults, sponginess, cracks, blowholes and other defects affecting their strength and value for the service intended. Castings shall be boldly filleted at angles and rises shall be sharp and perfect. Castings shall be cleaned of scale. Castings shall conform to AASHTO M 306. The bearing surfaces of the frames and covers shall seat firmly into the frame without rocking.
- D. Bedding material shall be a 65% - 35% sand-aggregate mixture or stone conforming to LADOTD Subsection 1003.10. Aggregate in mixture shall be gravel, stone or crushed concrete. The mixture shall be free of foreign matter. Provide certified gradation test report meeting LADOTD Subsection 1003.08 for bedding material for approval by the Parish Engineer. This shall occur at the beginning of the project.
- E. Specialty designs for conflict boxes may be submitted for review and approval of the Parish Engineer.

PART 3 - EXECUTION

3.1 INSTALLATION OF CONCRETE DRAINAGE STRUCTURES

- A. All precast concrete drainage structures shall be installed to line and grade and shall be placed on a minimum 9" base consisting of compacted bedding material or 6" of lean concrete finished to a flat surface. Compaction of bedding material shall be by mechanical means such as vibratory plate.
- B. The space between the pipe and the structure opening shall then be grouted from both sides for the full wall thickness. Pipe sections shall extend two (2) inches on the inside of the structure wall and project outside sufficiently for connection with the next pipe section. Any openings between pipe joints greater than ½" shall be grouted with non-shrink grout.
- C. Where the precast concrete drainage structures fall, wholly or in part, under the roadbed, they shall be backfilled to the top of the highest pipe with compacted bedding material and then with usable soil as per LADOTD Subsection 203.06(a) from the top of the highest pipe to the bottom of the roadway base.
- D. Where the precast concrete drainage structures are outside the roadbed, they shall be carefully backfilled with bedding material to the top of the highest pipe except concrete pipe, and from there up with native material free of stones, cobbles and debris and compacted in layers as necessary to achieve a density matching the surrounding native soil.

- E. Grate and cover adjustments by means other than cast-in-place concrete or pre-cast units shall be submitted to the Parish Engineer. Approval will be at the discretion of the Parish Engineer.

END OF SECTION

SECTION 10

RIP RAP

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Ascension Parish Subdivision Construction Specifications.
- B. LADOTD standard specifications, 2006 edition unless otherwise specified.

1.2 DESCRIPTION OF WORK

- A. The work covered by this section of the specifications consists of furnishing and the installation of rip rap and geotextile fabric.

1.3 DEFINITIONS

- A. For the purposes of these specifications, the Parish Engineer shall be defined as: the office of the Parish Engineer, the Department of Public Works, or the Engineering Review Agency.
- B. For the purposes of these specifications, the following describe the limits of work:
 - 1. Roadbed: width of roadway, either edge of pavement or edge of pavement; or, back of curb to back of curb, plus five (5) feet on both sides.
 - 2. ROW Transition Area: area between edge of Roadbed and established ROW.
 - 3. Lots: all work outside of the ROW as indicated on the construction plans.

PART 2 - PRODUCTS

2.1 STONE

- A. Rip rap stone shall meet LADOTD material specifications.

2.2 RECYCLED PORTLAND CEMENT CONCRETE

- A. Recycled Portland cement concrete shall meet LADOTD material specifications.

2.3 GEOTEXTILE FABRIC

- A. Geotextile material shall meet LADOTD material specifications.

PART 3 – EXECUTION

3.1 SURFACE PREPARATION

- A. Areas on which riprap is to be placed shall be graded to required section and compacted as directed. Geotextile fabric shall be placed on areas prior to placing riprap. Ends of fabric shall be buried for anchorage, and adjacent fabric strips shall be lapped at least 10" and pinned at maximum 5-foot intervals.

3.2 PLACEMENT

- A. Riprap shall be placed by methods that do not damage geotextile fabric. Larger stones shall be placed first and smaller stones used to fill in areas between larger stones so that no geotextile fabric is exposed. Surface of completed riprap installation shall be uniform.

- B. When placement in water currents is required, riprap shall be placed by methods that compensate for drift.

END OF SECTION

SECTION 11 EROSION CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Ascension Parish Subdivision Construction Specifications.
- B. LADOTD standard specifications, 2006 edition unless otherwise specified.

1.2 DESCRIPTION OF WORK

- A. The work covered by this section of the specifications consists of the effort necessary to permit, install, monitor, maintain, and remove where required, temporary and permanent sedimentation and erosion control.

1.3 DEFINITIONS

- A. For the purposes of these specifications, the Parish Engineer shall be defined as: the office of the Parish Engineer, the Department of Public Works, or the Engineering Review Agency.
- B. For the purposes of these specifications, the following describe the limits of work:
 - 1. Roadbed: width of roadway, either edge of pavement or edge of pavement; or, back of curb to back of curb, plus five (5) feet on both sides.
 - 2. ROW Transition Area: area between edge of Roadbed and established ROW.
 - 3. Lots: all work outside of the ROW as indicated on the construction plans.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Fertilizer, Seed, Straw Mulch & Fiber Mulch, Straw Mat, Excelsior Mat, Slab Sod shall meet LADOTD specifications or shall be on the LADOTD QPL at the time of installation.
- B. Materials not covered by project specifications shall meet commercial grade standards and shall be approved by the Parish Engineer before being incorporated into the project. No testing of materials used in temporary erosion control features will be required. Acceptance of temporary erosion control materials will be by visual inspection.

PART 3 - EXECUTION

3.1 TEMPORARY WORK

- A. Installation of temporary erosion control features shall be coordinated with construction of permanent erosion control features to ensure effective erosion control at all times.

- B. Temporary Erosion Control and Storm Water Pollution Prevention Plan: The contractor will abide by the terms and conditions of the Storm Water Pollution Prevention Plan (SWPPP) and the National Pollution Discharge Elimination System (NPDES) General Permit. The Contractor shall prevent to the maximum extent practicable the transmission of soil particles into streams, canals, lakes, reservoirs or other waterways. Except as necessary for construction, excavated material shall not be deposited in streams or impoundments, or in a position close enough to be washed into waterways by high water or runoff.
1. Lands or waters outside construction limits shall not be disturbed, except as authorized. The contractor shall not unnecessarily strip vegetation near stream banks.
 2. For disturbed areas greater than 1 acre including but not limited to: project construction limits, staging and disposal areas, temporary access roads, detours, and borrow areas, the contractor shall be required to develop a SWPPP (Storm Water Pollution Prevention Plan). The contractor shall contact LADEQ for the latest specific requirements regarding the Storm Water General Permit and Notice of Intent.
 3. The Parish Engineer may limit exposure of unprotected earth and may direct the contractor to provide immediate permanent or temporary erosion or pollution control measures to prevent contamination of streams, lakes, reservoirs, canals or other impoundments or prevent detrimental effects on property outside the right-of-way.
 4. As required by these specifications and as detailed in the contractors SWPPP, the contractor shall place, monitor, and maintain; temporary seed, fertilizer, mulch, sandbags, hay bales, silt fences, slope drains, sediment check dams, sediment basins, and other best management practices. Earth berms shall be constructed as needed to direct water away from slopes.
 5. The use of erosion control features or methods other than those in these specifications shall be as contained in the Contractors SWPPP and shall be considered included in the development and maintenance of the SWPPP.
 - (a) Temporary Seeding, Fertilizing and Mulching: Seeding, fertilizing and mulching shall be performed in accordance with Subsection 3.02, modified as follows. Ground preparation shall be limited to blading the area; grass seed shall be a fast-growing species suitable to the area; application rates of seed, fertilizer and mulch may be reduced when directed.
 - (b) Sandbags and Hay Bales: Sandbags shall be 1 cubic foot burlap bags, filled at least 3/4 full with sand. Hay bales shall be standard size bales and shall be secured by stakes.
 - (c) Slope Drains: Slope drains shall be constructed of pipe, riprap or other suitable material, with riprap protection at the discharge end.
 - (d) Sediment Basins: Sediment basins shall be excavated to collect silt, and shall be cleaned out as necessary to maintain their effectiveness. Basin outfall shall be riprap protected.
 - (e) Sediment Check Dams: Check dams shall be constructed in ditches, and shall consist of logs and brush or fencing.

- (f) Silt Fencing: Silt fencing shall be geotextile fabric, either wire-supported or self- supported, attached to posts.
- (g) Maintenance of Erosion Control Features: The contractor shall install, construct, repair, and maintain temporary erosion control features within 48 hours of initiation of land disturbance activities. Temporary erosion control features shall be inspected at least once every 14 calendar days, in advance of any anticipated rain events, and within 24 hours after a rainfall event of 0.5 inches or greater.
 - 1) Temporary Seeding: The seeded areas showing erosion after inspection shall be reseeded if necessary.
 - 2) Mulches: Mulched areas showing erosion shall be repaired and the mulch reapplied if necessary.
 - 3) Straw or Hay Bale Barriers: The bale barriers shall be inspected after each rainfall and time frame as defined above and at least daily during prolonged rainfall. Close attention shall be paid to the repair of damaged bales, "end runs" and undercutting beneath bales.
 - 4) Slope Drains: Slope drains shall be inspected weekly and after each rainfall as defined above, and repairs made if necessary. The contractor shall avoid the placement of any material on and prevent construction traffic across the slope drain.
 - 5) Sediment Check Dams: Sediment deposits shall be removed when the deposits reach one-half the height of the check dam. Inspections shall be made to insure that the center of the dam is lower than the edges. Erosion around the edges shall be corrected immediately.
 - 6) Silt Fencing: Sediment deposits shall be removed when the deposits reach one- half the height of the fence. If the fabric on the silt fence decomposes or becomes ineffective, the fabric shall be replaced promptly.
 - 7) Temporary Stone Construction Entrance and/or Wash Racks: The construction entrance shall be maintained to allow for removal of mud from the tires. The sediment from the wash rack runoff shall be removed once the wash rack is no longer performing as intended.

C. REMOVAL OF TEMPORARY EROSION CONTROL FEATURES

- 1. Temporary erosion control features existing at the time of construction of permanent erosion control features shall be removed or incorporated into the soil in such manner that no detrimental effect will result. The Parish Engineer may direct that temporary features be left in place.

3.2 PERMANENT EROSION CONTROL

- A. Permanent Erosion Control shall be placed within fourteen (14) days of final grading. The Developer/Contractor shall notify the Parish Engineer that such application has taken place

and over what designated areas of the project. The Parish Engineer will determine the successful germination and growth of the erosion control system chosen. Additional seeding or other erosion control techniques will be required if less than 90% of the designated areas has not been deemed successful.

- B. Seeding and Fertilizing: Seed beds shall be disked and pulverized; then leveled and lightly rolled prior to seeding. Seed shall be applied by one of the following methods:
 - 1. Broadcast: Seed and fertilizer may be used and be uniformly spread by hand or mechanical methods.
 - 2. Hydroseeding: Seed, fertilizer, mulch and tackifier may be use and placed in a single mechanical operation.
- C. Watering: When necessary, seeded areas may require periodically watered until final acceptance.
- D. Mulching: When necessary, mulching may be required to reduce sediment lose and moisture retention.
- E. Erosion Blanket: Erosion control blankets shall be straw or excelsior mats and shall be placed on seeded areas.
 - 1. On slopes, blanket strips shall be placed either transverse or parallel to slope. Blanket shall be turned down into 6" anchor slots at top and bottom of slope. Mats shall be stapled to ground at maximum 6-foot intervals staggered on adjacent rows. Straw mats shall be overlapped 6" on ends and sides; excelsior blanket strips shall be tightly butted with adjacent strips at ends and sides.
 - 2. In ditches, blanket strips shall be placed parallel to ditch, beginning at downstream end. Sides and ends of excelsior strips shall be tightly butted with adjacent strips; sides and ends of straw mats shall be turned down into 6" deep anchor slots at ends and sides. Mats shall be stapled to ground at maximum 4- foot intervals, staggered on adjacent rows.
- F. Slab Sod: Areas to be slab sodded shall be disked and pulverized at least 3" deep. Approximately 90% of the required fertilizer shall be placed on the area prior to placing sod, and the remainder of the fertilizer shall be broadcast after sod is placed. Sod shall be rolled or tamped after placement.
- G. Turf will be considered to be established and completed when the areas to be turfed have produced grass over a minimum of 70 percent of the entire area as determined by the Parish Engineer by randomly sampling on a square yard basis and when the areas to be turfed have no spots greater than 4 square feet that are void of grass. This area will include all areas between the back of curb to the beginning of lot lines, servitudes, pond slopes, ditches and ditch slopes and public areas. This does not include private lot areas outside of servitudes. Also, this requirement will not be required at the time of Final Inspection should a utility contractor disturb ground to install utility lines within two weeks prior

END OF SECTION

SECTION 12 GRAVITY SEWAGE COLLECTION

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

- A. The work covered by this section of these specifications consists of the construction of sewers and manholes complete as specified herein.
- B. Minor details not usually shown or specified, but necessary for the proper installation and operation, shall be included in the work, the same as if herein specified or shown.
- C. All materials furnished and all work installed shall comply with the requirements of all governmental departments having jurisdiction.

1.2 MATERIALS AND WORKMANSHIP

- A. All materials and apparatus required for the work, except as specifically specified otherwise, shall be new, of first class quality, and shall be furnished, delivered, erected, and connected, and finished in every detail, and shall be so selected and arranged as to fit properly.
- B. All equipment and materials shall be installed in accordance with the recommendations of the manufacturer, including the performance of such tests as the manufacturer recommends.

1.3 SUBSTITUTION OF MATERIALS

- A. Substitution of materials shall be in accordance with the provisions of these specifications.
- B. Should a substitution be accepted and should the substitute material prove defective or otherwise unsatisfactory for the service intended and within the warranty period, this material or equipment shall be replaced with the new material or equipment specified by name.

1.4 DEFINITIONS

- A. For the purposes of these specifications, the Parish Engineer shall be defined as: the office of the Parish Engineer, the Department of Public Works, or the Engineering Review Agency.
- B. For the purposes of these specifications, the following describe the limits of work:
 - 1. Roadbed: width of roadway, either edge of pavement or edge of pavement; or, back of curb to back of curb, plus five (5) feet on both sides.
 - 2. ROW Transition Area: area between edge of Roadbed and established ROW.
 - 3. Lots: all work outside of the ROW as indicated on the construction plans.

PART 2 - PRODUCTS

2.1 PIPE, VALVES AND FITTINGS

- A. Approved gravity sewer main and service line products are:

1. Solid wall PVC in sizes 4" through 15" shall be DR35 (dimension ratio 35) conforming to ANSI/ASTM D 3034 except with the additional requirement that the basic material shall be only Cell Class 12454-B and additionally shall comply with PVC 1120 with a long-term 2000 psi hydrostatic design stress. Fittings for solid wall PVC sewer pipe shall meet the requirements of ASTM D 3034.
2. Solid wall PVC pipes in sizes 18" through 27" shall have a uniform solid wall and a minimum Pipe Stiffness of 46 psi with wall thickness T-1 (DR 35) unless designated otherwise, in compliance with ASTM F679, except that the basic material shall be only Cell Class 12454 B with the additional requirements that it shall comply PVC 1120 with a long-term 2000 psi hydrostatic design stress.
3. PVC profile wall pipe, "Ultra-Rib", meeting the requirements of ASTM F 794. Fittings for profile wall PVC pipe shall meet the requirements of ASTM D 3034.
4. PVC corrugated pipe, "A-2000", meeting the requirements of ASTM F 949. Fittings for corrugated PVC sewer pipe shall meet the requirements of ASTM F 949.
5. Ductile Iron gravity collection pipe shall conform to AWWA C 151, Thickness Class 51. Pipe shall be epoxy or polyethylene lined and bituminous coated. A bonded polyethylene lining shall be equal to that manufactured by American Cast Iron Pipe or U.S. Pipe and thickness shall be 40 mils nominal and 25 mils minimum in pipe tapering to 10 mils minimum at joints. Epoxy lining shall comply with AWWA C 550 and be 2-coat high-build catalyzed epoxy with thickness range of 8 to 16 mils total dry film thickness. Bituminous coating shall conform to ANSI A 21.51.
6. In lieu of epoxy coated ductile iron pipe under subdivision streets, other specified types of pipe may be used provided they are installed in casings. Casings shall be steel casing meeting the specifications for Steel Pipe for Jacking and Boring specified hereinafter or AWWA C 151, thickness Class 51 ductile iron pipe having the standard manufacturer's lining and coating.

B. Steel Pipe for Jack & Bore Casing (State or Federal Highways)

1. Pipe

Where casing pipe is shown on the Drawings, pipe shall be steel having a minimum yield stress of 35,000 psi, conforming to ANSI B 36.10 or API 5L. Casings shall have the following wall thicknesses:

<u>Size (Non. Diam., In.)</u>	<u>Diameter Base</u>	<u>Nom. Thickness Uncoated (Inches)</u>	<u>Nom. Thickness Coated* (Inches)</u>
Under 12	I.D	0.250	0.250
14 and 16	O.D.	0.281	0.250
18	O.D.	0.313	0.250
20	O.D.	0.344	0.281
24	O.D.	0.375	0.312
26	O.D.	0.438	0.375
28 and 30	O.D.	0.469	0.406
32	O.D.	0.500	0.438
34 and 36	O.D.	0.532	0.469
38, 40 and 42	O.D.	0.563	0.500

* Both the interior and exterior of the pipe shall have a bituminous coating complying with specifications of the approving agency.

NOTE: For sizes over forty-two inch (42"), the Developer shall submit design calculations and liner material data on tunneling the installation for approval by the Engineer.

Upon written permission of the approving agency (railroad company or highway department), the Developer will be permitted to substitute reinforced concrete culvert pipe or bonded bituminous coated corrugated metal pipe for steel casing pipe specified above, provided that the substituted pipe conforms to the approving agencies' specifications.

2. Joints

Joints shall be butt-welded. Coating, if required, shall be continuous at the joints.

3. Carrier Runners

Metal carrier pipes shall be supported by utilizing three-way or concentric insulating casing cradle as manufactured by T.D. Williamson, Inc., Tulsa, OK; Piping Insulators, Inc., Canton, MA; or equal. Non-metallic carrier pipes shall be supported by stainless steel banded treated wood or all plastic runners. Space runners as specified under installation of carrier pipes within casing pipes.

4. Casing Seal

Use casing seals in the annulus between the casing and carrier pipe which are either cement grout, bituminous material, or compressible rubber seals such as "Link Seal" by Thunderline, Wayne, MI; or rubber boots as manufactured by T.D. Williamson, Inc., Tulsa, OK; or equal.

C. Polyvinyl Chloride Pipe (PVC) For Direct Boring

In Lieu of steel casings and carrier pipes specified hereinbefore Restrained Joint PVC pipe in sizes 8" through 12" equal to CertainTeed Certa-Lok C900/RJ, Class 200 may be used and installed to line and grade by direct boring methods.

2.2 MANHOLES

A. Precast Concrete Manholes

Precast reinforced concrete manholes including tops, cones, intermediate and base sections shall conform to ASTM C 478. Manhole sections shall utilize rubber gaskets conforming to ASTM C 443 or preformed plastic joint sealant conforming to ASTM C-990 and installed according to the manufacturer's recommendations. Coat manhole interiors with XYPEX "Concentrate" and "Modified" per manufacturer's recommendations or use XYPEX C-1000T admixture during manufacture of manholes. Wrap all joints with six (6") inch wide plastic joint sealant equal to EZ-Wrap as manufactured by Press-Seal Gasket Corp. Lifting inserts shall be embedded in manhole walls, through wall holes are prohibited. Invert channels shall be smooth and accurately shaped to a semi-circular bottom conforming to the inside of the adjacent sewer section. Channels shall extend up at least three-quarters (3/4) of the inside diameter of the pipe. Changes in the direction of sewer flow shall follow a smooth radius curve.

B. Cast-In-Place Manholes

Concrete for Cast-In-Place Manholes shall be a minimum 4,000 psi at 28 days. Coat manhole interiors with XYPEX "Concentrate" and "Modified" per manufacturer's recommendations or use

XYPEX C-1000T admixture during manufacture of manholes. Wrap all joints with six (6") inch wide plastic joint sealant equal to EZ-Wrap as manufactured by Press-Seal Gasket Corp. Reinforcing for Cast-In-Place manhole bases shall be as follows:

Cast In Place Base Reinforcement		
Manhole Depth (ft.)	Concrete Thickness (in.)	Reinforcement
0 - 8	8	# 5 @ 12" E.W.
8 -12	10	# 5 @ 12" E.W.
12 - 20	12	# 5 @ 10" E.W.
Over 20	14	# 5 @ 8" E.W.

Base slab projection beyond outside wall of Cast-In-Place manholes shall be as follows:

Cast In Place Base Projection	
Manhole Diameter (ft.)	Projection (in.)
4	6
5	9
6	12

Wall thicknesses for Cast-In-Place manholes shall be as follows:

Cast In Place Wall Thicknesses	
Manhole Depth (ft.)	Wall Thickness (in.)
0 - 12	6
12 - 20	8
Over 20	12

C. Manhole Frames and Covers

Manhole frames shall be cast iron and shall provide a minimum twenty-two inch (22 in.) clear opening. Frame shall have a minimum weight of one-hundred-sixty pounds (160 lbs.) and shall be equal to Vulcan V-1241-1. Manhole covers shall be cast iron with a diameter of twenty-three and one-quarter inches (23-1/4"), shall have a minimum weight of one-hundred-twenty pounds (120 lbs.) and shall have a surface pattern equal to Vulcan V-1099, Type 1 clearly displaying the word SEWER. Frame and cover shall be bolt down, four (4) bolt configuration, stainless steel bolts provided to be located on manhole within the roadbed and or below flood elevation. Castings shall conform to AASHTO M 306.

D. Manhole Drop Connections

If inlet pipe enters the manhole 2 feet above the manhole invert or higher, an external drop line is required and shall comply with details in the Plans. The drop line shall be of the same size and material as that of the inlet pipe. Backfill drop assembly with sanitary sewer bedding material. Extend the bedding material a minimum of 4 inches outside bells.

PART 3 - EXECUTION

3.1 TRENCHING AND FORMING PIPE BED

- A. Excavation shall include the removal, handling, re-handling, refill or backfilling, and disposal of any and all material encountered in the work, and shall include all pumping, bailing, drainage and sheeting and bracing.
- B. The work of excavation shall also include the removal and disposal of quicksand, obstacles or other conditions, which may be encountered in the work. It includes the clearing and removal of pavements, curbs, sidewalks, shrubbery, and other obstructions not otherwise provided for in the plans.
- C. The width of the trench shall be equal to the pipe outside diameter plus 18" to permit thorough tamping of the backfill under the haunches and around the pipe.
- D. Where firm foundation is not encountered at the grade established, due to soft, spongy or other unstable soil conditions, such unstable soil shall be removed and replaced with a foundation fill consisting of bedding material (specified hereinafter) or other suitable approved material properly compacted to provide adequate support for the pipe.
- E. All pipe shall be carefully laid to the lines and grades shown on the plans. Any pipe not true in alignment or which shows settlement after laying, shall be removed and re-laid at the Developer's expense.
- F. Wherever practical, pipe laying shall begin at the downstream end of the line. Before being set in place each section of pipe shall be thoroughly cleaned, and free of dirt. All bells shall be laid on the upstream end.
- G. The lower segment of the pipe barrel shall be supported by the earth foundation or bedding for the full length of the barrel. Bell holes where required shall be carefully excavated to provide uniform bearing for the pipe barrel.
- H. Bedding material shall be a 65% - 35% sand-aggregate mixture or stone conforming to LADOTD Subsection 1003.10. Aggregate in mixture shall be gravel, stone or crushed concrete. The mixture shall be free of foreign matter. Provide certified gradation test report meeting LADOTD Subsection 1003.08 for bedding material for approval by the Parish Engineer. This shall occur at the beginning of the project. Bedding material shall be placed in the trench beginning a minimum of four (4) inches below the pipe invert and carefully compacted under and around the pipe to a point twelve (12) inches above the top of the pipe.
- I. Where the trench falls within the Roadbed, backfill from the point twelve (12) inches above the pipe shall be native or imported materials treated with cement, placed in twelve (12) inch loose lifts, and compacted to 95 percent of maximum density (Standard Proctor).
- J. Where the trench falls outside of the roadbed, backfill shall be native or imported material suitable for lot construction, placed in twelve (12) inch loose lifts and compacted to a density consistent with the adjacent undisturbed soils.
- K. Provide compaction reports for backfill at roadway trenches.

3.2 MANHOLE INSTALLATION

- A. Manholes shall be installed to line and grade and shall be placed on a minimum 9" base consisting of compacted 65%-35% sand-aggregate mix or "610" limestone bedding material or 6" of lean concrete finished to a flat surface. Granular bedding material shall be

compacted to 95% Standard Procter density.

- B. Where a manhole falls, in part or in whole, under or within the roadbed, the manhole shall have bedding material placed to the top of the highest pipe and sand from the top of the pipe to the bottom of the roadway base. Elsewhere manholes shall be backfilled to the top of the highest pipe with bedding material and then with excavated native material free of cobbles, large stones and other deleterious material placed and compacted in lifts as necessary to achieve a density matching the surrounding soil.

3.3 UTILITIES, LOCATIONS, AND ELEVATIONS

- A. Examine the site and verify the location and elevation of all utilities and their relation to the work before commencing work.
- B. Verify location and method of tie-in of all utility lines with the appropriate representatives of the utility provider.

3.4 GENERAL PIPING REQUIREMENTS

- A. Furnish and install, including all labor and materials required, the various piping systems as shown and/or specified, adhering to the general routing and methods of distribution including all required pipe fittings, valves, hangers, sleeves, inserts, and other such items and appurtenances as may be required for the satisfactory operation of the various systems. Valves shall be installed for the control and/or isolation of all branch force mains.
- B. All piping shall be installed in the most neat and workmanlike manner, employing only mechanics skilled in each respective trade.
- C. All pipe shall be properly reamed after cutting and shall be cleaned before installation.
- D. Wherever practical, pipe laying for the gravity sewer shall proceed upgrade with the spigot ends of the pipe in the direction of flow. Each pipe shall be laid true to line and grade and in such a manner as to form a close concentric joint with the adjoining pipe and to prevent sudden offsets in the flow-line.
- E. The Developer/Contractor shall carefully install all jacked and bored crossings to the required grade and alignment. Casing will be required for gravity and force main crossings utilizing pipe other than HDPE or as required by LADOTD or railroads. The boring operation shall be accomplished using a commercial type boring rig. The hole made by the installation shall be the same diameter (within 2 inches) as the largest outside joint diameter of the pipe installed. The pipe shall be installed in the hole immediately after the bore has been made, and in no event shall the hole be left open while unattended.
- F. Wyes and tee branches for sewer service lines shall be placed in the line at points indicated by the Parish Engineer. Riser pipe and service lines shall be laid at the location and grades indicated by the Parish Engineer.
- G. In general, service lines will be laid on a one (1%) grade unless otherwise directed by the Parish Engineer. The ends of all service lines and other points of future service connections are to be capped with an approved water-tight stopper. The end of each service connection shall be clearly marked with a length of 6" PVC pipe placed vertically and extending a minimum of three (3) feet above finished grade.

3.5 PIPE ASSEMBLY

- A. PVC sewer pipe shall be flexible gasket, "push-on" type joints, and shall conform to ASTM D-3212.
- B. Connections between different types of pipes and accessories shall be made with fittings recommended by the manufacturer and approved by the Parish Engineer.
- C. All pipe connected to manholes shall be installed utilizing rubber "A-Lok" or boot and stainless steel clamp.

3.6 OPEN ENDS

- A. Keep all ends of pipes closed with caps or plugs so as to prevent dirt, debris or construction materials from entering the pipes during construction.

3.7 TESTING

- A. All sewers and manholes shall be tested to assure their being watertight in accordance with Section 3.7 C of these specifications.
- B. Before leakage tests all lines must be lamped to see that they are clean and that no sags are in the lines. The Parish Engineer shall be present during all of these tests. The Developer/Contractor shall furnish enough personnel to remove manhole lids, hold lamps and mirrors.
- C. The Developer/Contractor shall have the sewer piping tested by the following method or other method approved by the Parish Engineer.
 - 1. Low Pressure Air Testing: After a manhole to manhole reach of pipe has been backfilled, cleaned and services installed, air tight plugs shall be placed in the line at each manhole. Low pressure air shall be introduced into this sealed line until the internal air pressure reaches four psig greater than the average back pressure of any ground water that may be over the pipe. At least two minutes shall be allowed for the air pressure to stabilize. After the stabilization period, the pressure shall be at least 3.5 psig and the air supply shall be disconnected. The portion of line being tested shall be termed acceptable if the time required in minutes for the pressure to decrease from 3.5 psig to 2.5 psig (greater than the average back pressure of any ground water that may be over the pipe) is not less than the time shown for the given diameters in the following table:

Pipe Diameter in Inches	Minutes
4	2.0
6	3.0
8	4.0
10	5.0

- 2. Any excessive leaks in the system shall be repaired and retested. 100% of the gravity sewer pipe installed shall be air tested. Provide written report of air test results.

- D. Deflection Testing: For flexible sewer pipe (PVC and HDPE) 100% of the pipe installed shall be tested. The maximum allowable initial deflection of a flexible sewer pipe shall 5% for PVC pipes and 3.3% for HDPE pipes. Test only after the final backfill has been placed and compacted, as specified, and not less than thirty (30) days from final trench compaction.
1. The test mandrel shall have equally spaced runner arms. For pipe size 6 through 12-inch mandrel, use at least 7 and preferably 8 or 9 arms equal to that manufactured by Phos Incorporated, Carpenteria, CA. or Cherne Industries, Inc., Minneapolis, MN. For 15 inch and larger pipe size, fabricate the mandrel with at least 12 arms and arm lengths at least equal to the pipe diameter.
 2. The manufacturer or Developer/Contractor shall calculate the base inside diameter of the pipe in accordance with the A.N.S.I./A.S.T.M. Specification for the piping product with appropriate modification to the method as for A.N.S.I./A.S.T.M. D3034 for P.V.C. pipe. Calculations of the base inside pipe diameter less the allowable deflection, and the resulting allowable mandrel outside diameter shall be submitted for approval by the Parish Engineer before testing. The Developer shall provide a proving ring for odd arm mandrels and calipers or ring for even arm mandrels.
 3. Pull the mandrel through the sewer by one man with a hand line without any mechanical advantage. When the mandrel cannot be pulled by this method at any location, the test fails. Attach a tail line for removing a mandrel that will not pass. Repair failure locations by removing and replacing the failed sections. Provide written report of deflection test results.
- E. AIR VACUUM TEST: After completion of manhole construction, wall sealing, and backfilling, the Contractor shall conduct a vacuum test as follows:
1. All manholes are to be vacuum tested following backfill and compaction. The ring and lid casting assembly shall be installed prior to testing. The testing equipment shall consist of a gasoline-powered vacuum pump with sufficient vacuum hose length and a test head of proper size to fit the inside opening of the manhole. The test head shall be equipped with an inflatable rubber bladder to affect the seal to the manhole, an air pressure gauge, and a safety valve for filling the bladder, a 30-inch Hg liquid-filled vacuum gauge, a double air exhaust manifold with quarter turn ball valves, three bolt-on feet, and a bridge assembly with height adjustment rod.
 2. Contractor shall plug all pipe openings, taking care to securely brace the plugs and the pipe. The plugs shall be placed a minimum of 6 inches beyond the manhole wall.
 3. With the vacuum tester in place, inflate the compression to affect a seal between the vacuum base and the structure. Connect the vacuum pump to the outlet port with the valve open and evacuate the manhole to 10 inches Hg (0.3 bar) for 48-inch diameter manholes and 5 inches Hg (0.15 bar) for 60-inch and greater diameter manholes.
 4. Close vacuum inlet/outlet ball valve, disconnect the vacuum pump, and monitor the vacuum for the specified time period. If the vacuum does not drop in excess of 1-inch Hg over the specified time period, the manhole is considered acceptable passes the test. If the manhole fails the test, identify the leaking areas by removing the head assembly, coating the interior surfaces of the manhole with a soap and water solution, and repeating the vacuum test for approximately thirty seconds. Once the leaks have been identified, complete all necessary repairs by sealing the leaks of the manhole to the satisfaction of the Parish Engineer, and repeat test procedures until satisfactory results are obtained.

Vacuum Test Timetable			
Depth (Feet)	Manhole Diameter (Inches)		
	48"	60"	72"
4'	10 sec.	13 sec.	16 sec.
8'	20 sec.	26 sec.	32 sec.
12'	30 sec.	39 sec.	48 sec.
16'	40 sec.	52 sec.	64 sec.
20'	50 sec.	65 sec.	80 sec.
24'	60 sec.	78 sec.	96 sec.
*T	5.0 sec.	6.5 sec.	8.0 sec.

*Add extra testing time "T", for each additional 2-foot depth. (The values listed above have been extrapolated for ASTM designation C924-85.)

5. The Parish Engineer reserves the right to reject any and all manholes that do not pass vacuum testing requirements, and replacement shall be at the Contractor's expense. A significant number of leaks on a single manhole or significant number of manholes leaking shall be considered as a basis for rejection and replacement of manholes.

END OF SECTION

SECTION 13 SEWER FORCE MAINS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Ascension Parish Subdivision Construction Specifications.

1.2 DESCRIPTION OF WORK

- A. The work covered by this section of these specifications consists of furnishing and the construction of sewer force mains and appurtenances complete as specified herein.
- B. Minor details not usually shown or specified, but necessary for the proper installation and operation, shall be included in the work, the same as if herein specified or shown.
- C. All materials furnished and all work installed shall comply with the requirements of all governmental departments having jurisdiction.

1.3 MATERIALS AND WORKMANSHIP

- A. All materials and apparatus required for the work, except as specifically specified otherwise, shall be new, of first class quality, and shall be furnished, delivered, erected, and connected, and finished in every detail, and shall be so selected and arranged as to fit properly.
- B. All equipment and materials shall be installed in accordance with the recommendations of the manufacturer, including the performance of such tests as the manufacturer recommends.

1.4 SUBSTITUTION OF MATERIALS

- A. Substitution of materials shall be in accordance with the provisions of these specifications.
- B. Should a substitution be accepted and should the substitute material prove defective or otherwise unsatisfactory for the service intended and within the guaranty period, this material or equipment shall be replaced with the new material or equipment specified by name.

1.5 DEFINITIONS

- A. For the purposes of these specifications, the Parish Engineer shall be defined as: the office of the Parish Engineer, the Department of Public Works, or the Engineering Review Agency.
- B. For the purposes of these specifications, the following describe the limits of work:
 - 1. Roadbed: width of roadway, either edge of pavement or edge of pavement; or, back of curb to back of curb, plus five (5) feet on both sides.
 - 2. ROW Transition Area: area between edge of Roadbed and established ROW.

3. Lots: all work outside of the ROW as indicated on the construction plans.

PART 2 - PRODUCTS

2.1 PIPE, VALVES AND FITTINGS

A. Approved sewer force main products are:

1. Polyvinyl Chloride (PVC) Plastic Pipe less than 4" in diameter shall conform to ASTM D 2241, SDR 21, Cell Class 12454-B. PVC force mains sizes 4" through 12" shall conform to AWWA C 900, DR 18, Class 150. PVC force mains over 12" shall conform to AWWA C 905, SDR 25, Class 165.
All PVC force main pipe shall have rubber gasket bell and spigot or coupling type joints conforming to ASTM D 3139. Fittings for PVC force main pipe less than 3" shall be PVC solvent weld. Fittings 3" and larger shall be ductile iron conforming to AWWA C 110. Thrust restraint shall be provided through the use of joint restraints equal to EBAA Iron Mega-lug or Uni-Flange.
2. Ductile Iron shall conform to AWWA C 151, Thickness Class 51. Pipe shall be epoxy or polyethylene lined and bituminous coated. A bonded polyethylene lining shall be equal to that manufactured by American Cast Iron Pipe or U.S. Pipe and thickness shall be 40 mils nominal and 25 mils minimum in pipe tapering to 10 mils minimum at joints. Epoxy lining shall comply with AWWA C 550 and be 2-coat high-build catalyzed epoxy with thickness range of 8 to 16 mils total dry film thickness. Bituminous coating shall conform to ANSI A 21.51. Thrust restraint shall be provided through the use of joint restraints equal to EBAA Iron Mega-lug or Uni-Flange.
3. HDPE pressure pipe in sizes 4" through 63" shall comply with ANSI/AWWA C 906. The pipe shall be equal to Driscopipe 8600 as manufactured by Phillips Driscopipe, Inc., Dallas, Texas, and shall conform to ASTM-D-1248 (Type III, Class C., Category 5, P34). Minimum cell classification values shall be 355434C as referenced in ASTM D-3350. Polyethylene piping may be joined by thermal butt- fusion, flange assemblies, or mechanical joint adapters as may be recommended by the pipe supplier. Polyethylene piping shall not be joined by solvent cements, adhesives (such as epoxies), or threaded-type connections. All joining methods shall be capable of conveying water at not less than the design pressure of the piping system and shall be recommended for use by the pipe manufacturer. All fittings are to be joined to polyethylene piping by thermal heat fusion. Polyethylene fusion fittings may include one or more ports for effecting a mechanical connection, such as by compression or flange, to other piping. Polyethylene fittings may be molded, thermoformed from pipe sections, or fabricated by heat fusion joining polyethylene sheet or block. Molded fittings shall meet the requirements of ASTM D2683 for socket-type fittings, or ASTM D3261 for butt-type fittings, and the requirements of this standard.
4. Fittings for sewer force mains shall be ductile iron mechanical joint conforming to AWWA C 153. fittings shall be epoxy or polyethylene lined and bituminous coated. A bonded polyethylene lining shall be equal to that manufactured by American Cast Iron Pipe or U.S. Pipe and thickness shall be 40 mils nominal and 25 mils minimum in pipe tapering to 10 mils minimum at joints. Epoxy lining shall comply with AWWA C 550 and be 2-coat high-build catalyzed epoxy with thickness range of 8 to 16 mils total dry film thickness. Bituminous coating shall conform to ANSI A 21.51. Thrust restraint shall be provided through the use of joint restraints equal to EBAA Iron Mega-lug or Uni-Flange.

B. Steel Pipe for Jack & Bore Casing

1. Pipe

Where casing pipe is shown on the Drawings, pipe shall be steel having a minimum yield stress of 35,000 psi, conforming to ANSI B 36.10 or API 5L. Casings shall have the following wall thicknesses:

<u>Size (Non. Diam., In.)</u>	<u>Diameter Base</u>	<u>Nom. Thickness Uncoated (Inches)</u>	<u>Nom. Thickness Coated* (Inches)</u>
Under 12	I.D	0.250	0.250
14 and 16	O.D.	0.281	0.250
18	O.D.	0.313	0.250
20	O.D.	0.344	0.281
24	O.D.	0.375	0.312
26	O.D.	0.438	0.375
28 and 30	O.D.	0.469	0.406
32	O.D.	0.500	0.438
34 and 36	O.D.	0.532	0.469
38, 40 and 42	O.D.	0.563	0.500

* Both the interior and exterior of the pipe shall have a bituminous coating complying with specifications of the approving agency.

NOTE: For sizes over forty-two inch (42"), the Developer shall submit design calculations and liner material data on tunneling the installation for approval by the Parish Engineer.

Upon written permission of the approving agency (railroad company or highway department), the Developer will be permitted to substitute reinforced concrete culvert pipe or bonded bituminous coated corrugated metal pipe for steel casing pipe specified above, provided that the substituted pipe conforms to the approving agencies' specifications.

2. Joints

Joints shall be butt-welded. Coating, if required, shall be continuous at the joints.

3. Carrier Runners

Metal carrier pipes shall be supported by utilizing three-way or concentric insulating casing cradle as manufactured by T.D. Williamson, Inc., Tulsa, OK; Piping Insulators, Inc., Canton, MA; or equal. Non-metallic carrier pipes shall be supported by stainless steel banded treated wood or all plastic runners. Space runners as specified under installation of carrier pipes within casing pipes.

4. Casing Seal

Use casing seals in the annulus between the casing and carrier pipe which are either cement grout, bituminous material, or compressible rubber seals such as "Link Seal" by Thunderline, Wayne, MI; or rubber boots as manufactured by T.D. Williamson, Inc., Tulsa, OK; or equal.

C. Polyvinyl Chloride Pipe (PVC) For Direct Boring

In Lieu of steel casings and carrier pipes specified hereinbefore Restrained Joint PVC pipe in sizes 8" through 12" equal to CertainTeed Certa-Lok C900/RJ, Class 200 may be used and installed to line and grade by direct boring methods.

D. Valves

1. General

- a. Valves shall be suitable for their service, location and operating position as indicated.
- b. Buried valves size two inches (2") and larger shall be mechanical joint or slip joint to suit type of pipe used and buried valves smaller than two inches (2") shall be threaded.
- c. Provide a two inch (2") square operating nut on buried iron valves size two inch (2") and larger and provide an operating key on smaller buried valves.
- d. Provide a valve extension stem of appropriate length for deep lines so that the operator nut shall not be more than thirty-six inches (36") below finished grade. Coordinate the stem extension length with the lengths of valve wrenches furnished.
- e. Opening direction of all valve operators shall be counter-clockwise and an indicating arrow and the word OPEN shall be cast on all operators.
- f. Line and coat all ferrous valves in conformance with AWWA Specifications. Line and coat the valves sized three inch (3") and larger in conformance with AWWA C 550 with fusion bonded epoxy or thermoplastic to 6 to 12 mils in one coat or with high-build catalyzed epoxy in 2 coats to 8 to 16 mils total thickness.
- g. Valves with resilient seats shall have seats of natural or synthetic rubber suitable for service in sewage or sludge.
- h. Submit compliance certification, certified dimension drawings and specified design or test data for all valves.

2. Gate Valves

- a. Sizes four through twelve-inch (4"-12") shall be resilient seated gate valves with 200 psi rating and comply with ANSI/AWWA C 509. Sizes fourteen through forty-eight inches (14"-48") shall be solid wedge gate valves with 150 psi rating and comply with ANSI/AWWA C 500. Valve and connections, operators, resilient seats, and lining and coating shall be specified hereinbefore.
- b. All gate valves shall be fully equal in area to the pipes upon which they are placed. Valves shall be suitable for the location in the position shown. They shall be iron-bodied with internal bronze or S.S. trim and mounting, stuffing box or O-ring seals which can be changed while fully open and under pressure, and be complete with accessories. Stuffing box follower bolts shall be of steel and nuts shall be of bronze.
- c. Gate valves shall have inside screw and non-rising stem.
- d. Valves specified as gate valves smaller than two inches (2") shall be ball valves and shall have internal components of bronze, stainless steel, or TFE

and have iron, bronze or stainless steel body with screw ends, lever handle, or key operator and 150 psi rating.

3. Plug or Ball Valves

- a. Valves three through twelve inch (3"-12") and larger shall be self-lubricating, resilient-seal eccentric plug or TFE seat concentric ball types with iron body and one hundred fifty (150) psi bi-directional rating. Valves that cannot seat to full rated pressure against flow in either direction are prohibited. The minimum port area as a percent of full pipe areas for sizes twenty-inch and smaller shall be 80% for eccentric plug and 74% for TFE seat ball type and for sizes twenty-four inch (24") and larger shall be 70%.
- b. Valve end connections, operators, resilient seats and lining and coating shall be as specified hereinbefore.

4. Air Valves

- a. Air and vacuum valves, air release valves or combination air release valves shall be of the types suitable for sewage service with properly sized orifices for the service pressure and flows indicated. Working pressure rating shall be 150 psi, minimum. Valves shall be constructed of cast iron body, stainless steel trim with stainless steel floats, and shock-proof synthetic seats. All linkage, pins or levers shall be stainless steel. Valves with components of plastic shall be prohibited. Valve design shall prevent jamming or damage to the float or seat during operating and closing.
- b. Where the normal pipeline flow velocity is over 5 fps, the valve shall incorporate slow closing speed features by an auxiliary perforated check valve of either the center-guided spring loaded type, swing check with external adjustable weight type, or double door spring loaded type.
- c. All air valves shall be complete with isolation valve below them, blow off valve, quick disconnect couplings and flushing hose.

5. Valve Boxes

Valve boxes for gate valves shall be two-piece slip adjustment type, cast iron, complete with cover. Shaft shall have a minimum inside diameter of 5-1/4 inches, and shall have suitable bells or bases. Mark the lids with raised cast "SEWER".

E. Tracer Wire

A non-corrosive metallic wire for installation over all non-metallic buried pressure pipes to facilitate their location shall be either of the following:

Stainless Steel Wire - shall be 0.040" or larger bare stainless steel wire.

Copper Wire - shall be type T, AWG #16-gauge standard copper wire with insulation.

PART 3 - EXECUTION

3.1 TRENCHING AND FORMING PIPE BED

- A. Excavation shall include the removal, handling, re-handling, refill or backfilling, and disposal of any and all material encountered in the work, and shall include all pumping, bailing, drainage and sheeting and bracing.
- B. The work of excavation shall also include the responsibility of added expenses or other

liability that may arise from quicksand, obstacles or conditions, which may be encountered in the work. It includes the clearing and removal of pavements, curbs, sidewalks, shrubbery, and other obstructions not otherwise provided for in the plans.

- C. Where firm foundation is not encountered at the grade established, due to soft, spongy or other unstable soil conditions, such unstable soil shall be removed and replaced with a foundation fill consisting of bedding material (specified hereinafter) or other suitable approved material properly compacted to provide adequate support for the pipe.
- D. Where practical pipe laying shall begin at the downstream end of the line. Before being set in place each section of pipe shall be thoroughly cleaned, and free of dirt. All bells shall be laid on the upstream end.
- E. For all pipe, bedding material shall be a 65% - 35% sand-aggregate mixture or stone conforming to LADOTD Subsection 1003.10. Aggregate in mixture shall be gravel, stone or crushed concrete. The mixture shall be free of foreign matter. Provide certified gradation test report meeting LADOTD Subsection 1003.08 for bedding material for approval by the Parish Engineer. This shall occur at the beginning of the project. Bedding material shall be placed in the trench beginning a minimum of four (4) inches below the pipe invert and carefully compacted under and around the pipe to a point twelve (12) inches above the top of the pipe.
- F. Where the trench falls within the Roadbed, backfill from the point twelve (12) inches above the pipe shall be native or imported materials treated with cement, placed in twelve (12) inch loose lifts, and compacted to 95 percent of maximum density (Standard Proctor).
- G. Where the trench falls outside of the roadbed, backfill shall be native or imported material suitable for lot construction, placed in twelve (12) inch loose lifts and compacted to a density consistent with the adjacent undisturbed soils.
- H. Provide compaction reports for backfill at roadway trenches.

3.2 UTILITIES, LOCATIONS, AND ELEVATIONS

- A. Examine the site and verify the location and elevation of all utilities and their relation to the work before commencing work.
- B. Verify location and method of tie-in of all utility lines with the appropriate representatives of the Owner.

3.3 GENERAL PIPING REQUIREMENTS

- A. Furnish and install, including all labor and materials required, the various piping systems as shown and/or specified, adhering to the general routing and methods of distribution including all required pipe fittings, valves, hangers, sleeves, inserts, and other such items and appurtenances as may be required for the satisfactory operation of the various systems. Valves shall be installed for the control and/or isolation of all branch force mains.
- B. All piping shall be installed in the most neat and workmanlike manner, employing only mechanics skilled in each respective trade.
- C. All pipe shall be properly reamed after cutting and shall be cleaned before installation.
- D. The Developer/Contractor shall carefully install all jacked and bored crossings to the required grade and alignment. Casing will be required for gravity and force main crossings

utilizing pipe other than HDPE, C900RJ PVC or as required by LA DOTD or railroads. The boring operation shall be accomplished using a commercial type boring rig. The hole made by the installation shall be the same diameter (within 2 inches) as the largest outside joint diameter of the pipe installed. The pipe shall be installed in the hole immediately after the bore has been made, and in no event shall the hole be left open while unattended.

- E. Install manual valves in a valve box extending from grade to below the valve body, with a minimum 4-inch cover measured from grade to top of valve.
- F. For sewage force main piping, thrust restraint shall be provided at all tees, bends, and other fittings where thrust can be expected to occur. Thrust restraint shall be achieved through use of joint restraints as specified with the approved piping materials.

3.5 PIPE ASSEMBLY

- A. PVC sewer pipe shall be flexible gasket.
- B. Connections between different types of pipes and accessories shall be made with fittings recommended by the manufacturer and approved by the Parish Engineer.

3.6 OPEN ENDS

- A. Keep all ends of pipes closed with caps or plugs so as to prevent dirt, debris or construction materials from entering the pipes during construction.

3.7 TESTING

- A. The Developer/Contractor shall test the completed sections of sewage force main pipe by the following method or other method approved by the Parish Engineer.
 - 1. All sewage force main piping systems shall be tested to assure their being watertight. Wherever pipes are placed so they will be ultimately concealed, these tests shall be conducted and the absolute water-tightness of each piping system shall be demonstrated before that system is concealed and made inaccessible.
 - 2. Tests for force main piping shall consist of subjecting the piping to a hydrostatic pressure equal to the pressure rating of the pipe for a period of not less than two hours with an allowable pressure drop of 5 psig.
 - 3. Developer/Contractor shall install all plugs, valves, tanks, pumps, and accurate gauges to perform test. During this period, all leaks in pipe, fittings and accessories, in the particular piping system which is being tested, shall be stopped and the hydrostatic test shall be again applied. The procedure shall be repeated until for an entire one-hour period, the test pressure can be maintained. The testing shall be performed under the observation of the Parish Inspector. After all testing and installations, test entire system for operation under normal operating pressure.
 - a. Any excessive leaks in the pressure system shall be repaired immediately upon discovery. Cost for repairing faulty work, including re-excavating and re-backfilling and for making test, shall be the responsibility of the Developer/Contractor.
 - 4. Provide written report of pressure test results.

END OF SECTION

SECTION 14
SELF PRIMING WASTEWATER PUMPING STATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Ascension Parish Subdivision Construction Specifications.

1.2 GENERAL

- A. Connecting, start-up, and testing of sewerage pumping units and their appurtenances as indicated on the Drawings and as herein specified. These specifications direct attention to certain features of the pumping units, but do not purport to cover all the details of their design. The equipment furnished shall be designed, constructed, and erected in conformance with accepted high quality standards.
- B. Motor starters and wiring are specified under the appropriate electrical sections.
- C. Pumping units shall be equipped with the necessary accessories, including casing heater, automatic air release valve, pressure gages, and piping connections.

1.3 DEFINITIONS

- A. For the purposes of these specifications, the Parish Engineer shall be defined as: the office of the Parish Engineer, the Department of Public Works, or the Engineering Review Agency.
- B. For the purposes of these specifications, the following describe the limits of work:
 - 1. Roadbed: width of roadway, either edge of pavement or edge of pavement; or, back of curb to back of curb, plus five (5) feet on both sides.
 - 2. ROW Transition Area: area between edge of Roadbed and established ROW.
 - 3. Lots: all work outside of the ROW as indicated on the construction plans.

1.4 GENERAL REQUIREMENTS

- A. Coordination
 - 1. Exercise adequate planning and supervision throughout the project; be responsible for timely submittal of shop drawings and timely arrival of manufacturer's service representatives; be responsible for coordination of anchor bolt setting, equipment setting and connections of piping, electrical and controls.
- B. Completeness
 - 1. The following Specifications describe major functions and features, but do not necessarily cover all details entering into the design and operation of the equipment or items that individual manufacturer may consider as an option accessory.

2. Wherever in these Specifications specific equipment, materials, or manufactured products are called for or described, such are specified to establish the basic standard or level of quality materials, and features.
3. The Developer shall be responsible for a complete and workable pump station. He shall coordinate between individual equipment manufacturers and furnish whatever interface connections, controls, interlocks and accessories that are required between all interconnected components, items or systems so that they operate repeatedly and reliably within the specifications and overall design requirement. Individual equipment units that are furnished with inadequate materials, accessories or controls, or are not properly designed by the manufacturer to satisfy the specific application as indicated by the Specifications, shall not be accepted until properly modified or replaced.

C. Equipment Design

1. The design of equipment and components shall be of adequate materials and strength for the specific application and exposures, and their design and installation shall meet all applicable codes and regulations.
2. Developer shall be responsible for all permit applications and all efforts necessary in securing all Agency reviews and approvals.

D. Foundations, Anchors, and Bases

1. Manufactured equipment and assembled systems shall be furnished with foundation layout drawings, bases and anchor bolt recommendations. Unless indicated otherwise, all application and furnished by the manufacturer. Anchor bolt materials shall be as follows:

<i>Exposure Location</i>	<i>Material</i>
Severely corrosive-acid, oxidizing chemicals, sludge, salt, water, chlorides, and sulfur compounds	Type 316 stainless steel
Corrosive-submerged or frequently wetted by raw or treated water or mild chemicals	Type 303 or Type 304 stainless steel
General Use- outdoors or indoors and infrequently wetted by potable or treated water, rainwater or condensation	Hot-dip galvanized steel

2. The Developer shall furnish the necessary materials and construct suitable concrete foundations or concrete pads at least six inches (6") high for all equipment installed by him. The tops of foundations shall be at such elevations as will permit grouting as specified below.
3. All equipment shall be installed by skilled mechanics and in accordance with the instructions of the manufacturer.
4. In setting pumps, motors, and other item of equipment customarily grouted, the Developer shall make an allowance of at least 1 in. for grout under the equipment bases. Shims used to level and adjust the bases shall be steel. Shims may be left embedded in the grout, in which case they shall be installed neatly and so as to be as inconspicuous as possible in the completed work. Unless otherwise permitted, all grout shall be suitable non-shrink grout.

5. Grout shall be mixed and placed in accordance with the recommendations of the manufacturer. Where practicable, the grout shall be placed through the grout holes in the base and worked outward and under the edges of the base and across the rough top of the concrete foundation to a peripheral form so constructed as to provide a suitable chamfer around the top edge of the finished foundation.

E. Equipment Bolts, Studs, and Screws

1. Bolts and accessories for general equipment use shall be carbon steel, without coating. Unless indicated otherwise.
Bolts and accessories for use in corrosive locations shall be stainless steel: Type 316 for severe corrosion, such as exposure to acid waters, and marine salt- water; and Type 303 or 304 for other corrosive exposure, such as treated or untreated water and wastewater or mild chemicals.
2. Stainless steel bolts and accessories shall comply with ASTM F 593, Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
3. Except as specified above, stud, tap, and machine bolts and nuts for general use shall conform to ASTM A 307, Specification for Carbon Steel Externally Threaded Standard Fasteners. Hexagon nuts and accessories of the same metal quality as the bolts shall be used. All threads shall conform to ANSI B1.1, Standard for Unified Inch Screw Threads, Coarse Thread Series and have a Class 2A tolerance. Zinc or cadmium coatings shall be furnished where specified, indicated, or required.
4. Machine and set screws shall conform to Federal Specifications FF-S-91, unless otherwise specified.
5. All machine screws and lag screws shall utilize either cut washers or lock washers. All bolt heads and nuts bearing on plastics shall have cut washers.

F. Nameplates

1. Each piece of equipment shall be provided with a substantial nameplate of non-corrodible metal permanently attached and inscribed with the manufacturer's name, model or type designation, serial number, and principal rated capacities or other characteristics and similar appropriate information.
2. Provide engraved laminated plastic or embossed non-corrodible metal nameplates on all panels for instrumentation of electrical controls of the process and equipment, or for lighting, starters, or motor control centers and each system component, including switches, pushbuttons, indicating lights, instrument, and devices or pieces for which the use or identified may not be readily apparent. Indent marked plastic tape shall be unacceptable. Nameplates shall be permanently attached with stainless steel screws, bolts and nuts, or rivets. Drive pins or contact adhesive attachment shall be unacceptable after completion of the installation of the panel components.

G. Lubricants

1. During assembly and start-up and prior to operation, the Developer shall furnish all lubricants and devices necessary for the proper lubrication of all equipment furnished under this contract.

H. Storage and Protection

1. Protect equipment from damage from weather, dust, moisture or other causes. Protect rubber items from sunlight and petroleum products. Protect painted surfaces from scratches or damage. Protect ferrous surfaces from corrosion. Shield plastics from direct sunlight. Store instruments, controls and electrical components in air-conditioned (low relative humidity) locations. Electric motors or equipment with ferrous bearings which are not installed and operated within 60 days of delivery shall be either stored in an air-conditioned warehouse or lubricated and rotated every 30 days.

I. Manufacturer's Service Representatives

1. For all systems, assemblies, units or items covered hereinafter, furnish manufacturer's service representatives in conformance with the Specification General Requirements as indicated.

J. Acceptance Tests

1. After installation of the equipment and after completion of the services of the manufacturer's representative the Developer shall operate each unit to demonstrate its ability to operate continuously without vibration, jamming, excess leaking, excess noise, and overheating, and to perform its specified functions satisfactorily to the extremes of all operating conditions specified. In addition, the tests shall demonstrate that the unit satisfies any performance guarantee requirements at the specified rated operating condition.
2. All defects and defective equipment shall be corrected promptly or replaced at no expense to the Owner.
3. All adjustments necessary to place the equipment in satisfactory working order shall be made at the time of the above tests.

K. Record Drawings

1. Manufacturers and their service representatives shall furnish written reports of installation and testing and furnish as-built drawings which reflect any field changes or alterations.

L. Operation and Maintenance Data

1. For all systems, assemblies, units or items covered hereinafter, furnish operation and maintenance data.

1.5 DESIGN CAPABILITIES

- A. As a guide to sizing and adjusting the various pumping units at start-up, the design capacities and ranges of operating conditions anticipated and intended are as follows:

Pump Station No.	
Location/Name	
Description of Work	
Design Operating Conditions	
Capacity (gpm)	
Total Dynamic Head (ft.)	
Total Dynamic Suction Lift (ft)	
Maximum Re-priming Lift (ft)	
Maximum Static Suction Lift (ft)	
Total Static Discharge Head (ft)	
Minimum Efficiency @ Design (ft) (%)	
Pump Curve; gpm @ TDH (ft)	
Re-prime Lift Capacity (ft)	
<u>Pump Selection</u>	
Impeller Diameter (in)	
Speed (rpm)	
Motor Horsepower Required	
Motor Horsepower to be Supplied	
Motor Power: Volts	
Phases	
Hz	
Pump Selection	

PART 2 - PRODUCTS

2.1 PUMPS

- A. General

1. This section of the specifications covers the materials, equipment, and construction procedures applicable to the self-priming suction lift wastewater pumps. The sections covering standard items of construction shall be complied with unless

there is a contradiction with the section, in which case, the material and/or procedures specified in this section shall govern.

B. Scope

1. Under this specification, the Developer shall furnish and install complete and ready for operation those self-priming suction lift raw wastewater pump stations of the capacity specified hereinbefore.

C. Pump Types, Sizes, and Operating Conditions

1. The pumps shall be of the horizontal self-priming centrifugal type shall be specifically designed for the handling of raw, unscreened sanitary domestic sewage. Pumps, panels and enclosures shall be manufactured by Gorman-Rupp or preapproved equal.
2. Consideration shall be given to the sanitary sewage service anticipated, in which occasionally debris will lodge between the pump suction check valve and seat, resulting not only in loss of the suction leg, but also in the siphoning of liquid from the pump casing to the approximate center line of the impeller. Such occurrence shall be considered normal with proper installation of air release line to atmosphere.
3. In consideration of such occurrence and of the unattended operation anticipated, each pump shall be so designed as to retain adequate liquid in the pump casing to insure unattended automatic re-priming while operating at its rated speed in a completely open system without suction check valves and with a dry suction leg.

D. Reprime Performance

1. Each pump must be capable of a re-prime lift as specified while operating at the selected speed and impeller diameter. Re-prime lift is defined as the static height of pump suction centerline above liquid that the pump will prime; and delivery within five minutes on liquid remaining in the pump casing after a delivering pump is shut down with the suction check valve removed. Additional standards under which re-prime tests shall be run are:
 - a. Piping shall incorporate a discharge check valve downstream from the pump. Check valve size shall be equal (or greater than) the pump discharge diameter.
 - b. A ten-foot length of one-inch pipe shall be installed between pump and discharge check valve. This line shall be open to atmosphere at all times to duplicate the air displacement rate of a typical pump station fitted with an air release valve.
 - c. No restrictions shall be present in pump or suction piping which could serve to restrict the rate of siphon drop of the suction leg. Suction pipe configuration for re-prime test shall incorporate a minimum horizontal run of 4.5 Feet and 90-degree elbow.
 - d. Impeller shall be set at the clearances recommended by the manufacturer in the pump service manual.
 - e. Re-prime lift repeatability shall be demonstrated by five sequential re-prime cycles.
 - f. Liquid to be used for re-prime test shall be water.

2. Certified re-prime test data, prepared by the pump manufacturer and registered professional engineer, shall be submitted to the Owner for approval.

E. Serviceability

1. The pump manufacturer shall demonstrate to the Owner's satisfaction that due consideration has been given to reducing maintenance costs by incorporating the following features.

- a. Internal Passages

1. All openings, internal passages, and internal recirculation ports shall be large enough to permit the passage of a sphere 3 inches in diameter, and any trash or stringy material which may pass through the average house collection system. Screens or any internal devices that create a maintenance nuisance or interfere with priming and performance of the pump shall not be permitted.
2. Dimensional drawings indicating size and locations of the priming recirculation port or ports shall be submitted to the Owner for approval prior to shipment.

- b. Special Tools

No special tools shall be required for replacement of any components within the pump.

- c. Cover Plate

The pump must be equipped with a removable cover plate, allowing access to pump interior to permit the clearance of stoppages and to provide simple access for service and repairs without removing suction or discharge piping.

- d. Wear Plate and Rotating Assembly

The pump shall be fitted with a replaceable wear plate. Replacement of the wear plate, impeller, seal, and suction check valve shall be accomplished through the removable cover plate. The entire rotating assembly, which includes bearings, shaft, seal, and impeller, shall be removable as a unit without removing the pump volute or piping.

- e. Suction Check Valves

Each pump shall incorporate a suction check valve that can be removed or installed through the removable cover plate opening, without disturbing the suction piping. Sole function of check valve shall be to eliminate re-priming with each cycle. Pumps requiring suction check valves to prime or re-prime will not be acceptable.

- f. Impeller Clearance Adjustment

Means shall be provided for external adjustment of the clearance between the impeller and wear plate. The entire rotating assembly shall move as one unit to enable the clearances to be adjusted. Clearance adjustment by means of moving the shaft, thereby affecting the seal, shall not be acceptable.

F. Materials of Construction

1. Pump Casing

All areas of the pump casing and volute which are exposed to sewage shall be constructed of cast iron of no lesser grade than class 30.

2. Impeller

The impeller shall be two-vanned, semi-open, non-clog, cast or ductile iron with integral pump out vanes on the back shroud. Impeller shall thread onto the pump shaft and be secured with a lock-screw.

3. Seal

a. The pump shaft shall be sealed against leakage by a mechanical seal. Both the stationary sealing member and mated rotating member shall be of tungsten carbide. Each of the mated surfaces shall be lapped to a flatness of one light band, as measured by an optical flat under monochromatic light. The stationary seal seat shall be double floating so that faces will not lose alignment during periods of shock loads that will cause deflection, vibration, and axial movement of the pump shaft.

b. The seal shall be lubricated with oil from a separate, oil-filled reservoir. The same oil shall not be used to lubricate both the shaft seal and the shaft bearings.

c. The seal shall be warranted for a minimum of four years from date of shipment. Should the seal fail within the first year, the manufacturer shall be obligated, upon notification, to furnish a new seal, without charge to Owner, F.O.B. Factory. The cost of replacement seals thereafter will be on a pro-rated basis as follows: failure within two years, 25% of new seal price; failure within three years, 50% of new seal price; failure within four years, 75% of new seal price.

4. Shaft Bearings

The pump shaft bearings shall be anti-friction ball or tapered roller bearings, of ample size and proper design to withstand all radial and thrust loads which can reasonably be expected during normal operation. Bearing shall be lubricated from a separate reservoir. Pump designs in which the same oil lubricates both the shaft bearings and the shaft seal shall not be acceptable.

5. Pump Suction Spool

Each pump shall be equipped with a one-piece, cast iron suction spool, flanged on each end. Each spool shall have one 1-1/4 inch npt and one 1/4 inch npt tapped hole with pipe plugs for mounting of gauges or other instrumentation.

6. Unit Base

The unit base shall comprise a base plate, perimeter flange, and reinforcements. Base plate shall be fabricated of steel not less than 1/4" thick, and shall incorporate openings for access to all internal cavities to permit complete grouting of unit base after installation. Perimeter flange and reinforcements shall be designed to prevent flexing or warping under operating conditions. Base plate and/or flange shall be drilled for hardware used to secure unit base to concrete pad as shown on the contract drawings. Unit base shall contain provisions for lifting the complete pump unit during shipping and installation.

7. High Temperature Sensors

Pump supplier will furnish high temperature sensor on each sewer pump. Electrical contractor will wire.

G. Spare Parts

1. There shall be furnished with the pump station the following minimum spare parts (as applicable):

- a. One spare pump mechanical seal (complete), and with it all gaskets, seals, sleeves, "O"-rings, and packings required for replacement of the seal.
- b. One set of impeller clearance adjustment shims.
- c. One cover plate "O"-ring.
- d. One rotating assembly "O"-ring.
- e. One complete rotating assembly for each of the three pump sizes provided.

H. Required Accessories

1. Pump Drain Kit

The pump drain kit shall consist of a 10' length of plastic hose with a quick connect female kamlock fitting on one end of hose and two sets of fittings for pump drains. Each set of fittings for pump drain includes a pipe nipple, bushing, bronze gate valve and quick connect male kamlock fitting.

2. Pump Air Release Valves

a. Function

Each pump shall be equipped with one automatic air release valve, between the pump and check valve, designed to permit the escape of air to the atmosphere during initial priming or unattended re-priming cycles. Upon completion of the priming or re-priming cycle, the valve shall close to prevent recirculation. Valves shall provide visible indication of valve closure, and shall operate solely on discharge pressure. Valves which require connection to the suction line shall not be acceptable.

b. Construction

All valve parts exposed to sewage shall be constructed of cast iron, ductile iron, stainless steel, or similar corrosion resistant materials. Diaphragms, if used, shall be fabric-reinforced neoprene or similar inert material.

c. Serviceability

1. A cleanout port, 3 inches or larger in diameter, shall be provided for ease of inspection, cleanout, and service.
2. Valves shall be field adjustable for varying discharge heads.
- 3.

PART 3 – EXECUTION

3.1 DRIVE UNIT

- A. Motors
 - 1. The pump motors shall be horizontal, TEFC, induction type, with normal starting torque and low starting current characteristics, suitable for 3 phase, 60 hertz, 480 volts, ac electrical current. Motors supplied shall be one (1) nominal size larger than required to be non-overloading over the entire operating range. The motors shall be furnished with space heaters. Where 3 phase power at the site is not feasible, the Developer/Contractor can submit an alternate plan for electric motors/drive configurations/voltages for review and approval. Approval will be by the Parish Engineer on a case by case basis.
 - 2. Each motor shall be in current NEMA design cast iron frame with copper windings.
- B. Drive Transmission
 - 1. Power shall be transmitted from motors to pumps by means of v-belt drive assemblies. The drive assemblies must be selected to establish proper pump speed to meet the specified operating conditions.
 - 2. Each drive assembly shall have a minimum of two v-belts. In no case will a single belt drive be acceptable. Each v-belt drive assembly shall be selected on the basis that adequate power will be transmitted from driver to pump.
 - 3. Drive systems with a safety factor of less than 1.5 to 1.0 shall not be considered sufficient for the service intended.
 - 4. Computation of safety factors shall be based on performance data published by the drive manufacturer.
- C. Belt Guards
 - 1. Pump drive transmissions shall be enclosed on all sides in a guard constructed of any one or combination of materials consisting of expanded, perforated, or solid sheet metal, except that maximum perforated or expanded openings shall not exceed ½ inch.
 - 2. Guards shall be manufactured to permit complete removal from the pump unit without interference with any unit component, and shall be securely fastened to the unit base.
 - 3. All metal shall be free of burrs and sharp edges. Structural joints shall be continuously welded. Panels may be riveted to frames with not more than five-inch spacing. Tack welds shall not exceed four-inch spacing.
 - 4. The guard shall be primed with a minimum of 1.5 Mils of zinc-based synthetic primer. A finish acrylic enamel coating (minimum 1.5 Mils) shall be applied in accordance with section 3, color definitions of ANSI 253.1; 1967, Safety color code for marking physical hazards.

3.2 GAUGE ASSEMBLIES

- A. Gauge assemblies shall be installed on the suction and discharge side of each pump. Gauge assemblies shall consist of threaded brass, pipe taps, fittings, isolation valve gauge cock, pressure gauge, and a gauge diaphragm.
- B. Pressure gauges shall be bronze or stainless steel bourdon tube, stainless steel rack and pinion movement, mounted on socket independent of case, steel or aluminum alloy or phenol cased, black numerals on white background and long life plastic dial face, heavy

glass or unbreakable plastic window, 4-1/2" dial size, accuracy +/- 1/2%, 1/4" NPT connection. Gauges shall be equal to Hellicoid by American Chain and Cable Co., Bridgeport, CT; Ashcroft by Dresser Industries, Stratford, CT; or U.S. Gauge by Ametek, Sellersville, PA.

- C. Discharge gauges shall be combination dials with a range of 0 to 50 psig and 115 feet of water. Suction gauges shall have compound dials with range from 34 ft. water vacuum to 115 ft. head, unless designated otherwise. Sewage gauges shall employ a Teflon or other appropriate diaphragm seal coating and housing lining. The bottom housing shall be removable for cleaning without removing the diaphragm, and shall be tapped for 1" HPT and valved. In lieu of the gauge diaphragm with 1" tap, it will be acceptable for appropriate service to furnish a flanged isolating pressure sensor with 1/4" tap and full pipe diameter elastomer sensing element as manufactured by Red Valve Co., Inc. Carnegie, PA; Robbins Myers (Moyno RKL), Lumberton, NJ; or acceptable equivalent. The pressure gauge and diaphragm portion shall be prefilled with ethylene glycol or silicone oil.

3.3 SEWAGE PUMP STATION PUMP CONTROL PANELS - PANEL CP

- A. Furnish and install one control panel at each sewage pump station for control of pumps including a 2-pump relay type alternator wired as shown on the plans. The panel will be a NEMA 12 SS 316 or fiberglass enclosure with back mounting panel, piano type hinge, and latch. The panel will have an inner swing door for installation for control and indicating device such as control stations, pilot lights, elapse time meters, and operating handle for main circuit breaker.
- B. All motor starters shall be 3-Phase NEMA Rated Full Voltage Non-Reversing sized for the appropriate 3-Phase motors per NEC. Furnish thermal magnetic trip circuit breakers sized as shown on the plans. Main and motor circuit breakers will have 25,000 AMP RMS minimum interrupting capacity. Single pole will be rated at 10,000 AMP RMS interrupting capacity.
- C. Furnish 3-Phase Voltage monitors as shown on the plans. Three-Phase monitors should shut down the pumps in case of phase loss, phase unbalance, phase reversal, or under-over voltage.
- D. Furnish 11-pin octal base plug-in relays for 120V AC Controls. Use 8-pin, octal base plug-in on-relay timer delay relays for all timer relays. Furnish time range shown on the plans.
- E. Furnish non-resettable elapse time meters (ET) rated at 120V AC with a range to 99,999.9 hours.
- F. Furnish transformer type (240V) pilot lights at panel (PL). This will permit the lamps the lamps to operate at half voltage prolonging lamp life considerably.
- G. Use industrial grade selector switches, such as Allen & Bradley 800T Series for all controls switches. S1 will be two position, S2, S4 and S5 will be 3-position. S3 will be normally close pushbutton, momentary contact.
- H. Use 300V, box type terminal blocks. Use 15 AMP terminal blocks. Other terminal blocks will be appropriate for the motors being utilized.
- I. Minimum size wiring for control will be No. 14 AWG Copper. Size incoming leads and Motor T-Leads as appropriate for the motor size.
- J. Furnish proper laminated plastic nameplates for all devices (including relays) with minimum size letters 3/16" high. Use nameplate schedule for panel door in these specifications.

- K. Tag all wires at both ends. Number the terminal blocks as shown on the plans.
- L. Furnish one 100W outdoor cast aluminum incandescent light with red globe and cast aluminum guard for indication of high water level in station wet well. Install on meter pole.
- M. Furnish in-line flasher in panel for the high water level lights. Wire as shown on the plans.
- N. Install lightning arresters for 120/240V Systems.
- O. Furnish four normally open float switches for one-off operation of pumps and for high water level alarm. Switches will have a SS316 float with Nitrile PVC Jacket. The switches will be equipped with a 30' 3/C-14 type SO Cord. Mount the switches with the proper clamps on a 1" schedule 40 SS316 pipe mounted in each wet well.
- P. Furnish the following spare parts:
1. Six (6) of each size and type of fuse;
 2. Twenty-four (24) pilot light lamps for control panel;
 3. Two (2) of each type of plug-in relay;
 4. Two (2) of each type of plug-in time delay relays;
 5. One (1) of each type of phase sequence-under/over voltage protector relay;
 6. Three (3) float switches.
- Q. Provide nameplate schedule for panel doors as follows:

MARK	ENGRAVING
CB1	Main Panel Pole
PL1	Control Power On
PL2	Call Pump No. 1
PL3	Call Pump No. 2
PL4	Call Lag Pump
PL5	High Wet Well Water Level
PL6	High Temp. - Pump No. 1
PL7	High Temp. - Pump No. 2
PL8	Pump No. 1 Running
PL9	Pump No. 1 Ready
PL10	Pump No. 2 Running
PL11	Pump No. 2 Ready
MARK	ENGRAVING
S1	Control Power
S2	Pump Alternator Alt Pump 1 Pump 2 Lead Lead
S3	High Temp Reset

S4	Pump No. 1 Control - Hand-Off-Auto
S5	Pump No. 2 Control - Hand-Off-Auto
S6	Outside Floodlight

3.4 DRAWINGS AND OTHER DATA

- A. The Developer shall furnish three (3) complete sets of the following drawings and other data for approval before construction is begun:
1. Pumps
 - a. Certified dimensional outline drawings of the pumping unit.
 - b. Recommended spare parts.
 - c. Sectional Drawings and parts list.
 - d. Operating and Maintenance instructions.
 - e. Pump performance curve.
 2. Motors
 - a. Horsepower, speed, temperature rise, NEMA design letter, enclosure, frame number.

3.5 STATION ENCLOSURE

- A. Description
1. The station enclosure shall contain and enclose all pumps and equipment, and shall be constructed to enhance serviceability by incorporating the following design characteristics:
 - a. Access panels shall be provided. Panels shall be sized and placed to permit routine maintenance operations through the panel openings of the enclosure. For these purposes, routine maintenance shall include pump and motor inspection, drive belt adjustment, and pump cleanout. Panels shall be secured with tamper-proof hardware.
 - b. Not less than four access panels shall be provided with a hinge and latch. Such panels shall provide access to frequently performed adjustments and inspections of the electrical controls. Hinge shall be the continuous type. Latch shall engage the enclosure at not less than two places, and shall be protected by a keyed lock.
 - c. One access panel shall contain a screened vent to maximize air flow for enclosure ventilation.
 - d. Station enclosure, less base, must be completely removable or able to be disassembled following the removal of reusable hardware. After removal or disassembly, no portion of the enclosure shall project above the surface of the base to interfere with maintenance operations or endanger personnel.
 - e. Removal or disassembly of the enclosure shall be accomplished by not more than two maintenance personnel without the use of lifting equipment.
- B. Materials

1. The station enclosure shall be manufactured of molded reinforced orthophthalic polyester resins with a minimum of 30% fiberglass, and a maximum of 70% resin. Resin fillers or extenders shall not be used. Glass fibers shall have a minimum average length of 1 1/4 inches. Major design considerations shall be given to structural stability, corrosion resistance, and water tight properties. The polyester laminates shall provide a balance of mechanical, chemical, and electrical properties to insure long life. They must be impervious to micro-organisms, mildew, mold, fungus, corrosive liquids, and gases which can reasonably be expected to be present in the environment surrounding the wet well.
2. All interior surfaces of the housing shall be coated with a polyester resin-rich finish. It shall provide: maintenance free service, abrasion resistance; and protection from sewage, greases, oils, gasoline, and other common chemicals.
3. The outside of the enclosure shall be coated with a suitable pigmented resin compounded to insure long, maintenance-free life.

C. Enclosure Base

1. Station base shall be constructed of pre-cast, reinforced concrete, bonded inside a fiberglass form covering top and sides, and shall be designed to insure adequate strength to resist deformation of structure during shipping, lifting, or handling. Base shall incorporate drainage provisions, and shall be provided with an opening of sufficient size to permit piping and service connections to the wet well.
2. Station base shall incorporate anchor recesses for securing the pump station to the concrete pad supplied by the developer in accordance with the station plans. Color used shall de-emphasize the presence of dirt, grease, etc.

D. Ventilating Blower

1. An exhaust blower shall be mounted in the roof of the enclosure. Blower capacity shall be sufficient to change station air once every two minutes. Blower motor shall be operated automatically and shall be turned on at approximately 70°F and shall be turned off at 55°F. Blower motor and control circulate shall be protected by a thermal-magnetic air circuit breaker to provide overcurrent and overload protection. Blower exhaust outlet shall be protected by a screen, and shall be designed to prevent the entrance of rain, snow, rocks, and foreign material.

3.6 TESTING

- A. Developer shall be responsible for conducting a performance test for each pump individually and in combined operation in the installed pump station. The performance test shall include the following items:
 1. Pumping Rate (gpm)
 2. Discharge Head (feet)
 3. Motor voltage and current draw (each leg for 3 phase motors)
- B. Submit a written report of the performance test.

END OF SECTION

SECTION 15
SUBMERSIBLE WASTEWATER PUMPING STATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Ascension Parish Subdivision Construction Specifications.

1.2 GENERAL

- A. Construction, start-up, and testing of a duplex submersible pump station and its appurtenances as indicated on the Drawings and as herein specified. These specifications direct attention to certain features of the pumping station, but do not purport to cover all the details of their design. The equipment furnished shall be designed, constructed, and erected in conformance with accepted high quality standards.
- B. Submersible pump units shall be equipped with the necessary accessories, including break-away fitting, guide rail system, lifting chain and piping connections.
- C. Control cabinet, interconnecting wiring and electrical appurtenances are specified under the appropriate electrical sections.

1.3 DEFINITIONS

- A. For the purposes of these specifications, the Parish Engineer shall be defined as: the office of the Parish Engineer, the Department of Public Works, or the Engineering Review Agency.
- B. For the purposes of these specifications, the following describe the limits of work:
 - 1. Roadbed: width of roadway, either edge of pavement of edge of pavement; or, back of curb to back of curb, plus five (5) feet on both sides.
 - 2. ROW Transition Area: area between edge of Roadbed and established ROW.
 - 3. Lots: all work outside of the ROW as indicated on the construction plans.

1.4 GENERAL REQUIREMENTS

- A. Coordination
 - 1. Exercise adequate planning and supervision throughout the project; be responsible for timely submittal of shop drawings and timely arrival of manufacturer's service representatives; be responsible for coordination of wet well installation, equipment setting and connections of piping, electrical and controls.
- B. Completeness
 - 1. The following Specifications describe major functions and features, but do not necessarily cover all details entering into the design and operation of the equipment or items that individual manufacturer may consider as an option

accessory.

2. Wherever in these Specifications specific equipment, materials, or manufactured products are called for or described, such are specified to establish the basic standard or level of quality materials, and features.
3. The Developer shall be responsible for a complete and workable pump station. He shall coordinate between individual equipment manufacturers and furnish whatever interface connections, controls, interlocks and accessories that are required between all interconnected components, items or systems so that they operate repeatedly and reliably within the specifications and overall design requirement. Individual equipment units that are furnished with inadequate materials, accessories or controls, or are not properly designed by the manufacturer to satisfy the specific application as indicated by the Specifications, shall not be accepted until properly modified or replaced.

C. Equipment Design

1. The design of equipment and components shall be of adequate materials and strength for the specific application and exposures, and their design and installation shall meet all applicable codes and regulations.
2. Developer shall be responsible for all permit applications and all efforts necessary in securing all Agency reviews and approvals.

D. Foundations, Anchors, and Bases

1. Manufactured equipment and assembled systems shall be furnished with foundation layout drawings, bases and anchor bolt recommendations. Unless indicated otherwise, all application and furnished by the manufacturer. Anchor bolt materials shall be as follows:

<i>Exposure Location</i>	<i>Material</i>
Severely corrosive-acid, oxidizing chemicals, sludge, salt, water, chlorides, and sulfur compounds	Type 316 stainless steel
Corrosive-submerged or frequently wetted by raw or treated water or mild chemicals	Type 303 or Type 304 stainless steel
General Use- outdoors or indoors and infrequently wetted by potable or treated water, rainwater or condensation	Hot-dip galvanized steel

2. The Developer shall furnish the necessary materials and construct suitable concrete foundations or concrete pads at least six inches (6") high for all equipment installed by him. The tops of foundations shall be at such elevations as will permit grouting as specified below.
3. All equipment shall be installed by skilled mechanics and in accordance with the instructions of the manufacturer.
4. In setting pumps, motors, and other item of equipment customarily grouted, the Developer shall make an allowance of at least 1 in. for grout under the equipment bases. Shims used to level and adjust the bases shall be steel. Shims may be left embedded in the grout, in which case they shall be installed neatly and so as to be as inconspicuous as possible in the completed work. Unless otherwise permitted, all grout shall be suitable non-shrink grout.

5. Grout shall be mixed and placed in accordance with the recommendations of the manufacturer. Where practicable, the grout shall be placed through the grout holes in the base and worked outward and under the edges of the base and across the rough top of the concrete foundation to a peripheral form so constructed as to provide a suitable chamfer around the top edge of the finished foundation.

E. Equipment Bolts, Studs, and Screws

1. Bolts and accessories for general equipment use shall be carbon steel, without coating. Unless indicated otherwise.
Bolts and accessories for use in corrosive locations shall be stainless steel: Type 316 for severe corrosion, such as exposure to acid waters, and marine salt- water; and Type 303 or 304 for other corrosive exposure, such as treated or untreated water and wastewater or mild chemicals.
2. Stainless steel bolts and accessories shall comply with ASTM F 593, Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
3. Except as specified above, stud, tap, and machine bolts and nuts for general use shall conform to ASTM A 307, Specification for Carbon Steel Externally Threaded Standard Fasteners. Hexagon nuts and accessories of the same metal quality as the bolts shall be used. All threads shall conform to ANSI B1.1, Standard for Unified Inch Screw Threads, Coarse Thread Series and have a Class 2A tolerance. Zinc or cadmium coatings shall be furnished where specified, indicated, or required.
4. Machine and set screws shall conform to Federal Specifications FF-S-91, unless otherwise specified.
5. All machine screws and lag screws shall utilize either cut washers or lock washers. All bolt heads and nuts bearing on plastics shall have cut washers.

F. Nameplates

1. Each piece of equipment shall be provided with a substantial nameplate of non-corrodible metal permanently attached and inscribed with the manufacturer's name, model or type designation, serial number, and principal rated capacities or other characteristics and similar appropriate information.
2. Provide engraved laminated plastic or embossed non-corrodible metal nameplates on all panels for instrumentation of electrical controls of the process and equipment, or for lighting, starters, or motor control centers and each system component, including switches, pushbuttons, indicating lights, instrument, and devices or pieces for which the use or identified may not be readily apparent. Indent marked plastic tape shall be unacceptable. Nameplates shall be permanently attached with stainless steel screws, bolts and nuts, or rivets. Drive pins or contact adhesive attachment shall be unacceptable after completion of the installation of the panel components.

G. Lubricants

1. During assembly and start-up and prior to operation, the Developer shall furnish all lubricants and devices necessary for the proper lubrication of all equipment furnished under this contract.

H. Storage and Protection

1. Protect equipment from damage from weather, dust, moisture or other causes. Protect rubber items from sunlight and petroleum products. Protect painted surfaces from scratches or damage. Protect ferrous surfaces from corrosion. Shield plastics from direct sunlight. Store instruments, controls and electrical components in air-conditioned (low relative humidity) locations. Electric motors or equipment with ferrous bearings which are not installed and operated within 60 days of delivery shall be either stored in an air-conditioned warehouse or lubricated and rotated every 30 days.

I. Manufacturer's Service Representatives

1. For all systems, assemblies, units or items covered hereinafter, furnish manufacturer's service representatives in conformance with the Specification General Requirements as indicated.

J. Acceptance Tests

1. After installation of the equipment and after completion of the services of the manufacturer's representative, the Developer shall operate each unit to demonstrate its ability to operate continuously without vibration, jamming, excess leaking, excess noise, and overheating, and to perform its specified functions satisfactorily to the extremes of all operating conditions specified. In addition, the tests shall demonstrate that the unit satisfies any performance guarantee requirements at the specified rated operating condition.
2. All defects and defective equipment shall be corrected promptly or replaced at no expense to the Owner.
3. All adjustments necessary to place the equipment in satisfactory working order shall be made at the time of the above tests.

K. Record Drawings

1. Manufacturers and their service representatives shall furnish written reports of installation and testing and furnish as-built drawings which reflect any field changes or alterations.

L. Operation and Maintenance Data

1. For all systems, assemblies, units or items covered hereinafter, furnish operation and maintenance data.

1.5 DESIGN CAPABILITIES

- A. As a guide to sizing and adjusting the various pumping units at start-up, the design capacities and ranges of operating conditions anticipated and intended are as follows:

Pump Station No.	
Location/Name	
Description of Work	
Design Operating Conditions	

Capacity (gpm)	
Total Dynamic Head (ft.)	
Total Static Discharge Head (ft)	
Minimum Efficiency @ Design (ft) (%)	
Pump Curve; gpm @ TDH (ft)	
Pump Station No.	
<u>Pump Selection</u>	
Impeller Diameter (in)	
Speed (rpm)	
Motor Horsepower Required	
Motor Horsepower to be Supplied	
Motor Power: Volts	
Phases	
Hz	
Pump Selection	

PART 2 - PRODUCTS

2.1 CONCRETE WET WELL

A. General

1. This section of the specifications covers the materials, equipment, and construction procedures applicable to the concrete wet well. The sections covering standard items of construction shall be complied with unless there is a contradiction with the section, in which case, the material and/or procedures specified in this section shall govern.

B. Concrete Wet Well

1. Precast concrete construction shall be designed per ASTM standard C-478. Concrete shall achieve a minimum 28-day compression strength of 4,500 psi. Joints between precast sections shall be sealed with ConSeal CS-102 or approved equal.
2. Aluminum access hatch with stainless steel hardware shall be provided. Dimensions of opening to be coordinated with pump manufacturer and shown on the approved shop drawings.
3. Developer shall provide a geotechnical investigation of the existing soils at the proposed wet well location by a Geotechnical Engineer licensed in the state of

Louisiana. If this pump station is being installed in conjunction with a new wastewater treatment plant and is within fifty (50) feet of the treatment plant, a soil boring at this location is not required. The Geotechnical Engineer shall provide a foundation design for the wet well, installation requirements, and anti-flotation calculations. Wetwell installation shall not begin until the Review Agency has approved the installation requirements specific to this site.

2.2 PUMPS

A. General

1. This section of the specifications covers the materials, equipment, and construction procedures applicable to the submersible wastewater pumps. The sections covering standard items of construction shall be complied with unless there is a contradiction with the section, in which case, the material and/or procedures specified in this section shall govern.

B. Pumps

1. Pumps shall be Hydromatic submersible Vortex or approved equal. Pumps should be capable of pumping the design peak flow at the design head pressure.

C. Slide Rail System

1. Stainless Steel guide rails with 4" breakaway fitting including upper guide bracket and lifting chain shall be provided with each pump.

D. Piping

1. Connecting pipe from pump risers to site piping shall be Schedule 80 PVC with threaded brass fittings

E. Spare Parts

1. There shall be furnished with the pump station the following minimum spare parts (as applicable):
 - a. One spare pump mechanical seal (complete), and with it all gaskets, seals, sleeves, "O"-rings, and packings required for replacement of the seal.
 - b. One set of impeller clearance adjustment shims.
 - c. Required Accessories.

2.3 SEWAGE PUMP STATION PUMP CONTROL PANEL

- A. Furnish and install one control panel with four float control at each pump station for control of pumps including a 2-pump relay type alternator wired as shown on the plans. The panel will be a NEMA 12 SS 316 enclosure with back mounting panel, piano type hinge, and latch. The panel will have an inner swing door for installation for control and indicating device such as control stations, pilot lights, elapse time meters, and operating handle for main circuit breaker.

- B. All motor starters shall be 3-Phase NEMA Rated Full Voltage Non-Reversing sized for the appropriate 3-Phase motors per NEC. Furnish thermal magnetic trip circuit breakers sized as shown on the plans. Main and motor circuit breakers will have 25,000 AMP RMS minimum interrupting capacity. Single pole will be rated at 10,000 AMP RMS interrupting capacity. Where 3 phase power at the site is not feasible, the Developer/Contractor can submit an alternate plan for electric motors/drive configurations/voltages for review and approval. Approval will be by the Parish Engineer on a case by case basis. Furnish 3-Phase Voltage monitors as shown on the plans. Three-Phase monitors should shut down the pumps in case of phase loss, phase unbalance, phase reversal, or under- over voltage.
- C. Furnish 11-pin octal base plug-in relays for 120V AC Controls. Use 8-pin, octal base plug-in on-relay timer delay relays for all timer relays. Furnish time range shown on the plans.
- D. Furnish non-resettable elapse time meters (ET) rated at 120V AC with a range to 99,999.9 hours.
- E. Furnish transformer type (240V) pilot lights at panel (PL). This will permit the lamps the lamps to operate at half voltage prolonging lamp life considerably.
- F. Use industrial grade selector switches, such as Allen & Bradley 800T Series for all controls switches. S1 will be two position, S2, S4 and S5 will be 3-position. S3 will be normally close pushbutton, momentary contact.
- G. Use 300V, box type terminal blocks. Use 15 AMP terminal blocks. Other terminal blocks will be appropriate for the motors being utilized.
- H. Minimum size wiring for control will be No. 14 AWG Copper. Size incoming leads and Motor T-Leads as appropriate for the motor size.
- I. Furnish proper laminated plastic nameplates for all devices (including relays) with minimum size letters 3/16" high. Use nameplate schedule for panel door in these specifications.
- J. Tag all wires at both ends. Number the terminal blocks as shown on the plans.
- K. Furnish one 100W outdoor cast aluminum incandescent light with red globe and cast aluminum guard for indication of high water level in station wet well. Install on meter pole.
- L. Furnish in-line flasher in panel for the high water level lights. Wire as shown on the plans.
- M. Install lightning arresters for 120/240V Systems.
- N. Furnish four normally open float switches for one-off operation of pumps and for high water level alarm. Switches will have a SS316 float with Nitrile PVC Jacket. The switches will be equipped with a 30' 3/C-14 type SO Cord. Mount the switches with the proper clamps on a 1" schedule 40 SS316 pipe mounted in each wet well.
- O. Furnish the following spare parts:
 - 1. Six (6) of each size and type of fuse;
 - 2. Twenty-four (24) pilot light lamps for control panel;
 - 3. Two (2) of each type of plug-in relay;
 - 4. Two (2) of each type of plug-in time delay relays;
 - 5. One (1) of each type of phase sequence-under/over voltage protector relay;

6. Three (3) float switches.

P. Provide nameplate schedule for panel doors as follows:

MARK	ENGRAVING									
CB1	Main Panel Pole									
PL1	Control Power On									
PL2	Call Pump No. 1									
PL3	Call Pump No. 2									
PL4	Call Lag Pump									
PL5	High Wet Well Water Level									
PL6	High Temp. - Pump No. 1									
PL7	High Temp. - Pump No. 2									
PL8	Pump No. 1 Running									
PL9	Pump No. 1 Ready									
PL10	Pump No. 2 Running									
PL11	Pump No. 2 Ready									
S1	Control Power									
S2	<table style="margin-left: 40px; border: none;"> <tr> <td></td> <td colspan="2" style="text-align: center;">Pump Alternator</td> </tr> <tr> <td style="text-align: center;">Alt</td> <td style="text-align: center;">Pump 1</td> <td style="text-align: center;">Pump 2</td> </tr> <tr> <td></td> <td style="text-align: center;">Lead</td> <td style="text-align: center;">Lead</td> </tr> </table>		Pump Alternator		Alt	Pump 1	Pump 2		Lead	Lead
	Pump Alternator									
Alt	Pump 1	Pump 2								
	Lead	Lead								
S3	High Temp Reset									
S4	Pump No. 1 Control - Hand-Off-Auto									
S5	Pump No. 2 Control - Hand-Off-Auto									
S6	Outside Floodlight									

PART 3 – EXECUTION

3.1 DRAWINGS AND OTHER DATA

A. The Developer shall furnish three (3) complete sets of the following drawings and other data for approval before construction is begun:

1. Pumps

- a. Certified dimensional outline drawings of the pumping unit.
- b. Recommended spare parts.
- c. Sectional Drawings and parts list.
- d. Operating and Maintenance instructions.
- e. Pump performance curve.

2. Control Panel
 - a. Certified dimensional drawing of cabinet.
 - b. One-line diagram of wiring and interconnection.

END OF SECTION

SECTION 16
WASTEWATER TREATMENT PLANT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Ascension Parish Subdivision Construction Specifications.

1.2 GENERAL

- A. Construction, start-up, and testing of a residential subdivision wastewater treatment plant and its appurtenances as indicated on the Drawings and as herein specified. These specifications direct attention to certain features of the treatment plant, but do not purport to cover all the details of their design. The equipment furnished shall be designed, constructed, and erected in conformance with accepted high quality standards.
- B. The plant shall be modular in design divided into two major sections; the aeration compartment and the clarifier (settling). The treatment plant structure shall be designed to withstand normal pressures from the soil and from the interior hydrostatic load
- C. The principal items of equipment in each unit include: Air diffusers, effluent trough, return sludge air lift and skimmers, rotary blower(s) complete with necessary motors and controls, blower and motor housing, all necessary internal piping and accessory equipment as herein specified.
- D. Control cabinet, interconnecting wiring and electrical appurtenances are specified under the appropriate electrical sections

1.3 DEFINITIONS

- A. For the purposes of these specifications, the Parish Engineer shall be defined as: the office of the Parish Engineer, the Department of Public Works, or the Engineering Review Agency.
- B. For the purposes of these specifications, the following describe the limits of work:
 - 1. Roadbed: width of roadway, either edge of pavement or edge of pavement; or, back of curb to back of curb, plus five (5) feet on both sides.
 - 2. ROW Transition Area: area between edge of Roadbed and established ROW.
 - 3. Lots: all work outside of the ROW as indicated on the construction plans

1.4 GENERAL REQUIREMENTS

- A. Coordination

1. Exercise adequate planning and supervision throughout the project; be responsible for timely submittal of shop drawings and timely arrival of manufacturer's service representatives; be responsible for coordination of basin installation, equipment setting and connections of piping, electrical and controls.

B. Completeness

1. The following Specifications describe major functions and features, but do not necessarily cover all details entering into the design and operation of the equipment or items that individual manufacturer may consider as an option accessory.
2. Wherever in these Specifications specific equipment, materials, or manufactured products are called for or described, such are specified to establish the basic standard or level of quality materials, and features.
3. The Developer shall be responsible for a complete and workable treatment plant. He shall coordinate between individual equipment manufacturers and furnish whatever interface connections, controls, interlocks and accessories that are required between all interconnected components, items or systems so that they operate repeatedly and reliably within the specifications and overall design requirement. Individual equipment units that are furnished with inadequate materials, accessories or controls, or are not properly designed by the manufacturer to satisfy the specific application as indicated by the Specifications, shall not be accepted until properly modified or replaced.

C. Equipment Design

1. The design of equipment and components shall be of adequate materials and strength for the specific application and exposures, and their design and installation shall meet all applicable codes and regulations.
2. Developer shall design the wastewater treatment plant to meet effluent requirements for the following receiving watersheds. DEQ discharge limits at the time of permit approval will govern the design.

Bayou Manchac watershed.

All other Ascension Parish watersheds

3. Developer shall be responsible for all permit applications and all efforts necessary in securing all Agency reviews and approvals.

D. Foundations, Anchors, and Bases

1. Manufactured equipment and assembled systems shall be furnished with foundation layout drawings, bases and anchor bolt recommendations. Unless indicated otherwise, all application and furnished by the manufacturer. Anchor bolt materials shall be as follows:

<i>Exposure Location</i>	<i>Material</i>
Severely corrosive-acid, oxidizing chemicals, sludge, salt, water, chlorides, and sulfur compounds	Type 316 stainless steel
Corrosive-submerged or frequently wetted by raw or treated water or mild chemicals	Type 303 or Type 304 stainless steel

General Use- outdoors or indoors and infrequently wetted by potable or treated water, rainwater or condensation	Hot-dip galvanized steel
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2. The Developer shall furnish the necessary materials and construct suitable concrete foundations or concrete pads at least six inches (6") high for all equipment installed by him. The tops of foundations shall be at such elevations as will permit grouting as specified below.
3. All equipment shall be installed by skilled mechanics and in accordance with the instructions of the manufacturer.
4. In setting blowers, motors, and other item of equipment customarily grouted, the Developer shall make an allowance of at least 1 in. for grout under the equipment bases. Shims used to level and adjust the bases shall be steel. Shims may be left embedded in the grout, in which case they shall be installed neatly and so as to be as inconspicuous as possible in the completed work. Unless otherwise permitted, all grout shall be suitable non-shrinkgrout.
5. Grout shall be mixed and placed in accordance with the recommendations of the manufacturer. Where practicable, the grout shall be placed through the grout holes in the base and worked outward and under the edges of the base and across the rough top of the concrete foundation to a peripheral form so constructed as to provide a suitable chamfer around the top edge of the finished foundation.

E. Equipment Bolts, Studs, and Screws

1. Bolts and accessories for general equipment use shall be carbon steel, without coating. Unless indicated otherwise. Bolts and accessories for use in corrosive locations shall be stainless steel: Type 316 for severe corrosion, such as exposure to acid waters, and marine salt-water; and Type 303 or 304 for other corrosive exposure, such as treated or untreated water and wastewater or mild chemicals.
2. Stainless steel bolts and accessories shall comply with ASTM F 593, Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
3. Except as specified above, stud, tap, and machine bolts and nuts for general use shall conform to ASTM A 307, Specification for Carbon Steel Externally Threaded Standard Fasteners. Hexagon nuts and accessories of the same metal quality as the bolts shall be used. All threads shall conform to ANSI B1.1, Standard for Unified Inch Screw Threads, Coarse Thread Series and have a Class 2A tolerance. Zinc or cadmium coatings shall be furnished where specified, indicated, or required.
4. Machine and set screws shall conform to Federal Specifications FF-S-91, unless otherwise specified.
5. All machine screws and lag screws shall utilize either cut washers or lock washers. All bolt heads and nuts bearing on plastics shall have cut washers.

F. Nameplates

1. Each piece of equipment shall be provided with a substantial nameplate of non-corrodible metal permanently attached and inscribed with the manufacturer's name, model or type designation, serial number, and principal rated capacities or other characteristics and similar appropriate information.
2. Provide engraved laminated plastic or embossed non-corrodible metal nameplates on all panels for instrumentation of electrical controls of the process and

equipment, or for lighting, starters, or motor control centers and each system component, including switches, pushbuttons, indicating lights, instrument, and devices or pieces for which the use or identified may not be readily apparent. Indent marked plastic tape shall be unacceptable. Nameplates shall be permanently attached with stainless steel screws, bolts and nuts, or rivets. Drive pins or contact adhesive attachment shall be unacceptable after completion of the installation of the panel components.

G. Lubricants

1. During assembly and start-up and prior to operation, the Developer shall furnish all lubricants and devices necessary for the proper lubrication of all equipment furnished under this contract.

H. Storage and Protection

1. Protect equipment from damage from weather, dust, moisture or other causes. Protect rubber items from sunlight and petroleum products. Protect painted surfaces from scratches or damage. Protect ferrous surfaces from corrosion. Shield plastics from direct sunlight. Store instruments, controls and electrical components in air-conditioned (low relative humidity) locations. Electric motors or equipment with ferrous bearings which are not installed and operated within 60 days of delivery shall be either stored in an air-conditioned warehouse or lubricated and rotated every 30 days.

I. Manufacturer's Service Representatives

1. For all systems, assemblies, units or items covered hereinafter, furnish manufacturer's service representatives in conformance with the Specification General Requirements as indicated.

J. Acceptance Tests

1. After installation of the equipment and after completion of the services of the manufacturer's representative the Developer shall operate each unit to demonstrate its ability to operate continuously without vibration, jamming, excess leaking, excess noise, and overheating, and to perform its specified functions satisfactorily at the extremes of all operating conditions specified. In addition, the tests shall demonstrate that the unit satisfies any performance guarantee requirements at the specified rated operating condition.
2. All defects and defective equipment shall be corrected promptly or replaced at no expense to the Owner.
3. All adjustments necessary to place the equipment in satisfactory working order shall be made at the time of the above tests.

K. Record Drawings

1. Manufacturers and their service representatives shall furnish written reports of installation and testing and furnish as-built drawings which reflect any field changes or alterations.

L. Operation and Maintenance Data

1. For all systems, assemblies, units or items covered hereinafter, furnish operation and maintenance data.

PART 2 - PRODUCTS

2.1 CONCRETE BASIN AND CHAMBERS

A. General

1. This section of the specifications covers the materials, equipment, and construction procedures applicable to the concrete basins and chambers. The sections covering standard items of construction shall be complied with unless there is a contradiction with the section, in which case, the material and/or procedures specified in this section shall govern.
2. Developer shall provide a geotechnical investigation of the existing soils at the proposed wet well location by a Geotechnical Engineer licensed in the state of Louisiana. The Geotechnical Engineer shall provide a foundation design for the concrete basins, installation requirements, and anti-flotation calculations. Basin installation shall not begin until the Parish Engineer has approved the installation requirements specific to this site.

B. Concrete Aeration Basins (Primary Treatment)

1. Precast concrete construction shall be designed per ASTM standard C-478. Concrete shall achieve a minimum 28-day compression strength of 5,000 psi. Joints between precast sections shall be sealed with ConSeal CS-102 or approved equal.
2. The aeration compartment has sufficient capacity to provide at least 24 hours detention of the full design flow and has a minimum of 80 cubic feet of volume per pound of BOD applied. Air is introduced along one wall near the bottom, baffles are provided where necessary to insure rapid circular flow without dead spots where sewage solids can accumulate and become septic.

C. Concrete Settling Tank (Secondary Treatment)

1. The final settling basin has sufficient volume to provide a retention time of four hours at average daily flow. A baffle zone is provided at the inlet of the clarifier. The baffles performance is adequate to eliminate all turbulence downstream from the baffle. The baffle extends above the surface to entrap all floating material. Settling tank is formed by sloping the end wall of the plate structure and by inclining in the opposite direction the partition wall between the settling tank and the aeration compartment. The bottom of the tank is formed into an inverted pyramidal hopper or hoppers. All side walls have a slope of at least 60 degrees. Flat bottom area of each hopper is the minimum practicable and in no case greater than one square foot. After flowing through the final settling tank the clarified liquid will pass over the edge of the effluent trough weir into the effluent trough and through the effluent pipe to the settling tank outlet. There is an effluent baffle before the weir extended no more than 3" above and below the water surface.
2. The sludge which settles to the bottom of the hopper or hoppers is returned continuously to the sludge holding tank by means of the air lift placed in each hopper. The surface area of the clarifier is as follows: $(\text{peak flow}) (\text{gpd}) \div (\text{clarifier surface area}) (\text{sq. ft.}) \leq 1,000$.
3. The clarifier discharges through an aluminum, "vee-notch", weir with adjustable

side plates. The average overflow rate shall not exceed 20,000 gpd/sf at peak flow.

D. Disinfection

1. The plant includes a chlorine contact chamber that will allow for a minimum 15-minute retention time at peak flow. The disinfection chamber is equipped with a Norweco LF4600 tablet chlorinator to dose the chamber with chlorine. **Needs to have different tablet feeder sizes based on average plantflow.

2.2 AERATION SYSTEMS

A. General

1. This section of the specifications covers the materials, equipment, and construction procedures applicable to the aeration system. The sections covering standard items of construction shall be complied with unless there is a contradiction with the section, in which case, the material and/or procedures specified in this section shall govern.

B. Air Piping

1. All air piping from the blower or blowers to the air header is schedule 40 steel pipe with malleable iron fittings. Flexible reinforced rubber connecting sleeves are provided where required.

C. Air Diffusion Drop-Pipes and Diffusers

1. Each air diffusion device is connected to the air header with a 1-1/4" schedule 40 steel drop-pipe. The drop-pipe is connected to the air header in a manner to permit raising the drop-pipe and diffusion device above the water surface quickly and without disturbing air flow to the other diffusers. The air diffusion devices are designed to distribute air over the entire length of the aeration tank. The diffusers have an efficiency rating such that an adequate supply of oxygen is maintained in the aeration tank to treat the sewage load for which the plant is designed. Diffuser diaphragm membrane is constructed of EPDM rubber containing 8 engineered orifices spaced to release air from the bottom of the diffuser, rising to a common exit port around the hollow centered top.

D. Sludge Return Air Lift(s)

1. One sludge return air lift(s) for each hopper is installed in the final settling tank of the sewage treatment plant. The sludge return pipe is 3" ϕ schedule 40 PVC pipe and fittings. An air control valve is furnished for each air lift. Plug valves are provided and placed in the sludge return lines to allow the operator to manually direct the sludge to the head of the aeration compartment or in the sludge holding tank.

E. Air Lift Skimmer

1. An airlift skimming device is installed in the settling zone of each clarification basin downstream of the scum baffle to remove floating material and discharge it: by means of an air lift to the aeration compartment of the sewage treatment plant. It consists of a drop-pipe or skimming pipe mounted so that it can be raised or lowered with respect to the basin water surface by means of an adjusting screw with hand knob. The air lift shall be equipped with a 3/4" diameter rubber air line and an air control valve. A discharge pipe is installed from the skimmer air lift to the aeration compartment. The skimming devices are constructed of 3" diameter PVC,

Sch. 40 pipe with a removable galvanized clean out. The line runs on top of the plant and returns back to the aeration chamber for removal.

F. Spare Parts

1. There shall be furnished with the treatment plant the following minimum spare parts (as applicable):
 - a. One spare blower and motor assembly.
 - b. Required accessories and tools.

2.3 Blowers, Motors and Electrical Controls

A. Blowers

1. Positive displacement blowers shall be furnished to provide aeration for the treatment process and operation of air lifts. Each to deliver 148 CFM of free air measured at the blower inlet at 4.4 PSI maximum when operating at a maximum speed of 1,750 RPM. Blowers shall be rotary positive displacement type with V-belt connection to the motors. Blowers shall be equipped with filter-silencer on suction intake, pressure relief valve and discharge piping shall include air relief valve and flexible coupling. Gas type check valves shall be installed if two blowers are specified above.

B. Motors

1. Each blower is driven by a V-belt driven, horizontal ball bearing electric motor with open drip-proof enclosure. The motor is mounted on an adjustable sliding base. The motors have a 15% service factor but shall not be over-loaded beyond the nameplate rating at the design conditions specified above.
2. Where 3 phase power at the site is not feasible, the Developer/Contractor can submit an alternate plan for electric motors/drive configurations/voltages for review and approval. Approval will be by the Parish Engineer on a case by case basis.

C. Electrical Controls

1. A factory assembled electrical control panel is provided. For each blower-motor, thermal magnetic circuit breakers are provided, to serve both as disconnect switches and over Current protection against short circuits or grounds of the motor branch circuit conductors, control equipment and motors.
2. Magnetic across-the-line starters with thermal overload protection are supplied to operate and protect the motors. For 3 phase motors, a heater coil shall be provided in each phase to give positive protection against single phasing.
3. A time clock is provided to vary the running time for each blower and to alternate the blower operation. All components are internally wired to a numbered terminal strip for convenient wiring by the electrical contractor. The control center enclosure is of NEMA 3R construction. Manual H-O-A switches are provided for electrical equipment mounted on the plant.

2.3 Miscellaneous

- A. Fiberglass grating. Developer shall provide fiberglass grating over all plant openings and shall be secured as described above.
- B. Sampling Port. Developer shall install an effluent sampling port prior to the tail end of the

discharge pipe and no less than twenty-five (25) feet from the Chlorine Contact Chamber. Sampling Port shall provide sufficient fall and space to collect a representative effluent water sample and shall meet all other current DEQ requirements.

PART 3 – EXECUTION

3.1 DRAWINGS AND OTHER DATA

- A. The Developer shall furnish three (3) complete sets of the following drawings and other data for approval before construction is begun:
 - 1. Blowers and Motors
 - a. Certified dimensional outline drawings of the aeration system.
 - b. Sectional Drawings and parts list.
 - c. Operating and Maintenance instructions.
 - 2. Control Panel
 - a. Certified dimensional drawing of cabinet.
 - b. One-line diagram of wiring and interconnection.

END OF SECTION

