

1 PARISH OF WEST FELICIANA
2 ORDINANCE NUMBER: _____
3

4 AN ORDINANCE TO REPEAL AND REENACT CHAPTER 130 – SUBDIVISIONS, AND
5 TO PROVIDE FURTHER WITH RESPECT THERETO:
6

7 The West Feliciana Parish Council hereby ordains:
8

9 Chapter 130 is hereby repealed and reenacted in the Code of Ordinances of the Parish of West
10 Feliciana to read as follows:
11

12 **CHAPTER 130 - SUBDIVISION ORDINANCE**

13 **Article I – General**

14 **Sec. 130-1. Authority and purpose.**

15 In accordance with the provisions of R.S. 33:101 et seq., and particularly R.S. 33:112 thereof, the
16 following ordinance is adopted by the parish council and the parish.

- 17 a) This chapter is adopted for the purpose of guiding development in the unincorporated areas of
18 West Feliciana Parish, and to provide for the consideration of the West Feliciana Parish Rural
19 Development Plan and existing and future needs of the parish to protect, promote and improve
20 the public health, safety, morals, convenience, order, appearance, prosperity, and general
21 welfare.
- 22 b) The regulations hereby enacted are designed to exercise the full range of authority available to
23 the parish under Louisiana law to:
- 24 1) Promote the public health, safety, and general welfare, while recognizing the rights of real
25 property owners, by adopting a subdivision ordinance and providing for administrative
26 procedures and development standards.
- 27 2) Help achieve the goals, policies, and actions of the Rural Development Plan.
- 28 3) Facilitate the adequate provision of transportation, water, sewerage, drainage, schools,
29 parks, and other public requirements by providing a means for regulating the impact of
30 development on community infrastructure.
- 31 4) Establish a procedure for the submission and recording of plats and maps, the subdividing
32 or re-subdividing of any real property and the review of these plats and maps.

- 1 5) Carry out such other purposes in the public interest as may be specifically cited in this
2 chapter.

3 **Sec. 130-2. Minimum Requirements and Policy**

- 4 a) The provisions of this chapter should be considered minimum requirements for the promotion
5 of the purposes of these regulations.
- 6 b) It is the policy of the West Feliciana Parish Government that no building permit shall be issued
7 or granted for the development or use of any land subject to the provisions of this chapter until
8 a plat of the lot, parcel, or site of the proposed development has been approved under the
9 provisions of this chapter.
- 10 c) No new subdivision plats shall be recorded, or offered for record, nor shall any land be offered
11 for sale with reference to such new subdivision plat, until the plat has been approved as
12 provided for in this chapter.
- 13 d) The burden of proof will be with the applicant for a new subdivision to demonstrate full
14 compliance with the intent and purpose of this chapter.
- 15 e) All development must comply with relevant Federal and State regulations. Whenever any
16 provision of this chapter imposes a greater requirement or a higher standard than is required in
17 any Federal or State statute or regulation, the provisions of this chapter shall govern unless
18 preempted by Federal or State law.
- 19 f) It is not the intent of this chapter to interfere with or annul any easements, covenants, or other
20 agreements between parties; provided that where this chapter imposes a greater requirement
21 than is imposed by other ordinances, regulations, or permits, or by easements, covenants, or
22 agreements, the provisions of this chapter shall govern, except where expressly qualified in
23 this chapter.

24 **Sec. 130-3. Subdivision Review.**

25 Every subdivision of land within the unincorporated area of the parish shall be approved by the
26 appropriate authority as hereafter provided. No sale, agreement to sell or lease, or any other transfer
27 or conveyance or agreement to transfer or convey all or any portion of said subdivision shall be
28 made, unless and until said subdivision and the final plat thereof are approved as required by these
29 regulations. Within such subdivisions, no building permit shall be issued for the erection of any
30 building on any property unless and until said subdivision and the final plat thereof have been
31 approved as required by this chapter. Public money shall not be expended for the maintenance of
32 streets or any other improvements until these improvements have been accepted as provided in
33 this chapter and the plan of such land has been approved as provided in this chapter and recorded
34 in the official conveyance records of the office of the clerk of court for the parish.

- 35 a) Exemptions

1) This Chapter shall not apply to:

- i) Land in a subdivision, the plat of which is filed for record in the conveyance records of the parish, prior to the effective date of the ordinance from which this chapter is derived, except in the case of re-subdivision of such subdivision.
- ii) Subdivisions in which a building exists on each proposed lot, provided that the owner certifies on the plat that all such existing buildings were constructed prior to the effective date of the ordinance from which this chapter is derived, and provided that such plat is submitted to the director of planning and zoning prior to the filing with the clerk of court for the parish.
- iii) The subdivision of land to be used for orchards, forestry, the raising of crops, recreation, hunting, fishing, or mineral production activities, provided that the owner certifies upon the plat that such land is to be used only for these purposes; and, further, provided that a plat be submitted to the planning and zoning commission and director of planning and zoning for approval and signature prior to filing with the clerk of court for the parish, and provided that such plat include a servitude grant for utilities, a building set back line, and a right-of-way for road construction in compliance with the provisions of this chapter.
- iv) Small parcels of land sold to or exchanged between adjoining property owners, where such sale or exchange does not create additional lots, provided that the director of planning and zoning certifies upon the plat that said sale or exchange does not create additional lots.
- v) Partitions within estates or otherwise between co-owners, donations from parents to children and the sell-off by landowners of one parcel of land from a larger tract.
- vi) Any parcel, wherever located, upon which a servitude of passage is created for ingress or egress which does not create a through passage and is used exclusively as a driveway. Such a servitude need not meet any street planning dimensions, except said servitude must be adequate in dimensions to provide for ingress and egress by service and emergency vehicle
- vii) Any maps submitted for certification as an exemption under the provisions set forth in subsections (i) through (v) of this section must be approved by signature of the Planning and Zoning chairman, or his authorized designee, and approved by the Planning and Zoning administrator, or his authorized designee.
- viii) All maps submitted for approval as exempt under this chapter shall set forth all necessary signature lines ordinarily required for subdivision approval, although only the signatures required, as stated above, shall be necessary for approval as an exempt transaction.

1 ix) All transactions approved as exemptions shall be presented for review and information
2 purposes at the next regular meeting of the Planning and Zoning Commission.

3 x) Notwithstanding the classification of any transaction as exempt hereunder, it is
4 provided that the plat submitted to certify exemption shall include a certification that
5 the method of sewerage disposal or sanitary treatment facility complies with all
6 applicable codes and regulations of the state.

7 b) Minor Subdivisions

8 1) Minor Subdivisions involve the realignment or shifting of lot boundary lines, including
9 removal, addition, alignment, or shifting of interior lot boundary lines, or the re-designation
10 of lot numbers, provided the application meets the following requirements:

11 i) Does not involve the creation of any new street, utilities, or other public improvement
12 except as otherwise provided in this Section.

13 ii) Does not involve more than five (5) acres of land or three (3) lots of record. Does not
14 reduce a lot size below the minimum area or frontage requirements established by the
15 zoning chapter.

16 2) Parcels of land where a portion has been expropriated or has been dedicated, sold, or
17 otherwise transferred to the parish, thereby leaving a severed portion of the original
18 property which requires a re-designation of lot number and establishment of new lot
19 boundary lines.

20 3) Minor subdivision plats are considered final plats, and require the signature of the
21 Administrator, and Parish Sanitarian.

22 c) Standard Subdivisions

23 1) Standard Subdivisions involve the realignment or shifting of lot boundary lines, including
24 removal, addition, alignment, or shifting of interior boundary lines, or the re-designation
25 of lot numbers, provided the application meets the following requirements:

26 i) Does not qualify as a Minor or Major Subdivision.

27 ii) Involves creation of not fewer than four (4) nor more than eight (8) lots of record.

28 iii) May involve the creation of new streets or public improvements.

29 iv) Does not reduce a lot size below the minimum area or frontage requirements.

30 v) Otherwise meets all the requirements of this chapter.

- 1 2) Standard subdivision plats are considered final plats, and require the signature of the
2 Administrator, Sanitarian, School Board, Planning and Zoning Commission President and
3 the Parish President.

4 d) Major Subdivisions

- 5 1) Major subdivisions are all other subdivisions of land within the Parish that are not
6 considered minor subdivisions or standard subdivisions or otherwise exempted by this
7 chapter. Major subdivisions include the creation of more than 8 lots or any number of lots
8 where:

9 i) New streets are created.

10 ii) Water or sewer lines are extended.

11 iii) Drainage improvements through one or more lots must be installed.

12 iv) Variance of any subdivision standard is desired.

- 13 2) Major subdivisions require a preliminary plat be submitted to the administrator for
14 approval. The Administrator shall review and recommend approval of the preliminary plat
15 for final approval by the Planning and Zoning Commission and Parish Council. With final
16 approval of the preliminary plat the applicant can prepare construction plans for public
17 improvements required by the plat.

18 i) Preliminary plats expire after 1 year from approval if no construction plans have been
19 approved.

- 20 3) Construction plans require the approval of the Parish Engineer and the Director of Public
21 Works.

22 i) Upon approval, construction of public improvements may begin.

23 ii) Such construction shall be inspected and approved by the Director of Public Works.

24 iii) Construction plans expire after 1 year if no construction has begun.

25 iv) Construction plans for any remaining improvements expire if construction has been
26 halted for a period of 1 year.

- 27 4) A final plat shall be submitted to the administrator after completion and final inspection of
28 improvements by the Director of Public Works. Final Plats shall be approved by the
29 Planning and Zoning Commission and Parish Council.

- 30 5) Lots in Major Subdivisions that are approved in the Final Plat shall not be subdivided again
31 by the applicant/developer.

1 **Article II . Procedures**

2 **Sec. 130-4. General**

- 3 a) The West Feliciana Parish subdivision process is initiated with an application to the
4 Administrator. Once the Administrator determines that the application is complete it goes
5 either to the Minor Subdivision Plat Review Process, the Standard Subdivision Plat Review
6 Process, or the Major Subdivision Plat Review Process as described above.
- 7 b) Application for the subdivision of land must be by the owner of record. The owner of record
8 may legally delegate an agent to act on their behalf. Such delegation shall be evidenced in
9 writing. Submission of a false delegation shall be considered the filing of a false public
10 document and subject to the criminal penalties provided in Louisiana law.
- 11 c) Applications must be submitted on forms and in such numbers as required by the
12 Administrator.
- 13 d) Filing fees are to be established from time to time by the Parish, as set forth in an ordinance.
14 Prior to review of an application, all associated fees must be paid in full.
- 15 e) All applications shall be complete and sufficient for processing before the Administrator is
16 required to review the application. An application is complete when it contains all the
17 information necessary to decide whether the development as proposed will comply with all the
18 requirements of this chapter.
- 19 f) Applications for the subdivision of land should be reviewed in accordance with this Article
20 and by all other applicable Parish, state or federal offices and departments, concurrently.
- 21 g) Denial or disapproval by any other Parish, state or federal office or departments shall affect a
22 termination of consideration of the application under this article.
- 23 h) Any application that requires a variance shall not be eligible for final approval until the
24 variance has been granted.

25 **Sec. 130-5. Subdivision Requirements**

- 26 a) The Subdivision application and required exhibits for major subdivisions shall be filed in the
27 Planning and Zoning office no later than 12:00 p.m. noon, twenty-eight (28) days prior to the
28 Planning and Zoning Commission meeting at which the Plat is to be considered. The Plat that
29 is received shall be stamped showing the date, time, and acknowledgement that the filing fees
30 have been paid. No Plat shall be accepted without filing fees being paid at time of submission.
- 31 b) Submission Requirements for Minor and Standard Subdivisions
- 32 1) The application for subdivision and 4 copies of the Plat of the proposed subdivision shall
33 be filed in the Planning and Zoning Office.

- 1 i) Plats shall comply with Section 130-10.
- 2 2) For standard subdivisions only:
 - 3 i) Location of the subdivision, if a part of some larger subdivision or tract of land, and
 - 4 where appropriate, by reference to permanent survey monuments.
 - 5 ii) The location of all National and State registered trees shall be indicated on the plat.
 - 6 iii) Proposed easements showing location, size, and use.
 - 7 iv) Any additional information that may be reasonably required by the Administrator
 - 8 which will aid in the evaluation of the proposed subdivision.
 - 9 v) Existing and Proposed Servitudes and Rights of Way.
 - 10 vi) Pre and post division drainage features must be depicted on a separate plan sheet signed
 - 11 and sealed by a Professional Engineer registered in the State of Louisiana for standard
 - 12 subdivisions.
 - 13 vii) New utility infrastructure shall also be included when applicable.
- 14 3) Electronic "Shapefiles" (containing .shp, .shx, .dbf, and .prj files) shall be delivered to the
- 15 administrator for both minor and standard subdivisions.
- 16 c) Submission Requirements for Major Subdivision Preliminary Plat
 - 17 1) In addition to the submission requirements outlined for minor and standard plats, a major
 - 18 subdivision preliminary plat submission shall include the following:
 - 19 i) A composite road plan with graphic alignment, dimensioned right-of-way widths, and
 - 20 intended type of surfacing material. A traffic study signed and sealed by a Professional
 - 21 Engineer licensed in the State of Louisiana may be required by the Administrator or
 - 22 Parish Engineer.
 - 23 ii) Location of common open space not reserved or dedicated.
 - 24 iii) Proposed sites for possible multi-family dwellings, shopping centers, community
 - 25 facilities, industry, other uses, exclusive of single-family dwellings.
 - 26 iv) Existing buildings, roads, easements, telephone lines, gas lines, power lines, and
 - 27 features located on the subdivision and abutting its boundaries.
 - 28 v) Location, identification, and principal dimensions for all proposed public and private
 - 29 easements, including roads, bikeways, pedestrian ways, railroads, and utility rights-of-
 - 30 way.
 - 31 vi) Evidence that correspondence has been mailed by US Postal Service, certified mail, to
 - 32 each adjacent property owner within 200', at the address provided in the records of the

- West Feliciana Parish Assessor, providing notice of the date, time and place of the scheduled meeting of the Planning and Zoning Commission, not less than 14 days prior to such meeting.
- 2) The Preliminary Subdivision Plat shall have a soil survey provided.
 - 3) The developer shall prepare plans for erosion control, sediment control, and re-vegetation of disturbed soil areas.
 - 4) In the case of subdivisions located in flood hazard areas, contours shall be drawn on the Preliminary Plat or a Supplemental Plat. Contours shall be drawn at least at one (1) foot intervals unless another contour interval is specified by the Planning and Zoning Administrator.
 - 5) A hydrologic and hydraulic (H&H) analysis signed and sealed by a Professional Engineer registered in the State of Louisiana shall be required, and shall meet the approval of the Building Department, Department of Public Works, and Parish Engineer. Location and sizes of all culverts to be provided, bridges and drainage ditches, channels and easements shall be shown. If the developer intends to build the subdivision in phases, the H&H analysis must be for the entire tract of land and all drainage infrastructure must be built in the first phase.
 - 6) A generalized grading plan identifying areas of cuts, fills, and street gradients may be required prior to Preliminary Plan approval. Intended contours shall be shown on solid lines at the same interval as required for existing contours, which shall be shown as dashed lines.
 - 7) When warranted by unusual conditions the Department of Public Works and Parish Engineer may require the typical centerline profile of streets, road, storm drainage, and underground utilities plotted with sufficient accuracy to ensure that designs will conform to the prescribed standards approved by the Department of Public Works and Parish Engineer.
 - 8) When applicable, textual materials shall be submitted as follows:
 - i) Estimated total number of gallons per day of water system requirements and proposed method of supply.
 - ii) Estimated total number of gallons per day of sewage to be treated and proposed method of treatment.
 - iii) Any additional information that may be reasonably required by the Planning and Zoning Commission which will aid in the evaluation of the proposed subdivision.
- d) Drawing Requirements

- 1) The prints of the map shall be clear and crisp reproductions.
- 2) The preliminary plat shall comply with Section 130-10.
- 3) When a preliminary plat reflects not only surveying work but design of drainage, roadways, and other public facilities, then both the Professional Land Surveyor and the Professional Engineer responsible for their respective work must stamp and sign the preliminary plat. A note on the preliminary plat must clearly identify the division of the Engineers and the Surveyors work.
- 4) Major Subdivision plans and profile sheets depicting design of drainage, roadways, etc. are engineering work and must be signed and sealed by a Professional Engineer registered in the State of Louisiana. Those construction plans must be approved by the Department of Public Works before construction begins.
- 5) All drawings shall be submitted on sheet size twenty-four (24) inches by thirty-six (36) inches using as many sheets as necessary, as well as required electronic file submission.
- 6) Electronic "Shapefiles" (containing .shp, .shx, .dbf, and .prj files) shall be delivered to the administrator for both major subdivisions.

Sec. 130-6. Filing Fees

a) General

- 1) Filing fees shall be established by ordinance.
- 2) No Preliminary or Final subdivision plat shall be considered until filings fees are paid as required herein.
- 3) No fees are refundable upon any processing, partial or complete, of a subdivision plat.

b) Fee Payment

- 1) The application fee for a minor subdivision or standard subdivision shall be paid at the time of submission of the application.
- 2) The application fee for a major subdivision plat shall be paid, one-half (1/2) of the fee for application for preliminary plat review and the remaining half following preliminary plat approval and the start of final plat review.
 - i) At the time of preliminary plat submittal, a mailing notification fee of the current cost of regular mail, per abutting property owner, must be submitted to West Feliciana Parish.

1 ii) At the time of final plat submittal, the Applicant shall submit 4 copies of the final plat
2 to West Feliciana Parish.

3 3) All fees (application and mailing) shall be payable to West Feliciana Parish Government.

4 c) The subdivision fee schedule shall be reviewed annually by the Planning and Zoning
5 Commission and recommendations made to the Council for any amendments that may be
6 needed. Nothing herein is intended to require a recommendation from the Commission prior
7 to the Council amending the fee schedule.
8

9 **Sec. 130-7. Minor Subdivision Review Procedure**

10 a) Review and Decision by Administrator

11 1) After submittal to the administrator of a complete application and payment of fees the
12 Administrator shall review the minor subdivision plat to ensure compliance with the
13 provisions of this chapter.

14 2) The Administrator may refer the application to other affected or interested agencies for
15 review and comment.

16 3) The Administrator may approve, approve with conditions, or deny the minor subdivision
17 plat.

18 4) The Administrator may require a minor subdivision to be reviewed as a standard
19 subdivision if non-typical or unusual conditions exist, such as if the property has previously
20 been the subject of a minor subdivision.

21 5) The minor subdivision plat shall be approved, approved with conditions, or denied within
22 60 days of filing of a complete application, except where such time is extended with the
23 consent of the applicant.

24 6) Minor subdivisions require only final administrative approval. This approval may provide
25 for the dedication, acceptance, relocation, or deletion of public utility servitudes, other than
26 streets, or the deletion of gas, electric, or telephone utility servitudes on the property being
27 subdivided.

28 7) All minor subdivision plats approved or certified by an administrative procedure shall
29 designate such fact on the plat.

30 8) Approval by the Administrator does not constitute the acceptance of the dedication of any
31 land, easement, or public utility or facility set forth on the plat; such acceptance is only
32 affected by the action of the West Feliciana Parish Council.

33 b) Recording of the Plat

- 1) The plat shall be recorded with the Clerk of Court of West Feliciana Parish and copied into the conveyance record book of the parish, and a duplicate filed with the assessor of the parish by the Applicant.
- 2) A copy of the letter of recordation shall be returned to the Planning and Zoning Office.

Sec. 130-8. Standard Subdivision Review Procedure

a) Review by Administrator

- 1) After submittal to the administrator of a complete application and payment of fees the Administrator shall review the standard subdivision plat to ensure compliance with the provisions of this chapter.
- 2) The Administrator may refer the application to other affected or interested agencies for review and comment.
- 3) The standard subdivision plat shall be approved, approved with conditions, or denied within 60 days of filing of a complete application, except where such time is extended with the consent of the applicant.
- 4) The Administrator may approve, approve with conditions, or deny the subdivision plat.
- 5) The Administrator or the Parish President may require a standard subdivision to be reviewed as a major subdivision if non-typical or unusual conditions exist, such as if the property has previously been the subject of a minor or standard subdivision.

b) Decision by Planning and Zoning Commission

- 1) In deciding to approve, approve with conditions, or deny the proposed standard subdivision, the Commission shall consider the recommendation of the Administrator, relevant comments of all interested parties and the requirements in this chapter, and the review criteria below.
- 2) The standard subdivision plat shall be approved, approved with conditions, or denied within 60 days of filing of a complete application, except where such time is extended with the consent of the applicant.
- 3) Standard subdivisions shall be advertised in the official journal, setting the date and time for the public hearing at which the subdivision will be considered by the Commission.
- 4) Standard subdivisions require only Planning and Zoning Commission approval. The approval may provide for the dedication, acceptance, relocation, or deletion of public utility servitudes, other than streets, or the deletion of gas, electric, or telephone utility servitudes on the property being subdivided.

- 1 5) Approval by the Commission does not constitute the acceptance of the dedication of any
2 land, easement, or public utility or facility set forth on the plat; such acceptance is only
3 affected by the action of the West Feliciana Parish Council.

4 c) Standard Subdivision Plat Review Criteria

- 5 1) Consideration of the requirements of this Article for a standard subdivision.
6 2) For a plat not meeting the requirements, determination as to whether a variance has been
7 approved.
8 3) Whether there are any additional conditions that are appropriate and should be met before
9 approval.
10 4) Consideration of concerns raised by other interested parties or agencies.
11 i) Nothing herein prohibits approval based solely on objections.
12 5) Consideration of the denial of any other mandatory agencies, offices, or departments.

13 d) Appeal

- 14 1) The approval or disapproval of a Standard Subdivision application may be appealed to the
15 Parish Council.
16 2) The appeal shall be filed within 15 days of the approval or disapproval.
17 3) The appeal shall be on a form promulgated by the Administrator.
18 4) The appeal shall state the reasons for the appeal.
19 5) The Council shall consider an appeal in a regular or special meeting.
20 6) The Council shall uphold the decision of the Commission unless the Council determines
21 that the Commission's decision was arbitrary or capricious, or if the Council determines
22 that the application lacks a mandatory element.
23 7) The decision by the Parish Council on an appeal shall be final and unappealable.

24 e) Recording of the Standard Subdivision Plat

- 25 1) Approved standard subdivision plats are filed as final plats, upon the passage of 15 days
26 and no appeal having been lodged, or
27 2) Upon the upholding the approval or approval with conditions by the Parish Council.
28 3) The plat shall be recorded with the Clerk of Court of West Feliciana Parish and copied into
29 the conveyance record book of the parish, and a duplicate filed with the assessor of the
30 parish by the Applicant.

1 4) A copy of the letter of recordation shall be returned to the Planning and Zoning Office.

2 5)

3
4 **Sec. 130-9. Major Subdivision Review Procedure**

5 a) Preliminary Plat Review by the Planning and Zoning Commission and Parish Council

6 1) Before applying for a Major Subdivision Plat, an applicant must schedule a pre-application
7 conference with the Administrator to discuss the procedures, standards and regulations
8 required for approval.

9 2) The subdivider shall submit black and white prints of the preliminary plats, in compliance
10 with Section 130-10.

11 3) Major subdivisions require approval of a preliminary plat by the Planning and Zoning
12 Commission and Parish Council.

13 4) After submittal to the Administrator of a complete application and the payment of fees the
14 Administrator shall:

15 i) Provide that a sign be erected on the property containing information that the property
16 is the subject of a Major Subdivision application and the date, time, and location of the
17 hearing on the matter before the Planning and Zoning Commission, not less than 21
18 days prior to the hearing date.

19 ii) Schedule the application for consideration by the Planning and Zoning Commission
20 and Parish Council.

21 iii) Review the preliminary subdivision plat to ensure compliance with the provisions of
22 this Article, involving other interested parties and agencies as necessary for a complete
23 review of the preliminary plat.

24 iv) Prepare a recommendation to the Planning and Zoning Commission on the merits of
25 the proposed preliminary plat.

26 v) Provide for the posting of notice of the purpose, time, and place of the public hearing
27 on the preliminary plat by at least one publication in the official journal, not less than
28 21 days prior to the hearing date.

29 vi) Send notice of the public hearing on the preliminary plat to the applicant by certified
30 mail not less than five days before the date of the hearing.

31 5) The Planning and Zoning Commission shall consider the recommendation of the
32 Administrator, relevant comments of all interested parties and the review criteria below.

- 1 6) The Planning and Zoning Commission may attach conditions required to make the
2 subdivision comply with this code, or as necessary to protect the health, safety and welfare
3 of West Feliciana Parish and minimize adverse impacts on adjacent properties.

4 b) Preliminary Plat Review Criteria

- 5 1) Consideration of the pertinent elements of the West Feliciana Parish comprehensive plan
6 and any other adopted plans. Nothing herein is to be interpreted to mandate adherence to
7 the comprehensive plan.
- 8 2) Consideration of the extent to which the proposed development will reinforce the existing
9 or planned character of the neighborhood.
- 10 3) Determination that the proposed development demonstrates:
- 11 i) Compliance with all requirements of this Article.
- 12 ii) Dedications of rights of way and easements are sufficient to provide for public
13 improvements required for the subdivision.
- 14 iii) Adequate public improvements and facilities required to support the subdivision are
15 planned.
- 16 iv) Subdivision design is appropriate for and tailored to the natural characteristics of the
17 site.
- 18 v) Adequate, safe, and convenient arrangement of access, such as pedestrian circulation
19 facilities, bicycle facilities, roadways, driveways, and off-street parking, stacking, and
20 loading space, as appropriate.
- 21 vi) Adequate design of grades, paving, gutters, drainage, and treatment of turf to handle
22 storm water.
- 23 vii) Adequate access for disabled or handicapped residents through the provision of special
24 parking spaces, accessible routes between parking areas and buildings, passenger
25 loading zones and access to other facilities, as appropriate.
- 26 viii) That any adverse impacts on adjacent properties have been minimized or mitigated.
- 27 ix) Following Preliminary Plat Approval
- 28 4) The applicant is notified in writing of the decision by the appropriate authorities. In the
29 event of a denial, or approval with conditions, the Planning and Zoning Commission or
30 Parish Council shall put in writing the specific reasons for their action.

- 1 5) In the event the Planning and Zoning Commission or Parish Council denies the preliminary
2 plat, the applicant may revise the plat to address the deficiencies in the plat or request a
3 variance from requirements that were the basis for denial and resubmit for review.
- 4 6) In the event the Planning and Zoning Commission and Parish Council approve the plat or
5 approve it with conditions the applicant may begin preparation of construction plans for
6 any public improvements set forth in the preliminary plat.
- 7 7) Upon approval by the Council, an approved copy of the preliminary plat will be returned
8 to the subdivider.
- 9 8) A preliminary plat expires after 1 year if final construction plans have not been approved.

10 c) Construction Plan Review and Approval

- 11 1) The applicant has one year from the date the preliminary plat is approved to submit
12 complete construction plans for the development, or portion or a phase within, for which
13 preliminary approval has been granted.
- 14 2) The administrator may extend this approval by one year upon written request from the
15 applicant and must notify the Planning and Zoning commission of any such extension at
16 its next regularly scheduled meeting. Any further extensions must be approved by
17 resolution of the Planning and Zoning commission.
- 18 3) Construction plans require the approval of the Parish Engineer and the Director of Public
19 Works.
- 20 4) Bond. In the event the subdivider desires to sell lots prior to final approval of the
21 subdivision as provided by this chapter, the Parish Council shall require of the subdivider
22 a performance bond with a surety acceptable to the council in the amount of 110 % of the
23 cost of construction, as estimated by the Parish Engineer. Such bond shall be conditioned
24 upon the satisfactory completion of improvements and final acceptance of the subdivision
25 as hereafter provided.
- 26 5) After initial construction plans have been approved as set forth above and the required bond
27 posted, the subdivider may commence construction of improvements.
 - 28 i) The Administrator shall be notified in advance of the date when such construction shall
29 begin.
 - 30 ii) Construction shall be performed under the supervision of the Department of Public
31 Works and shall always be subject to inspection by that group.
 - 32 iii) This in no way shall relieve the subdivider and his engineer of close field supervision
33 and final compliance with approved plans and specifications.

- 1 iv) If the Director of Public Works or Parish Engineer determines that construction is not
2 proceeding in accordance with the approved construction plans, it shall notify the
3 developer in writing, setting forth in detail such discrepancies.
- 4 v) If all corrective steps are not undertaken by the subdivider within seven days after
5 receipt of such written notice, the Director of Public Works shall notify the Parish
6 Council in writing and the Parish Council shall have the right to call the bond.
- 7 6) When construction is complete, in accordance with the approved construction plan and
8 complies with the provisions of this chapter, the subdivider shall certify that all work has
9 been completed and request final inspection and approval by the Parish Engineer and the
10 Director of Public Works.
- 11 7) Construction plans expire after 1 year if no construction has begun.
- 12 8) Construction plans for any remaining improvements expire if construction has been halted
13 for a period of 1 year.
- 14 9) The final construction plans shall meet accepted engineering standards and practices and
15 must be signed and sealed by a Professional Engineer registered in the State of Louisiana.
- 16 10) The final construction plans shall meet the standards and requirements of this Article and
17 other relevant ordinances of the Parish, State, or Federal government.
- 18 11) Failure to meet the deadlines herein shall require the resubmission of the entire subdivision
19 application.
- 20 d) Approval of Final Major Subdivision Plat
- 21 1) When the applicant has completed final inspection and approval of construction, the final
22 plat may be submitted to the Administrator for review and action. The Administrator shall
23 review and submit the final plat to the Planning and Zoning Commission within 60 days,
24 except where such time is extended by the applicant, with a recommendation of approval
25 or denial.
- 26 2) The Planning and Zoning Commission shall make a recommendation to the Parish Council
27 for the approval, approval with conditions, or denial of the final plat.
- 28 3) Meetings to consider Major subdivisions shall be advertised in the official journal, setting
29 the date and time for the public hearing at which the subdivision will be considered by the
30 Parish Council.
- 31 4) The approval of a final plat shall not be deemed to constitute the acceptance of the
32 dedication of any street or other land, public utility or facility shown on the face of the plat.
33 However, the Parish Council may, by resolution, accept any dedication for streets, parks,
34 public utility lines or facilities, or other public purposes.

1 e) Major Subdivision Review Criteria

- 2 1) Consideration of the requirements of this Article for a major subdivision.
- 3 2) For a plat not meeting the requirements, determination as to whether a variance has been
- 4 approved.
- 5 3) Whether there are any additional conditions that are appropriate and should be met before
- 6 approval, including but not limited to whether to accept the dedication of any street or other
- 7 land, public utility or facility shown on the face of the plat.
- 8 4) Consideration of concerns raised by other interested parties or agencies; nothing herein
- 9 prohibits approval based solely objections.
- 10 5) Consideration of the denial of any other mandatory agencies, offices, or departments.

11 f) Appeal

12 1) Preliminary Plat of Major Subdivision

- 13 i) If the preliminary plat is denied or approved with conditions, by the Commission, the
- 14 applicant may appeal the action to the Parish Council.
- 15 ii) The appeal shall be filed within 15 days of the action.
- 16 iii) The appeal shall be on a form promulgated by the Administrator.
- 17 iv) The appeal shall state the reasons for the appeal.
- 18 v) The Council shall consider an appeal in a regular or special meeting.
- 19 vi) The Council shall uphold the decision of the Commission unless the Council
- 20 determines that the Commission's decision was arbitrary or capricious, or if the Council
- 21 determines that the application lacks a mandatory element.
- 22 vii) The decision by the Parish Council on an appeal shall be final and unappealable.

23 2) Final Plat of Major Subdivision

- 24 i) The approval, approval with conditions or denial of a Major Subdivision by the Council
- 25 is subject to appeal to the 20th Judicial District Court, Parish of West Feliciana, State
- 26 of Louisiana, by the applicant or an adjacent property owner.
- 27 ii) The appeal shall be filed within 30 days of the approval or denial.
- 28 iii) The appeal shall state the reasons for the appeal.
- 29 iv) The decision of the Council shall be upheld unless the Court determines that the
- 30 Council's decision was arbitrary or capricious, or if the Court determines that the
- 31 application lacks a mandatory element.

1 g) Recording of Final Plat of Major Subdivision

- 2 1) After council approval of the final plat has been granted, the owner shall furnish the
3 administrator with three prints of the approved final plat, as well as required electronic file
4 submission.
- 5 2) Approved major subdivision plats are filed as final plats, upon the passage of 30 days and
6 no appeal having been lodged, or
- 7 3) Upon the upholding the approval or approval with conditions by the Court.
- 8 4) The final plat shall be recorded along with the restrictions and maintenance covenants with
9 the Clerk of Court of West Feliciana Parish and copied into the conveyance record book of
10 the parish, and a duplicate filed with the assessor of the parish by the Administrator.
- 11 5) A copy of the letter of recordation shall be returned to the Planning and Zoning Office.
- 12 6) A letter of final acceptance is given to the owner.
- 13 7) For a period of 24 months after final acceptance of subdivisions subject to public
14 maintenance, the owner shall keep all improvements in good condition, making repairs to
15 such improvements as may be required.
- 16 i) The owner shall file with the parish council a maintenance agreement and surety bond
17 securing to the parish council satisfactory performance of this obligation for a period
18 of two years from the date of council approval of the final plat. The bond shall be
19 subject to cancellation only upon written approval of the parish council.

20
21 **Sec. 130-10. Plats.**

- 22 a) All plats for the subdivision of land shall conform with the standards hereafter set forth and
23 the laws of the state governing surveying, plotting and subdivision of land and all other
24 applicable ordinances of the parish.
- 25 1) Preliminary plat.
- 26 i) The purpose of the preliminary plat is to provide information to enable required
27 agencies in the parish, to determine whether the proposed layout of the land in question
28 is satisfactory from the standpoint of public interest and will meet the requirements of
29 these regulations. Changes may be necessary in the preliminary plat before it can be
30 approved.
- 31 ii) Composition of the preliminary plat. The following items normally will be required to
32 be shown on the preliminary plat:

- 1 (a) *Title*. The title under which the proposed subdivision is to be recorded; the location
2 of the property to be subdivided; the name of the owner or owners and/or the
3 applicant; and the name of the appropriate licensed design professional of record,
4 if any, who is platting the tract. The title should read: "Preliminary Plat of...",
5 "Subdivision Name", "the legal description and township and range".
- 6 (b) *Boundary lines and existing improvements*. Boundaries of the subdivision location;
7 width and names of streets adjoining the subdivision; section and township lines;
8 indication of incorporated areas, sewer districts, zoning district classification and
9 boundaries, school districts and other legally established districts; all water courses,
10 drainage ditches, wooded areas, and other features within the area to be subdivided
11 as well as the same facts regarding adjacent property.
- 12 (c) *Adjoining property*. The names of all adjoining subdivisions, and the names and
13 record owners of adjoining tracts.
- 14 (d) *Features of proposed subdivision*. The proposed location, names, and width of
15 streets; layout, and approximate dimensions of lots; any other necessary
16 descriptions of lots, servitudes, and easements; and location and dimensions of
17 existing buildings, if any; and subdivider's front building lines with setbacks. The
18 lots shall not encroach on rights-of-way and all such rights-of-way shall be
19 excluded from lot area.
- 20 (e) *Sewers, water lines and drainage ditches*. Existing drainage ditches, sanitary and
21 storm sewers, water mains, fire hydrants, fire protection draft sites, culverts, and
22 other underground structures within the tract or immediately adjacent: statement of
23 proposed plans for drainage and sewage disposal, including location of proposed
24 culverts and bridges and contours from USGS Quadrangle Maps or better.
- 25 (f) *Public utilities*. The location of all existing and proposed public utilities including
26 storm and sanitary sewers, water, gas, and power lines, if applicable.
- 27 (g) *Method of sewer disposal*. Preliminary plat must indicate the method of sewer
28 disposal proposed. Any method of sewer disposal shall comply with the LAC Title
29 51, Part XIII.
- 30 (h) *Special use areas*. Location and size of proposed parks, playgrounds, church or
31 school sites or other special uses of land.
- 32 (i) *Keys*. North arrow, scale, and date.
- 33 (j) *Vicinity map*. A key or vicinity map with a north arrow and showing existing roads
34 and drainage channels.

- 1 (k) *Flood elevation data*. The preliminary plat shall indicate by shading the FIRM base
2 flood elevation, indicate the FIRM community and panel numbers, as well as all
3 other relevant information pertaining to the base flood elevation.
- 4 (l) *Public or private servitudes*. All public or private servitudes must be indicated as
5 such with the intended use specified listed and a proper dedication note displayed
6 on the preliminary plat.
- 7 (m) *Contours*. Approximate pre-development contours must be shown on the
8 preliminary plat.
- 9 iii) A checklist with the above requirements will be provided to the professional of record
10 for him to execute and turn in with the preliminary plat for approval. The preliminary
11 plat will not be reviewed unless the executed checklist accompanies this submittal.
- 12 2) Construction plans. The basic requirements for development plans are as follow, but not
13 limited to:
- 14 i) Title sheet with general notes, sheet index with list of standard details to be used,
15 engineer's certification, vicinity map.
- 16 ii) Typical section showing the street section proposed with proper utility allocations. If
17 various sections are utilized, multiple sections may be included.
- 18 iii) Drainage map. Contour map of the area comprising the subdivision and sufficient
19 additional area to include all watersheds which might be a factor in the design of the
20 storm sewer system.
- 21 iv) Layout plans shall be included, when applicable, for storm sewer system and/or ditch
22 drainage system including culvert locations, utility allocations (showing water,
23 firewater, fire protection draft sites, and sewer), street geometry and signage,
24 stormwater pollution prevention, and joint layout (for concrete streets).
- 25 v) Layout plan of sanitary sewer system treatment site and lift station if applicable.
- 26 vi) Plan; profile. Plan and profile of all streets, including the following:
- 27 vii) Profile along the center line and each property line.
- 28 viii) Proposed curb grade if curb and gutter.
- 29 ix) Grade of storm sewers and/or ditch drainage system. Hydraulic grade line required if
30 curb and gutter streets proposed. Drainage calculations shall be turned in with the
31 construction plans.
- 32 x) Grade of sanitary sewers.

- 1 xi) Design details of street and sewerage improvements.
- 2 xii) Street names.
- 3 xiii) Details of adjoining streets with radius callouts and graphical grades where
- 4 required.
- 5 xiv) Standard details (with final set submitted for construction permit approval).
- 6 xv) Special details if anything is required outside of the standard plans.
- 7 3) Final plat. The final plat shall be submitted on a reasonable size paper commiserate to the
- 8 size of the development and shall be to scale. The following information is required on the
- 9 final plat:
- 10 i) Name of subdivision.
- 11 ii) Name, address, and signature of the subdivider.
- 12 iii) North arrow, scale, and date.
- 13 iv) The outer boundary lines with accurate distances, angles, or true bearings if available,
- 14 the exact location width of all recorded streets and ways intersecting the boundaries of
- 15 the tract being divided.
- 16 v) Distances and angles, or true bearings if available, to the established street lines or
- 17 official monuments, which shall be accurately described on the plat; municipal, range,
- 18 township, parish, and section lines accurately tied to the lines of the subdivision by
- 19 distances and angles, or true bearings, if available.
- 20 vi) Street (public and private), alleys, and ways, together with their names and widths.
- 21 vii) All curve data, the lengths of all arcs, radii, internal angles, points of curvature, lengths,
- 22 and bearings of tangents.
- 23 viii) All dimensions, both linear and angular, necessary for determining the exact
- 24 boundary of all lots in the subdivision; all angles must either be given directly or
- 25 indicated by the bearings shown; where any lot line is curved, the significant elements
- 26 of the curve, such as the arc length and the subtending central angle, bearing and
- 27 dimensions of side lot lines and where a curve is involved an indication if it is a radial
- 28 line and any and all mathematical information and data necessary to locate all interior
- 29 and exterior boundary lines of any lot.
- 30 ix) Every plat shall show a note giving reference to the basis of the bearing. The bearings
- 31 used shall be referenced to some well-established line.

- 1 x) All block indications, if any; lot numbers; all individual areas shall be designated by
2 number or letter, and lots in new subdivisions shall be numbered consecutively. No
3 tract or portion of land shall be indicated as "Reserved".
- 4 xi) Control monuments, benchmarks, and vertical control: The plat must indicate the
5 accurate location, material, type and description of all permanent control monuments
6 and benchmarks. All monuments, benchmarks, and vertical control are to meet the
7 specification and standard set forth by the United State Geological Survey (USGS) and
8 the Louisiana Professional Engineering and Land Surveying Board (LAPELS).
- 9 xii) Special use areas: Location and size of proposed parks, playgrounds, church or school
10 sites or other special uses of land to be considered for dedication or sale for public use,
11 and of all property that may be designated by deed and covenants for the common use
12 of the property owners in the subdivision, along with a statement for responsibility for
13 maintenance.
- 14 xiii) Description of the tract being subdivided.
- 15 xiv) Statement of (public or private) dedication: Statement signed by the owner to the
16 effect that the streets and rights-of-way are dedicated to the perpetual use of the public
17 (or homeowners' Association- HOA - if private) for proper purposes, and that all areas
18 shown as servitudes are granted to the public (or HOA where applicable) for the use of
19 utilities, drainage, sewage disposal or other proper purpose in the general interest of the
20 public.
- 21 a. Said statement shall further provide that no trees, shrubs, or other plants may
22 be planted, nor shall any building, fence, structure, or improvements be
23 constructed or installed within or over any servitude or right-of-way to prevent
24 or unreasonably interfere with any purpose for which the servitude or right-of-
25 way is dedicated.
- 26 (a) Where a sewage treatment plant or oxidation pond is to be used for this purpose, it
27 shall be dedicated on a separate tract, or lot by the owner for that purpose only.
- 28 (b) Where a fire protection draft site is required, it shall be certified that any source
29 credited for fire protection shall be maintained indefinitely unless replaced by a
30 more appropriate source in both capacity and location.
- 31 xv) Statement regarding sewage disposal: Statement signed by the owner and/or subdivider
32 to the effect that, outside of a public wastewater suburban transportation network, no
33 person shall provide or install a method of sewage disposal until the method of sewage
34 treatment and disposal has been approved by the Health Unit of West Feliciana Parish.

- 1 xvi) Restrictions and maintenance: Private restrictions or restrictive covenants and their
2 periods of existence to apply to lots in the subdivision shall be signed by the owner or
3 his agent and recorded in the office of the Clerk of Courts for West Feliciana Parish,
4 and references to such instrument shall be made on the plat and a copy shall be
5 furnished to the administrator prior to acceptance of the final plat application.
- 6 xvii) Flood elevation data: The final plat showing the subdivision of property shall
7 include record inundation, the FEMA flood zone(s) and the base flood elevation(s), all
8 of which shall be provided by the administrator.
- 9 xviii) Professional land surveyor's certification and seal: This certification shall be a
10 statement by a registered professional land surveyor licensed to practice in the State of
11 Louisiana to the effect that the plan is based upon an actual survey made by him and
12 that the final plat is in accordance with the West Feliciana standards and that distances,
13 courses, and angles and all other required survey information, are shown correctly, that
14 the monuments have been set and the lot and block corners staked correctly on the
15 ground and that he has fully complied with the provision of the R.S. 33:5051, et seq.,
16 and regulations governing platting. The engineer's or land surveyor's seal shall also be
17 shown.
- 18 xix) Recommendation for approval and signature blocks for the planning and zoning
19 commissioner, director of public works, and parish sanitarian shall be shown on the
20 final plat. All surveying for perimeter, street centerline, property line and control
21 documentation of a subdivision shall be performed with the precision as specified for
22 that class of survey in accordance with the minimum standards for the practice of land
23 surveying as promulgated by the Louisiana Professional Engineering and Land
24 Surveying Board.
- 25 4) A checklist with the above requirements will be provided to the professional of record for
26 him to execute and turn in with the final plat for approval. The final plat will not be reviewed
27 unless the executed checklist accompanies this submittal.

Sec. 130-11. Violation and penalty.

Whoever, being an owner or agent of an owner of any land subject to this chapter, sells or agrees to sell, leases or agrees to lease, or in any other manner transfers, conveys or agrees to transfer or convey all or any portion of a subdivision before such subdivision has been approved by the parish council shall be fined not more than \$500.00, or imprisoned for not more than 30 days, or both for each lot or parcel so sold, leased or otherwise transferred or conveyed or agreed to be sold, leased, transferred or conveyed. Where decisions are left in this chapter to the administrator, any person dissatisfied with such decision may appeal therefrom to the parish council. Such appeal shall be made by letter addressed to the parish council through its secretary with sufficient copies to all members of the parish council. Upon receipt of such an appeal, the secretary shall notify the members of the parish council of such appeal, and then expeditiously place the appeal on the agenda of the parish council for a hearing.

Article III. Public Improvements

Sec. 130-12. General Requirements

a) In each new subdivision, the sub divider and the Planning and Zoning Commission (or Administrator on a minor or standard subdivision) shall agree on the type, location, and extent of necessary public improvements depending on the characteristics of the proposed developments and its relationships to surrounding areas.

b) Type of Improvements:

- 1) The following improvements are standard general improvements that may be required for a Subdivision. Any improvements required by a subdivision plat shall be constructed at the expense of the sub divider in a manner approved by the Parish which is consistent with sound construction and local practice.
 - i) Roads, grading, base, and surfacing.
 - ii) Curbs and gutters, if required.
 - iii) Sidewalks.
 - iv) Sanitary sewer, laterals, and mains.
 - v) Storm sewers or storm drainage system, as required.
 - vi) Water distribution system.
 - vii) Fire hydrants.
 - viii) Street lighting.

- ix) Natural gas utility system
 - x) Permanent reference monuments and monument boxes.
 - xi) Other facilities as may be specified or required in these regulations by the Planning and Zoning Commission if non-typical conditions apply.
- 2) All utilities in major subdivisions in the Parish except major power transmission and distribution lines shall be underground. Where specific requirements on design and construction are provided, they shall apply.
- c) Completion of Improvements
- 1) Before the Final Plat is signed by the Planning and Zoning Commission representative, all applicants shall be required to complete, in accordance with the Planning and Zoning Commission's decision and to the satisfaction of the Parish, all streets, utilities and other improvements, including lot improvements on the individual lots, specified in the Final Subdivision Plat.
 - 2) To dedicate same to the local government, free and clear of all liens and encumbrances on the property (except existing easements) and public improvements thus dedicated. Except,
 - 3) The Planning and Zoning Commission, at its discretion, may waive the requirement that the applicant complete and offer for dedication all public improvements prior to approval of the Final Subdivision Plat if all the requirements are met.

Sec. 130-13. Improvements Agreement and Guarantee of Improvements

- a) Requirements for Final Plat Approval Prior to Completion of Improvements.
- 1) A Final Plat may be approved or recorded after the sub divider has submitted and the Parish Council has approved the following:
 - i) A Subdivision Improvements Agreement or other agreements, contracts, or bids, setting forth the cost, plan, method, parties involved, guaranteeing to construct any required public improvements shown in the Final Plat documents.
 - ii) A surety bond which is sufficient in the judgment of the Parish Council to make reasonable provision for the completion of the improvements in accordance with design and time specifications.
 - 2) A surety bond in amount stipulated in the Subdivision Improvements Agreement shall accompany the Final Plat submission to ensure completion of the improvements according to design and time specifications.
 - 3) If the improvements are not constructed in accordance with all the required specifications, the Parish shall notify the sub dividers of noncompliance and discuss with them the reasons

1 for noncompliance. Proposed schedules for correction of noncompliance shall be
2 established.

3 4) If the Parish determines that the sub dividers will not construct any or all of the
4 improvements in accordance with all of the specifications, the Parish shall have the power
5 to execute against the surety bonds. It may be necessary to construct the improvements in
6 accordance with the specifications set forth in the Final Plat.

7 5) No Final Plat shall be accepted by the Council for recording until said improvements are
8 constructed and approved by the Commission. However, the Administrator will supply the
9 sub divider with a letter guaranteeing Final Plat approval when improvements are
10 constructed to Parish Specifications.

11 b) Time Schedule and Release of Guarantee of Improvements.

12 1) The period within which required improvements must be completed shall be specified by
13 the Parish Council and shall be incorporated in the bond and shall not in any event exceed
14 two (2) years from date of Final Approval.

15 2) The Parish Council may, upon proof of difficulty, recommend extensions of the completion
16 date set forth in such bond for a maximum period of one (1) year, contingent upon the term
17 of the surety bond being so extended.

18 3) Except for streets and roads, from time to time as the required improvements in a
19 subdivision are completed, the sub divider shall apply in writing to the respective
20 department for a partial or full release of the collateral. Upon receipt of such written
21 application, the Parish, or its agents shall inspect the improvements which have been
22 completed.

23 4) The Parish has the authority to monitor and inspect progress toward the completion of
24 improvements at any time during the construction period. If the Parish deems that
25 satisfactory progress has not been made, it may execute against the surety bond, but only
26 after written notification to the sub divider, not less than seven (7) days before execution.

27
28 **Sec. 130-14. Dedications**

29 a) How Established

30 1) A public and/or private street, utility or other easement, right-of-way or other right granted
31 to the public, shall be established through the provisions of this section.

32 2) A public and/or private street, utility or other easement, right-of-way or other right granted
33 to the public, is established when designated on a Final Plat and includes submissions
34 required by this Section and such dedication is accepted by action of the Parish Council.

1 b) Submission Contents

- 2 1) When property is to be dedicated at the time of plat approval, the dedicated property shall
3 be shown on the plat submitted for recordation. The plat shall contain the information
4 required for Final Plat, and information about the areas dedicated. This shall contain the
5 following additional data:
- 6 i) The names, locations, dimensions, boundaries, courses and other geographic data for
7 each street, alley, easement, right-of-way, square, park or other right or property
8 granted or dedicated to the public.
- 9 ii) The name and number of each lot, square, park, or other parcel dedicated to public use.
- 10 iii) The purpose or use for which the dedication is made (e.g., drainage servitude).
- 11 2) A certificate of a licensed surveyor or civil engineer of the State of Louisiana stating that
12 the same is in accordance with the provisions of L.S.A.-R.S. 33:5051 and with the laws
13 and ordinances of West Feliciana Parish.
- 14 3) A formal Act of Dedication executed by the owner or owners of the property or their duly
15 authorized agent of the streets, alleys, easements, servitudes, parks, squares or other items
16 or areas to be dedicated to public use.

17 c) Procedure for Dedication

- 18 1) A proposal for dedication shall be submitted to the Administrator in compliance with
19 appropriate submission requirements.
- 20 2) The Administrator will forward the proposal to the Council, which shall either accept or
21 reject the offer of dedication. The taking of no action by the Council within 60 days of
22 submission shall be deemed a rejection.

23 d) Effect of Dedication

- 24 1) A dedication shall irrevocably vest the public with title to the items so dedicated, subject
25 to the right of the Parish to abandon, revoke or dispose of any public property or dedication.
- 26 2) When a private street is established in a subdivision, the designated right-of-passage shall
27 be owned by the developer or another private entity or entities.
- 28 3) Nothing contained herein shall operate to negate or alter the provisions of LSA R.S.
29 33:5051 or any other statutory provisions relative to dedication or the jurisprudence
30 interpreting same.
- 31 4) At least annually, the Department of Public Works shall submit to the Council a proposed
32 ordinance to amend the Official Parish Map to reflect the newly accepted streets.

1 **Sec. 130-15. Acceptance of Improvements for Perpetual Maintenance**

2 a) General

- 3 1) Approval by the Planning and Zoning Commission of the Final Plat shall not constitute an
4 acceptance by the Council for perpetual maintenance of the roads, streets, other public
5 lands, or improvements dedicated for public use.
- 6 2) Until such time as the developer has obtained written acceptance for perpetual maintenance
7 of the improvements, the developer shall be responsible for all maintenance and repair to
8 the improvements.
- 9 3) Perpetual Maintenance by the Parish shall not be assumed until three (3) years has elapsed
10 (the warranty period) since inspection of the completed improvements.

11 b) Procedures for Establishing Perpetual Maintenance

- 12 (1) Upon completion of the required improvements, the developer shall notify the Parish in
13 writing and request an inspection.
- 14 (2) The Parish shall inspect the improvements and shall notify the developer in writing of
15 the findings of the inspection.
- 16 (3) If the improvements are deficient, the reasons for the deficiency shall be stated and
17 corrective measures shall be outlined in the letter of notification.
- 18 (4) If the improvements pass inspection by the Parish, the Administrator will issue a written
19 notice to the council requesting perpetual maintenance at the end of the warranty period
20 and the warranty period shall run from the date of the final inspection.
- 21 (5) If adopted by the Council, the Resolution accepting the public street(s) or other
22 improvement for perpetual maintenance shall be recorded with the Clerk of Court of
23 West Feliciana Parish.

24 (b) Warranty Period

- 25 (1) The developer shall furnish the West Feliciana Parish Council a Maintenance Bond in
26 the amount of ten (10%) of the total cost of the improvements as a warranty for the
27 maintenance of improvement accepted for perpetual maintenance by the Parish.
- 28 (2) In the event a failure due to faulty construction occurs within three (3) years of the date
29 of the final inspection (the warranty period), the developer shall perform satisfactory
30 repairs, or the Surety Bond may be called, and repairs made and paid for with the
31 proceeds of the Surety Bond by the Parish.

- 1 (3) At the end of the warranty period, an inspection shall be made by the Parish and if no
2 failure or problem exists due to faulty construction, the developer will be released from
3 responsibility for maintenance and the Parish will take no action on the Surety Bond.
4

5 **Sec. 130-16. – Construction Quality Control**

6 (a) Certification Required

- 7 (1) Following completion of the improvements, the design engineer for the Subdivision must
8 certify that all improvements were constructed according to approved engineering plans
9 before the Public Works Engineer and will recommend acceptance of the improvements.
10 (2) The latest edition of the Louisiana D.O.T.D. "Standard Specifications for Roads and
11 Bridges" shall be used as a guide for construction quality and is hereby incorporated in
12 the Development Regulations by reference.

13 (b) Inspections

- 14 (1) The cost all of inspection services by the Parish Engineer shall be borne by the
15 Developer.
16 (2) The developer shall retain the inspection service of the design engineering firm or
17 independent testing laboratory to assure compliance with construction plans and
18 specifications and standard construction practices for the following non-exclusive
19 particulars:
20 i. Back-fill of culverts or utility lines crossing roadway.
21 ii. Compaction of roadway sub-grade.
22 iii. Processing of road base, including application of lime if deemed necessary.
23 iv. Installation of storm sewers, especially line and grade.
24 v. Roadway surface construction.
25 vi. Post-construction testing of water and sewerage collection system.
26 vii. Resident inspection of water, wastewater, and electrical systems for the acceptance
27 of West Feliciana Parish Utilities Department.
28 1) The cost of inspection services shall be borne by the developer. All test results shall be
29 reported to the Public Works Engineer with copies to the developer and/or his
30 representative.
31 2) A certified inspector shall be present at the asphalt or concrete batch plants whenever
32 material is prepared for use in construction of the development infrastructure and shall

1 certify that the material used was of approved quality and in conformity with the
2 specifications.

3 3) The Public Works Engineer shall be notified when construction of a subdivision
4 commences and when base course (if asphaltic concrete is used) construction is to be done.

5 4) The Developer's design engineer shall submit the soil test reports and recommendations to
6 the Public Works Engineering before construction of the soil cement base course.

7 5) Laboratory testing reports shall be approved by the developer's design engineer and
8 provided to the Public Works Engineer. Required reports are as follows:

9 6) Atterberg limits of soil at the base course grade.

10 7) Lime and/or cement determination for base course.

11 8) Compaction tests of road sub-grade and base course.

12 9) Design mix for asphaltic concrete.

13 10) Design mix for Portland cement concrete.

14 11) Compressive strength testing for structural concrete and concrete pavement.

15 12) Coring of roadways.

16 13) The design engineer shall certify as acceptable and submit to the Public Works Engineer
17 for approval of materials to be used for storm sewers.

18 14) The West Feliciana Utilities Department is the approval authority for utilities under its
19 jurisdiction. All required test results for improvements under their jurisdiction shall be
20 reported to the West Feliciana Utilities Department.

21 15) The Parish Engineer may inspect all infrastructure as they deem necessary to ensure proper
22 construction methods were used.

23 24 **Article IV. Development Standards and Criteria**

25 26 **Sec. 130-17. General Requirements**

27 a) The subdivision standards contained within this Chapter are designated for the establishment
28 of minimum requirements for property located within the Parish of West Feliciana, to provide
29 the necessary facilities and services demanded by urbanization. The sub divider shall prepare
30 the proposed subdivision plat in conformance with the following development standards and
31 criteria.

1 b) Planning

- 2 1) It shall be the duty of the Planning and Zoning Commission to study each proposed
3 subdivision plat in connection with elements of the Parish Comprehensive Plan, and the
4 general character of the area, and to take into consideration the general requirements of the
5 Parish of the land to be subdivided. Particular attention will be given to the specific
6 requirements for public utilities, roads, utility, pedestrian and other easements, the
7 adequacy of street connections and the suitability of the land for development.
- 8 2) It shall be the duty of the Planning and Zoning Commission to discourage the subdividing
9 of lands that are far in advance of the infrastructure of the Parish; or that, by their location,
10 cannot be served by public utilities, fire protection, police protection or other public
11 service, or that are in areas subject to flooding, or that are topographically unsuitable for
12 development; or that for any other reason are being unwisely or prematurely subdivided.
- 13 3) It shall be the duty of the Planning and Zoning Commission to encourage the re-platting of
14 undeveloped lands deemed to be unsatisfactorily subdivided, or any underdeveloped land
15 that represents an obstacle to the orderly and efficient growth of the Parish.
- 16 4) If a tract is subdivided into larger parcels than ordinary building lots, such parcels shall be
17 arranged to allow the opening of future streets and logical future subdivision.
- 18 5) It shall be the duty of the Planning and Zoning Commission to encourage the coordinated
19 platting of adjacent small parcels of land.

20 c) Planning Principles

- 21 1) The subdivision layout shall result in the creation of lots which are developable and capable
22 of being built upon.
- 23 2) Consideration of land use, density, and design of subdivision shall follow from the
24 consideration of guidelines and policies as set forth in the Parish Comprehensive Plan.
- 25 3) Areas which cannot be feasibly serviced by necessary public services, including roads,
26 police, fire, and utilities, shall not be subdivided.
- 27 4) The proposed design within the subdivision shall not result in an over-intensive use of the
28 land.
- 29 5) The Administrator or Parish Engineer may require a pre and post design traffic study signed
30 and sealed by a Professional Engineer licensed in the State of Louisiana.
- 31 6) The design and development of subdivision shall preserve, insofar as it is practical, the
32 natural terrain and natural drainage which would enhance the subdivision, including all
33 plans for open space or other such land use planning elements as set forth in the Parish
34 Comprehensive Plan.

- 1 7) Public or private street layout shall provide access to all lots, or living units, within the
2 subdivision.
- 3 8) Reserve strips controlling access to streets shall not be permitted, except where their
4 control is placed with the Parish, as approved by the Planning and Zoning Commission.
- 5 9) Land subject to flooding or to inadequate drainage, located in a natural drainage channel,
6 or otherwise substandard land shall not be platted for any use which might endanger health,
7 life, property or which may aggravate flood or erosion hazards. Such land shall be set aside
8 for other uses which will not present these hazards. However, such land may be used for
9 development, provided the developer presents and constructs a suitable safeguard to
10 overcome the above listed deterrence. A competent, independent professional engineer
11 may be required at the expense of the sub divider for the purpose of verifying the technical
12 requirements.
- 13 10) Reasonable fire protection and fire service should not be significantly impaired.
- 14 11) Development of the subdivision should not adversely affect any historical, recreational, or
15 aesthetic value attached to the land proposed for subdivision or of adjacent land. The
16 Planning and Zoning Commission shall support the efforts of the Parish Government to
17 preserve and promote the heritage of West Feliciana Parish.
- 18 12) No subdivision or street shall bear the same name as another subdivision or street in the
19 Parish unless located on adjoining property.

21 **Sec. 130-18. Blocks**

22 a) Length, Shape and Width of Blocks

23 The length, width, and shape of a block shall be determined regarding:

- 24 1) Provisions of adequate building sites suitable to the special needs of the type of use
25 contemplated.
- 26 2) Requirements as to lot size and dimensions.
- 27 3) Need for convenient access, circulation, control, and safety of vehicular and pedestrian
28 traffic.
- 29 4) Limitations and opportunities of topography.

30 b) Maximum and Minimum Block Lengths

- 31 1) The maximum and minimum distance in feet between intersecting streets for a block
32 intended for commercial or industrial use is 1,500 feet and 500 feet, respectively.

- 2) For blocks intended for residential uses with lots 50 feet or less in width, the maximum distance between intersecting streets is 1,200 feet.
- 3) For blocks intended for residential uses with lots over 50 feet in width the maximum distance is 1,500 feet. The minimum distance between intersecting streets for all residential uses is 500 feet.
- 4) In blocks over 700 feet in length, the Commission may require a pedestrian crosswalk not less than ten (10') feet wide within the block to provide circulation or access to schools, playgrounds, shopping areas, transportation, or other community facilities.

Sec. 130-19. Lots

a) Lot Size and Shape

- 1) The lot size, width, depth, shape and orientation and the minimum building setback lines shall be appropriate for the location of the subdivision and for the type of development and uses contemplated.
- 2) To the extent possible, single family residential lots should not front on major arterials or state roadways. If single family lots are platted fronting on a major arterial or state highway the minimum lot width shall be no less than sixty (60) feet to minimize access points that could interfere with proper functioning of the roadway. The Planning and Zoning Commission may approve a subdivision for narrower lots meeting state health and highway requirements if shared access is designed into the plat to minimize these impacts.
- 3) Lots for nonresidential uses on major arterials or State highways shall be designed to permit shared access as outlined in Section 130.22.
- 4) No detached single-family lot shall be less than 10,000 square feet in area; sanitary sewer system must meet state health regulations.
- 5) Detached single-family lots shall have a frontage of not less than 125' feet with community sanitary sewer collection and not less than 125' with individual sanitary sewer system.
 - i) Wedge-shaped lots or lots fronting on a cul-de-sac shall have a frontage width of not less than twenty-five 75'.
 - ii) In RA districts only frontage may be 60'.
- 6) Residential lots served by a new individual sanitary sewer system shall have a minimum area as determined by Section 511B of Title 51, Public Health Sanitary Code of the State of Louisiana.

- 1 7) Corner lots shall have the necessary width to permit appropriate building setback for
2 orientation to both streets and to ensure the building is outside the sight triangle.
- 3 8) Insofar, as is practical, side lot lines shall be at right angles to straight streets and radial to
4 curved streets.
- 5 9) Setback lines established on the plat should be compatible with existing development in
6 the area.

7 b) Lot Orientation

- 8 1) Each lot shall have a direct frontage on a public or private street. Where a townhouse,
9 condominium, apartment complex or mobile home subdivision is planned, a certified copy
10 of restrictions, agreements, or contracts providing adequate public access and safety to each
11 unit must be submitted to the Planning and Zoning Commission.
- 12 2) Double frontage lots shall be prohibited except when alleys are approved or when reverse
13 frontage is used to provide separation and control of traffic or to overcome specific
14 disadvantages of topography and orientation. A planting screen of at least ten (10') feet in
15 width and across which there shall be no right of access shall be provided along the line of
16 lots abutting such streets. A statement dissolving the right of access of individual lots to
17 the arterial or collector street shall be placed on the Final Plat and recorded.
- 18 3) Where lots are created fronting on a substandard public right of way, the subdivision shall:
19 i) Dedicate the right of way needed to build the street to standard.
20 ii) Dedicate an easement for future street expansion, or
21 iii) Establish a building setback line at a distance from the public right of way equal to the
22 sum of one-half of the right of way deficit and the setback that would have been
23 required otherwise required to reserve for the opportunity of future street expansion.
- 24 4) The Planning and Zoning Commission shall determine which alternative is appropriate
25 based on the status of the planning for future street expansion and the timing of future street
26 expansion.

27 c) Building Setback Lines

- 28 1) Corner lots shall have the necessary width to permit appropriate building setback for
29 orientation to both streets and to ensure the building is outside the sight triangle.
- 30 2) Insofar, as is practical, side lot lines shall be at right angles to straight streets and radial to
31 curved streets.
- 32 3) Minimum building setback lines as required in Section 135-52 of the Zoning Ordinance
33 shall be shown on the plat.

1 d) Lot Identification and Addresses

- 2 1) All lots in the subdivision shall be numbered such that each lot created shall have a unique
3 lot number.
- 4 2) Municipal address numbers shall be assigned to all lots by the Parish, in accordance with
5 the 911 numbering system established by Communications District, which is the
6 coordinating agency for the issuance of property addresses on all public and private streets
7 and thoroughfares within West Feliciana Parish.
- 8 3) Property number addresses shall be issued in conformance with the street/road numbering
9 system established for all minor and major thoroughfares in West Feliciana Parish.
- 10 4) Property number addresses shall be issued only for building and/or property referenced as
11 lots of record or property divisions recognized and/or approved in accordance with this
12 Chapter, or previously approved by the Parish.
- 13 5) In those instances where plats are required to be approved, the property number addresses
14 on private streets shall be issued in the same manner as property number addresses on
15 public streets.
- 16

17 **Sec. 130-20. Streets**

18 a) Conformity with Existing Street Patterns and Plans

- 19 1) The arrangement character, extent, width, grade, and location of all streets shall conform
20 and shall be considered in their relation to existing and planned streets, topographical
21 conditions, to public convenience and safety, and in their appropriate relation to the
22 proposed uses of the land to be served by such streets.
- 23 2) Where such is not shown on an approved Comprehensive Plan, the arrangement of streets
24 in a subdivision shall either:
- 25 i) Provide for the continuation or appropriate projection of existing or proposed arterial
26 or collector streets into surrounding areas, but also designated, when possible, to deter
27 commercial or industrial traffic from residential areas, or
- 28 ii) Conform to a plan for the neighborhood approved or adopted by the Planning and
29 Zoning Commission to meet a particular situation where topographical or other
30 conditions make continuance or conformance to existing streets impracticable.
- 31 3) Minor streets shall be so laid out that their use by through traffic will be discouraged.
- 32 4) Where a proposed subdivision abuts or contains a railroad right-of-way or an existing or
33 proposed arterial thoroughfare, as designated in the Comprehensive Plan or other Highway

1 or Street Plan as adopted by the West Feliciana Parish Council, the Planning and Zoning
2 Commission may require one or more of the following:

- 3 i) Marginal access streets on each side of the right-of-way.
- 4 ii) Reverse frontage lots with required screen planting within the non-access frontage.
- 5 iii) Deep lots with service alleys.
- 6 iv) Adequate right-of-way that is appropriate for future traffic demands.
- 7 v) Other such treatment as may be necessary for adequate protection and the separation
8 of local and through traffic.
- 9 vi) Proper Road Signage is required for public and private streets, alleys, etc. in accordance
10 with the latest version of the MUTCD.
- 11 vii) All public roads shall be designed with sufficient drainage as set forth by the Parish
12 Engineer.

13 b) Street Configuration

- 14 1) Reserve strips controlling access to streets shall be prohibited except when their control is
15 placed under the jurisdiction of the West Feliciana Parish Council under conditions
16 approved by the Planning and Zoning Commission.
- 17 2) Half streets shall be prohibited.
- 18 3) Roads and streets shall be designed to intersect with existing roads and streets at angles as
19 near to right angles (90 degrees) as practicable. Lesser angles shall be permitted where
20 topography limitations do not allow a right-angle intersection, but:
 - 21 i) In no case may an intersection angle less than 75 degrees be approved without a waiver.
 - 22 ii) In no case may an intersection angle be approved where the intersection has less than
23 a 50-foot tangent intersecting the centerline of the existing road.
- 24 4) A tangent at least one hundred (100') feet shall be introduced between reverse curves on
25 major thoroughfares.
- 26 5) The center line grade of all streets shall be subject to approval by the Parish Engineer. The
27 gutter grade for streets with subsurface drainage shall not be less than 0.20 percent. The
28 ditch grade for streets with open ditches shall not be less than 0.10 percent. Maximum
29 grades for street ditches shall be limited to that which will not cause erosion of ditches or
30 other property.
- 31 6) Cross sections for streets, roadways, and shoulders may be required as determined by the
32 Department of Public Works and Parish Engineer.

- 1 7) All curbs, sidewalks, crosswalks, and pedestrian ways, intended for public dedication, shall
2 be designed, and constructed in accordance with ICC A117.1 Accessible and Usable
3 Buildings and Facilities.

4 c) Dead-end Streets and Cul-de-sacs

- 5 1) Permanent dead-end streets should be avoided.
- 6 2) When there are plans for extension of a dead-end street, the closed end of such streets shall
7 be provided with a temporary shell or gravel turnaround subject to the specifications of the
8 Department of Public Works and Parish Engineer.
- 9 3) All permanent streets not designed as a through street (a Cul-de-Sac) shall be governed by
10 the size of the tract, the surrounding area, accessibility to other streets, density of the
11 proposed development and other physical features.
- 12 4) The maximum length of a cul-de-sac shall be as follows; however, the Planning and Zoning
13 Commission may approve such streets of a greater length when unusual conditions exist.
14 The turnaround dimensions shall apply to a dead-end street over one hundred-fifty (150')
15 feet from a through street intersection.
- 16

17 **Table Error! No text of specified style in document..1 Cul-de-sac length**

Intended Use	Maximum Length	ROW Diameter	Pavement Diameter	Continuous
Residential	750'	100'	100'	
Commercial or Industrial	500'	120'	120'	

18 d) Alleys

- 19 1) Alleys shall have a minimum improved width of twenty (20') feet and may be required in
20 commercial and industrial subdivisions or townhouse developments but shall not be
21 encouraged or required for other residential development except under unusual conditions.
22 If Alleys are required, they are to remain private. Under no circumstance may the
23 maintenance of an Alley be deemed the responsibility of the Parish.
- 24 2) Dead-end alleys, alley intersections and changes in alley directions are prohibited.
- 25 3) A driveway easement assuring permanent rear lot access for interior lots may be substituted
26 for an alley.

27 e) Street Names

- 1) Major thoroughfares, arterials, and highways shall, whenever possible, have the same name throughout the entire length of the roadway. Likewise, local streets and roads shall, whenever possible, have the same name throughout their respective entire lengths.
 - 2) An applicant for a subdivision shall recommend street names for any new street created through the subdivision process. No street names shall be used which will duplicate or be confused with the names of existing streets located within the Parish of West Feliciana or any incorporated municipality.
 - 3) Identification as a public street or as a private street shall not distinguish road names from duplication. Example: Broussard Road and Broussard Lane (Private) is not acceptable.
 - 4) Suffixes such as Drive, Road, Street, Parkway, Avenue, Court, Loop, Circle, etc. do not remedy duplication. Prefixes such as Saint, Rue, Chemin, Avenue, etc. do not remedy duplication.
 - 5) Directional prefixes and suffixes in French or English may be allowed and will remedy duplication, however, such streets must be continuous.
 - 6) Alphabetical and numerical street names are discouraged.
 - 7) The Council shall have the final approval for all street names within the Parish. If any existing street name is changed the Council will notify owners of property fronting on any public or private street, road, or thoroughfare of the proposed or requested name change.
 - 8) Street names shall be reviewed and approved by the Planning and Zoning Commission during the subdivision review process.
 - 9) Street names may be changed by the action of West Feliciana Parish Council.
 - 10) The Council encourages applicants to recommend street names that promote the culture and history of West Feliciana Parish, its communities, and people.
- f) Street lighting shall be required in accordance with any applicable Parish Utility Department lighting standards.

Sec. 130-21. Private Streets and Alleys

- a) General Arrangement and Layout of Private Streets.
 - 1) The pattern or layout of the private street system in any project must provide for the following basic design concepts:
 - i) Provide adequate vehicle access to buildings and facilities within the plat boundaries.

- ii) Provide adequate interior traffic circulation and access to buildings by firefighting personnel and equipment.
 - iii) Provide adequate access to the existing public street system adjacent to the boundaries of the plat.
 - iv) Be so designed to allow for the orderly flow of vehicular traffic, which would not induce a hazard to vehicular traffic and the occupants of the development as determined by the Department of Public Works.
 - v) Private streets may be utilized only in those areas where there is no possibility of future extension of public streets into the area; and in areas where due to the boundaries of the subdivision there will be no future need to extend the private streets beyond the boundaries.
- 2) Each lot shall have a direct frontage on a public or private street. Where a townhouse, condominium, apartment complex, or mobile home subdivision is planned on a private street, a certified copy of restrictions, agreements or contracts providing adequate public access and safety to each unit must be submitted to the Parish Planning and Zoning Commission.
- b) Right-of-Way Widths and Pavement Requirements of Private Streets.
 - 1) Since private streets are established without the benefit of a formalized right-of-way width, it is required that a minimum unobstructed right-of-passage width of twenty-four feet (24') be provided along such private street except if designated as a one-way street in which event twenty feet (20') is required.
 - 2) If parallel parking is to be allowed along the private street, additional width will be required to accommodate it.
 - 3) The assurance of pavement construction requirements will be under the jurisdiction of the Department of Public Works review of construction standards.
- c) General Arrangement and Layout of Private Alleys
 - 1) Private alleys may be provided within any subdivision to provide secondary vehicular access to buildings which otherwise have their primary access from an adjacent public street or private street.
 - 2) Private alleys cannot be used or designed to provide the principal access to property outside the subdivision plat boundaries in which the private alleys are located.
- d) Right-of-Way Widths and Pavement of Private Alleys.

- 1) Since private alleys are established without the benefit of a formalized right-of-way width, it is required that a minimum unobstructed right-of-passage width of eighteen feet (18') be provided along such private alleys except if designated as a one-way private alley in which event twelve feet (12') is required.
- 2) No parallel parking will be allowed along a private alley and signs prohibiting parking will be prominently displayed.
- 3) The entire private alley right-of-way passage will be paved to the same pavement requirements that pertain to public alleys.
- 4) Intersections with private streets must be at right angles with variations not to exceed ten (10) degrees and have twenty-five (25') feet radii at all corners.
- 5) Intersections of two (2) private alleys are not allowed.
- 6) The assurance of pavement construction requirements will be under the jurisdiction of the Department of Public Works.
- e) Dead-Ends, Cul-de-Sacs, and T-Type Turnarounds.
 - 1) Dead-end private streets and private alleys over one hundred-fifty (150') feet long, measured from the nearest right-of-way line at the intersection, must be terminated by a circular cul-de-sac having a right-of-passage radius of not less than fifty feet (50').
 - 2) It is permissible for a private alley to be terminated by a T-type turnaround designated in conformance with the standards of the Department of Public Works.
 - 3) The maximum length of a private street or private alley that terminates in a cul-de-sac (or T-type turnaround for private alleys) will be seven hundred-fifty feet (750') measured from the closet intersection right-of-way line to the furthestmost edge of the cul-de-sac pavement (or the end of the private alley in the case of a private alley T-type turnaround).
- f) Intersections of Private Streets and Private Alleys.
 - 1) Private streets must not be direct projections of any public street.
 - 2) When a private street or private alley intersects with a public street there must be a minimum off-set distance of one hundred and twenty-five (125') feet from the center line of the private street or private alley to the center line of any adjacent street or alley intersecting the public street.
 - 3) Intersections of all private streets and private alleys with the public streets must be at right angles with variations not to exceed ten (10) degrees and have twenty-five feet (25') radii at all corners.
- g) Multiple Access Points to Public Streets.

1) All property containing private streets must have a private street system so designed to provide adequate emergency vehicular access.

2) The private street system must be designed to provide more than one point of access to the project or development from the public street adjacent to the boundaries of the project or development, if possible.

h) Designation of Private Streets and Private Alleys.

1) The right-of-passage of all private streets will be clearly marked and designated as private streets or private alleys on the Preliminary and Final plats.

i) Maintenance of Private Streets and Private Alleys.

1) The developer will cause to be created (or furnish a certified correct copy if already in existence) a financial and management legal entity or entities that will guarantee and assure the maintenance of all private streets and private alleys constructed.

2) The developer will provide a certification to the staff, prior to obtaining final subdivision approval, from an attorney licensed to practice law in the State of Louisiana, that the documentation, attached to such certification, provides for the creation of an entity that is responsible for the maintenance of the private streets, private roads and/or private alleys in the subdivision; which certification shall contain the name of the entity responsible for maintenance and its registered office.

j) Drainage of Private Streets and Private Alleys.

1) Private streets and private alleys must be provided with adequate drainage.

2) Storm water shall not flow for more than eight hundred (800) feet on any private street or private alley before it empties into an inlet or outfall.

3) If the private street or private alley is constructed with a cross-section that allows drainage down the center of the pavement, deviations in flow line elevations will not be allowed that result in ponding or standing water. Any inlet provided for this V cross-section type construction will be centered in the flow line.

4) The drainage area allowed for surface flow on any private street or private alley shall not exceed ten (10) acres, regardless of flow.

5) All flow of water across any intersection with a roadway, be it private streets, private alleys, or public streets, shall be through culverts or bridges.

6) The assurance of compliance of the drainage requirements will be under the jurisdiction of the Department of Public Works and they in no way modify or void any other development drainage requirements found in these Subdivision Regulations.

1 **Sec. 130-22. Access Standards**

2 a) General Requirements

- 3 1) In the review and approval of all subdivision plats the Planning and Zoning Commission
4 and/or Administrators shall ensure that these access standards can be met when site plans
5 for development are submitted. To the extent possible the plats shall note where access
6 would not be allowed.
- 7 2) These standards apply to access to major roads and highways not under the jurisdiction of
8 the Louisiana Department of Transportation and Development.
- 9 3) Where the Louisiana Department of Transportation and Development has jurisdiction, their
10 rules shall apply.

11 b) Access Management Classification System.

- 12 1) The following access classifications shall be used to guide application of these standards.
- 13 i) Access Class 1 - Limited Access Highways designed for high-speed, high volume
14 traffic movements. Access is permitted via interchanges.
- 15 ii) Access Class 2 - Highly controlled access facilities distinguished by their ability to
16 carry high speed, high volume traffic over long distances in a safe and efficient manner.
17 These highways are distinguished by a system of existing or planned service roads, a
18 highly controlled limited number of connections, medians openings and infrequent
19 traffic signals.
- 20 iii) Access Class 3 - These facilities are controlled access facilities where direct access to
21 abutting land will be controlled to maximize the through movement of traffic. This
22 class will be used where existing land use and roadway sections have not been built out
23 to the maximum land use or roadway capacity, or where the probability of significant
24 land use change soon is high. These highways are distinguished by existing or planned
25 restrictive medians and maximum distance between signals and driveway connections.
26 Local land use planning, zoning and subdivision regulations should be such to support
27 the restrictive spacing of this designation.
- 28 iv) Access class 4 -These facilities are controlled access highways where direct access to
29 abutting land will be controlled to maximize the through movement of traffic. This
30 class will be used where existing land use and roadway sections have not been built out
31 to the maximum land use or roadway capacity or where the probability of significant
32 land use change soon is high. These highways are distinguished by existing or planned
33 non-restrictive median treatments.

- 1 v) Access Class 5 - This class will be used where existing land use and roadway sections
2 have been built out to a greater extent than those roadway segments classified as Access
3 Classes 3 and 4 and where the probability of a major land use change is not as high as
4 those roadway segments classified Access Classes 3 and 4. These highways will be
5 distinguished by existing or planned restrictive medians.
- 6 vi) Access Class 6 - This class will be used where existing land use and roadway sections
7 have been built out to a greater extent than those roadway segments classified as Access
8 Classes 3 and 4, and where the probability of a major land use change is not as high as
9 those roadway segments classified Access Classes 3 and 4. These highways will be
10 distinguished by existing or planned non-restrictive medians or centers.
- 11 vii) Access Class 7 - This class shall only be used in urbanized areas where existing land
12 use and roadway sections are built out and where significant land use changes or
13 roadway widening will be limited. This class shall be assigned only to roadway
14 segments where there is little intended purpose to provide high speed travel. Access
15 needs, though generally high in those roadway segments, will not compromise the
16 public health, welfare, or safety. Exceptions to standards in this class will be considered
17 if the applicant's design changes substantially reduce the number of connections
18 compared to existing conditions. These highways can have either restrictive or non-
19 restrictive medians.
- 20 2) All connections on facility segments that have been assigned an access classification shall
21 meet or exceed the minimum connection spacing requirements of that access classification,
22 as specified in the Table 130-22.1: Access Classification and Standards.
- 23 3) Separation between access connections on all collectors and arterials under local
24 jurisdiction that have not been assigned an access classification shall be based upon the
25 posted speed limit in accordance with Table 130-22.2: Driveway Spacing for Non-
26 classified Roadways.
- 27 4) Driveway spacing shall be measured from the closest edge of the pavement to the next
28 closest edge of the pavement. The projected future edge of the pavement of the intersecting
29 road shall be used in measuring corner clearance, where widening, relocation, or other
30 improvement is indicated in an adopted local thoroughfare plan.
- 31 5) The Planning and Zoning Commission in approving a plat may reduce the connection
32 spacing requirements in situations where they prove impractical, but in no case shall the
33 permitted spacing be less than 80% of the applicable standard.
- 34 6) If the connection spacing of these standards cannot be achieved, then a system of joint use
35 driveways and cross access easements may be required.

- 7) Variation from these standards shall be permitted at the discretion of the Planning and Zoning Commission where the effect would be to enhance the safety or operation of the roadway. Examples might include a pair of one-way driveways in lieu of a two-way driveway, or alignment of median openings with existing access connections. Applicants may be required to submit a study prepared by a registered engineer to assist the Parish in determining whether the proposed change would exceed roadway safety or operational benefits of the prescribed standard.

Table Error! No text of specified style in document..2 Access Classification and Standards

Functional Class	Access Class	Medians ¹	Median Opening Spacing (feet)		Connection Spacing (feet)		Signal Spacing
			Directional	Full	> 45 mph	≤ 45 mph	
Arterials	2	Restrictive w/ Service Roads	1,320	2,640	1,320	660	2,640
	3	Restrictive	1,320	2,640	660	440	2,640
	4	Nonrestrictive					2,640
	Collectors	5	660	2,640/1,320	440	245	2,640/1,320
		6			440	245	1,320
Arterials Collectors Residential Collectors	7	Both Median Types	330	660	125		1,320

A Restrictive median physically prevents vehicle crossing
A Nonrestrictive median allows turns across at any point

Table Error! No text of specified style in document..3 Driveway Spacing for Non-classified Roadways

Posted Speed Limit (MPH)	Driveway Spacing (feet)
35 or <	125
36 - 45	245
> 45	440*

* Ideally any road having a speed limit over 45 MPH should be given access management classification.

1 c) Corner Clearance

- 2 1) Corner clearance for connections shall meet or exceed the minimum connection spacing
3 requirements for that roadway as shown in Table 2.
- 4 2) New connections shall not be permitted within the functional area of an intersection or
5 interchange as defined by the connection spacing standards of this chapter, unless:
- 6 i) No other reasonable access to the property is available, and
- 7 ii) The Planning and Zoning Commission determines that the connection does not create
8 a safety or operational problem upon review of a site-specific study of the proposed
9 connection prepared by a registered engineer and submitted by the applicant.
- 10 3) Where no other alternatives exist, the Planning and Zoning Commission may allow
11 construction of an access connection along the property line farthest from the intersection.
12 In such cases, directional connections (i.e., right in/out, right in only, or right out only) may
13 be required.
- 14 4) In addition to the required minimum lot size, all corner lots shall be of adequate size to
15 provide for required front yard setbacks and corner clearance on street frontage.

16 d) Joint and Cross Access

- 17 1) The Planning and Zoning Commission may require provisions be made on a plat
18 anticipated for major commercial development to enable adjacent commercial or office
19 properties classified as major traffic generators (i.e., shopping plazas, office parks), to
20 provide a cross access drive and pedestrian access to allow circulation between sites.
- 21 2) A unified access and circulation system plan that includes coordinated or shared parking
22 areas is encouraged wherever feasible.
- 23 3) When a plat reserves an easement to accommodate joint and cross access, the easement
24 shall be recorded with the deed.
- 25 4) The Planning and Zoning Commission may modify or waive the requirements of this
26 section where the characteristics or layout of abutting properties would make development
27 of a unified or shared access and circulation system impractical.

28 e) Interchange Areas

- 29 1) Subdivisions proposed within interchange areas will be designed to minimize impacts on
30 the interchange to protect the safety and operational efficiency of the limited access facility
31 and the interchange area.

- 2) The plat shall address current and future connections and median openings within 1/4 mile of an interchange area (measured from the end of the taper of the ramp furthest from the interchange) or up to the first intersection with an arterial road, whichever is less.
- 3) The distance to the first connection shall be at least 660 feet where the posted speed limit is greater than 45 mph or 440 feet where the posted speed limit is 45 mph or less. This distance shall be measured from the end of the taper for that quadrant of the interchange.
- 4) The minimum distance to the first median opening shall be at least 1,320 feet as measured from the end of the taper of the egress ramp.

f) Access Connection and Driveway Design

- 1) Driveway grades shall conform to the requirements of LA DOT Roadway Design Procedures and Details (Road Design Manual).
- 2) Driveway approaches must be designed and located to provide an exiting vehicle with an unobstructed view.
- 3) Construction of driveways along acceleration or deceleration lanes and tapers is discouraged due to the potential for vehicular weaving conflicts.
- 4) Driveways with more than one entry and one exit lane shall incorporate channelization features to separate the entry and exit sides of the driveway. Double yellow lines may be considered instead of medians where truck off-tracking is a problem.
- 5) Driveways across from median openings shall be consolidated wherever feasible to coordinate access at the median opening.
- 6) Driveway width and flair shall be adequate to serve the volume of traffic and provide for rapid movement of vehicles off the major thoroughfare, but standards shall not be so excessive as to pose safety hazards for pedestrians, bicycles, or other vehicles.
- 7) The length of driveways or "Throat Length" for major developments shall be designed in accordance with the anticipated storage length for entering and exiting vehicles to prevent vehicles from backing into the flow of traffic on the public street or causing unsafe conflicts with on-site circulation.

g) Reverse Frontage Lots

- 1) Access to double frontage lots shall be required on the street with the lower functional classification.
- 2) When a residential subdivision is proposed that would abut an arterial, it shall be designed to provide through lots along the arterial with access from a frontage road or an interior local road.

- 3) No access rights of these lots to the arterial shall be permitted by the plat. In addition, the Planning and Zoning Commission may require a berm or buffer yard at the rear of through lots to buffer residences from traffic on the arterial. The berm or buffer yard shall not be located within the public right-of-way.

Sec. 130-23. Drainage Requirements

The requirements for drainage control, whether surface or subsurface, shall be in accordance with the Flood and Drainage Protection Standards of section 130-31.

- 1) An impact fee for drainage will be collected to provide for the maintenance of the stormwater drainage system.

Sec. 130-24. Easements

a) General Requirements

- 1) All existing easements that traverse or border any property planned for development under these Regulations must be indicated on the plans submitted to the Planning and Zoning Commission for approval.
- 2) The Parish shall control the space allocation in street right-of-way and in public easements.

b) Utility Easements

- 1) Easements across lots or centered on rear or side lot lines shall be provided for utilities where necessary.
- 2) Utility easements shall have a total width of at least ten (10') feet, subject to Public Works and Utilities Department approval.

c) Drainage Easements

- 1) Where a subdivision is traversed by a water course, drainage way, channel, or stream, there shall be provided a storm water easement or drainage easement.
- 2) The drainage easement will be at least twenty (30') feet in width on each side of the water course, drainage way, channel, or stream and conforming substantially to the lines of such water courses.
- 3) Additional width of a drainage easement may be required to adequately handle drainage in a safe and effective manner.
- 4) The drainage easement shall meet the requirements of the Parish Engineering Departments responsible for drainage service.

- 1 5) A drainage easement may be less than twenty (30') feet if recommended by the Department
2 of Public Works and approved by the Planning and Zoning Commission.
- 3 6) Parallel streets or parkways may be required in connection with drainage easements for
4 major waterways.

6 **Sec. 130-25. Sidewalks**

7 a) General

- 8 1) All subdivisions may, but are not required, provide for the construction of sidewalks.
- 9 2) If sidewalks are provided, such shall not lie within the area proposed for dedication to the
10 Parish.
- 11 3) Sidewalks constructed within the area dedicated to the Parish for roads, drainage, or any
12 other use, shall be the responsibility of the adjacent property owner and not the Parish.

13 b) Sidewalks for Development Fronting on State Highways.

- 14 1) If the developer intends to construct the sidewalk in the State right of way, he must request
15 approval from the LA DOTD before submittal of the preliminary plat.
- 16 2) If the LA DOTD approves the application, the sidewalks will be shown on the preliminary
17 plat as approved by the LA DOTD.
- 18 3) The Parish shall have no responsibility for the maintenance of sidewalks constructed in the
19 State right of way.

20 c) Sidewalks constructed on a private street shall be the sole responsibility of the adjacent 21 property owner.

23 **Sec. 130-26. Bikeways and Trails**

24 a) General Requirements

- 25 1) Bikeways and or trails may be required on major plats when indicated as part of the Parish
26 Rural Development Plan.
- 27 2) If a bikeway or trail is required on a plat, the applicant shall only be required to provide an
28 easement for the future construction of the bikeway or trail.
- 29 3) The applicant may construct the bikeway or trail as a benefit and amenity for the
30 subdivision.

- 1 4) Bikeways and trails shall have a minimum width of seven (7') feet within an easement of
2 12 feet.

3
4 **Sec. 130-27. Utilities**

5 a) Water

- 6 1) For all proposed subdivisions within the Parish of West Feliciana, the sub divider shall
7 enter into an agreement with the appropriate Utilities Provider for the extension of the
8 public water system, including the installation of standard valves, fire hydrants, etc., so that
9 public water service shall be available for each lot within the subdivision. The developer
10 will bear any cost associated with upgrades necessary to serve their development.

11 i) All new water lines shall be a minimum 8" diameter.

- 12
13 2) Fire hydrants shall be designed to meet the specifications and located in accordance with
14 the standards promulgated by the appropriate Fire District.

15 b) Sanitary Sewer

- 16 1) If a subdivision is so located that it can be served by the extension of an existing public
17 sanitary sewer within a reasonable time, the sub divider shall enter into an agreement with
18 the appropriate Sewer District for the extension of the said sewer so that sanitary sewer
19 service shall be available for each lot within the subdivided area. The developer will bear
20 any cost associated with upgrades necessary to serve their development.

- 21 2) If the subdivision is located where a public sanitary sewer system is accessible, the
22 subdivider shall connect with such sanitary sewer system and provide adequate sewer lines
23 to each lot.

24 i) A sewer connection fee of \$100.00 per lot is charged developers of subdivisions, which
25 fee shall be collected when final acceptance is made by the council.

26 ii) Sewer connections and subdivision sewage collection and disposal systems shall
27 comply with the regulations of the L.D.H.H.R. O.H.S.E.Q.

28 iii) The council will review and approve the engineering calculations for these systems
29 prior to any construction.

30 iv) Sewage collection lines, treatment plants, etc., shall be inspected by the council and
31 written approval of these improvements shall be obtained from the council.

- v) In addition to the connection fee described above, an impact fee for wastewater collection and treatment will be required and collected at the time of final plat approval or building permit application for all new developments and construction requiring public sewer tie-ins in approved subdivisions. These wastewater impact fees will be based on the following table with daily average flows (and thus equivalency factors) as determined by Title 51, Chapter 15 of the Louisiana Public Health-Sanitary Code. (NOTE: An equivalency factor of 1.0 is equal to a unit that produced 400 gpd average wastewater flow.)

Table Error! No text of specified style in document..4 Impact Fee Numbers

Base Rate: \$750.00 for residential development; \$1,000.00 for commercial development

400 gpd = 1.0 equivalency factor

Building Type/Land Use	Daily Average Flow (gpd)	Resulting Equivalency Factor	Base Rate Multiplied by Number of...
Apartments, one bedroom	250	0.63	One-bedroom units
Apartments, two bedrooms	300	0.75	Two-bedroom units
Apartments, three bedrooms	400	1	Three-bedroom units
Assembly	2	0.01	Seats
Bowling alleys (no food service)	75	0.19	Lanes
Churches	5	0.01	Sanctuary seats
Churches (with permitted kitchens)	10	0.03	Sanctuary seats
Country clubs	50	0.13	Members
Dance halls	2	0.01	Permitted occupants
Drive-in theaters	5	0.01	Car spaces
Factories (no showers)	20	0.05	Employees
Factories (with showers)	35	0.09	Employees
Food service operations			

Restaurants (not 24-hours)	35	0.09	Seats
Restaurants (24-hour service)	50	0.13	Seats
Banquet rooms	5	0.01	Seats
Restaurants (along highway)	100	0.25	Seats
Restaurants, drive-in, curbside service	50	0.13	Car spaces
Bars, cocktail lounges, taverns	30	0.08	Seats
Video poker	100	0.25	Machines
Restaurants (fast food)	40	0.1	Seats
Hotels/motels (w/ food service)	145	0.36	Rooms
Homes and mobile homes (in subdivisions)	400	1	Units
Homes and mobile homes (in isolated, rural areas that are not part of subdivisions)	300	0.75	Units
Hospitals (no resident personnel)	200	0.5	Beds
Institutions (with residents)	100	0.25	People
Municipalities	100	0.25	People
Mobile home parks (six trailer spaces or more)	300	0.75	Mobile home spaces
Hotels and motels (without food service)	100	0.25	Rooms
Nursing homes	100	0.25	Patients
Office buildings	20	0.05	Employees
Recreational vehicle parks and camps	125	0.31	Trailer or tent spaces
Retail stores	20	0.05	Employees
Schools (elementary)	15	0.04	Students
Schools (high and junior high)	20	0.05	Students
Retail fuel stations (on major highways)	250	0.63	Fueling points

Shopping centers (no food service or laundry)	0.2	0.0005	Square feet
Swimming pools	10	0.03	Swimmers
Showers	20	0.05	Showers
Vacation cottages	50	0.13	People
Youth and recreation camps	50	0.13	People
Washing machines	400	1	Machines

- 3) The establishment, collection, oversight, investment and disbursement of all accounts and funds imposed by this impact fee shall be coordinated by the director of utilities and shall be performed according to the procedures and norms set forth in chapter 136, pertaining to impact fees. The definitions listed in section 136-2 are applicable to this section as well.
- 4) If public sanitary sewers are not available, the subdivision may be approved with a community collection system and treatment plant approved by the Parish Engineer and State Health Department.
- 5) All effluent discharged must meet State Health Regulations.
- 6) Developments of greater than 9 homes or units are required to provide a public sanitary sewer collection system.
- 7) No plat will be approved for an individual sewer system unless the applicant has obtained a permit from the State Health Officer and the minimum lot size is in accord with State regulations.
- 8) Design Specifications for sewage treatment plants
 - i) Gravity Collection (See Appendix I)
 - ii) Force Main (See Appendix II)
 - iii) Self Prime (See Appendix III)
 - iv) Sub Pump (See Appendix IV)
 - v) Submersible Sewage Pump Systems and Controls (See Appendix V)
 - vi) Wastewater Treatment Plant (See Appendix VI)
- c) Electricity

- 1) An underground electrical distribution system shall be provided in all Major residential and commercial subdivisions.
- 2) In industrial subdivisions, the electrical distribution system may be placed above or below ground as determined by the needs and proposed uses of the subdivision.

d) Other Utilities

- 1) The subdivision may make provisions for other utilities, including but not limited to telecommunications, cable, and gas services.
- 2) Easements for other utilities must be shown on the Plat.
- 3) Co-location of utilities is allowed if it meets all requirements of the respective utilities and is approved by the Planning and Zoning Commission on the preliminary plat.

Sec. 130-28. Common Sites and Open Space

a) General Requirements

- 1) The location of all lands within the subdivision intended to be conveyed or reserved in the deed, for use of all property owners shall be shown on the Preliminary and Final Plats.
- 2) The applicant shall identify the proposed method of ownership, management, and maintenance, of common spaces created by the plat.
- 3) The Planning and Zoning Commission may request any additional information it deems necessary to evaluate the proposal.

b) Conformance with Adopted Plans

When the Comprehensive Plan or other adopted plan for West Feliciana Parish shows a proposed park, playground, or other site for public use that is: located in whole or in part in a proposed subdivision; or, where open space dedication or reservation is indicated in the Comprehensive Plan design criteria for the area within which the subdivision is located; the Planning and Zoning Commission may:

- 1) Require dedication of the property for the public use when the primary beneficiaries of the public facility will be residents of the subdivision.
- 2) Require the applicant provide the facilities as common site or open space within the subdivision.
- 3) Require the reservation of such land within the proposed subdivision for later public acquisition.

c) Reservation of Land for Public Use

- 1) If the Planning and Zoning Commission requires reservation of land for public use, such reservation shall continue in effect for a period of not more than one (1) year from the date of filing of the proposed subdivision plan.
- 2) Reservation of land may be released early upon written notice by the respective governmental agency.
- 3) Additional reservation time may be provided upon mutual agreement of the sub divider and the appropriate governmental agency.
- 4) For lands intended for reservation, the sub divider may provide alternate plans for the development if lands set aside for public use are not acquired by the respective governmental agency.
- 5) If the appropriate governmental agency does not initiate action toward a commitment to acquire the land held in reservation during the period of such reservation, upon the expiration of the reservation any alternate subdivision plans for the tract shall become an integral part of the subdivision and upon meeting all technical requirements as found in these Regulations, shall be deemed to have obtained Preliminary Subdivision approval by the Planning and Zoning Commission.

Article V - Flood and Drainage Protection Standards

Sec. 130-29. Statement of Policy

- a) The following standards shall apply in addition to any other stated provisions for all proposed development within West Feliciana Parish both within and outside the currently designated one hundred (100) year flood hazard area.
- b) The Planning and Zoning Commission shall not allow the subdividing of any land in the flood hazard area where such land is found to be incompatible with its proposed use due to poor drainage, flooding, or other factors, which would make the area vulnerable to flood damages that could pose a potential hazard to public health and safety. Drainage standards and design criteria shall be maintained by the parish Department of Public Works (DPW).
- c) The objectives of the Storm water management plans required for new developments are:
 - 1) To reduce flood risk.
 - 2) Minimize adverse drainage impacts.
 - 3) Improve water quality.
 - 4) Promote sustainable infrastructure.

1 5) Reduce maintenance cost.

- 2 c) A drainage impact analysis shall be required for all major subdivisions or developments. A
3 drainage impact analysis may also be required for standard subdivisions. The drainage impact
4 analysis presents the storm water management plan. The storm water management plan shall
5 propose solutions to mitigate any adverse drainage impact. The storm water management plan
6 may include retention or detention ponds, and or elements of Low Impact design.

7
8 **Sec. 130-30. Development Within the 100-year Flood Hazard Area**

9 a) General Requirements

10 1) Development within this area shall be discouraged.

11 2) No development, fill, or obstruction of any type on or over any portion of a Designated
12 Floodway shall be permitted which alone or cumulatively with other such development,
13 fill or obstructions would cause or result in an obstruction or other situation which would
14 adversely affect the efficiency of or restrict the flow or capacity of a Designated Floodway
15 to cause foreseeable damage to others, wherever located.

16 3) Any proposal for development in a Designated Floodway shall obtain a Conditional Letter
17 of Map Revision (CLOMR). This certification is subject to review and approval or denial
18 by the West Feliciana Parish Floodplain Administrator and/or FEMA.

19 4) Development proposals shall have public utilities and facilities such as water, sewer, gas,
20 and electrical systems located and constructed to minimize flood damage.

21 5) New and replacement sanitary sewage systems shall be designed to minimize infiltration
22 of flood waters into the system and discharges from the system into flood waters.

23 6) New and replacement water distribution systems shall be designed to eliminate infiltration
24 of flood waters into the system and discharge from the system into flood waters.

25 7) Fill or other materials placed within a known flood hazard area or flood plain area shall be
26 protected against erosion. Acceptable means of protection include but are not limited to:
27 Riprap, vegetation covers, hydro-mulch, erosion control matting or bulk heading.

28 8) Placement of fill in the FEMA one hundred (100) year flood plain shall be mitigated by
29 excavation of fill material within the FEMA one hundred (100) year flood plain. No
30 reduction in the storage volume for storm water will be allowed below the FEMA base
31 flood elevation (100-year flood elevation).

32 9) All developments shall comply with the provisions of the Flood Damage Prevention
33 Ordinance of the applicable governing authority.

1 10) Lots within subdivisions designed for residential developments that are in the 100-year
2 flood zone, according to the latest FIRM, shall have the standard flood note information
3 statements on the plat and the 100-year flood zone line shall be delineated or noted on the
4 plat in accordance with the FIRM.

5 b) Manufactured Home Park Floor Elevations

6 1) Topographic contours shall be shown on the plat at one (1') foot elevation changes so that
7 it can be determined if manufactured homes, when set in place, shall have their floors at a
8 minimum of one (1') foot above the base flood elevation height and in accordance with
9 other applicable regulations.

10 2) When the foregoing cannot be established, the mobile homeowner shall take the necessary
11 precautions and certify to the Building Department, through the Flood Plain Administrator
12 having authority, that the manufactured home has been set to the required elevation to meet
13 the base flood elevation Flood Program Regulations.

14 3) The foregoing shall be required prior to provision of utilities or equipment integral to the
15 occupancy of the mobile home, e.g., air conditioning equipment, water heater, electrical
16 panels, etc.

17 c) Residential and Nonresidential Floor Elevations

18 1) Lots within developments proposed for residential, commercial, industrial, or other
19 nonresidential development shall be designated as being in or out of the 100- year Flood
20 Zone or Floodway as per the latest FIRM.

21 2) The plat shall state the following:

22 i) "Any structure, enclosed on three or more sides, built on property in the one hundred
23 (100) year Flood Zone as depicted on this plat shall be elevated to ensure the lowest
24 floor of such structure is located at a minimum of one (1') foot above the base flood
25 elevation for that area at that time.

26 a. Excluded from the foregoing are garages, carports and porches, which shall be
27 located at a minimum of six (6") inches above the base flood elevation.

28 ii) "In the event the property is in a Floodway, development is subject to review and
29 approval or denial by the West Feliciana Parish Floodplain Administrator and/or
30 FEMA."

31 iii) "Any utility and sanitary facilities shall be installed so as to minimize the effect on
32 same by Flood Waters."

33 iv) When certain circumstances as defined by FEMA may allow for flood proofing a
34 structure, the plat may state that:

- 1 a. "In lieu of elevating the structure on a site that falls within the 100- year flood
2 zone to an elevation equal to or above the base flood elevation, the building
3 may be flood-proofed as certified by a Louisiana Licensed Engineer or Land
4 Surveyor and approved by the Flood Plain Administrator."

5 d) Plat Submittal Requirements for Designated Flood Hazard Areas

6 Where any part of the proposed subdivision or development is located within a
7 Designated/Identified Flood Hazard area, the following additional information shall be provided
8 at a scale sufficient to determine compliance with this chapter.

- 9 1) Flood Plain Analysis shall be required for all subdivisions or developments of 5 acres or
10 more located within a Designated Flood Hazard. The complete analysis may be conducted
11 after Preliminary Plat approval by the Parish Council if the preliminary plat approval is
12 conditioned on completion and compliance with all findings of the flood plain analysis.
- 13 2) Any Flood Plain Impact Analysis conducted for a subdivision or development located in
14 Designated Flood Hazard Area Zone "A" shall include, as an integral part of the Flood
15 Plain Impact Analysis a Base Flood Elevation Determination in accordance with FEMA
16 document, "Managing Floodplain Development in Approximate Zone A Areas."
- 17 3) The Preliminary or Final Plats must clearly delineate areas of the development which are
18 in the 100-year flood hazard area as identified by the FIRM in effect at the time of
19 submittal.
- 20 4) Base flood elevation data shall be included on plats having any portion of proposed
21 property within an Identified Flood Hazard Zone.
- 22 i) The plat submittal shall delineate limits of Flood Hazard Zone identified in the FIRM.
- 23 5) The Preliminary and Final Plats shall delineate all streams and channels and water courses
24 in the designated flood hazard zone.
- 25 6) The Final Plat submittal shall include a declaration that "Development is not allowed in
26 designated floodway areas unless technical data is submitted to and approved by the Public
27 Works Director (or his/her designee), local Flood Plain Administrator and other applicable
28 regulatory agencies." See 130-30.a.2.

29
30 **Sec. 130-31. Drainage Plans Required for Major Subdivisions and Developments**

31 a) General Requirements

- 1) A Drainage Impact Analyses shall be required for all proposed major subdivisions or developments. Drainage Impact Analysis may be required for standard subdivisions by the Department of Public Works.
- 2) All proposed major subdivisions and other development that results in an increased risk of flooding to surrounding properties as determined by the drainage impact analysis shall be required to mitigate the increase through drainage improvements specified in the drainage plans.
- 3) The Drainage Impact Analysis of any proposed development and surrounding affected areas may be submitted to the Public Works Department after Preliminary Plat approval if the preliminary plat approval is conditioned on completion and compliance with all findings of the Drainage Impact Analysis.
- 4) The final plat and any development construction plans shall not be approved until a favorable written certification of the Drainage Impact Analysis has been made by the Public Works Director (or his/her designee).
- 5) Should the Drainage Impact Analysis determine the development will increase the risk of flooding to surrounding properties:
 - i) The plat shall be revised by the applicant to address the identified drainage impacts.
 - ii) The plat shall be returned to the Planning and Zoning Commission with revisions needed to meet the drainage impact issues for re-review.
 - iii) The Planning and Zoning Commission must find that revisions proposed to the preliminary plat will meet the drainage impacts before approval of a revised Preliminary Plat.
 - iv) No construction of any development components which are the subject of any Preliminary or Final plat approval by the Planning and Zoning Commission shall be commenced until a favorable written approval of the Drainage Impact Analysis has been made by the Public Works Director (or his/her designee). Violation of this provision can result in a cease-and-desist order being issued with respect to such development.
- (1) The developer's design engineer shall make provision in the drainage plan for each subdivision or development to accommodate potential runoff from its entire upstream drainage area, whether inside or outside of the development.
- (2) The design engineer shall study the effect of each subdivision or development on existing downstream drainage facilities or roadside ditch outside the area of the development. This portion of the study shall be limited to the effluent channel only.

- (3) Streets and lots of a proposed development shall be arranged so as to minimize artificial drainage channel relocation.
- (4) Storm sewers shall be constructed in accordance with Public Works design standards and with approved materials.
- (5) All roadway cross drains shall be reinforced concrete. No other material (i.e., plastic, metal, etc.) will be accepted unless otherwise approved by the Public Works Department.

(b) Exceptions

- (1) In areas where existing and/or development conditions will not accommodate equivalent discharge rates, as determined solely by the Public Works Department, a maximum increase of the pre-developments discharge rate of five (5%) percent of said rate, not to exceed five (5) cubic feet per second, shall be allowed.
- (2) Other methods of detention/retention must be utilized with prior approval of the Public Works Director (or his/her designee).

Sec. 130-32. Maintenance of Storm Water Management Facilities

(a) Maintenance Required by Property Owner

- (1) The owner of the proposed development or any successor who acquires title to the storm water management facility created as part of an approved plat or development plan shall always maintain the design section of the storm water management facility as indicated on the approved drainage plan(s).
- (2) Maintenance (such as mowing, bank or bulkhead repairs, and removing debris and trash that occurs on a regular basis, etc.) of all other public or private areas, access areas, or privately owned lots, which are a part of or adjacent to the facility shall be the responsibility of the owner of the storm water management facility.
- (3) In the event the Public Works Department determines that the storm water management facilities have not been maintained, the owner shall make the necessary modifications to conform to the original approved drainage plan within a thirty (30) day period from written notification from the Public Works Department.
- (4) Compliance with this section shall be mandatory and the requirements of this section shall be included on the Site Drainage Plan as well as within the Drainage Impact Analysis Report and shall be acknowledged in writing by the owner and/or developer, if different from owner.

- 1 (5) The developer shall provide the Public Works Department with an agreement or other
2 contractual arrangement evidencing that adequate provision has been made for future
3 maintenance of the facility in those instances where the facility is to be transferred by
4 the developer or is to be acquired by an Owners Association or other similar entity.

5 (b) Maintenance by the Parish

- 6 (1) If the owner does not act within the required time frame to remedy the situation, the
7 Public Works Department may perform the necessary modification, improvements, or
8 maintenance and bill the owner for the work at its operating cost, at such rates as have
9 been set by the Parish wage rates or FHWA equipment rates.
- 10 (2) Access in favor of West Feliciana Parish shall be provided from a public dedicated road
11 to the storm water management facility. The access shall be no less than a clear 20-foot-
12 wide travel way (graded to accommodate use by equipment) and sufficient area
13 proximate to such travel ways to allow de-siltation activities. A note shall be placed on
14 the final plat indicating that this access shall be provided to West Feliciana Parish.
- 15 6) In the event West Feliciana Parish determines that any storm water detention facility
16 requires desilting to ensure proper performance of such facility, then West Feliciana Parish
17 may perform on behalf and at the expense of the owner of such facility, the de-siltation and
18 other required remedial measures as determined necessary by West Feliciana Parish.
19 However, in no event shall West Feliciana Parish be obligated to perform such de-siltation
20 if West Feliciana Parish determines that the owner of the facility has not properly
21 maintained such facility.

22 b) Certifications

- 23 1) The engineer of record responsible for design of the site plan, drainage plan, or detention
24 facility for any development shall provide a letter of certification to the Public Works
25 Department prior to granting Final Plat approval. The letter shall certify that the
26 improvements were constructed in accordance with the approved construction plans and
27 specifications.

28
29 **Article VI - Variances**

30 **Sec. 130-33. Relief from Strict Compliance**

- 31 a) Upon application by the sub divider and where it can be shown in the case of a particular
32 proposed subdivision, that strict compliance with the requirements would result in
33 extraordinary hardship to the sub divider because of unusual topography, or other such
34 conditions, thus retarding the achievement of the objectives of these regulations, the sub
35 divider may be granted a variance from an identified provision of this Chapter.

- 1 b) A variance may vary, modify, or waive requirements so that substantial justice may be done,
2 and the public interest secured; provided that such variance, modification or waiver will not
3 have the effect of nullifying the intent and purpose of these regulations, or of the Development
4 Plan.
- 5 c) In no case shall any variance, modification or waiver be more than a minimum easing of the
6 requirements; in no case shall it have the effect of reducing the traffic capacity of any arterial
7 collector or minor streets; and in no case shall it have the effect of worsening drainage
8 conditions upstream or downstream of the development.
- 9 d) Variances shall be considered by the following procedure:
 - 10 1) The Administrator shall identify a proposal in a subdivision application that requires a
11 variance.
 - 12 2) The Administrator shall identify the specific provision or requirement of this Chapter for
13 which a variance is proposed.
 - 14 3) An application requiring a variance shall not proceed unless and until the variance is
15 granted.
 - 16 4) For a minor subdivision, the Administrator shall have the authority to grant a variance, in
17 accordance with this Article.
 - 18 5) For a standard subdivision, the Administrator shall make a recommendation to the Planning
19 and Zoning Commission, which Commission shall have the authority to grant a variance
20 in accordance with this Article.
 - 21 6) For a major subdivision, the Administrator and the Planning and Zoning Commission shall
22 both make a recommendation to the Parish Council, which shall have the authority to grant
23 a variance in accordance with this Article.

24 25 **Sec. 130-34. Variance Review Criteria**

- 26 a) To grant a Variance, the application must be determined to meet all the following criteria:
 - 27 1) The applicant will suffer under burden without the grant of the requested variance, which
28 cannot be only financial.
 - 29 2) The need for the variance cannot have resulted from an action of the applicant.
 - 30 3) There is no reasonable alternative subdivision proposal for which the same or similar
31 variance would not be required.

1 4) The grant of the variance will not impose a significant negative impact on adjacent property
2 owners or the community.

3 5) The variance is the least accommodation available to facilitate the approval of the
4 subdivision.

5 b) The applicant or an adjacent property owner may appeal the grant or denial of a variance using
6 the appeal process for the type of subdivision to which the variance would be applicable.
7

8 **Article VII - Enforcement**

9 **Sec. 130-35. Enforcement**

10 a) Enforcement of this chapter shall be the responsibility of the West Feliciana Parish President
11 and his designee(s).

12 1) Any person who violates any provision of the present subdivision regulations as revised
13 herein shall, upon conviction by a court of competent jurisdiction, be penalized by a fine
14 of not less than \$100.00 nor more than \$500.00. Each sale, residential lease, exchange, or
15 other disposition of any lot shall constitute a separate violation.

16 b) All fines and penalties shall be paid to West Feliciana Parish Government.

17 c) In addition to the fines and penalties herein above provided, the West Feliciana Parish
18 Government shall have the power and authority to seek injunctive relief in any court of
19 competent jurisdiction, enjoining any person who is in violation of the present subdivision
20 regulations, as revised herein, to:

21 1) Prevent the sale, residential lease, exchange, or other disposition of any new lot in any
22 subdivision not approved in accordance with the present subdivision regulations as revised.

23 2) Prevent the installation of utility systems within any subdivision or present utility service
24 to any lot in any subdivision in violation of the present subdivision regulations as revised.

25 3) Prevent issuance of building and development permits to any lot in any subdivision in
26 violation of the present subdivision regulations as revised.

27 4) Prevent approval of any water/sewage improvements for lot or parcel of land in any
28 subdivision in violation of State Health regulations and present subdivision chapter as
29 revised.

30 d) No utility company shall provide, electric, gas, sewer, communications or other utility services
31 to any lot, nor shall any lending institution lend funds for the construction or improvements on
32 any lot, nor shall any building permit agency issue any building permits for the construction
33 of any improvements on any lot, tract or parcel of land, nor shall any attorney or notary pass a

1 transfer of any lot, tract or parcel of land subdivided after the date of adoption of the
2 subdivision chapter as revised, as evidenced by the public records without first being presented
3 with a plat of final approval from the engineer review agency or Planning and Zoning
4 Commission of the lot, tract, or parcel of land on which utility services are to be provided, or
5 improvements to be constructed . Any person who violates any provision of the present
6 subdivision regulations as revised shall, upon conviction by a court of competent jurisdiction,
7 be penalized by a fine of not less than \$100.00 nor more than \$500.00. All fines and penalties
8 shall be paid to the West Feliciana Parish Government.
9

1 **CHAPTER 130**

2 **APPENDIX I – GRAVITY COLLECTION**

3 **Article 1) Gravity Sewage Collection**

4 **Article 2) GENERAL**

5 **Article 3) DESCRIPTION OF WORK**

6 **Article 4)** The work covered by this section of these specifications consists of the construction of
7 sewers and manholes complete as specified herein.

8 1.1 Minor details not usually shown or specified, but necessary for the proper installation
9 and operation, shall be included in the work, the same as if herein specified or shown.

10
11 1.2 All materials furnished and all work installed shall comply with the requirements of all
12 governmental departments having jurisdiction.

13
14 **Article 5) MATERIALS AND WORKMANSHIP**

15
16 1.3 All materials and apparatus required for the work, except as specifically specified
17 otherwise, shall be new, of first class quality, and shall be furnished, delivered, erected,
18 and connected, and finished in every detail, and shall be so selected and arranged as to
19 fit properly.

20
21 1.4 All equipment and materials shall be installed in accordance with the recommendations
22 of the manufacturer, including the performance of such tests as the manufacturer
23 recommends.

24
25 1.1 **SUBSTITUTION OF MATERIALS**

26
27 A. Substitution of materials shall be in accordance with the provisions of these
28 specifications.

- 1 B. Should a substitution be accepted and should the substitute material prove
2 defective or otherwise unsatisfactory for the service intended and within the
3 guaranty period, this material or equipment shall be replaced with the new material
4 or equipment specified by name.
5

6 1.2 DEFINITIONS
7

- 8 A. For the purposes of these specifications, the Parish Engineer shall be defined as:
9 the office of the Parish Engineer, the Department of Public Works, or the
10 Engineering Review Agency.
11

- 12 B. For the purposes of these specifications, the following describe the limits of work:
13

- 14 1. Roadbed: width of roadway, either edge of pavement of edge of pavement;
15 or, back of curb to back of curb, plus five (5) feet on both sides.
16
17 2. ROW Transition Area: area between edge of Roadbed and established
18 ROW.
19
20 3. Lots: all work outside of the ROW as indicated on the construction plans.
21

22 PART 2 - PRODUCTS
23

24 2.1 PIPE, VALVES AND FITTINGS
25

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

- 27 1. Solid wall PVC in sizes 4" through 15" shall be DR35 (dimension ratio
28 35) conforming to ANSI/ASTM D 3034 except with the additional
29 requirement that the basic material shall be only Cell Class 12454-B and
30 additionally shall comply with PVC 1120 with a long-term 2000 psi

1 hydrostatic design stress. Fittings for solid wall PVC sewer pipe shall meet
2 the requirements of ASTM D 3034.

- 3 2. Solid wall PVC pipes in sizes 18" through 27" shall have a uniform solid
4 wall and a minimum Pipe Stiffness of 46 psi with wall thickness T-1 (DR
5 35) unless designated otherwise, in compliance with ASTM F679, except
6 that the basic material shall be only Cell Class 12454 B with the additional
7 requirements that it shall comply PVC 1120 with a long-term 2000 psi
8 hydrostatic design stress.
- 9 3. PVC profile wall pipe, "Ultra-Rib", meeting the requirements of ASTM F
10 794. Fittings for profile wall PVC pipe shall meet the requirements of
11 ASTM D 3034.
- 12 4. PVC corrugated pipe, "A-2000", meeting the requirements of ASTM F
13 949. Fittings for corrugated PVC sewer pipe shall meet the requirements
14 of ASTM F 949.
- 15 5. Ductile Iron gravity collection pipe shall conform to AWWA C 151,
16 Thickness Class 51. Pipe shall be epoxy or polyethylene lined and
17 bituminous coated. A bonded polyethylene lining shall be equal to that
18 manufactured by American Cast Iron Pipe or U.S. Pipe and thickness shall
19 be 40 mils nominal and 25 mils minimum in pipe tapering to 10 mils
20 minimum at joints. Epoxy lining shall comply with AWWA C 550 and be
21 2-coat high-build catalyzed epoxy with thickness range of 8 to 16 mils total
22 dry film thickness. Bituminous coating shall conform to ANSI A 21.51.
- 23 6. In lieu of epoxy coated ductile iron pipe under subdivision streets, other
24 specified types of pipe may be used provided they are installed in casings.
25 Casings shall be steel casing meeting the specifications for Steel Pipe for
26 Jacking and Boring specified hereinafter or AWWA C 151, thickness
27 Class 51 ductile iron pipe having the standard manufacturer's lining and
28 coating.

29
30 B. Steel Pipe for Jack & Bore Casing (State or Federal Highways)

31 1. Pipe

32 Where casing pipe is shown on the Drawings, pipe shall be steel having a minimum yield stress of
33 35,000 psi, conforming to ANSI B 36.10 or API 5L. Casings shall have the following wall
34 thicknesses:

Size <u>Diam., In.)</u>	<u>(Non-Diameter</u> <u>Base</u>	Nom. Thickness <u>Uncoated (Inches)</u>	Nom. Thickness <u>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 (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.

1
2 C. Polyvinyl Chloride Pipe (PVC) For Direct Boring
3

4 In Lieu of steel casings and carrier pipes specified hereinbefore Restrained Joint PVC pipe in sizes
5 8" through 12" equal to CertainTeed Certa-Lok C900/RJ, Class 200 may be used and installed to
6 line and grade by direct boring methods. To be verified by LaDOTD or Railroad approving agency.
7

8 2.2 MANHOLES
9

10 A. Precast Concrete Manholes
11

12 Precast reinforced concrete manholes including tops, cones, intermediate and base sections shall
13 conform to ASTM C 478. Manhole sections shall utilize rubber gaskets conforming to ASTM C
14 443 or preformed plastic joint sealant conforming to ASTM C-990 and installed according to the
15 manufacturer's recommendations. Coat manhole interiors with XYPEX "Concentrate" and
16 "Modified" per manufacturer's recommendations or use XYPEX C-1000T admixture during
17 manufacture of manholes. All precast concrete for force main receiving manholes and one manhole
18 upstream and downstream of force main entry locations shall be contain anti-corrosion additive,
19 ConShield or equivalent. Wrap all joints with six (6") inch wide plastic joint sealant equal to EZ-
20 Wrap as manufactured by Press-Seal Gasket Corp. Lifting inserts shall be embedded in manhole
21 walls, through wall holes are prohibited. Invert channels shall be smooth and accurately shaped to
22 a semi-circular bottom conforming to the inside of the adjacent sewer section. Channels shall
23 extend up at least three-quarters (3/4) of the inside diameter of the pipe. Changes in the direction
24 of sewer flow shall follow a smooth radius curve.
25

26 B. Cast-In-Place Manholes
27

28 Concrete for Cast-In-Place Manholes shall be a minimum 4,000 psi at 28 days. Coat manhole
29 interiors with XYPEX "Concentrate" and "Modified" per manufacturer's recommendations or use
30 XYPEX C-1000T admixture during manufacture of manholes. All concrete for force main
31 receiving manholes and one manhole upstream and downstream of force main entry locations shall
32 be contain anti-corrosion additive, ConShield or equivalent. 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

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

9 10 D. Manhole Drop Connections

11
12 If inlet pipe enters the manhole 2 feet above the manhole invert or higher, an external drop line is
13 required and shall comply with details in the Plans. The drop line shall be of the same size and
14 material as that of the inlet pipe. Backfill drop assembly with sanitary sewer bedding material.
15 Extend the bedding material a minimum of 6 inches outside bells.

16 17 18 PART 3 - EXECUTION

19 20 3.1 TRENCHING AND FORMING PIPE BED

21
22 A. Excavation shall include the removal, handling, re-handling, refill or backfilling,
23 and disposal of any and all material encountered in the work, and shall include all
24 pumping, bailing, drainage and sheeting and bracing.

25
26 B. The work of excavation shall also include the removal and disposal of quicksand,
27 obstacles or other conditions, which may be encountered in the work. It includes
28 the clearing and removal of pavements, curbs, sidewalks, shrubbery, and other
29 obstructions not otherwise provided for in the plans.

30
31 C. The width of the trench shall be equal to the pipe outside diameter plus 18" to
32 permit thorough tamping of the backfill under the haunches and around the pipe.

- 1
- 2 D. Where firm foundation is not encountered at the grade established, due to soft,
- 3 spongy or other unstable soil conditions, such unstable soil shall be removed and
- 4 replaced with a foundation fill consisting of bedding material (specified
- 5 hereinafter) or other suitable approved material properly compacted to provide
- 6 adequate support for the pipe.
- 7
- 8 E. All pipe shall be carefully laid to the lines and grades shown on the plans. Any
- 9 pipe not true in alignment or which shows settlement after laying, shall be
- 10 removed and re-laid at the Developer's expense.
- 11
- 12 F. Wherever practical, pipe laying shall begin at the downstream end of the line.
- 13 Before being set in place each section of pipe shall be thoroughly cleaned, and
- 14 free of dirt. All bells shall be laid on the upstream end.
- 15
- 16 G. The lower segment of the pipe barrel shall be supported by the earth foundation
- 17 or bedding for the full length of the barrel. Bell holes where required shall be
- 18 carefully excavated to provide uniform bearing for the pipe barrel.
- 19
- 20 H. Bedding material shall be a 65% - 35% sand-aggregate mixture or stone
- 21 conforming to LADOTD Subsection 1003.10. Aggregate in mixture shall be
- 22 gravel, stone or crushed concrete. The mixture shall be free of foreign matter.
- 23 Provide certified gradation test report meeting LADOTD Subsection 1003.08 for
- 24 bedding material for approval by the Parish Engineer. This shall occur at the
- 25 beginning of the project. Bedding material shall be placed in the trench beginning
- 26 a minimum of six (6) inches below the pipe invert and carefully compacted under
- 27 and around the pipe to a point twelve (12) inches above the top of the pipe. Where
- 28 poor soils are encountered, bedding requirements shall be as shown in the Plan
- 29 details. The Resident Project Representative will make the determination on
- 30 whether the soil will be deemed as "poor soil" and eligible for more extensive
- 31 bedding requirements.
- 32
- 33 I. Where the trench falls within the Roadbed, backfill from the point twelve (12)
- 34 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.

1 C. An as-built survey by a licensed surveyor needs to be provided after construction
2 is complete. As-built survey is to be submitted in both hard copy and in electronic
3 format in state plan coordinate system that is compatible with Ascension Parish
4 Government GIS software. Minimum survey items to be included are:

- 5
- 6 1. Sanitary sewer manhole tops
 - 7 2. Inverts of all pipes entering manhole
 - 8 3. Invert at bottom of manhole
 - 9 4. Sewer service line stack location
- 10

11 D. All elbows and wyes for service laterals are to be marked using GPS locating
12 devices that will work with APG Software.

13

14

15

16 3.4 GENERAL PIPING REQUIREMENTS

17

18 A. Furnish and install, including all labor and materials required, the various piping
19 systems as shown and/or specified, adhering to the general routing and methods
20 of distribution including all required pipe fittings, valves, hangers, sleeves, inserts,
21 and other such items and appurtenances as may be required for the satisfactory
22 operation of the various systems. Valves shall be installed for the control and/or
23 isolation of all branch force mains.

24

25 B. All piping shall be installed in the most neat and workmanlike manner, employing
26 only mechanics skilled in each respective trade.

27

28 C. All pipe shall be properly reamed after cutting and shall be cleaned before
29 installation.

30

1 D. Wherever practical, pipe laying for the gravity sewer shall proceed upgrade with
2 the spigot ends of the pipe in the direction of flow. Each pipe shall be laid true to
3 line and grade and in such a manner as to form a close concentric joint with the
4 adjoining pipe and to prevent sudden offsets in the flow-line.

5
6 E. The Developer/Contractor shall carefully install all jacked and bored crossings to
7 the required grade and alignment. Casing will be required for gravity and force
8 main crossings utilizing pipe other than HDPE or as required by LADOTD or
9 railroads. The boring operation shall be accomplished using a commercial type
10 boring rig. The hole made by the installation shall be the same diameter (within 2
11 inches) as the largest outside joint diameter of the pipe installed. The pipe shall be
12 installed in the hole immediately after the bore has been made, and in no event
13 shall the hole be left open while unattended.

14
15 F. Wyes and tee branches for sewer service lines shall be placed in the line at points
16 indicated by the Parish Engineer. Riser pipe and service lines shall be laid at the
17 location and grades indicated by the Parish Engineer.

18 In general, service lines will be laid on a one (1%) grade unless otherwise directed by the Parish
19 Engineer. The ends of all service lines and other points of future service connections are to be
20 capped with an approved water-tight stopper. The end of each service connection shall be clearly
21 marked with a length of 6" PVC pipe placed vertically and extending a minimum of three (3) feet
22 above finished grade.

23 24 25 3.5 PIPE ASSEMBLY

26
27 A. PVC sewer pipe shall be flexible gasket, "push-on" type joints, and shall conform
28 to ASTM D-3212.

29
30 B. Connections between different types of pipes and accessories shall be made with
31 fittings recommended by the manufacturer and approved by the Parish Engineer.
32

- 1 C. All pipe connected to manholes shall be installed utilizing rubber “A-Lok” or boot
2 and stainless steel clamp stainless steel clamps. All boots will be required to have
3 a stainless steel shear band.
4

5 3.6 OPEN ENDS
6

- 7 A. Keep all ends of pipes closed with caps or plugs so as to prevent dirt, debris or
8 construction materials from entering the pipes during construction.
9

10 3.7 TESTING
11

- 12 A. All sewers and manholes shall be tested to assure their being watertight in
13 accordance with Section 3.7 C of these specifications.
14

- 15 B. Before leakage tests all lines must be lamped to see that they are clean and to see
16 that they are clean, alignment is acceptable, and that no sags are in the lines. The
17 Parish Engineer or their designated representative shall be present during all of
18 these tests. The Developer/Contractor shall furnish enough personnel to remove
19 manhole lids, hold lamps and mirrors.
20

- 21 C. The Developer/Contractor shall have the sewer piping tested by the following
22 method or other method approved by the Parish Engineer.

- 23 1. Low Pressure Air Testing: After a manhole to manhole reach of pipe has
24 been backfilled, cleaned and services installed, air tight plugs shall be
25 placed in the line at each manhole. Low pressure air shall be introduced
26 into this sealed line until the internal air pressure reaches four psig greater
27 than the average back pressure of any ground water that may be over the
28 pipe. At least two minutes shall be allowed for the air pressure to stabilize.
29 After the stabilization period, the pressure shall be at least 3.5 psig and the
30 air supply shall be disconnected. The portion of line being tested shall be
31 termed acceptable if the time required in minutes for the pressure to
32 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, to be turned over to the parish upon completion of the test Forms for documentation of such tests should be included in this particular specification and should have name, title, and signature blanks for the project contractor and Parish representative

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 if

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)		
	18"	24"	30"
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.

1 **CHAPTER 130 APPENDIX II**

2 **SEWER FORCE MAINS**

3 **PART 1 – GENERAL**

4
5 1.1 **RELATED DOCUMENTS**

6
7 A. Ascension Parish Subdivision Construction Specifications.

8
9 1.2 **DESCRIPTION OF WORK**

10
11 A. The work covered by this section of these specifications consists of furnishing and the
12 construction of sewer force mains and appurtenances complete as specified herein.

13
14 B. Minor details not usually shown or specified, but necessary for the proper installation and
15 operation, shall be included in the work, the same as if herein specified or shown.

16
17 C. All materials furnished and all work installed shall comply with the requirements of all
18 governmental departments having jurisdiction.

19
20 1.3 **MATERIALS AND WORKMANSHIP**

21
22 A. All materials and apparatus required for the work, except as specifically specified
23 otherwise, shall be new, of first class quality, and shall be furnished, delivered, erected, and
24 connected, and finished in every detail, and shall be so selected and arranged as to fit properly.

25
26 B. All equipment and materials shall be installed in accordance with the recommendations of
27 the manufacturer, including the performance of such tests as the manufacturer recommends.

28
29 1.4 **SUBSTITUTION OF MATERIALS**

1
2 A. Substitution of materials shall be in accordance with the provisions of these specifications.

3
4 B. Should a substitution be accepted and should the substitute material prove defective or
5 otherwise unsatisfactory for the service intended and within the guaranty period, this material or
6 equipment shall be replaced with the new material or equipment specified by name.

7
8 1.5 DEFINITIONS

9
10 A. For the purposes of these specifications, the Parish Engineer shall be defined as: the office
11 of the Parish Engineer, the Department of Public Works, or the Engineering Review Agency.

12
13 B. For the purposes of these specifications, the following describe the limits of work:

14
15 1. Roadbed: width of roadway, either edge of pavement of edge of pavement; or, back of curb
16 to back of curb, plus five (5) feet on both sides.

17
18 2. ROW Transition Area: area between edge of Roadbed and established ROW.

19
20
21 3. Lots: all work outside of the ROW as indicated on the construction plans.

22
23
24 PART 2 – PRODUCTS

25
26 2.1 PIPE, VALVES AND FITTINGS

27
28 A. Approved sewer force main products are:

1 1. Polyvinyl Chloride (PVC) Plastic Pipe less than 4" in diameter shall conform to ASTM D
2 2241, SDR 21, Cell Class 12454-B. PVC force mains sizes 4" through 12" shall conform to
3 AWWA C 900, DR 18, Class 150. PVC force mains over 12" shall conform to AWWA C 905,
4 SDR 25, Class 165.

5 All PVC force main pipe shall have rubber gasket bell and spigot or coupling type joints
6 conforming to ASTM D 3139. Fittings for PVC force main pipe less than 3" shall be PVC solvent
7 weld. Fittings 3" and larger shall be ductile iron conforming to AWWA C 110. Thrust restraint
8 shall be provided through the use of joint restraints equal to EBAA Iron Mega-lug or Uni-Flange.

9
10 2. Ductile Iron shall conform to AWWA C 151, Thickness Class 51. Pipe shall be epoxy or
11 polyethylene lined and bituminous coated. A bonded polyethylene lining shall be equal to that
12 manufactured by American Cast Iron Pipe or U.S. Pipe and thickness shall be 40 mils nominal and
13 25 mils minimum in pipe tapering to 10 mils minimum at joints. Epoxy lining shall comply with
14 AWWA C 550 and be 2-coat high-build catalyzed epoxy with thickness range of 8 to 16 mils total
15 dry film thickness. Bituminous coating shall conform to ANSI A 21.51. Thrust restraint shall be
16 provided through the use of joint restraints equal to EBAA Iron Mega-lug or Uni-Flange.

17
18 3. HDPE pressure pipe in sizes 4" through 63" shall comply with ANSI/AWWA C 906. The
19 pipe shall be equal to Driscopipe 8600 as manufactured by Phillips Driscopipe, Inc., Dallas, Texas,
20 and shall conform to ASTM-D-1248 (Type III, Class C., Category 5, P34). Minimum cell
21 classification values shall be 355434C as referenced in ASTM D-3350. Polyethylene piping may
22 be joined by thermal butt- fusion, flange assemblies, or mechanical joint adapters as may be
23 recommended by the pipe supplier. Polyethylene piping shall not be joined by solvent cements,
24 adhesives (such as epoxies), or threaded-type connections. All joining methods shall be capable of
25 conveying water at not less than the design pressure of the piping system and shall be
26 recommended for use by the pipe manufacturer. All fittings are to be joined to polyethylene piping
27 by thermal heat fusion. Polyethylene fusion fittings may include one or more ports for effecting a
28 mechanical connection, such as by compression or flange, to other piping. Polyethylene fittings
29 may be molded, thermoformed from pipe sections, or fabricated by heat fusion joining
30 polyethylene sheet or block. Molded fittings shall meet the requirements of ASTM D2683 for
31 socket-type fittings, or ASTM D3261 for butt-type fittings, and the requirements of this standard.

32
33 4. Fittings for sewer force mains shall be ductile iron mechanical joint conforming to AWWA
34 C 153. Fittings shall be epoxy or polyethylene lined and bituminous coated. A bonded
35 polyethylene lining shall be equal to that manufactured by American Cast Iron Pipe or U.S. Pipe
36 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:

Size (Non. Diam., In.)	Diameter	Base Nom. Thickness Uncoated (Inches)	Nom. Thickness Coated* (Inches)
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.

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

5
6 2. Joints

7 Joints shall be butt-welded. Coating, if required, shall be continuous at the joints.
8

9 3. Carrier Runners

10
11 Metal carrier pipes shall be supported by utilizing three-way or concentric insulating casing cradle
12 as manufactured by T.D. Williamson, Inc., Tulsa, OK; Piping Insulators, Inc., Canton, MA; or
13 equal. Non-metallic carrier pipes shall be supported by stainless steel banded treated wood or all
14 plastic runners. Space runners as specified under installation of carrier pipes within casing pipes.
15

16 4. Casing Seal

17
18 Use casing seals in the annulus between the casing and carrier pipe which are either cement grout,
19 bituminous material, or compressible rubber seals such as "Link Seal" by Thunderline, Wayne,
20 MI; or rubber boots as manufactured by T.D. Williamson, Inc., Tulsa, OK; or equal.
21

22 C. Polyvinyl Chloride Pipe (PVC) For Direct Boring

23
24 In Lieu of steel casings and carrier pipes specified hereinbefore Restrained Joint PVC pipe in sizes
25 8" through 12" equal to CertainTeed Certa-Lok C900/RJ, Class 200 may be used and installed to
26 line and grade by direct boring methods.

27 D. Valves

28 1. General

29
30 a. Valves shall be suitable for their service, location and operating position as indicated.

1
2 b. Buried valves size two inches (2") and larger shall be mechanical joint or slip joint to suit
3 type of pipe used and buried valves smaller than two inches (2") shall be threaded.

4
5 c. Provide a two inch (2") square operating nut on buried iron valves size two inch (2") and
6 larger and provide an operating key on smaller buried valves.

7
8 d. Provide a valve extension stem of appropriate length for deep lines so that the operator nut
9 shall not be more than thirty-six inches (36") below finished grade. Coordinate the stem extension
10 length with the lengths of valve wrenches furnished.

11
12 e. Opening direction of all valve operators shall be counter-clockwise and an indicating arrow
13 and the word OPEN shall be cast on all operators.

14
15 f. Line and coat all ferrous valves in conformance with AWWA Specifications. Line and coat
16 the valves sized three inch (3") and larger in conformance with AWWA C 550 with fusion bonded
17 epoxy or thermoplastic to 6 to 12 mils in one coat or with high-build catalyzed epoxy in 2 coats to
18 8 to 16 mils total thickness.

19
20 g. Valves with resilient seats shall have seats of natural or synthetic rubber suitable for service
21 in sewage or sludge.

22
23 h. Submit compliance certification, certified dimension drawings and specified design or test
24 data for all valves.

25 2. Gate Valves

26
27 a. Sizes four through twelve-inch (4"-12") shall be resilient seated gate valves with 200 psi
28 rating and comply with ANSI/AWWA C 509. Sizes fourteen through forty-eight inches (14"-48")
29 shall be solid wedge gate valves with 150 psi rating and comply with ANSI/AWWA C 500. Valve
30 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, stainless steel trim with stainless steel floats, and shock-proof synthetic seats. Body of valves shall be stainless steel for pipes sizes equal to or less than 4" and either cast iron or stainless steel for pipe sizes greater than 4". 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.

d. The contractor shall record GPS coordinates (+/- meter accuracy) based on La. State Plan Coordinate System, for each valve installed.

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".

Valve boxes not in pavement shall be set in a 4" thick, 18" diameter concrete slab.

E. Tracer Wire

For direct burial, install green marking tape with the lettering "CAUTION BURIED SEWER" should also be installed along with the tracing wire. In addition, for horizontal directional drills, braided wire will be utilized due to its higher tensile strength to prevent regular breakage in long pulls. 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.

a. Locator wire shall be insulated THW 14 copper wire with green colored insulation for all open cut installations.

b. Locator wire shall be insulated Copperhead 7x7 stranded copper clad steel wire with green colored insulation (or approved equal) for all horizontal directional drills and pit bore installations.

1 c. Warning/cautionary tape shall be constructed of an aluminum film inner layer, which has
2 been printed on both sides with a green background and white letters stating "Caution Buried
3 Sewer". The aluminum film shall be sandwiched between layers of translucent Mylar which shall
4 be thermally bonded to the aluminum inner layer.

5 6 PART 3 – EXECUTION

7 8 3.1 TRENCHING AND FORMING PIPE BED 9

10 A. Excavation shall include the removal, handling, re-handling, refill or backfilling, and
11 disposal of any and all material encountered in the work, and shall include all pumping, bailing,
12 drainage and sheeting and bracing.

13
14 B. The work of excavation shall also include the responsibility of added expenses or other
15 liability that may arise from quicksand, obstacles or conditions, which may be encountered in the
16 work. It includes the clearing and removal of pavements, curbs, sidewalks, shrubbery, and other
17 obstructions not otherwise provided for in the plans.

18 C. Where firm foundation is not encountered at the grade established, due to soft, spongy or
19 other unstable soil conditions, such unstable soil shall be removed and replaced with a foundation
20 fill consisting of bedding material (specified hereinafter) or other suitable approved material
21 properly compacted to provide adequate support for the pipe.

22
23 D. Where practical pipe laying shall begin at the downstream end of the line. Before being set
24 in place each section of pipe shall be thoroughly cleaned, and free of dirt. All bells shall be laid on
25 the upstream end.

26
27 E. For all pipe, bedding material shall be a 65% - 35% sand-aggregate mixture or stone
28 conforming to LADOTD Subsection 1003.10. Aggregate in mixture shall be gravel, stone or
29 crushed concrete. The mixture shall be free of foreign matter. Provide certified gradation test report
30 meeting LADOTD Subsection 1003.08 for bedding material for approval by the Parish Engineer.
31 This shall occur at the beginning of the project. Bedding material shall be placed in the trench
32 beginning a minimum of four (4) inches below the pipe invert and carefully compacted under and
33 around the pipe to a point twelve (12) inches above the top of the pipe.

1
2 F. Where the trench falls within the Roadbed, backfill from the point twelve (12) inches above
3 the pipe shall be native or imported materials treated with cement, placed in twelve (12) inch loose
4 lifts, and compacted to 95 percent of maximum density (Standard Proctor).

5
6 G. Where the trench falls outside of the roadbed, backfill shall be native or imported material
7 suitable for lot construction, placed in twelve (12) inch loose lifts and compacted to a density
8 consistent with the adjacent undisturbed soils.

9
10 H. Provide compaction reports for backfill at roadway trenches.
11
12

13 3.2 UTILITIES, LOCATIONS, AND ELEVATIONS 14

15 A. Examine the site and verify the location and elevation of all utilities and their relation to
16 the work before commencing work.
17

18 B. Verify location and method of tie-in of all utility lines with the appropriate representatives
19 of the Owner.
20

21 3.3 GENERAL PIPING REQUIREMENTS 22

23 A. Furnish and install, including all labor and materials required, the various piping systems
24 as shown and/or specified, adhering to the general routing and methods of distribution including
25 all required pipe fittings, valves, hangers, sleeves, inserts, and other such items and appurtenances
26 as may be required for the satisfactory operation of the various systems. Valves shall be installed
27 for the control and/or isolation of all branch force mains.
28

29 B. All piping shall be installed in the most neat and workmanlike manner, employing only
30 mechanics skilled in each respective trade.
31

1 C. All pipe shall be properly reamed after cutting and shall be cleaned before installation.

2
3 D. The Developer/Contractor shall carefully install all jacked and bored crossings to the
4 required grade and alignment. Casing will be required for gravity and force main crossings
5 utilizing pipe other than HDPE, C900RJ PVC or as required by LA DOTD or railroads. The boring
6 operation shall be accomplished using a commercial type boring rig. The hole made by the
7 installation shall be the same diameter (within 2 inches) as the largest outside joint diameter of the
8 pipe installed. The pipe shall be installed in the hole immediately after the bore has been made,
9 and in no event shall the hole be left open while unattended.

10
11 E. The design of force main systems should be for peak flows at full build-out. Initial system
12 designs should be as close as possible to the minimum 2 ft/sec velocity to ensure additional
13 capacity for future growth. The peak flow calculation be calculated by multiplying the average
14 demand by peaking factor using as follows: $\text{Peak Factor} = 1 + 14 / (4 + \sqrt{P})$ where P is the
15 population in thousands.

16
17 F. Install manual valves in a valve box extending from grade to below the valve body, with a
18 minimum 4-inch cover measured from grade to top of valve.

19 G. For sewage force main piping, thrust restraint shall be provided at all tees, bends, and other
20 fittings where thrust can be expected to occur. Thrust restraint shall be achieved through use of
21 joint restraints as specified with the approved piping materials.

22 H. Pipe-line markers shall be placed at all canal crossings and at all force main bends.

23 24 25 3.5 PIPE ASSEMBLY

26
27 A. PVC sewer pipe shall be flexible gasket.

28
29 B. Connections between different types of pipes and accessories shall be made with fittings
30 recommended by the manufacturer and approved by the Parish Engineer.

31 32 3.6 OPEN ENDS

1
2 A. Keep all ends of pipes closed with caps or plugs so as to prevent dirt, debris or construction
3 materials from entering the pipes during construction.
4

5 3.7 TESTING
6

7 A. The Developer/Contractor shall test the completed sections of sewage force main pipe by
8 the following method or other method approved by the Parish Engineer.
9

10 1. All sewage force main piping systems shall be tested to assure their being watertight.
11 Wherever pipes are placed so they will be ultimately concealed, these tests shall be conducted and
12 the absolute water-tightness of each piping system shall be demonstrated before that system is
13 concealed and made inaccessible.
14

15 2. Tests for force main piping shall consist of subjecting the piping to a hydrostatic pressure
16 equal to 1.5 times the pressure rating of the pipe for a period of not less than two hours with an
17 allowable pressure drop of 5 psig.
18

19 3. Developer/Contractor shall install all plugs, valves, tanks, pumps, and accurate gauges to
20 perform test. During this period, all leaks in pipe, fittings and accessories, in the particular piping
21 system which is being tested, shall be stopped and the hydrostatic test shall be again applied. The
22 procedure shall be repeated until for an entire one-hour period, the test pressure can be maintained.
23 The testing shall be performed under the observation of the Parish Inspector. After all testing and
24 installations, test entire system for operation under normal operating pressure.
25

26 a. Any excessive leaks in the pressure system shall be repaired immediately upon discovery.
27 Cost for repairing faulty work, including re-excavating and re-backfilling and for making test, shall
28 be the responsibility of the Developer/Contractor.
29

30 4. Provide written report of pressure test results. Forms for documentation of such tests should
31 be included in this particular specification and should have name, title, and signature blanks for
32 the project contractor and Parish representative.

INTRODUCTION

1 **CHAPTER 130 APPENDIX III**
2 **SELF PRIMING WASTEWATER PUMPING STATION**

3
4 **PART 1 - GENERAL**
5

6 1.1 **RELATED DOCUMENTS**
7

8 A. Ascension Parish Subdivision Construction Specifications.
9

10 1.2 **GENERAL**
11

12 A. Connecting, start-up, and testing of sewerage pumping units and their appurtenances as
13 indicated on the Drawings and as herein specified. These specifications direct attention to certain
14 features of the pumping units, but do not purport to cover all the details of their design. The
15 equipment furnished shall be designed, constructed, and erected in conformance with accepted
16 high quality standards.

17
18 B. Motor starters and wiring are specified under the appropriate electrical sections.
19

20 C. Pumping units shall be equipped with the necessary accessories, including casing heater,
21 automatic air release valve, pressure gages, and piping connections.
22
23
24
25

26 1.3 **DEFINITIONS**
27

28 A. For the purposes of these specifications, the Parish Engineer shall be defined as: the office
29 of the Parish Engineer, the Department of Public Works, or the Engineering Review Agency.

1
2 B. For the purposes of these specifications, the following describe the limits of work:

3
4 1. Roadbed: width of roadway, either edge of pavement of edge of pavement; or, back of curb
5 to back of curb, plus five (5) feet on both sides.

6
7 2. ROW Transition Area: area between edge of Roadbed and established ROW.

8
9 3. Lots: all work outside of the ROW as indicated on the construction plans.

10
11 1.4 SUBMITTALS

12 A. Furnish complete assembly, foundation support, and installation drawings, together with
13 detailed specifications and data covering pumps, motors, material used, parts, devices and other
14 accessories forming a part of the equipment furnished shall be submitted for approval in
15 accordance with the procedure set forth in the General Conditions.

16
17 B. Data and specifications for the equipment shall include, but shall not be limited to the
18 following:

19 1. Settings Plans; setting plans shall include:

20 a. Anchor bolt layout

21 b. Anchor bolt dimensions

22 c. Outline dimensions and weights of pumps, bases, motors, and control enclosures.

23 2. Pumps data and drawings shall include:

24 a. Manufacturer, type and model number.

25 b. Assembly drawing, nomenclature and material list, O&M manual, and parts list.

26 c. Type, manufacturer, model numbers, location and spacing of bearings.

27 d. Impeller type, diameter, thru-let dimensions, shreader size, number of vanes and
28 identification number.

e. Complete motor performance data including: rating, voltage/phase/frequency; design type; service factor; insulation class; motor pole number; actual rotation speed when combined with the specified pumps; current, power factor and active input power (KW) as a continuous function of shaft power from no load to at least 115 percent load, start (max. inrush) current; locked rotor current; NEC code letter; and motor torque as a continuous function through the motor start cycle from no rotation to synchronous speed.

f. Complete performance test curve(s) showing full range (shutoff to run-out) head vs. Capacity, NPSHR, hydraulic efficiency, motor active (KW) input power, motor total (KVA) input power (Based on measured current and voltage), and shaft power (BHP). See Section 3.01 Shop Tests.

g. Location and description of Service Centers and spare parts stock.

h. Warranty for the proposed equipment.

3. The manufacturer shall indicate, by arrows to points on the Q/H curves, limits recommended for stable operation, between which the pumps are to be operated to prevent surging, cavitation, and vibration. The stable operating range shall be as large as possible, and shall be based on actual hydraulic and mechanical characteristics of the units and shall meet the hydraulic performance requirements of the proposed system.

4. Furnish shop drawings and other pertinent data to the Engineer and obtain his approval before fabrication. The drawings shall be complete with respect to dimensions, materials of construction, wiring diagrams, and all supporting engineering information.

5. At least one month before installation of this work, submit four (4) copies of operation and maintenance instructions to the Engineer.

1.5 AS-BUILT DRAWINGS AND REPORTS

A. As-built drawings shall be provided to the owner, along with all pump test reports.

1.6 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.

1
2 B. Completeness
3

4 1. The following Specifications describe major functions and features, but do not necessarily
5 cover all details entering into the design and operation of the equipment or items that individual
6 manufacturer may consider as an option accessory.
7

8 2. Wherever in these Specifications specific equipment, materials, or manufactured products
9 are called for or described, such are specified to establish the basic standard or level of quality
10 materials, and features.
11

12 3. The Developer shall be responsible for a complete and workable pump station. He shall
13 coordinate between individual equipment manufacturers and furnish whatever interface
14 connections, controls, interlocks and accessories that are required between all interconnected
15 components, items or systems so that they operate repeatedly and reliably within the specifications
16 and overall design requirement. Individual equipment units that are furnished with inadequate
17 materials, accessories or controls, or are not properly designed by the manufacturer to satisfy the
18 specific application as indicated by the Specifications, shall not be accepted until properly
19 modified or replaced.
20

20 C. Equipment Design
21

22 1. The design of equipment and components shall be of adequate materials and strength for
23 the specific application and exposures, and their design and installation shall meet all applicable
24 codes and regulations.
25

26 2. Developer shall be responsible for all permit applications and all efforts necessary in
27 securing all Agency reviews and approvals.
28

29 A. Site Design

30 1. The DEVELOPER shall be responsible for a finished surface within the fenced in area of
31 the pump station site. The finished surface shall be 8 inches of 610 limestone on top of 7 oz. woven
32 geotextile fabric.

2. Site shall have an access drive which shall be accessible from a public street. Site drive shall be 12 ft minimum width and hard surfaced.
3. The site design shall include a clearance of at least 20 feet from the structure to property lines on at least 2 sides.
4. The site security fence and entrance gate shall be placed far enough from the street to allow maintenance vehicles to be off the main roadway when the operator stops to unlock the gate.
5. Site shall be designed with a lighting system operating on a photocell and on/off switch with a manual switch override. Site lighting shall be designed to minimize off site impacts while maintaining functionality for maintenance personnel working on pump station components.
6. The power service feeding the pump station shall be 230 or 460 Volt, 3 phase, 4 wire service.
7. The pump station site plan shall be submitted to the Parish Engineer for approval.
8. The Parish shall indicate the desired location of the pump station(s) within the boundaries of the proposed development.
9. Each station location shall be required to have a pump station sign indicating the station name, municipal address, and emergency contact information. The Parish will provide a detail of the sign required.
10. Pump station site plan shall include location for generator hookup.

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:

Exposure Location	Material
-------------------	----------

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
---	--------------------------

1
2 2. The Developer shall furnish the necessary materials and construct suitable concrete
3 foundations or concrete pads at least six inches (6") high for all equipment installed by him. The
4 tops of foundations shall be at such elevations as will permit grouting as specified below.
5

6 3. All equipment shall be installed by skilled mechanics and in accordance with the
7 instructions of the manufacturer.
8

9 4. In setting pumps, motors, and other item of equipment customarily grouted, the Developer
10 shall make an allowance of at least 1 in. for grout under the equipment bases. Shims used to level
11 and adjust the bases shall be steel. Shims may be left embedded in the grout, in which case they
12 shall be installed neatly and so as to be as inconspicuous as possible in the completed work. Unless
13 otherwise permitted, all grout shall be suitable non-shrink grout.
14
15
16

17 5. Grout shall be mixed and placed in accordance with the recommendations of the
18 manufacturer. Where practicable, the grout shall be placed through the grout holes in the base and
19 worked outward and under the edges of the base and across the rough top of the concrete
20 foundation to a peripheral form so constructed as to provide a suitable chamfer around the top edge
21 of the finished foundation.
22

23 E. Equipment Bolts, Studs, and Screws 24

25 1. Bolts and accessories for general equipment use shall be carbon steel, without coating.
26 Unless indicated otherwise.

27 Bolts and accessories for use in corrosive locations shall be stainless steel: Type 316 for severe
28 corrosion, such as exposure to acid waters, and marine salt- water; and Type 303 or 304 for other
29 corrosive exposure, such as treated or untreated water and wastewater or mild chemicals.
30

31 2. Stainless 316 SST steel bolts and accessories shall comply with ASTM F 593, Specification
32 for Stainless Steel Bolts, Hex Cap Screws, and Studs.

1
2 3. Except as specified above, stud, tap, and machine bolts and nuts for general use shall
3 conform to ASTM A 307, Specification for Carbon Steel Externally Threaded Standard Fasteners.
4 Hexagon nuts and accessories of the same metal quality as the bolts shall be used. All threads shall
5 conform to ANSI B1.1, Standard for Unified Inch Screw Threads, Coarse Thread Series and have
6 a Class 2A tolerance. Zinc or cadmium coatings shall be furnished where specified, indicated, or
7 required.

8
9 4. Machine and set screws shall conform to Federal Specifications FF-S-91, unless otherwise
10 specified.

11
12 5. All machine screws and lag screws shall either utilize cut washers or lock washers. All bolt
13 heads and nuts bearing on plastics shall have cut washers.

14
15 F. Nameplates

16
17 1. Each piece of equipment shall be provided with a substantial nameplate of non- corrodible
18 metal permanently attached and inscribed with the manufacturer's name, model or type
19 designation, serial number, and principal rated capacities or other characteristics and similar
20 appropriate information.

21
22 2. Provide engraved laminated plastic or embossed non-corrodible metal nameplates on all
23 panels for instrumentation of electrical controls of the process and equipment, or for lighting,
24 starters, or motor control centers and each system component, including switches, pushbuttons,
25 indicating lights, instrument, and devices or pieces for which the use or identified may not be
26 readily apparent. Indent marked plastic tape shall be unacceptable. Nameplates shall be
27 permanently attached with stainless steel screws, bolts and nuts, or rivets. Drive pins or contact
28 adhesive attachment shall be unacceptable after completion of the installation of the panel
29 components.

30
31 G. Lubricants

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

4
5 H. Storage and Protection

6
7 1. Protect equipment from damage from weather, dust, moisture or other causes. Protect
8 rubber items from sunlight and petroleum products. Protect painted surfaces from scratches or
9 damage. Protect ferrous surfaces from corrosion. Shield plastics from direct sunlight. Store
10 instruments, controls and electrical components in air-conditioned (low relative humidity)
11 locations. Electric motors or equipment with ferrous bearings which are not installed and operated
12 within 60 days of delivery shall be either stored in an air-conditioned warehouse or lubricated and
13 rotated every 30 days.

14 I. Manufacturer's Service Representatives

15
16 1. For all systems, assemblies, units or items covered hereinafter, furnish manufacturer's
17 service representatives in conformance with the Specification General Requirements as indicated.

18
19 J. Acceptance Tests

20
21 1. After installation of the equipment and after completion of the services of the
22 manufacturer's representative the Developer shall operate each unit to demonstrate its ability to
23 operate continuously without vibration, jamming, excess leaking, excess noise, and overheating,
24 and to perform its specified functions satisfactorily to the extremes of all operating conditions
25 specified. In addition, the tests shall demonstrate that the unit satisfies any performance guarantee
26 requirements at the specified rated operating condition.

27
28 2. All defects and defective equipment shall be corrected promptly or replaced at no expense
29 to the Owner.

30
31 3. All adjustments necessary to place the equipment in satisfactory working order shall be
32 made at the time of the above tests.

1
2 K. Record Drawings

3
4 1. Manufacturers and their service representatives shall furnish written reports of installation
5 and testing and furnish as-built drawings which reflect any field changes or alterations.
6

7 L. Operation and Maintenance Data

8
9 1. For all systems, assemblies, units or items covered hereinafter, furnish operation and
10 maintenance data.
11
12
13
14

15 1.7 DESIGN CAPABILITIES

16
17 A. As a guide to sizing and adjusting the various pumping units at start-up, the design
18 capacities and ranges of operating conditions anticipated and intended are as follows:
19

20 Pump Station No.

21 Location/Name

22 Description of Work

23 Design Operating Conditions

24 Capacity (gpm)

25 Total Dynamic Head (ft.)

26 Total Dynamic Suction Lift (ft)

27 Maximum Re-priming Lift (ft)

28 Maximum Static Suction Lift (ft)

- 1 Total Static Discharge Head (ft)
- 2 Minimum Efficiency @ Design (ft) (%)
- 3
- 4 Pump Curve; gpm @ TDH (ft)
- 5
- 6 Re-prime Lift Capacity (ft)
- 7
- 8 Pump Selection
- 9 Impeller Diameter (in)
- 10 Speed (rpm)
- 11 Motor Horsepower Required
- 12 Motor Horsepower to be Supplied
- 13 Motor Power: Volts
- 14 Phases
- 15 Hz
- 16
- 17 Pump Selection

18

19 PART 2 - PRODUCTS

20

21 2.1 FENCING AND GATES

22

23 A. General

24

- 25 a. Fence shall be plumb and level to the owner's satisfaction.
- 26 b. Fence design type shall be board on board.

c. The fencing and gates for the pump station site should be constructed as shown on sheets 1 through 3 of Standard Plan No. 902-06 for the City of Baton Rouge/Parish of East Baton Rouge Department of Public Works.

B. Fence Posts

a. Fence posts shall be 2 inch schedule 40 galvanized pipe. Fence posts shall be 8 feet long. 2.5 feet of each post shall be below grade inside of an 8 diameter hole 2.5 feet deep. The hole shall be filled with 4000 psi concrete.

b. All fence posts shall have galvanized dome caps.

C. Fencing

a. Runner Boards: Runner boards shall be 2x4 treated pine. Three (3) runners shall be provided. Runner boards shall be secured to each fence post with a galvanized lag bolts. Each post shall have three (3) lag bolts attaching runner boards.

b. Fence Boards: Fence boards shall be 6 foot long, grade #2 cedar fence boards, or better. Fence board design shall be board on board. A spacer shall be used during installation and the first set of picket boards nailed to runners shall have a 3 inch gap between boards. The second row of picket boards shall be centered over each 3 inch gap. Six (6) stainless steel ring shank nails shall be used to nail each fence board.

D. Gates

a. Posts: The post that will have the gate hinges shall be 3 inch schedule 40 galvanized pipe.

b. Hinges: All gates shall have two (2) bulldog type galvanized hinges secured to a 3 inch gate post.

c. Gates: All gates shall have a welded galvanized tubed frame that is attached to bulldog hinges. Runner boards shall be attached to the welded gate frame. Cedar fence boards with board on board design shall be secured to the runner boards.

d. Cane Bolts: One (1) heavy duty cane bolt shall be installed on each gate. If concrete pad or drive is not already underneath gate, then at least a 12in x 12in x 4in deep concrete pad shall be

1 poured under the cane bolt. The center of the concrete pad shall have a hole drilled out in the
2 center to receive the cane bolt.

3 e. Handles and Latches: One (1) handle and one (1) latch shall be installed on each gate.
4 Latch shall be pad-lockable.

5 2.2 CONCRETE WET WELL

6 A. General

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

11 B. Concrete Wet Well and Valve Vault

12 1. Precast concrete construction shall be designed per ASTM standard C-478. 1. Class 1
13 air-entrained precast concrete shall achieve a minimum 28-day compression strength of 5,500 psi
14 and be manufactured by a Quality Certified Plant of the NPCA (National Precast Concrete
15 Association). Type I/II cement shall be used (suitable for type II cement per ASTM C-150). Joints
16 between precast sections shall be sealed with ConSeal CS-102 or approved equal per ASTM C-
17 990. Penetrations to use Kor-N-Seal Flexible Pipe Connectors to meet or exceed ASTM C-923.
18 Concrete components as manufactured by Gainey's Concrete Products, Inc., or prior approved
19 equal.

20 2. The minimum wet well diameter shall be 6 feet.

21 3. Concrete wet wells and grout shall include Xypex Bio San C500 antimicrobial and
22 crystalline admixture or prior approved equal at a rate of 1% by weight of total cementitious
23 materials and in accordance with manufacturer's instructions. Product shall include field detention
24 colorant, antimicrobial additive and crystalline chemical all in one package. No exceptions.

25 4. Top slabs shall be fitted with a 4" ductile iron pipe with 180 degree elbow for venting.
26 Vent pipes shall be fitted with a 16 mesh stainless steel metal insect screen.

27 5. The pump station wet well access door shall be Model AHS/D as manufactured by U.S.F.
28 Fabrication, Inc., or prior approved equal, with the size being specified on the plans and also as
29 recommended by the pump supplier. Door leaf shall be 1/4-inch thick aluminum diamond plate
30 reinforced for an AASHTO H20-44 wheel load. Upon request, manufacturer shall provide
31 structural calculations showing that the door design meets the loading requirements of AASHTO
32 H20-44. (The access door is designed for off-street locations that may occasionally receive
33 AASHTO H20-44 wheel loads.) The frame shall be extruded aluminum with an integral anchor
34 flange and door seat on all four sides. The access door shall be equipped with a flush lifting handle
35 that does not protrude above the cover, and a 316 stainless steel hold open arm with red vinyl grip

1 that automatically keeps the cover in its upright, open position. Each door shall include stainless
2 steel gas shocks for easy opening. The access door shall allow visual inspections, limited
3 maintenance and level system adjustment while safety grate is left in place. The grate shall be
4 counter-balanced for ease of opening. The safety grate shall be orange in color to promote visual
5 awareness of hazard. The door shall have 316 stainless steel hinges and 316 stainless steel tamper
6 resistant bolts/locknuts. The door shall be equipped with a watertight 316 stainless steel slamlock
7 with threaded plug, removable outside key, and fixed inside handle. The slamlock latches onto a
8 316 stainless steel striker plate that is bolted to the frame. An adhesive backed vinyl material that
9 protects the product during shipping and installation shall cover the entire top of the frame and
10 cover. Installation shall be in accordance with the manufacturer's attached instructions. The entire
11 frame including the seat on which the reinforcing rests shall be supported by concrete or other
12 material designed to support the specified load. The door shall be manufactured and assembled in
13 the United States. Manufacturer shall guarantee the door against defects in materials and
14 workmanship for a period of ten years.

15 6. The pump station valve vault access door shall be identical to the wet well access door,
16 except that it shall not have a safety grate.

17 7. DEVELOPER shall provide a geotechnical investigation of the existing soils at the
18 proposed wet well location by a Geotechnical Engineer licensed in the state of Louisiana. If this
19 pump station is being installed in conjunction with a new wastewater treatment plant and is within
20 fifty (50) feet of the treatment plant, a soil boring at this location is not required. The Geotechnical
21 Engineer shall provide a foundation design for the wet well, installation requirements, and anti-
22 flotation calculations. Wet well installation shall not begin until the Parish Engineer / Review
23 Agency has approved the installation requirements specific to this site.

24 2.1

25 2.2 PUMPS

27 A. General

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

34 B. Scope

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

5
6 C. Pump Types, Sizes, and Operating Conditions
7

8 1. The pumps shall be of the horizontal self-priming centrifugal type shall be specifically
9 designed for the handling of raw, unscreened sanitary domestic sewage. Pumps, panels and
10 enclosures shall be manufactured by Gorman-Rupp or preapproved equal.

11 2. Consideration shall be given to the sanitary sewage service anticipated, in which
12 occasionally debris will lodge between the pump suction check valve and seat, resulting not only
13 in loss of the suction leg, but also in the siphoning of liquid from the pump casing to the
14 approximate center line of the impeller. Such occurrence shall be considered normal with proper
15 installation of air release line to atmosphere.

16
17 3. In consideration of such occurrence and of the unattended operation anticipated, each pump
18 shall be so designed as to retain adequate liquid in the pump casing to insure unattended automatic
19 re-priming while operating at its rated speed in a completely open system without suction check
20 valves and with a dry suction leg.

21
22 D. Reprime Performance
23

24 1. Each pump must be capable of a re-prime lift as specified while operating at the selected
25 speed and impeller diameter. Re-prime lift is defined as the static height of pump suction centerline
26 above liquid that the pump will prime; and delivery within five minutes on liquid remaining in the
27 pump casing after a delivering pump is shut down with the suction check valve removed.
28 Additional standards under which re-prime tests shall be run are:

29
30 a. Piping shall incorporate a discharge check valve downstream from the pump. Check valve
31 size shall be equal (or greater than) the pump discharge diameter.
32

1 b. A ten-foot length of one-inch pipe shall be installed between pump and discharge check
2 valve. This line shall be open to atmosphere at all times to duplicate the air displacement rate of a
3 typical pump station fitted with an air release valve.

4
5 c. No restrictions shall be present in pump or suction piping which could serve to restrict the
6 rate of siphon drop of the suction leg. Suction pipe configuration for re-prime test shall incorporate
7 a minimum horizontal run of 4.5 Feet and 90-degree elbow.

8
9 d. Impeller shall be set at the clearances recommended by the manufacturer in the pump
10 service manual.

11
12 e. Re-prime lift repeatability shall be demonstrated by five sequential re-prime cycles.

13
14 f. Liquid to be used for re-prime test shall be water.

15
16 2. Certified re-prime test data, prepared by the pump manufacturer and registered professional
17 engineer, shall be submitted to the Owner for approval.

18
19 E. Serviceability

20
21 1. The pump manufacturer shall demonstrate to the Owner's satisfaction that due
22 consideration has been given to reducing maintenance costs by incorporating the following
23 features.

24
25 a. Internal Passages

26 1. All openings, internal passages, and internal recirculation ports shall be large enough to
27 permit the passage of a sphere 3 inches in diameter, and any trash or stringy material which may
28 pass through the average house collection system. Screens or any internal devices that create a
29 maintenance nuisance or interfere with priming and performance of the pump shall not be
30 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
2 1. Pump Casing

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

5 2. Impeller

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

9
10 3. Seal
11

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

18
19 b. The seal shall be lubricated with oil from a separate, oil-filled reservoir. The same oil shall
20 not be used to lubricate both the shaft seal and the shaft bearings.

21
22 c. The seal shall be warranted for a minimum of four years from date of shipment. Should the
23 seal fail within the first year, the manufacturer shall be obligated, upon notification, to furnish a
24 new seal, without charge to Owner, F.O.B. Factory. The cost of replacement seals thereafter will
25 be on a pro-rated basis as follows: failure within two years, 25% of new seal price; failure within
26 three years, 50% of new seal price; failure within four years, 75% of new seal price.

27
28 4. Shaft Bearings

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

1
2 5. Pump Suction Spool

3 Each pump shall be equipped with a one-piece, cast iron suction spool, flanged on each end. Each
4 spool shall have one 1-1/4 inch npt and one 1/4 inch npt tapped hole with pipe plugs for mounting
5 of gauges or other instrumentation.
6

7 6. Unit Base

8 The unit base shall comprise a base plate, perimeter flange, and reinforcements. Base plate shall
9 be fabricated of steel not less than 1/4" thick, and shall incorporate openings for access to all
10 internal cavities to permit complete grouting of unit base after installation. Perimeter flange and
11 reinforcements shall be designed to prevent flexing or warping under operating conditions. Base
12 plate and/or flange shall be drilled for hardware used to secure unit base to concrete pad as shown
13 on the contract drawings. Unit base shall contain provisions for lifting the complete pump unit
14 during shipping and installation.
15

16 7. High Temperature Sensors

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

19 G. Spare Parts
20

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

- 23 a. One spare pump mechanical seal (complete), and with it all gaskets, seals, sleeves, "O"-
24 rings, and packings required for replacement of the seal.
25 b. One set of impeller clearance adjustment shims.
26 c. One cover plate "O"-ring.
27 d. One rotating assembly "O"-ring.
28 e. One complete rotating assembly for each of the three pump sizes provided.
29

30 H. Required Accessories
31

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.

I. PUMP STATION PIPING, VALVES AND FITTINGS

1. Piping and Fittings shall conform to Ascension Parish Subdivision Specifications Section 13 – Sewer Force Mains.

2. Piping and fittings shall be supported to prevent any transfer of loads to the pumps.

3. Only metallic piping shall be used when passing through concrete.

4. Where piping penetrates walls of the wet well or valve vault, wall piping shall be used, as shown.

B. Piping

1. Piping and fittings larger than two inches shall be ductile iron in accordance with the Contract Documents.

C. Valves

1. Valves shall be provided where required by and according to the Contract Documents.

2. Each pump shall have one (1) check valve and one (1) plug valve in accordance with Valve Specifications.

3. Pump station must include an emergency bypass connection point on the downstream side of both pump shutoff valves. Emergency bypass connection shall consist of (1) plug valve with one (1) camlock hose connection and blind cap.

D. Check Valves

1. Swing check valves are of self-contained, free-swinging disc style, allowing a full waterway. Valve disc swings freely open and is keyed to valve hinge pin without use of pins. Valves conform to all standards set forth in AWWA C508, Latest Edition. Valve hinge pins are Stainless Steel. Manufacturer should have minimum of 10 years experience supplying AWWA C508 valves. Valves may be supplied with external lever with weight or spring to assist closure if required by customer. The pressure rating shall be 200 for valves 12" and smaller and 150 psi for valves 14" through 24".

2. Valve bodies shall be of ASTM A-126 Class B cast iron. Flanges shall be in full compliance with ANSI B16.1 Class 125. Seats shall be constructed of ASTM B-62 bronze and be mechanically retained in the valve body. Disc shall be of cast iron ASTM A-126 Class B with mechanically secured bronze disc seat of ASTM B-62 material. The hinge shall be constructed of ductile iron ASTM A-536 Grade 65-45-12 with a stainless steel hinge pin. Packing shall be non-asbestos type and mechanically adjustable.

3. Testing shall be performed in accordance with AWWA C-508-93 with the test results being furnished to the customer upon request.

E. Plug Valves

1. Plug valves shall be of the non-lubricating, eccentric type and shall be designed for a working pressure of 175 psi for valves 12" and smaller, 150 psi for valves 14" and larger. Valves shall provide tight shut-off at rated pressure. Valves 12" and smaller shall have round port design. 14" and larger valves shall have rectangular port design.

2. The plug valve body shall be cast iron ASTM A126 Class B with welded-in overlay of at least 95% nickel alloy content on all surfaces contacting the face of the plug. Sprayed, plated, nickel welded rings or seats screwed into the body are not acceptable.

3. The valve plug shall be ductile iron ASTM A-536, Grade 65-45-12, in valve sizes up to 20", and ASTM A126 Class B cast iron in sizes 24" and larger, with Buna N resilient seating surface to mate with the body seat. Valve flanges shall be in strict accordance with ANSI B16.1, Class 125.

4. Plug valve shall be furnished with permanently lubricated sleeve type bearings conforming to AWWA C517. Bearings shall be of sintered, oil impregnated type 316 stainless steel ASTM A-743 Grade CF-8M or bronze ASTM B-127.

5. Valve shaft seals shall be of the "U" cup type, in accordance with AWWA C517. Seals shall be self-adjusting and repackable without moving the bonnet from the valve.

F. Combination Air Release and Vacuum Valves

1. The combination air valve shall combine the operating features of both an air and vacuum valves and an air release valve in one housing. The air and vacuum valve portion shall automatically exhaust large quantities of air during the filling of the pipeline and automatically allow air to reenter the pipeline when the internal pressure of pipeline approaches a negative value due to column separation, draining of the pipeline, or other emergency. The air release valve portion shall automatically release small amounts of air from the pipeline while it is under pressure.

2. The inlet and outlet of the valve shall have the same cross-section area. The float shall be guided by a stainless steel guide shaft and seat drip-tight against a synthetic rubber seal.

3. The float shall be of all stainless steel construction and capable of withstanding maximum system surge pressure without failure. The body and cover shall be concentrically located and of ductile iron and all valve internal parts shall be stainless steel with Buna-N rubber seat. Must be manufactured per ANSI/AWWA C512-04.

4. The air valve shall be supplied with the valve manufacturer's backwash kit with back flushing hose and quick disconnect couplings.

5. The combination air release and vacuum valve shall be Model 36WW from Cla-Val, Newport Beach, CA, U.S.A., or prior approved equal.

2.5 PAINTING

1 A. General

2 1. Piping, valves and miscellaneous metals, etc., shall be painted with a high grade industrial
3 paint manufactured by Tnemec, Koppers, or prior approved equal unless such items are galvanized
4 or stainless steel.

5 2. Schedule

6 1. Touch-up painting shall be performed in the field, after installing the lift station, according
7 to the equipment manufacturer's recommendations, with paint of equal quality to the original.

8 2. The minimum acceptable paint system shall be a two coat coal tar epoxy protective coating
9 system applied to the dry film thickness recommended by the paint manufacturer and approved by
10 the Engineer.

11
12 PART 3 – EXECUTION

13 INSTALLATION

14 A. General

15 1. The lift station installation shall be made in strict accordance with the manufacturer's
16 instructions and recommendations as approved by the Engineer.

17 2. The installation shall meet all requirements of the Contract Documents for a complete and
18 operable lift station.

19 B. Requirements

20 1. Make piping connections and equipment adjustments required to ensure proper operation
21 of the lift station at design conditions.

22 2. Make necessary electrical connections and installations in accordance with the NEC.

23 3. Backfill, compact, fine grade, and provide erosion control in accordance with the
24 requirements of the Contract Documents.

25 4. Refer to applicable portions of Section 02200 for excavating, backfilling and finish
26 grading.

27 3.2 COMPLETION

28 A. General

29 1. Before diverting flow into the lift station, all individual components must have been
30 checked, tested, and approved by the manufacturer's representative and the Engineer according to
31 the formal testing procedures and recording forms provided by the manufacturer.

1 B. Testing

2 1. Check the following Items:

3 a. Manual operation of the pump.

4 b. Automatic operation for alternating pumps.

5 c. Automatic operation of pumps in parallel.

6 d. Automatic operation for the alarm system.

7 e. Automatic operation of lag pump when the lead pump fails and the water level continues
8 to rise.

9 f. All other components for proper operation under actual design conditions.

10 g. Capacity of each pumping unit and the combined units by either a portable measuring
11 device or mathematical method as approved by the Engineer.

12 h. Voltage and current for the pumps.

13 i. Direction of movement of the impeller.

14
15 3.1 DRIVE UNIT

16
17 A. Motors

18 1. The pump motors shall be horizontal, TEFC, induction type, with normal starting torque
19 and low starting current characteristics, suitable for 3 phase, 60 hertz, 480 volts, ac electrical
20 current. Motors supplied shall be one (1) nominal size larger than required to be non-overloading
21 over the entire operating range. The motors shall be furnished with space heaters. Where 3 phase
22 power at the site is not feasible, the Developer/Contractor can submit an alternate plan for electric
23 motors/drive configurations/voltages for review and approval. Approval will be by the Parish
24 Engineer on a case by case basis.

25
26 2. Each motor shall be in current NEMA design cast iron frame with copper windings.

27
28 B. Drive Transmission

1 1. Power shall be transmitted from motors to pumps by means of v-belt drive assemblies. The
2 drive assemblies must be selected to establish proper pump speed to meet the specified operating
3 conditions.

4
5 2. Each drive assembly shall have a minimum of two v-belts. In no case will a single belt
6 drive be acceptable. Each v-belt drive assembly shall be selected on the basis that adequate power
7 will be transmitted from driver to pump.

8
9 3. Drive systems with a safety factor of less than 1.5 to 1.0 shall not be considered sufficient
10 for the service intended.

11
12 4. Computation of safety factors shall be based on performance data published by the drive
13 manufacturer.

14 15 C. Belt Guards

16
17 1. Pump drive transmissions shall be enclosed on all sides in a guard constructed of any one
18 or combination of materials consisting of expanded, perforated, or solid sheet metal, except that
19 maximum perforated or expanded openings shall not exceed ½ inch.

20
21 2. Guards shall be manufactured to permit complete removal from the pump unit without
22 interference with any unit component, and shall be securely fastened to the unit base.

23
24 3. All metal shall be free of burrs and sharp edges. Structural joints shall be continuously
25 welded. Panels may be riveted to frames with not more than five- inch spacing. Tack welds shall
26 not exceed four-inch spacing.

27
28 4. The guard shall be primed with a minimum of 1.5 Mils of zinc-based synthetic primer. A
29 finish acrylic enamel coating (minimum 1.5 Mils) shall be applied in accordance with section 3,
30 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. Pressure gauges should be glycerin filled. 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

1 sized as shown on the plans. Main and motor circuit breakers will have 25,000 AMP RMS
2 minimum interrupting capacity. Single pole will be rated at 10,000 AMP RAMS interrupting
3 capacity.

4
5 C. Furnish 3-Phase Voltage monitors as shown on the plans. Three-Phase monitors should
6 shut down the pumps in case of phase loss, phase unbalance, phase reversal, or under- over voltage.

7
8 D. Furnish 11-pin octal base plug-in relays for 120V AC Controls. Use 8-pin, octal base plug-
9 in on-relay timer delay relays for all timer relays. Furnish time range shown on the plans.

10
11 E. Furnish non-resettable elapse time meters (ET) rated at 120V AC with a range to 99,999.9
12 hours.

13
14 F. Furnish transformer type (240V) pilot lights at panel (PL). This will permit the lamps the
15 lamps to operate at half voltage prolonging lamp life considerably.

16
17 G. Use industrial grade selector switches, such as Allen & Bradley 800T Series for all controls
18 switches. S1 will be two position, S2, S4 and S5 will be 3-position. S3 will be normally close
19 pushbutton, momentary contact.

20
21 H. Use 300V, box type terminal blocks. Use 15 AMP terminal blocks. Other terminal blocks
22 will be appropriate for the motors being utilized.

23 I. Minimum size wiring for control will be No. 14 AWG Copper. Size incoming leads and
24 Motor T-Leads as appropriate for the motor size.

25
26 J. Furnish proper laminated plastic nameplates for all devices (including relays) with
27 minimum size letters 3/16" high. Use nameplate schedule for panel door in these specifications.

28
29 K. Tag all wires at both ends. Number the terminal blocks as shown on the plans.

1 L. Furnish one 100W outdoor LED bulb with red globe and cast aluminum guard for
2 indication of high water level in station wet well. Install on meter pole.

4 M. Furnish in-line flasher in panel for the high water level lights. Wire as shown on the plans.

6 N. Install lightning arresters for 120/240V Systems.

8 O. Furnish four normally open float switches for on-off operation of pumps and for high water
9 level alarm. Switches will have a SS316 float with Nitrile PVC Jacket. The switches will be
10 equipped with a 30' 3/C-14 type SO Cord. Mount the switches with the proper clamps on a 1"
11 schedule 40 SS316 pipe mounted in each wet well.

13 P. Furnish the following spare parts:

- 14 1. Six (6) of each size and type of fuse;
- 15 2. Twenty-four (24) pilot light lamps for control panel;
- 16 3. Two (2) of each type of plug-in relay;
- 17 4. Two (2) of each type of plug-in time delay relays;
- 18 5. One (1) of each type of phase sequence-under/over voltage protector relay;
- 19 6. Three (3) float switches.

21 Q. Provide nameplate schedule for panel doors as follows:

23 MARK ENGRAVING

24 CB1 Main Panel Pole

25 PL1 Control Power On

26 PL2 Call Pump No. 1

27 PL3 Call Pump No. 2

28 PL4 Call Lag Pump

29 PL5 High Wet Well Water Level

1 PL6 High Temp. - Pump No. 1
 2 PL7 High Temp. - Pump No. 2
 3 PL8 Pump No. 1 Running
 4 PL9 Pump No. 1 Ready
 5 PL10 Pump No. 2 Running
 6 PL11 Pump No. 2 Ready
 7 MARK ENGRAVING
 8 S1 Control Power
 9
 10 S2 Pump Alternator
 11 Alt Pump 1 Pump 2
 12 Lead Lead
 13 S3 High Temp Reset
 14 S4 Pump No. 1 Control - Hand-Off-Auto
 15 S5 Pump No. 2 Control - Hand-Off-Auto
 16 S6 Outside Floodlight
 17

18 3.4 DRAWINGS AND OTHER DATA

19
 20 A. The Developer shall furnish three (3) complete sets of the following drawings and other
 21 data for approval before construction is begun:

- 22
- 23 1. Pumps
 - 24 a. Certified dimensional outline drawings of the pumping unit.
 - 25 b. Recommended spare parts.
 - 26 c. Sectional Drawings and parts list.
 - 27 d. Operating and Maintenance instructions.
 - 28 e. Pump performance curve.

1
2 2. Motors

- 3
4 a. Horsepower, speed, temperature rise, NEMA design letter, enclosure, frame number.
5

6 3.5 STATION ENCLOSURE

7
8 A. Description

- 9
10 1. The station enclosure shall contain and enclose all pumps and equipment, and shall be
11 constructed to enhance serviceability by incorporating the following design characteristics:
12

13 a. Access panels shall be provided. Panels shall be sized and placed to permit routine
14 maintenance operations through the panel openings of the enclosure. For these purposes, routine
15 maintenance shall include pump and motor inspection, drive belt adjustment, and pump cleanout.
16 Panels shall be secured with tamper-proof hardware.
17

18 b. Not less than four access panels shall be provided with a hinge and latch. Such panels shall
19 provide access to frequently performed adjustments and inspections of the electrical controls.
20 Hinge shall be the continuous type. Latch shall engage the enclosure at not less than two places,
21 and shall be protected by a keyed lock.
22

23 c. One access panel shall contain a screened vent to maximize air flow for enclosure
24 ventilation.

25 d. Station enclosure, less base, must be completely removable or able to be disassembled
26 following the removal of reusable hardware. After removal or disassembly, no portion of the
27 enclosure shall project above the surface of the base to interfere with maintenance operations or
28 endanger personnel.
29

30 e. Removal or disassembly of the enclosure shall be accomplished by not more than two
31 maintenance personnel without the use of lifting equipment.

1
2 B. Materials
3

4 1. The station enclosure shall be manufactured of molded reinforced orthophthalic polyester
5 resins with a minimum of 30% fiberglass, and a maximum of 70% resin. Resin fillers or extenders
6 shall not be used. Glass fibers shall have a minimum average length of 1 1/4 inches. Major design
7 considerations shall be given to structural stability, corrosion resistance, and water tight properties.
8 The polyester laminates shall provide a balance of mechanical, chemical, and electrical properties
9 to insure long life. They must be impervious to micro-organisms, mildew, mold, fungus, corrosive
10 liquids, and gases which can reasonably be expected to be present in the environment surrounding
11 the wet well.
12

13 2. All interior surfaces of the housing shall be coated with a polyester resin-rich finish. It
14 shall provide: maintenance free service, abrasion resistance; and protection from sewage, greases,
15 oils, gasoline, and other common chemicals.
16

17 3. The outside of the enclosure shall be coated with a suitable pigmented resin compounded
18 to insure long, maintenance-free life.
19

20 C. Enclosure Base
21

22 1. Station base shall be constructed of pre-cast, reinforced concrete, bonded inside a fiberglass
23 form covering top and sides, and shall be designed to insure adequate strength to resist deformation
24 of structure during shipping, lifting, or handling. Base shall incorporate drainage provisions, and
25 shall be provided with an opening of sufficient size to permit piping and service connections to the
26 wet well.
27

28 2. Station base shall incorporate anchor recesses for securing the pump station to the concrete
29 pad supplied by the developer in accordance with the station plans. Color used shall de-emphasize
30 the presence of dirt, grease, etc.
31

32 D. Ventilating Blower

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

8
9 3.6 TESTING

10
11 A. Developer shall be responsible for conducting a performance test for each pump
12 individually and in combined operation in the installed pump station. The performance test shall
13 include the following items:

- 14
15 1. Pumping Rate (gpm)
16
17 2. Discharge Head (feet)
18
19 3. Motor voltage and current draw (each leg for 3 phase motors)
20

21 B. Submit a written report of the performance test.
22

1 **CHAPTER 130 APPENDIX IV**

2 **SUBMERSIBLE WASTEWATER PUMPING STATION**

3 **PART 1 GENERAL**

4 **1.1 RELATED DOCUMENTS**

5 A. Ascension Parish Subdivision Construction Specifications.

7 **1.2 DEFINITIONS**

8 A. For the purposes of these specifications, the Parish Engineer shall be defined as: the office
9 of the Parish Engineer, the Department of Public Works, or the Engineering Review Agency.

10 B. For the purposes of these specifications, the following describe the limits of work:

11 1. Roadbed: width of roadway, either edge of pavement or edge of pavement; or, back of curb
12 to back of curb, plus five (5) feet on both sides.

13 2. ROW Transition Area: area between edge of Roadbed and established ROW.

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

15 **1.3 PRE-SUBMITTAL**

16 A. All manufacturers and/or manufacturers' representative shall submit substitution
17 equipment for consideration which shows compliance with, or an itemized list of
18 deviations/exceptions with technical justification of such to all performance, construction, service
19 and warranty requirements of this specification and any failure to provide this information will
20 result in a non-review by the Engineer and Ascension Parish. This pre-submittal shall be submitted
21 by the DEVELOPER/CONTRACTOR to the Project Engineer and Ascension Parish at least
22 fourteen (14) days prior to bid; otherwise, such substitution requests will not be considered for the
23 project. Equipment must be conditionally approved by the Engineer in writing at least five (5)
24 business days prior to bid for all named or substitute manufacturers in order to be offered for this
25 project. Three (3) business days prior to bid, the Engineer will furnish a final listing of equipment
26 appearing to meet the specifications and conditionally approved for this project. In no case shall
27 equipment be accepted for this project if not approved by the Engineer in writing prior to bid. Pre-
28 submittal data shall include, but not be necessarily limited to: typical motor, as well as pump,
29 performance curves; compliance documentation for all performance values, compliance
30 documentation for all construction details described in, and calculations required by, Section 1.4.
31 If a substitution is requested after the bid opening by the winning contractor, the contractor is
32 responsible for the engineering cost to review the request, whether the request is granted or not.

33 **1.4 SUBMITTALS**

1 A. Furnish complete assembly, foundation support, and installation drawings, together with
2 detailed specifications and data covering pumps, motors, material used, parts, devices and other
3 accessories forming a part of the equipment furnished shall be submitted for approval in
4 accordance with the procedure set forth in the General Conditions.

5
6 B. Data and specifications for the equipment shall include, but shall not be limited to the
7 following:

8 1. Settings Plans; setting plans shall include:

9 a. Anchor bolt layout

10 b. Anchor bolt dimensions

11 c. Outline dimensions and weights of pumps, bases, motors, and control enclosures.

12 2. Pumps; data and drawings shall include:

13 a. Manufacturer, type and model number.

14 b. Assembly drawing, nomenclature and material list, O&M manual, and parts list.

15 c. Type, manufacturer, model numbers, location and spacing of bearings.

16 d. Impeller type, diameter, thru-let dimensions, shreader size, number of vanes and
17 identification number.

18 e. Complete motor performance data including: rating, voltage/phase/frequency; design type;
19 service factor; insulation class; motor pole number; actual rotation speed when combined with the
20 specified pumps; current, power factor and active input power (KW) as a continuous function of
21 shaft power from no load to at least 115 percent load, start (max. inrush) current; locked rotor
22 current; NEC code letter; and motor torque as a continuous function through the motor start cycle
23 from no rotation to synchronous speed.

24 f. Complete performance test curve(s) showing full range (shutoff to run-out) head vs.
25 Capacity, NPSHR, hydraulic efficiency, motor active (KW) input power, motor total (KVA) input
26 power (Based on measured current and voltage), and shaft power (BHP). See Section 3.01 Shop
27 Tests.

28 g. Location and description of Service Centers and spare parts stock.

29 h. Warranty for the proposed equipment.

30 3. The manufacturer shall indicate, by arrows to points on the Q/H curves, limits
31 recommended for stable operation, between which the pumps are to be operated to prevent surging,
32 cavitation, and vibration. The stable operating range shall be as large as possible, and shall be

1 based on actual hydraulic and mechanical characteristics of the units and shall meet the hydraulic
2 performance requirements of the proposed system.

3 4. Furnish shop drawings and other pertinent data to the Engineer and obtain his approval
4 before fabrication. The drawings shall be complete with respect to dimensions, materials of
5 construction, wiring diagrams, and all supporting engineering information.

6 5. At least one month before installation of this work, submit four (4) copies of operation and
7 maintenance instructions to the Engineer.

8 1.5 AS-BUILT DRAWINGS AND REPORTS

9 A. As-built drawings shall be provided to the owner, along with all pump test reports.

10 1.6 GENERAL REQUIREMENTS

11 A. Coordination

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

16 B. Completeness

17 1. The following Specifications describe major functions and features, but do not necessarily
18 cover all details entering into the design and operation of the equipment or items that individual
19 manufacturer may consider as an option accessory.

20 2. Wherever in these Specifications specific equipment, materials, or manufactured products
21 are called for or described, such are specified to establish the basic standard or level of quality
22 materials, and features.

23 3. The DEVELOPER shall be responsible for a complete and workable pump station. He shall
24 coordinate between individual equipment manufacturers and furnish whatever interface
25 connections, controls, interlocks and accessories that are required between all interconnected
26 components, items or systems so that they operate repeatedly and reliably within the specifications
27 and overall design requirement. Individual equipment units that are furnished with inadequate
28 materials, accessories or controls, or are not properly designed by the manufacturer to satisfy the
29 specific application as indicated by the Specifications, shall not be accepted until properly
30 modified or replaced.

31 4. The DEVELOPER shall be responsible for establishment of permanent electrical power
32 and potable water to the pump station site. Potable water shall be provided to the site while
33 adhering to all Louisiana Department of Health requirements including but not limited to a
34 backflow prevention device.

1 5. The design of equipment and components shall be of adequate materials and strength for
2 the specific application and exposures, and their design and installation shall meet all applicable
3 codes and regulations.

4 6. The DEVELOPER shall be responsible for all permit applications and all efforts necessary
5 in securing all agency approvals.

6 C. Site Design

7 1. The DEVELOPER shall be responsible for a finished surface within the fenced in area of
8 the pump station site. The finished surface shall be 8 inches of 610 limestone on top of 7 oz. woven
9 geotextile fabric.

10 2. Site shall have an access drive which shall be accessible from a public street. Site drive
11 shall be 12 ft minimum width and hard surfaced.

12 3. The site design shall include a clearance of at least 20 feet from the structure to property
13 lines on at least 2 sides.

14 4. The site security fence and entrance gate shall be placed far enough from the street to allow
15 maintenance vehicles to be off the main roadway when the operator stops to unlock the gate.

16 5. Site shall be designed with a lighting system operating on a photocell and on/off switch
17 with a manual switch override. Site lighting shall be designed to minimize off site impacts while
18 maintaining functionality for maintenance personnel working on pump station components.

19 6. The power service feeding the pump station shall be 230 or 460 Volt, 3 phase, 4 wire
20 service.

21 7. The pump station site plan shall be submitted to the Parish Engineer for approval.

22 8. The Parish shall indicate the desired location of the pump station(s) within the boundaries
23 of the proposed development.

24 9. Each station location shall be required to have a pump station sign indicating the station
25 name, municipal address, and emergency contact information. The Parish will provide a detail of
26 the sign required.

27 10. Pump station site plan shall include location for generator hookup.

28 D. Foundations, Anchors, and Bases

29 1. Manufactured equipment and assembled systems shall be furnished with foundation layout
30 drawings, bases and anchor bolt recommendations. Unless indicated otherwise, all application and
31 furnished by the manufacturer. All Anchor bolt materials shall be Type 316 stainless steel.

32 2. 2.

1 2.

2

3 2.

4 2.

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6 2.

7 2.

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9 2.

10 2.

11

12 2. The DEVELOPER shall furnish the necessary materials and construct suitable concrete
13 foundations or concrete pads at least six inches (6") high for all equipment installed by him. The
14 tops of foundations shall be at such elevations as will permit grouting as specified below.

15 3. All equipment shall be installed by skilled mechanics and in accordance with the
16 instructions of the manufacturer.

17 4. In setting pumps, motors, and other item of equipment customarily grouted, the
18 DEVELOPER shall make an allowance of at least 1 in. for grout under the equipment bases. Shims
19 used to level and adjust the bases shall be steel. Shims may be left embedded in the grout, in which
20 case they shall be installed neatly and so as to be as inconspicuous as possible in the completed
21 work. Unless otherwise permitted, all grout shall be suitable non-shrink grout.

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

27 E. Equipment Bolts, Studs, and Screws

28 1. Bolts and accessories for general equipment use shall be type 316 stainless steel, without
29 coating. Unless indicated otherwise.

30 2. Stainless steel bolts and accessories shall comply with ASTM F 593, Specification for
31 Stainless Steel Bolts, Hex Cap Screws, and Studs.

1 3. Except as specified above, stud, tap, and machine bolts and nuts for general use shall
2 conform to ASTM A 307, Specification for Carbon Steel Externally Threaded Standard Fasteners.
3 Hexagon nuts and accessories of the same metal quality as the bolts shall be used. All threads shall
4 conform to ANSI B1.1, Standard for Unified Inch Screw Threads, Coarse Thread Series and have
5 a Class 2A tolerance. Zinc or cadmium coatings shall be furnished where specified, indicated, or
6 required.

7 4. Machine and set screws shall conform to Federal Specifications FF-S-91, unless otherwise
8 specified.

9 5. All machine screws and lag screws shall utilize either cut washers or lock washers. All bolt
10 heads and nuts bearing on plastics shall have cut washers.

11 F. Lubricants

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

16 G. Storage and Protection

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

24 PART 2 PRODUCTS

25 2.1 FENCING AND GATES

27 A. General

29 a. Fence shall be plumb and level to the owner's satisfaction.

30 b. Fence design type shall be board on board.

c. The fencing and gates for the pump station site should be constructed as shown on sheets 1 through 3 of Standard Plan No. 902-06 for the City of Baton Rouge/Parish of East Baton Rouge Department of Public Works.

B. Fence Posts

a. Fence posts shall be 2 inch schedule 40 galvanized pipe. Fence posts shall be 8 feet long. 2.5 feet of each post shall be below grade inside of an 8 diameter hole 2.5 feet deep. The hole shall be filled with 4000 psi concrete.

b. All fence posts shall have galvanized dome caps.

C. Fencing

a. Runner Boards: Runner boards shall be 2x4 treated pine. Three (3) runners shall be provided. Runner boards shall be secured to each fence post with a galvanized lag bolts. Each post shall have three (3) lag bolts attaching runner boards.

b. Fence Boards: Fence boards shall be 6 foot long, grade #2 cedar fence boards, or better. Fence board design shall be board on board. A spacer shall be used during installation and the first set of picket boards nailed to runners shall have a 3 inch gap between boards. The second row of picket boards shall be centered over each 3 inch gap. Six (6) stainless steel ring shank nails shall be used to nail each fence board.

D. Gates

a. Posts: The post that will have the gate hinges shall be 3 inch schedule 40 galvanized pipe.

b. Hinges: All gates shall have two (2) bulldog type galvanized hinges secured to a 3 inch gate post.

c. Gates: All gates shall have a welded galvanized tubed frame that is attached to bulldog hinges. Runner boards shall be attached to the welded gate frame. Cedar fence boards with board on board design shall be secured to the runner boards.

d. Cane Bolts: One (1) heavy duty cane bolt shall be installed on each gate. If concrete pad or drive is not already underneath gate, then at least a 12in x 12in x 4in deep concrete pad shall be

1 poured under the cane bolt. The center of the concrete pad shall have a hole drilled out in the
2 center to receive the cane bolt.

3 e. Handles and Latches: One (1) handle and one (1) latch shall be installed on each gate.
4 Latch shall be pad-lockable.

6 2.2 CONCRETE WET WELL

7 A. General

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

12 B. Concrete Wet Well and Valve Vault

13 1. Precast concrete construction shall be designed per ASTM standard C-478. 1. Class 1
14 air-entrained precast concrete shall achieve a minimum 28-day compression strength of 5,500 psi
15 and be manufactured by a Quality Certified Plant of the NPCA (National Precast Concrete
16 Association). Type I/II cement shall be used (suitable for type II cement per ASTM C-150). Joints
17 between precast sections shall be sealed with ConSeal CS-102 or approved equal per ASTM C-
18 990. Penetrations to use Kor-N-Seal Flexible Pipe Connectors to meet or exceed ASTM C-923.
19 Concrete components as manufactured by Gainey's Concrete Products, Inc., or prior approved
20 equal.

21 2. The minimum wet well diameter shall be 6 feet.

22 3. Concrete wet wells and grout shall include Xypex Bio San C500 antimicrobial and
23 crystalline admixture or prior approved equal at a rate of 1% by weight of total cementitious
24 materials and in accordance with manufacturer's instructions. Product shall include field detention
25 colorant, antimicrobial additive and crystalline chemical all in one package. No exceptions.

26 4. Top slabs shall be fitted with a 4" ductile iron pipe with 180 degree elbow for venting.
27 Vent pipes shall be fitted with a 16 mesh stainless steel metal insect screen.

28 5. The pump station wet well access door shall be Model AHS/D as manufactured by U.S.F.
29 Fabrication, Inc., or prior approved equal, with the size being specified on the plans and also as
30 recommended by the pump supplier. Door leaf shall be 1/4-inch thick aluminum diamond plate
31 reinforced for an AASHTO H20-44 wheel load. Upon request, manufacturer shall provide
32 structural calculations showing that the door design meets the loading requirements of AASHTO
33 H20-44. (The access door is designed for off-street locations that may occasionally receive
34 AASHTO H20-44 wheel loads.) The frame shall be extruded aluminum with an integral anchor

1 flange and door seat on all four sides. The access door shall be equipped with a flush lifting handle
2 that does not protrude above the cover, and a 316 stainless steel hold open arm with red vinyl grip
3 that automatically keeps the cover in its upright, open position. Each door shall include stainless
4 steel gas shocks for easy opening. The access door shall allow visual inspections, limited
5 maintenance and level system adjustment while safety grate is left in place. The grate shall be
6 counter-balanced for ease of opening. The safety grate shall be orange in color to promote visual
7 awareness of hazard. The door shall have 316 stainless steel hinges and 316 stainless steel tamper
8 resistant bolts/locknuts. The door shall be equipped with a watertight 316 stainless steel slamlock
9 with threaded plug, removable outside key, and fixed inside handle. The slamlock latches onto a
10 316 stainless steel striker plate that is bolted to the frame. An adhesive backed vinyl material that
11 protects the product during shipping and installation shall cover the entire top of the frame and
12 cover. Installation shall be in accordance with the manufacturer's attached instructions. The entire
13 frame including the seat on which the reinforcing rests shall be supported by concrete or other
14 material designed to support the specified load. The door shall be manufactured and assembled in
15 the United States. Manufacturer shall guarantee the door against defects in materials and
16 workmanship for a period of ten years.

17 6. The pump station valve vault access door shall be identical to the wet well access door,
18 except that it shall not have a safety grate.

19 7. DEVELOPER shall provide a geotechnical investigation of the existing soils at the
20 proposed wet well location by a Geotechnical Engineer licensed in the state of Louisiana. If this
21 pump station is being installed in conjunction with a new wastewater treatment plant and is within
22 fifty (50) feet of the treatment plant, a soil boring at this location is not required. The Geotechnical
23 Engineer shall provide a foundation design for the wet well, installation requirements, and anti-
24 flotation calculations. Wet well installation shall not begin until the Parish Engineer / Review
25 Agency has approved the installation requirements specific to this site.

26 8. PUMP DESIGN: For Solids-handling pumps, each pump shall be automatically and firmly
27 connected to the discharge connection, guided by no less than two 2-inch diameter, Schedule 40,
28 type 316 stainless steel guide bars extending from the top of the station to the discharge connection.
29 Sealing of the pumping unit to the discharge connection shall be accomplished by a machined
30 metal-to-metal watertight contact. Sealing of the discharge interface with a diaphragm, O-ring or
31 profile gasket will not be acceptable. No portion of the pump shall bear directly on the sump floor.
32 Each pump shall be fitted with stainless steel lifting chain or stainless steel cable. The working
33 load of the lifting system shall be 50% greater than the pump unit weight.

34 2.3 PUMP SYSTEM & CONTROLS

35 A. Pump system and controls shall be in accordance with Specification Section 16 of the AP
36 Subdivision Construction Specifications. See "Section 16 – Submersible Sewage Pump Systems
37 & Controls".

2.4 PUMP STATION PIPING, VALVES AND FITTINGS

A. General

1. Piping and Fittings shall conform to Ascension Parish Subdivision Specifications Section 13 – Sewer Force Mains.

2. Piping and fittings shall be supported to prevent any transfer of loads to the pumps.

3. Only metallic piping shall be used when passing through concrete.

4. Where piping penetrates walls of the wet well or valve vault, wall piping shall be used, as shown.

B. Piping

1. Piping and fittings larger than two inches shall be ductile iron in accordance with the Contract Documents.

C. Valves

1. Valves shall be provided where required by and according to the Contract Documents.

2. Each pump shall have one (1) check valve and one (1) plug valve in accordance with Valve Specifications.

3. Pump station must include an emergency bypass connection point on the downstream side of both pump shutoff valves. Emergency bypass connection shall consist of (1) plug valve with one (1) camlock hose connection and blind cap.

D. Check Valves

1. Swing check valves are of self-contained, free-swinging disc style, allowing a full waterway. Valve disc swings freely open and is keyed to valve hinge pin without use of pins. Valves conform to all standards set forth in AWWA C508, Latest Edition. Valve hinge pins are Stainless Steel. Manufacturer should have minimum of 10 years experience supplying AWWA C508 valves. Valves may be supplied with external lever with weight or spring to assist closure if required by customer. The pressure rating shall be 200 for valves 12" and smaller and 150 psi for valves 14" through 24".

2. Valve bodies shall be of ASTM A-126 Class B cast iron. Flanges shall be in full compliance with ANSI B16.1 Class 125. Seats shall be constructed of ASTM B-62 bronze and be mechanically retained in the valve body. Disc shall be of cast iron ASTM A-126 Class B with mechanically secured bronze disc seat of ASTM B-62 material. The hinge shall be constructed of ductile iron ASTM A-536 Grade 65-45-12 with a stainless steel hinge pin. Packing shall be non-asbestos type and mechanically adjustable.

3. Testing shall be performed in accordance with AWWA C-508-93 with the test results being furnished to the customer upon request.

E. Plug Valves

1. Plug valves shall be of the non-lubricating, eccentric type and shall be designed for a working pressure of 175 psi for valves 12" and smaller, 150 psi for valves 14" and larger. Valves shall provide tight shut-off at rated pressure. Valves 12" and smaller shall have round port design. 14" and larger valves shall have rectangular port design.

2. The plug valve body shall be cast iron ASTM A126 Class B with welded-in overlay of at least 95% nickel alloy content on all surfaces contacting the face of the plug. Sprayed, plated, nickel welded rings or seats screwed into the body are not acceptable.

3. The valve plug shall be ductile iron ASTM A-536, Grade 65-45-12, in valve sizes up to 20", and ASTM A126 Class B cast iron in sizes 24" and larger, with Buna N resilient seating surface to mate with the body seat. Valve flanges shall be in strict accordance with ANSI B16.1, Class 125.

4. Plug valve shall be furnished with permanently lubricated sleeve type bearings conforming to AWWA C517. Bearings shall be of sintered, oil impregnated type 316 stainless steel ASTM A-743 Grade CF-8M or bronze ASTM B-127.

5. Valve shaft seals shall be of the "U" cup type, in accordance with AWWA C517. Seals shall be self-adjusting and repackable without moving the bonnet from the valve.

F. Combination Air Release and Vacuum Valves

1. The combination air valve shall combine the operating features of both an air and vacuum valves and an air release valve in one housing. The air and vacuum valve portion shall automatically exhaust large quantities of air during the filling of the pipeline and automatically allow air to reenter the pipeline when the internal pressure of pipeline approaches a negative value due to column separation, draining of the pipeline, or other emergency. The air release valve portion shall automatically release small amounts of air from the pipeline while it is under pressure.

2. The inlet and outlet of the valve shall have the same cross-section area. The float shall be guided by a stainless steel guide shaft and seat drip-tight against a synthetic rubber seal.

3. The float shall be of all stainless steel construction and capable of withstanding maximum system surge pressure without failure. The body and cover shall be concentrically located and of ductile iron and all valve internal parts shall be stainless steel with Buna-N rubber seat. Must be manufactured per ANSI/AWWA C512-04.

4. The air valve shall be supplied with the valve manufacturer's backwash kit with back flushing hose and quick disconnect couplings.

5. The combination air release and vacuum valve shall be Model 36WW from Cla-Val, Newport Beach, CA, U.S.A., or prior approved equal.

2.5 PAINTING

A. General

1. Piping, valves and miscellaneous metals, etc., shall be painted with a high grade industrial paint manufactured by Tnemec, Koppers, or prior approved equal unless such items are galvanized or stainless steel.

2. Schedule

1. Touch-up painting shall be performed in the field, after installing the lift station, according to the equipment manufacturer's recommendations, with paint of equal quality to the original.

2. The minimum acceptable paint system shall be a two coat coal tar epoxy protective coating system applied to the dry film thickness recommended by the paint manufacturer and approved by the Engineer.

PART 3 EXECUTION

3.1 INSTALLATION

A. General

1. The lift station installation shall be made in strict accordance with the manufacturer's instructions and recommendations as approved by the Engineer.

2. The installation shall meet all requirements of the Contract Documents for a complete and operable lift station.

B. Requirements

1. Make piping connections and equipment adjustments required to ensure proper operation of the lift station at design conditions.

2. Make necessary electrical connections and installations in accordance with the NEC.

3. Backfill, compact, fine grade, and provide erosion control in accordance with the requirements of the Contract Documents.

4. Refer to applicable portions of Section 02200 for excavating, backfilling and finish grading.

3.2 COMPLETION

A. General

1 1. Before diverting flow into the lift station, all individual components must have been
2 checked, tested, and approved by the manufacturer's representative and the Engineer according to
3 the formal testing procedures and recording forms provided by the manufacturer.

4 B. Testing

5 1. Check the following Items:

6 a. Manual operation of the pump.

7 b. Automatic operation for alternating pumps.

8 c. Automatic operation of pumps in parallel.

9 d. Automatic operation for the alarm system.

10 e. Automatic operation of lag pump when the lead pump fails and the water level continues
11 to rise.

12 f. All other components for proper operation under actual design conditions.

13 g. Capacity of each pumping unit and the combined units by either a portable measuring
14 device or mathematical method as approved by the Engineer.

15 h. Voltage and current for the pumps.

16 i. Direction of movement of the impeller.

17 C. Acceptance

18 2. Verify that the following have been completed in accordance with the Contract Documents

19 a. Installation requirements are complete.

20 b. Testing is complete and any required corrections have been made.

21 c. Site is free from debris and is finish graded.

22 d. Erosion control materials have been applied in accordance with the Contract Documents.

23 e. Manufacturer shall submit a report certifying proper installation, adjustment, lubrication,
24 calibration, and operation of equipment at time of startup inspection.

CHAPTRE 130 APPENDIX V
SUBMERSIBLE SEWAGE PUMP SYSTEMS & CONTROLS

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, triplex or quadplex submersible pump station and its appurtenances as indicated on the Drawings and as herein specified.

B. This section includes submersible solids handling pumps to be supplied with integral electric motor, discharge elbow, guide bar brackets, access covers, electrical controls, and other miscellaneous installation accessories. All pumps and controls shall be supplied by a single source supplier that adheres to the quality standards established and expressly named in this specification. This shall ensure single source responsibility for the complete pumping system. Along with equipment furnished by the pump, controls, and accessories supplier, it shall be the DEVELOPER's responsibility to supply electrical power to the site from the local power utility. Acceptable voltages are 240 VAC, three phase, or 480 VAC three phase. In addition to these requirements, all internal station discharge piping and appurtenances shall be ductile iron. Force main material shall be noted on the plans.

C. Control cabinet, interconnecting wiring and electrical appurtenances are specified under the appropriate electrical sections.

1.3 PRE-SUBMITTAL

A. All manufacturers and/or manufacturers' representative shall submit substitution equipment for consideration which shows compliance with, or an itemized list of deviations/exceptions with technical justification of such to all performance, construction, service and warranty requirements of this specification and any failure to provide this information will result in a non-review by the Engineer and Ascension Parish. This pre-submittal shall be submitted by the DEVELOPER/CONTRACTOR to the Project Engineer and Ascension Parish at least fourteen (14) days prior to bid; otherwise, such substitution requests will not be considered for the project. Equipment must be conditionally approved by the Engineer in writing at least five (5) business days prior to bid for all named or substitute manufacturers in order to be offered for this project. Three (3) business days prior to bid, the Engineer will furnish a final listing of equipment appearing to meet the specifications and conditionally approved for this project. In no case shall equipment be accepted for this project if not approved by the Engineer in writing prior to bid. Pre-

1 submittal data shall include, but not be necessarily limited to: typical motor, as well as pump,
2 performance curves; compliance documentation for all performance values, compliance
3 documentation for all construction details described in, and calculations required by, Section 1.8;
4 and Service warranty compliance documentation required by Section 2.1.M. of this specification.
5 If a substitution is requested after the bid opening by the winning contractor, the contractor is
6 responsible for the engineering cost to review the request, whether the request is granted or not.

7 1.4 QUALITY ASSURANCE

8 A. Manufacturer's Qualifications

9 1. All equipment approved for this project shall meet or exceed all performance, service, and
10 warranty requirements of this specification. The pump manufacturer shall have a minimum of 500
11 units of similar type pumps installed and operating for no less than five (5) years in the United
12 States.

13 2. The solid-handling pumps shall be suitable for pumping raw sewage and shall be designed
14 and fully guaranteed for this use. The fluid temperature range shall be from 40 degrees to 110
15 degrees F.

16 1.5 MANUFACTURER'S SERVICE REPRESENTATIVES

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

19 1.6 TESTING

20 A. General

21 1. Each pump shall be shop tested and field tested as specified hereinafter. All costs for the
22 tests shall be borne by the Developer. The Developer shall submit the complete shop test
23 procedures to the Parish Engineer / Engineering Review Agency for approval at least 30 days prior
24 to the shop test. In the event any equipment fails to meet the performance values set forth in this
25 specification, the equipment shall be modified and re-tested or replaced with equipment that
26 performs in accordance with this specification.

28 B. Shop Tests

30 1. The motor and cable on each pump shall be tested for moisture content or insulation
31 defects. After the test, the pump cable end shall be fitted with a shrink-fit rubber boot to protect it
32 from moisture or water.

C. Startup and Field Tests

1. Manufacturer startup, testing and training shall be provided to Owner personnel. The manufacturer shall include (1) day of startup, testing and training.

2. Equipment shall be field tested as specified hereinafter. Field testing shall be composed of acceptance tests. The Developer shall provide the services of authorized equipment supplier's representatives to conduct all field tests.

a. The pumping units operate as specified without excessive noise, cavitation, vibration, and without overheating of the bearings.

b. All automatic and manual controls function in accordance with the specified requirements.

c. All defects and defective equipment shall be corrected promptly or replaced by the Developer. All costs for replacement of defective equipment shall be borne by the Developer.

d. All adjustments necessary to place the equipment in satisfactory working order shall be made at the time of the above tests.

1.7 PERFORMANCE

A. Submersible pumps must have the necessary characteristics and be properly selected to perform under the operating conditions shown on the Construction Drawings.

Pump Station No.

Location/Name

Design Operating Conditions

Number of Pumps _____

Primary Duty Point @ 60 Hz _____ GPM @ _____ FT.TDH

Minimum Shutoff Head @ 60 Hz _____ FT

Max NPSHRe at Primary Duty Point _____ FT

Secondary Duty Point @ 45 Hz _____ GPM @ _____ FT.TDH

Max NPSHRe at Secondary Duty Point _____ FT

Motor Rating (HP) at 40 degrees C _____ HP

Phase/Cycle/Voltage 3 / 60 / 230 or 460

Motor Design Type NEMA Design B

Motor Service Factor Greater than 1.10

1 Motor Insulation Rating Class H
2 Maximum Pump Speed _____ RPM
3 Maximum Rated Current _____ Amps
4 Minimum Rated FL Power Factor (%) _____ %
5 Maximum NEC Code Letter "G"
6 Minimum Pump Discharge Size (Inches) _____ Inch
7

8 1.8 SUBMITTALS

9

10 A. Furnish complete assembly, foundation support, and installation drawings, together with
11 detailed specifications and data covering pumps, motors, material used, parts, devices and other
12 accessories forming a part of the equipment furnished shall be submitted for approval in
13 accordance with the procedure set forth in the General Conditions.
14

15 B. Data and specifications for the equipment shall include, but shall not be limited to the
16 following:

17 1. Settings Plans; setting plans shall include:

18 a. Anchor bolt layout

19 b. Anchor bolt dimensions

20 c. Outline dimensions and weights of pumps, bases, motors, and control enclosures.

21 2. Pumps; data and drawings shall include:

22 a. Manufacturer, type and model number.

23 b. Assembly drawing, nomenclature and material list, O&M manual, and parts list.

24 c. Type, manufacturer, model numbers, location and spacing of bearings.

25 d. Impeller type, diameter, thru-let dimensions, shreader size, number of vanes and
26 identification number.

27 e. Complete motor performance data including: rating, voltage/phase/frequency; design type;
28 service factor; insulation class; motor pole number; actual rotation speed when combined with the
29 specified pumps; current, power factor and active input power (KW) as a continuous function of
30 shaft power from no load to at least 115 percent load, start (max. inrush) current; locked rotor

current; NEC code letter; and motor torque as a continuous function through the motor start cycle from no rotation to synchronous speed.

f. Complete performance test curve(s) showing full range (shutoff to run-out) head vs. Capacity, NPSHR, hydraulic efficiency, motor active (KW) input power, motor total (KVA) input power (Based on measured current and voltage), and shaft power (BHP). See Section 1.6 B Shop Tests.

g. Location and description of Service Centers and spare parts stock.

h. Warranty for the proposed equipment.

3. The manufacturer shall indicate, by arrows to points on the Q/H curves, limits recommended for stable operation, between which the pumps are to be operated to prevent surging, cavitation, and vibration. The stable operating range shall be as large as possible, and shall be based on actual hydraulic and mechanical characteristics of the units and shall meet the hydraulic performance requirements of the proposed system.

4. Furnish shop drawings and other pertinent data to the Engineer and obtain his approval before fabrication. The drawings shall be complete with respect to dimensions, materials of construction, wiring diagrams, and all supporting engineering information.

5. At least one month before installation of this work, submit four (4) copies of operation and maintenance instructions to the Engineer.

1.9 DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle items of equipment in a manner that will prevent any damage.

B. Follow manufacturer's instructions for short term and long term storage, particularly with respect to proper lubricants and periodic rotation of shafts.

1.10 COORDINATION

A. Coordinate this work with the work of other trades to avoid interferences and to provide for timely installation.

PART 2 PRODUCTS

2.1 PUMPS

A. General

1. This section of the specifications covers the materials, equipment, and construction procedures applicable to the submersible wastewater pumps. All equipment approved for this project shall meet or exceed all performance, service and warranty requirements of this

1 specification. The submersible wastewater pumps shall be manufactured by Xylem Flygt, or prior
2 approved equal.

3 B. Submersible Solids-Handling Pumps

4 1. Submersible solids-handling pumps shall be equipped with submersible electric motor,
5 connected for operation on electrical service as shown on the plans with 50 feet of screened cable
6 suitable for submersible pump applications. The power cable shall be sized according to NEC and
7 ICEA standards and also meet with P-MSHA Approval. Each pump shall be supplied with a
8 mating cast iron discharge connection and be capable pump performance as shown in the
9 performance data table above. Each pump shall be fitted with sufficient length of stainless steel
10 lifting chain. The working load of the lifting system shall be 50% greater than the pump unit
11 weight. Pumps shall be capable of passing a 3" solid.

12 2. All equipment and materials shall be subject to the Engineer's review and shall not be
13 purchased or manufactured until the review is complete.

14
15 C. Pump Design

16 1. For Solids-handling pumps, each pump shall be automatically and firmly connected to the
17 discharge connection, guided by no less than two 2-inch diameter, Schedule 40 stainless steel guide
18 bars extending from the top of the station to the discharge connection. Sealing of the pumping
19 unit to the discharge connection shall be accomplished by a machined metal-to-metal watertight
20 contact. Sealing of the discharge interface with a diaphragm, O-ring or profile gasket will not be
21 acceptable. No portion of the pump shall bear directly on the sump floor. Each pump shall be
22 fitted with stainless steel lifting chain or stainless steel cable. The working load of the lifting
23 system shall be 50% greater than the pump unit weight.

24 D. Pump Construction

25 1. Major pump components shall be of grey cast iron, ASTM A-48, Class 35B, with smooth
26 surfaces devoid blow holes or other irregularities. All exposed nuts or bolts shall be AISI type 304
27 stainless steel. All metal surfaces coming into contact with the pumpage, other than stainless steel
28 or brass shall be protected by a factory applied spray coating of acrylic dispersion zinc phosphate
29 primer and a polyester resin paint finish on the exterior of the pump.

30 2. Sealing design shall incorporate metal-to-metal contact between machined surfaces.
31 Critical mating surfaces where watertight sealing is required shall be machined and fitted with
32 nitrile or Viton rubber O-rings. Fittings will be the result of controlled compressing of rubber O-
33 rings in two planes and O-ring contact of four sides without the requirement of a specific torque
34 limit.

3. Rectangular cross-sectioned gaskets requiring specific torque limits to achieve compression shall not be considered as adequate or equal. No secondary sealing compounds, elliptical O-rings, grease or other devices shall be used.

E. Cooling System

1. Each unit shall be cooled according to the following:

a. Pumps 1 hp and under: Motors are sufficiently cooled by the surrounding environment or pumped media. A cooling jacket is not required.

b. Pumps larger than 1 hp: Each unit shall be provided with an integral motor cooling system. A stainless steel motor cooling jacket shall encircle the stator housing, providing for dissipation of motor heat regardless of the type of pump installation. An impeller, integral to the cooling system and driven by the pump shaft, shall provide the necessary circulation of the cooling liquid through the jacket. The cooling liquid shall pass about the stator housing in the closed loop system in turbulent flow providing for superior heat transfer. The cooling system shall have one fill port and one drain port integral to the cooling jacket. The cooling system shall provide for continuous pump operation in liquid or ambient temperatures of up to 104°F (40°C). Operational restrictions at temperatures below 104°F are not acceptable. Fans, blowers or auxiliary cooling systems that are mounted external to the pump motor are not acceptable.

F. Cable Entry Seal

1. The cable entry seal design shall preclude specific torque requirements to insure a watertight and submersible seal. The cable entry shall consist of dual cylindrical elastomer grommets, flanked by washers, all having a close tolerance fit against the cable outside diameter and the entry inside diameter. The grommets shall be compressed by the cable entry unit, thus providing a strain relief function. The assembly shall provide ease of changing the cable when necessary using the same entry seal. The cable entry junction chamber and motor shall be sealed from each other, which shall isolate the stator housing from foreign material gaining access through the pump top. Epoxies, silicones, or other secondary sealing systems shall not be considered equal.

G. Motor

1. The pump motor shall be a NEMA B design, induction type with a squirrel cage rotor, shell type design, housed in an air filled, watertight chamber. The stator windings shall be insulated with moisture resistant Class H insulation rated for 180°C (356°F). The stator shall be insulated by the trickle impregnation method using Class H monomer-free polyester resin resulting in a winding fill factor of at least 95%. The motor shall be inverter duty rated in accordance with NEMA MG1, Part 31. The stator shall be heat-shrink fitted into the cast iron stator housing. The use of multiple step dip and bake-type stator insulation process is not acceptable. The use of pins, bolts, screws or other fastening devices used to locate or hold the stator and that penetrate the stator

housing are not acceptable. The motor shall be designed for continuous duty while handling pumped media of up to 104°F. The motor shall be capable of no less than 30 evenly spaced starts per hour. The rotor bars and short circuit rings shall be made of aluminum. Three thermal switches shall be embedded in the stator end coils, one per phase winding, to monitor the stator temperature. These thermal switches shall be used in conjunction with and supplemental to external motor overload protection and shall be connected to the motor control panel.

2. The junction chamber shall be sealed off from the stator housing and shall contain a terminal board for connection of power and pilot sensor cables using threaded compression type terminals. The use of wire nuts or crimp-type connectors is not acceptable. The motor and the pump shall be produced by the same manufacturer.

3. The motor service factor (combined effect of voltage, frequency and specific gravity) shall be 1.15. The motor shall have a voltage tolerance of +/- 10%. The motor shall be designed for continuous operation in up to a 40°C ambient and shall have a NEMA Class B maximum operating temperature rise of 80°C. A motor performance chart shall be provided upon request exhibiting curves for motor torque, current, power factor, input/output kW and efficiency. The chart shall also include data on motor starting and no-load characteristics.

4. Motor horsepower shall be sufficient so that the pump is non-overloading throughout its entire performance curve, from shut-off to run-out. The motor and cable shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 65 feet or greater.

H. Bearings

1. The integral pump/motor shaft shall rotate on two bearings. The motor bearings shall be sealed and permanently grease lubricated with high temperature grease. The upper motor bearing shall be a single ball type bearing to handle radial loads. The lower bearing shall be a two row angular contact ball bearing to handle the thrust and radial forces. The minimum L10 bearing life shall be 50,000 hours at any usable portion of the pump curve.

I. Mechanical Seal

1. Each pump shall be provided with a positively driven dual, tandem mechanical shaft seal system consisting of two seal sets, each having an independent spring. The lower primary seal, located between the pump and seal chamber, shall contain one stationary and one positively driven rotating corrosion resistant tungsten-carbide ring. The upper secondary seal, located between the seal chamber and the seal inspection chamber shall be a leakage-free seal. The upper seal shall contain one stationary and one positively driven rotating corrosion resistant tungsten-carbide seal ring. The rotating seal ring shall have small back-swept grooves laser inscribed upon its face to act as a pump as it rotates, returning any fluid that should enter the dry motor chamber back into the lubricant chamber. All seal rings shall be individual solid sintered rings. Each seal interface shall

1 be held in place by its own spring system. The seals shall not depend upon direction of rotation for
2 sealing. Mounting of the lower seal on the impeller hub is not acceptable. Shaft seals without
3 positively driven rotating members or conventional double mechanical seals containing either a
4 common single or double spring acting between the upper and lower seal faces are not acceptable.
5 The seal springs shall be isolated from the pumped media to prevent materials from packing around
6 them, limiting their performance.

7 2. Each pump shall be provided with a lubricant chamber for the shaft sealing system. The
8 lubricant chamber shall be designed to prevent overfilling and shall provide capacity for lubricant
9 expansion. The seal lubricant chamber shall have one drain and one inspection plug that are
10 accessible from the exterior of the motor unit. The seal system shall not rely upon the pumped
11 media for lubrication.

12 3. The area about the exterior of the lower mechanical seal in the cast iron housing shall have
13 cast in an integral concentric spiral groove. This groove shall protect the seals by causing abrasive
14 particulate entering the seal cavity to be forced out away from the seal due to centrifugal action.

15 4. A separate seal leakage chamber shall be provided so that any leakage that may occur past
16 the upper, secondary mechanical seal will be captured prior to entry into the motor stator housing.
17 Such seal leakage shall not contaminate the motor lower bearing. The leakage chamber shall be
18 equipped with a float type switch that will signal if the chamber should reach 50% capacity.

19 J. Impeller

20 1. The impeller shall be of ASTM A-532 (Alloy III A) 25% chrome cast iron) dynamically
21 balanced, semi-open, multi-vane, back swept, screw-shaped, non-clog design. The impeller
22 leading edges shall be mechanically self-cleaned automatically upon each rotation as they pass
23 across a spiral groove located on the volute suction. The screw-shaped leading edges of the gray
24 iron impeller shall be hardened to Rc 45 and shall be capable of handling solids, fibrous materials,
25 heavy sludge and other matter normally found in wastewater. The screw shape of the impeller inlet
26 shall provide an inducing effect for the handling of up to 5% sludge and rag-laden wastewater. The
27 impeller to volute clearance shall be readily adjustable by the means of a single trim screw. The
28 impellers shall be locked to the shaft, held by an impeller bolt and shall be coated with alkyd resin
29 primer.

30 K. Volute

31 1. The pump volute shall be a single piece gray cast iron, ASTM A-48, Class 35B, non-
32 concentric design with smooth passages of sufficient size to pass any solids that may enter the
33 impeller. Minimum inlet and discharge size shall be as specified. The volute shall have a
34 replaceable suction cover insert ring in which are cast spiral-shaped, sharp-edged groove(s). The
35 spiral groove(s) shall provide trash release pathways and sharp edge(s) across which each impeller
36 vane leading edge shall cross during rotation so to remain unobstructed. The insert ring shall be

cast of ASTM A-532 (Alloy III A) 25% chrome cast iron and provide effective sealing between the multi-vane semi-open impeller and the volute housing.

L. Protection

1. All stators shall incorporate thermal switches in series to monitor the temperature of each phase winding. At 125 C (260 F) the thermal switches shall open, stop the motor and activate an alarm.

2. A leakage sensor shall be provided to detect water in the stator chamber. The Float Leakage Sensor (FLS) will be connected to a control unit providing a contact to stop the motor and send an alarm. (USE OF VOLTAGE SENSITIVE SOLID STATE SENSORS AND TRIP TEMPERATURE ABOVE 125 C (260 F) SHALL NOT BE ALLOWED)

3. Monitoring unit for the above sensors shall be supplied by the pump manufacturer. The monitoring unit shall be designed to mount flush in the control panel below and shall be equipped with separate lights to indicate each alarm condition. Power shall be 120 VAC, 60 Hz.

M. Pump Warranty

1. The pump manufacturer shall have a factory trained and authorized factory service center capable of completely servicing the proposed pumps within 100 miles of the Ascension Parish Utilities Department at 9039 South St. Landry Road, Gonzales, LA 70737. The pump manufacturer shall have a direct factory service center/stocking facility capable of completely servicing, and which stocks identical complete drive units, and spare parts for, the proposed pumps within 250 miles of the Ascension Parish Utilities Department at 9039 South St. Landry Road, Gonzales, LA 70737.

2. The pump manufacturer shall provide prorated warranty for the non-clog units supplied to the Owner against defects in material and workmanship for a period of at least five (5) years or 10,000 operating hours in writing under the operating conditions presented by this project.

3. The manufacturer shall guarantee clog-free operation for a period of 24 months from the date of start-up of the pumps by the local authorized factory representative. A certificate shall be provided to the Owner on the day of start up with the local contact information and effective date. Should the impeller clog with typical solids and/or modern trash debris normally found in domestic wastewater during this period, an authorized representative shall, either travel to the jobsite, remove the pump, clear the obstruction and reinstall the pump at no cost or reimburse the Owner for reasonable cost to provide this service. A written report shall be provided to the Owner detailing the service call with pictures for verification purposes.

2.2 PUMP CONTROL PANEL

1 A. General

2 1. It is the intention that this specification shall cover a complete Duplex, Triplex or Quadplex
3 Pump Lift Station Electrical Control System as hereinafter described and all necessary
4 appurtenances which might normally be considered a part of the complete electrical system for
5 this installation. It shall be factory assembled, wired and tested and covered by complete electrical
6 drawings and instructions.

7 2. The electrical control system shall be in accordance with all applicable electrical codes.

8 3. The control system described hereafter shall be supplied by the pump supplier to provide
9 single source responsibility for complete functioning system.

10 4. Signal conditioning, set point, control, alternation, logic function, transducer, alarm and all
11 other control functions shall be performed by solid-state modules which shall be standard catalog
12 items of the system manufacturer, with proven field performance.

13 5. At least one module of each type used in the system shall be stocked by the system
14 manufacturer for system expansions or renewal parts purposes. The modules shall be of a
15 compatible, integrated control family with a full range of control/protective/alternation/telemetry
16 capabilities and associated housings, enclosure system and appurtenances to perform a variety of
17 functions required by this project and foreseeable expansion.

18 6. The DEVELOPER shall provide proper grounding of the complete power system.

19 B. Control Panel Rack

20 1. The control panel rack shall be constructed of the materials and foundations as provided in
21 the construction drawings.

22 2. No portion of the panel rack shall be within eight (8) feet of the wet well or valve vault.

23 3. The panel rack shall be large enough for the control panel, disconnect and any other
24 components, like electric meter from the power company.

25 C. Control Panel Scope

26 1. The equipment provided shall be a completely integrated automatic control system
27 consisting of the required automation, and alarm monitoring equipment in a factory wired and
28 tested assembly.

29 2. All equipment and materials shall be subject to the Engineer's review and shall not be
30 purchased or manufactured until the review is complete.

31 3. The supplier shall prepare detailed design information, procure, configure, start-up, and
32 make ready for use, the complete system as indicated on the plans and specifications. These
33 submittals and drawings include descriptions of functional operation and performance, as well as

standards, but do not necessarily enumerate detailed specifications for all components and devices that are essential for system operation. However, all components and devices shall be furnished and installed as required to provide complete and operable systems for accomplishing the functions and meeting the performance set forth hereinafter.

4. The system shall be installed by the DEVELOPER, complete and ready to operate, including all necessary connections to sources of electrical power, interconnection between field equipment and accessories as specified or as recommended for best operation for the equipment furnished. The hardware that is installed in the control system shall be readily available. All necessary mounting panels, stands, hangers, and brackets shall be furnished and installed and shall comply with the relevant sections of the Specifications.

5. The Supplier shall include in the bid allowance for factory-trained service personnel to adjust all the equipment until the system has been completely accepted.

D. Quality Assurance

1. The Supplier shall maintain quality in both design and workmanship as well as materials used in manufacture of equipment supplied. All equipment supplied under this Contract shall be of new manufacture.

2. The Supplier shall be a firm that is engaged in the manufacturing of process control systems. The system shall be in regular production with pre-designed hardware and software for process control systems. When the specification conflicts with a manufacturer's standard system, the standard system may be furnished upon approval by the Engineer if the intention of the specification is met.

3. System shall be a standard system. Custom one of a kind application software and customized hardware components will not be accepted. A standard system is defined as one which is available, at time of bid, with fully tested hardware and software, full documentation, and prepared training classes such that no development must be done beyond system configuration.

4. Supplier shall be responsible for detailed engineering, manufacture, programming, test, start-up and demonstration of all equipment and software programs to the Owner to provide a complete operating system.

5. The manufacturer shall have been continuously involved in the design and manufacture of control systems for the past ten (20) years. The manufacturer shall have successfully built and placed into operation, systems similar to the one proposed herein and will furnish a list of at least ten (20) operating installations that have been in operation for five (5) years or more upon request by the Engineer. Evidence of experience and operational data may be required from the manufacturer to determine the suitability and efficiency of the equipment offered.

6. Provide all engineering and render coordination assistance, necessary for calibration of overall control system and to resolve interface discrepancies between panels, equipment, instrumentation and final control devices. Where interface conflicts exist, the Supplier shall document conflicts in writing to the Parish providing absolute information such as terminal numbers, device name, tests performed and diagnosis of problem.

7. All equipment supplied shall be of the most current and proven design at the time of delivery. The completed System and the equipment provided by the Supplier shall be compatible with the functions required and shall be a complete working System.

8. All electrical components of the System shall operate on 120 volt, single- phase, 60 Hertz current, except as otherwise noted in the specifications and on the drawings.

E. Submittals

1. A complete assembly shall be provided with job-specific wiring diagrams, parts lists, enclosure dimensional and door layout drawings and instructions.

2. Production Schematics shall be submitted for approval for all equipment herein specified. The Production Schematics Submittal shall include a Document List. An Order Specification shall be included which shall describe in detail the major functionality of the equipment being provided as well as components used detailed down to major component level. Each panel shall be provided with a job-specific wiring diagram, parts list, enclosure door layout and enclosure dimension drawing. The wiring diagram requirement applies to all field mounted instrumentation and control equipment. Interconnection details shall be shown for all field-mounted instrumentation. A Description of Operation shall be provided detailing the operation of the complete system, including the control and alarm handling.

3. Provide As-built Drawings and Instruction Manuals. These manuals shall include corrected Shop Drawings.

F. General Electrical Requirements

1. WIRING

a. All wiring shall be minimum 600 volt UL type MTW or AWM and have a current-carrying capacity of not less than 125% of the full load current. The conductors shall be in complete conformity with the national electric codes, state, local and NEMA electrical standards. For ease of servicing and maintenance, all wiring shall be color-coded. The wire color code shall be clearly shown on the drawings, with each wire's color indicated. In addition, the equipment wiring shall be permanently marked with wire numbers that correspond to the system schematics. The numbering convention shall comply with the municipal industry standard.

b. All control wiring shall be contained within plastic/PVC wiring duct with covers. Where dimensional constraints prevent the use of wiring duct, wires shall be trained to panel components

1 in groupings. The wire groupings shall be bundled and tied not less than every 3 inches with nylon
2 self-locking cable ties.

3 c. Every other cable tie shall be fastened to the enclosure door or inner device panel with a
4 cable tie mounting plate with pressure tape. Where wiring crosses hinged areas such as when
5 trained from the inner device panel to the enclosure door, spiral wrap shall be used.

6 2. INCOMING SERVICE AND LIGHTNING ARRESTOR

7 a. The service pole, metering, and main disconnect will be installed ahead of the lift station
8 control panel as provided by the electrical DEVELOPER. Phase conversion from single to three
9 phase shall be accomplished via a solid state unit located in the pump control panel at lift station
10 sites where three phase power is not available. Adequate ventilation for cooling shall be provided
11 when such devices are utilized. Conduit and wiring between the power company termination and
12 the lift station shall be furnished and installed by the DEVELOPER. The power supply will be as
13 indicated on the Construction Drawings.

14 b. A lightning arrestor shall be supplied in the control system and connected to each line of
15 the load side of main power disconnect. The arrestor shall protect the control system against
16 damage as the result of transient voltage surges caused by lightning interference, switching loads
17 and power line interference's. It shall begin shunting to ground at 1000 volts maximum.

18 c. Each panel shall be supplied with a properly sized control power circuit breaker and fused
19 control power transformer where necessary. The breaker shall supply power to all control wiring
20 within the enclosure.

21 3. NAMEPLATES

22 a. All major components and sub-assemblies shall be identified as to function with laminated,
23 engraved bakelite nameplates, or similar approved means.

24 G. SOLIDS-HANDLING PUMPS CONTROL SYSTEM

25 The pump manufacturer shall provide a Duplex, Triplex or Quadplex Pump Control system that
26 shall control 2, 3 or 4 pumps in an energy conservation mode of operation. The system shall be
27 capable of adapting to changing inflow conditions and shall automatically regulate pumped
28 outflow based on inflow conditions and shall seek an optimal energy efficiency for the pump
29 station. This shall be accomplished with Variable Frequency Drives (VFDs) with integral software
30 that is SCADA ready for operation. The manufacturer shall be able to offer Alarm Transmission
31 Service via Cloud (Internet) for a monthly fee. This system will incorporate the functionality as
32 noted in the following sections.

33 1. Electrical Control Panel

1 The NEMA 3R stainless steel control panel shall house both VFD's each equipped with integral
2 liquid level control, moisture and thermal protection modules and will be provided with the
3 minimum of the following:

4 a. The weatherproof, rain-tight enclosure shall be designed specifically for mounting in an
5 unprotected outdoor location. Outer door latch shall be a 3 point latch with rotating handle. It
6 shall have a gasketed, hinged, front weather door with locking capability and an internally mounted
7 hinged dead front panel so that all the components normally actuated by Operating Personnel are
8 accessible without opening the dead front and yet are not exposed to the elements or to
9 unauthorized personnel.

10 b. The enclosure shall have interior LED lighting above panel doors. Interior and exterior
11 door shall have door stops.

12 c. Two (2) stainless steel junction boxes (3 for triplex and quadplex) shall be mounted to the
13 bottom of the control panel with seal offs at the factory. Junction boxes shall be pre-wired at the
14 factory and ready for field wiring inside the junction boxes. There shall be one (1) junction box
15 for pumps (2 for triplex and quadplex) and one (1) junction box for the level transducer and high
16 level float. The two pump junction boxes shall be wired with shielded cabling all the way to the
17 VFDs inside of the control panel.

18 d. Power Entry

19 1. The control panel shall include a thermal magnetic main circuit breaker to provide an
20 incoming power disconnect means and short circuit/overcurrent protection for the control panel
21 equipment.

22 2. The circuit breaker must have a minimum ampere interrupting capacity of 42,000 @ 460
23 Volt symmetrical RMS amps. The circuit breaker shall be operable through the operator's door of
24 the enclosure and shall have a trip rating to allow full voltage starting and continuous operation of
25 the motors.

26 3. The commercial power input to the control panel/main breaker shall be UL service entrance
27 rated and labeled.

28 e. Emergency Power

29 1. The control panel shall include a second circuit breaker mechanically interlocked with the
30 main breaker to function as an emergency power interrupt and manual transfer switch. The
31 breakers shall allow the control panel to be powered by either commercial power or the owner's
32 portable emergency power generator. The interlock shall be padlock-able with both breakers in
33 the "off" position. The breakers shall be operable from the control panel operator's door.

34 2. A generator receptacle with angled backbox shall be provided and mounted on the side of
35 the enclosure by the panel manufacture. The Generator receptacle shall be of the metallic NEC

style configured to UL 1686 specifications. Receptacle must be suitable for NEMA 4X environments. Caps shall be of "Breech-Lock" design capable of being used as a flip lid or screw cover. Cable clamps must be of contoured smooth 2-screw design. Wire terminals must be of the increased safety design.

3. The receptacle shall be per parish standard and shall be Crouse-Hinds, or prior approved equal.

f. Each pump motor circuit shall be protected by a properly sized E frame molded case circuit breaker. Each pole of these breakers shall provide inverse time delay overload protection and instantaneous short circuit protection by means of a thermal magnetic element. The breaker shall be operated by a toggle type handle and shall have a Quick-make, Quick-break over center switching mechanism that is mechanically trip free from the handle so that the contacts cannot be held closed against short circuits and abnormal currents. Tripping due to overload or short circuit shall be clearly indicated by the handle automatically assuming a position midway between the manual "ON" and "OFF" position. The minimum interrupting rating of the breaker shall be 42,000 amps at 460 VAC. Pump motor circuit breaker toggle shall be operable through a cutout in the inner door.

g. Hand-Off-Automatic (integral the VFD HMI) switches to select the operating mode for each pump installed on the control panel inner dead front door.

h. Elapsed time meters for each pump motor.

i. In the event either pump operation selector switch is in the "Off" position, the control system software shall automatically designate the operating pump motor as the "next pump motor to operate" after that pump motor is started.

j. The hinged inner door shall be provided fabricated from, 5052-H32.080, marine alloy aluminum. The hinged inner door shall contain cutouts for all circuit breaker toggles. Control switches and indicators shall be labeled and mounted to the hinged inner door to keep operators from entering the live electrical compartment. A warning sign stating "DANGER -- Disconnect All Sources Of Power Before Opening Door" shall be installed on the inner door. The inner door shall be completely removable for ease of service and shall be held closed by at least (2) hand operated 1/4 turn fasteners. The following items shall be mounted on the inner door:

1. Pilot lights – Alarm, Pump Run, Pump Fail

2. Hand-Off-Automatic – Integral to the VFD Operator Interface

k. The control system enclosure shall include a removable back-panel. The back-panel shall be painted white and fabricated from cold roll steel.

1. Transient Voltage Surge Suppressors on the 120VAC circuit

1 m. Loop Power Surge Suppressor

2 n. Lightning Arrestor

3 o. Convenience Receptacle

4 1. An operator's door mounted 120 VAC duplex ground fault interrupter (GFI) type,
5 convenience receptacle rated at 15 amperes shall be supplied for the operation of a trouble light,
6 drill, etc. It shall be protected by a separate 15 ampere trip rated circuit breaker accessible from
7 the operator's door.

8 p. Local Alarm Light

9 1. A top mounted weatherproof, strobe alarm indication light assembly with shatter resistant
10 polycarbonate red lens mounted on a polycarbonate/ABS blend case shall be provided. The alarm
11 light shall be NEMA 4X rated, suitable for indoor or outdoor mounting and operate on 120 VAC
12 and be PLC rated. The strobe tube shall provide a minimum of 300,000 peak candela output and
13 shall be rated for 3,000 hour life. The alarm light shall flash upon occurrence of an alarm
14 condition.

15 q. Condensation Protective Heater

16 1. A 100 watt, 120 VAC condensation protective heater and adjustable high temperature
17 cutout thermostwitch shall be supplied in the control panel. The heater's surface area for heat
18 dissipation shall be large enough to prevent a skin burn (if an operator's hand should inadvertently
19 come in contact with the unit when energized). The heater shall be regulated by a humidistat
20 located within the control panel enclosure.

21 r. Components shall be fastened to the back-panel using stainless steel pinhead machine
22 screws. All devices shall be clearly labeled in accordance with the schematic ladder diagram.

23 2. Variable Frequency Drives

24 a. A variable frequency pump drive shall be provided for each pump in the system, sized for
25 the appropriate voltage and power. The pump drive shall be supplied by the pump manufacturer
26 and designed for wastewater pumping and with functionality pre-programmed for the specific
27 pump model used or a PLC of equivalent functionality shall be provided. The pump drive shall
28 provide all level control functionality, hand/auto operation, pump alternation, pump over
29 temperature monitoring, seal leakage monitoring, pump self-cleaning, sump cleaning and pipe
30 cleaning algorithms. The pump drive shall also include capability to monitor station inflow, pump
31 speed and energy consumption in order to automatically operate the pump station at optimal energy
32 efficiency.

33 b. The pump drive shall be tested and approved in accordance with national and international
34 standards and comply with Directive 98/37/EC, Safety of Machinery and EN60204-1.

c. It shall conform to the relevant safety provisions of the Low Voltage Directive 2006/95/EC and the EMC Directive 2004/108/EC and has been designed and manufactured in accordance with the following harmonized European standards:

EN 61800-5-1: 2003 Adjustable speed electrical power drive systems. Safety requirements. Electrical, thermal and energy.

EN 61800-3 2nd Ed: 2004 Adjustable speed electrical power drive systems. EMC requirements and specific test methods

EN 55011: 2007 Limits and Methods of measurement of radio disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment (EMC)

EN60529 : 1992 Specifications for degrees of protection provided by enclosures

d. The variable frequency drive ampere rating shall be equal to or greater than the ampere rating listed on the motor being driven by the variable frequency drive.

e. The drive units shall be modularly constructed. Printed circuit boards shall be connected in such manner that they are easily removed from the unit. Power components shall be readily accessible and be connected in such manner that they are easily removed from the unit. The pump drive shall be freestanding for wall mounting or cabinet installation construction, for 460V, 60HZ 3Phase power supply. It holds an IP55 and IP66 isolation class.

3. System Operation – VFD or PLC functionality

a. High/Low Level Sump Control:

1. The pump controls system shall provide automatic level control via means of a submersible pressure transducer (4-20mADC) and one (1) non-mercury liquid level float switch. User-programmable Start Level shall indicate the point at which the pump will start. Upon activation the pump shall run at maximum speed for a pre-determined period, then ramp down to the energy efficient Optimal speed, calculated by the pump drive. When the water level reaches the Stop Level, the pump shall stop. The Optimal Speed shall either be calculated by the pump drive or manually entered by the user.

2. In case of high inflow, the pump drive shall increase pump speed until the water level begins to decrease. When the water level reaches the Stop Level, the pump shall stop.

3. In case of very high inflow, in a duplex installation, when a single pump is unable to overcome the inflow conditions even at maximum speed, additional pumps shall be activated and run at maximum speed until the Stop Level is reached. If water levels continue to rise, a High Level Alarm shall be activated.

4. The pump drive shall incorporate a Minimum Speed function that prevents the pump from operating at speeds too low to move water based on the pump curve.

1 b. Run Time Averaging (Duplex Application Only)

2 1. In cases of duplex pumps/drives, the pump drive shall provide capability to balance run
3 times for even wear. This shall be an internal function of the drive and not require external devices,
4 such as an Alternating Relay. The function shall operate by determining a “random” start level
5 based on the Start Level setting. Each drive shall determine its own random start level independent
6 of each other. New random start levels will be determined every 24 hours. The pump with the
7 lowest random start level shall be first to start on any given pump cycle. The second pump shall
8 remain in Standby capacity in case the lead pump shall not be able to lower the water level as
9 described in the section above. By recalculating the random start levels every 24 hours, balanced
10 run times are accomplished.

11 c. Pump Cleaning Function

12 1. The Pump drive shall incorporate a “self-cleaning” function to remove debris from the
13 impeller. The cleaning shall be triggered by three circumstances:

14 a. Soft Clogging: When motor current equals 20% or greater above rated motor current, in
15 the drive, for a period of 7 seconds.

16 b. Hard Clogging: When motor current equals 80% or greater above rated current for a period
17 of 0.01 seconds.

18 c. Schedule Cleaning: The pump drive is pre-programmed to perform cleaning regularly.

19 2. The cleaning function shall consist of forced stopping, reversal and forward runs timed to
20 allow for debris to fall from the impeller. After cleaning cycle is complete, drive shall resume to
21 automatic operation.

22 d. Sump Cleaning Function

23 1. The pump drive shall incorporate a sump cleaning function to ensure surface solids and
24 grease is regularly removed from the sump. The sump cleaning function shall perform regularly
25 when enabled by the operator. Sump cleaning shall consist of the following functions:

26 a. Sump cleaning is triggered when internal timer expires and during a normal pump down
27 cycle.

28 b. Pump is automatically ramped to maximum speed.

29 c. Pump runs at maximum speed for designated time or until the pump is snoring.

30 d. When Sump Cleaning is over, the pump is shut off and resumes normal operation.

31 e. Pipe Cleaning Function:

1. The pump drive shall incorporate a pipe cleaning function to avoid discharge pipe sedimentation and clogging due to reduced pump speed. This shall be an automatic feature that initiates with every pump cycle. Upon reaching Pump Start Level, the drive shall operate the pump at 100% speed for a determined time before ramping down to the most energy efficient speed for the duration of the cycle.

f. Energy Efficient Speed Finder:

1. The pump drive shall provide a function that automatically calculates the most energy efficient speed for the pump based on station inflow characteristics. An algorithm calculates the optimal speed whereby the most water is pumped using the least amount of energy, the optimal speed is constantly adjusted to account for changes in inflow without requiring operator adjustment, multiple set points, etc.

2. The energy efficient function prevents the drive from running off of the system curve for the pump. This will ensure maximum hydraulic efficiency as well as electrical efficiency is maintained.

g. Alarms & Monitoring:

1. The pump drive shall provide alarms and monitoring for the drive, pump and sump. Alarms shall be presented on the LCD display, via a Summary Alarm relay and via Modbus registers. All alarms, when occurring, shall remain active until reset. Alarms shall have a built-in 4 second delay to prevent nuisance tripping. Alarms shall be as follows:

a. Pump Monitoring

i. Pump Over Temperature (thermal contacts in motor stator)

ii. Pump Seal Leak (FLS leakage sensor)

b. Sump Monitoring

i. High Sump Level (via level float switch or submersible transducer)

ii. Submersible transducer Sensor Error (Submersible transducer is not connected, reports faulty values or the wrong start level is used)

c. Pump Drive Monitoring (includes, but not limited to):

i. Drive Overcurrent

ii. Drive Overload Trip

iii. Drive Overvoltage

iv. Drive Undervoltage

v. Drive Overtemperature (internal)

- 1 vi. Drive Overtemperature (ambient)
- 2 vii. Drive Undertemperature (ambient)
- 3 viii. Input Phase Loss
- 4 ix. Drive Output Max Torque Exceeded
- 5 2. Monitoring Contact terminals:
- 6 a. The enclosure shall have the following set of contacts for PS monitoring:
- 7 1. Pump Run for each pump
- 8 2. Pump amps for each pump
- 9 3. Pump VFD fault for each pump
- 10 4. Pump Over Temp for each pump
- 11 5. Pump Seal Leak for each pump
- 12 6. High Level
- 13 7. Station power loss
- 14 8. AB Voltage
- 15 9. BC Voltage
- 16 10. AC Voltage
- 17 i.
- 18 3. Submersible Pressure Transducer
- 19 a. The liquid level of the wet well shall be sensed by a submersible level transducer. The
- 20 transducer shall be a 2-wire type to operate from the level controller's regulated loop power supply
- 21 and produce an instrumentation signal (4-20mA) in direct proportion to the measured level
- 22 excursion over a factory-calibrated range of zero to (30) feet of water.
- 23 b. The transducer shall be of the ceramic capacitive, relative pressure sensing type, suitable
- 24 for continuous submergence and operation and shall be installed in accordance with manufacturer's
- 25 instructions. The bottom diaphragm face of the sensor shall be installed approximately 6 inches
- 26 above the wet well floor. The sensor shall be hung in the wet well using a cable bracket including
- 27 two sliding cable locking jaws in a location in the wet well and as shown on the job plans.
- 28 c. The transducer housing shall be fabricated of PPS (polyphenylene sulfide) with a ceramic
- 29 bottom diaphragm.

1 d. The transducer element shall incorporate high over-pressure protection and be designed to
2 withstand intermittent overpressures (10) times the full-scale range being sensed. Metallic
3 diaphragms shall not be acceptable in that they are subject to damage or distortion. Sensing
4 principles employing LVDTs, resistive or pneumatic elements shall not be acceptable.

5 e. The internal pressure of the lower transducer assembly shall be relieved to atmospheric
6 pressure through a heavy-duty urethane jacketed hose/cable assembly and a slack PVC bellows
7 mounted in the control panel. The sealed breather system shall compensate for variations in
8 barometric pressure and expansion and contraction of air due to temperature changes and altitude
9 as well as prevent fouling from moisture and other corrosive elements.

10 f. The transducer assembly shall be installed where directed by the Engineer and connected
11 with other system elements and placed in successful operation.

12 g. The transducer shall have a programming feature using a standard USB interface and a
13 laptop computer, the servicing transmitter can be programmed on-the-fly to the required measuring
14 range. The design without sharp edges prevents particles, textiles and paper from sticking to the
15 housing or the diaphragm. The transducer shall be surge resistant.

16 h. The transducer power cable shall be steel reinforced PUR cable with high tensile stretch.

17 H. Spare Parts

18 1. The following spare parts shall be provided with the control panel:

19 a. (3) fuses of each type

20 b. (2) relays of each type

21 c. (2) fan filters

22 I. Control Panel Service, Training, and Guarantee

23 1. The services of a factory trained, qualified representative shall be provided to inspect the
24 completed installation, make all adjustments necessary to place the system in trouble-free
25 operation and instruct the operating personnel in the proper care and operation of the equipment.

26 2. After each system has been installed, the Supplier shall demonstrate with performance of
27 each unit, and document that the system operates properly as specified.

28 3. The Supplier shall provide systems training for operations staff totaling no less than 2
29 hours.

30 4. All training shall be conducted at the site. Travel expenses are the responsibility of the
31 supplier. All equipment shall be guaranteed against defects in material and workmanship for a
32 period of one year from the date of Owner's final inspection and acceptance to the effect that any
33 defective equipment shall be repaired or replaced without cost or obligation to the Owner.

INTRODUCTION

CHAPTER 130 APPENDIX VI
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 five major sections; the equalization chamber, the aeration compartment, the clarifier (settling), sludge holding chamber and disinfection chamber. 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, chlorinator, 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 Engineer shall be defined as: the office of the Parish Engineer, the Department of Utilities, 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 PRE-SUBMITTAL

1 A. All manufacturers and/or manufacturers' representative shall submit substitution
2 equipment for consideration which shows compliance with, or an itemized list of
3 deviations/exceptions with technical justification of such to all performance, construction, service
4 and warranty requirements of this specification and any failure to provide this information will
5 result in a non-review by the Engineer and Ascension Parish. This pre-submittal shall be submitted
6 by the DEVELOPER/CONTRACTOR to the Project Engineer and Ascension Parish at least
7 fourteen (14) days prior to bid; otherwise, such substitution requests will not be considered for the
8 project. Equipment must be conditionally approved by the Engineer in writing at least five (5)
9 business days prior to bid for all named or substitute manufacturers in order to be offered for this
10 project. Three (3) business days prior to bid, the Engineer will furnish a final listing of equipment
11 appearing to meet the specifications and conditionally approved for this project. In no case shall
12 equipment be accepted for this project if not approved by the Engineer in writing prior to bid. Pre-
13 submittal data shall include, but not be necessarily limited to: typical motor, as well as pump,
14 performance curves; compliance documentation for all performance values, compliance
15 documentation for all construction details and calculations. If a substitution is requested after the
16 bid opening by the winning contractor, the contractor is responsible for the engineering cost to
17 review the request, whether the request is granted or not.

18 1.5 GENERAL REQUIREMENTS

19 A. Coordination

20 1. Exercise adequate planning and supervision throughout the project; be responsible for
21 timely submittal of shop drawings and timely arrival of manufacturer's service representatives; be
22 responsible for coordination of basin installation, equipment setting and connections of piping,
23 electrical and controls.
24

25 B. Completeness

26 1. The following Specifications describe major functions and features, but do not necessarily
27 cover all details entering into the design and operation of the equipment or items that individual
28 manufacturer may consider as an option accessory.

29 2. Wherever in these Specifications specific equipment, materials, or manufactured products
30 are called for or described, such are specified to establish the basic standard or level of quality
31 materials, and features.

32 3. The DEVELOPER shall be responsible for a complete and workable treatment plant. He
33 shall coordinate between individual equipment manufacturers and furnish whatever interface
34 connections, controls, interlocks and accessories that are required between all interconnected
35 components, items or systems so that they operate repeatedly and reliably within the specifications
36 and overall design requirement. Individual equipment units that are furnished with inadequate

1 materials, accessories or controls, or are not properly designed by the manufacturer to satisfy the
2 specific application as indicated by the Specifications, shall not be accepted until properly
3 modified or replaced.

4 4. The DEVELOPER shall be responsible for establishment of permanent electrical power
5 and potable water service to the site. Potable water shall be provided to the site while adhering to
6 all Louisiana Department of Health requirements including but not limited to a backflow
7 prevention device.

8 5. The DEVELOPER shall be responsible for a finished surface within the fenced in area of
9 the WWTP. The finished surface shall be 8 inches of 610 limestone on top of a 7oz. woven
10 geotextile fabric.

11 C. Site Design

12 1. The DEVELOPER shall be responsible for a finished surface within the fenced in area of
13 the WWTP. The finished surface shall be 8 inches of 610 limestone on top of 7 oz. woven
14 geotextile fabric.

15 2. The site design shall include a clearance of at least 20 feet from the structure to property
16 lines on at least 2 sides.

17 3. The site shall be of adequate size to operate, maintain, and repair the pump station facility
18 including access for truck cranes and sewer vacuum cleaning trucks such that trucks can traverse
19 the site.

20 4. The site security fence and entrance gate shall be place far enough from the street to allow
21 maintenance vehicles to be off the main roadway when the operator stops to unlock the gate.

22 5. The site shall be designed with a lighting system operating on a photocell and on/off switch
23 with a manual switch override. Site lighting shall be designed to minimize off site impacts while
24 maintaining functionality for maintenance personnel.

25 6. WWTP supply power service shall be 230/460 volt, 3 phase, 4 wire service.

26 7. The WWTP site plan shall be submitted to the Parish Engineer for approval.

27 8. If additional equipment is required as outlined in D.2, site plan shall include slab, electrical
28 and plumbing for additional treatment equipment.

29 D. Equipment Design

30 1. The design of equipment and components shall be of adequate materials and strength for
31 the specific application and exposures, and their design and installation shall meet all applicable
32 codes and regulations.

2. DEVELOPER shall design the wastewater treatment plant to meet effluent requirements at the discharge point of the plant. DEQ discharge limits at the time of permit approval will govern the design. Additional equipment or design processes may need to be added to the standard Extended Aeration Treatment Plant design described herein in order to meet more stringent permit requirements in the future.

3. DEVELOPER shall be responsible for all permit applications, including LDEQ Request for Preliminary Determination (RPD) and all efforts necessary in securing all Agency reviews and approvals.

E. Foundations, Anchors, and Bases

1. Manufactured equipment and assembled systems shall be furnished with foundation layout drawings, bases and anchor bolt recommendations. Anchor bolt materials shall be 316 stainless 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 installed equipment.. The tops of foundations shall be at such elevations as will permit grouting as specified below. If approved by Ascension Parish, equipment may be installed on top of the precast concrete wastewater tanks.

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-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.

F. Equipment Bolts, Studs, and Screws

1. Bolts and accessories for general equipment use shall be 316 Stainless steel, without coating.

2. Stainless steel bolts and accessories shall comply with ASTM F 593, Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.

1 3. Except as specified above, stud, tap, and machine bolts and nuts for general use shall
2 conform to ASTM A 307, Specification for Carbon Steel Externally Threaded Standard Fasteners.
3 Hexagon nuts and accessories of the same metal quality as the bolts shall be used. All threads shall
4 conform to ANSI B1.1, Standard for Unified Inch Screw Threads, Coarse Thread Series and have
5 a Class 2A tolerance. Zinc or cadmium coatings shall be furnished where specified, indicated, or
6 required.

7 4. Machine and set screws shall conform to Federal Specifications FF-S-91, unless otherwise
8 specified.

9 5. All machine screws and lag screws shall utilize either cut washers or lock washers. All bolt
10 heads and nuts bearing on plastics shall have cut washers.

11 G. Nameplates

12 1. Each piece of equipment shall be provided with a substantial nameplate of non-corrodible
13 metal permanently attached and inscribed with the manufacturer's name, model or type
14 designation, serial number, and principal rated capacities or other characteristics and similar
15 appropriate information.

16
17 2. Provide engraved laminated plastic or embossed non-corrodible metal nameplates on all
18 panels for instrumentation of electrical controls of the process and equipment, or for lighting,
19 starters, or motor control centers and each system component, including switches, pushbuttons,
20 indicating lights, instrument, and devices or pieces for which the use or identified may not be
21 readily apparent. Indent marked plastic tape shall be unacceptable. Nameplates shall be
22 permanently attached with stainless steel screws, bolts and nuts, or rivets. Drive pins or contact
23 adhesive attachment shall be unacceptable after completion of the installation of the panel
24 components.

25 H. Lubricants

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

29 I. Storage and Protection

30 1. Protect equipment from damage from weather, dust, moisture or other causes. Protect
31 rubber items from sunlight and petroleum products. Protect painted surfaces from scratches or
32 damage. Protect ferrous surfaces from corrosion. Shield plastics from direct sunlight. Store
33 instruments, controls and electrical components in air-conditioned (low relative humidity)
34 locations. Electric motors or equipment with ferrous bearings which are not installed and operated

1 within 60 days of delivery shall be either stored in an air-conditioned warehouse or lubricated and
2 rotated every 30 days.

3 J. Manufacturer's Service Representatives

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

6 K. Acceptance Tests and Plant Startup

7 1. After installation of the equipment and after completion of the services of the
8 manufacturer's representative the DEVELOPER shall operate each unit to demonstrate its ability
9 to operate continuously without vibration, jamming, excess leaking, excess noise, and overheating,
10 and to perform its specified functions satisfactorily at the extremes of all operating conditions
11 specified. In addition, the tests shall demonstrate that the unit satisfies any performance guarantee
12 requirements at the specified rated operating condition.

13 2. All defects and defective equipment shall be corrected promptly or replaced at no expense
14 to the Owner.

15 3. All adjustments necessary to place the equipment in satisfactory working order shall be
16 made at the time of the above tests.

17 4. Equipment Supplier shall provide (2) days of startup and training for Owner personnel.

18 L. Record Drawings

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

22 M. Operation and Maintenance Data

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

29 PART 2 - PRODUCTS

30 2.1 CONCRETE BASIN AND CHAMBERS

31 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. Influent Bar Screen

1. To remove large debris, a manual bar screen shall be provided at the inlet of the EQ Basin to remove large solids from the incoming raw sewage. The bar screen shall remove debris larger than 1 inch diameter. The bars shall be steel flat bar 3/8 inch by 1 inch and shall be spaced 1 inch apart. The bar screen shall be sloped for ease of cleaning and shall have a drying tray. The bar screen and bar screen tank shall be constructed of 316 stainless steel.

C. Concrete Equalization Chamber

1. An equalization chamber shall be provided to protect the treatment plant from hydraulic surges during peak flows. Excess flow shall be stored in the equalization chamber and then pumped at a metered rate to the aeration chamber. The equalization period shall be sized to store the same volume anticipated during a 24-hour period. The chamber shall be constructed the same as the treatment plant.

2. The tank profile shall eliminate debris accumulation and enhance rotation of the tank contents. The chamber shall have a 1.5 ft minimum freeboard. The length to width ratio shall be 1.43 to 1 to provide adequate circulation velocity sufficient to scour the chamber bottom and prevent dead spots.

3. Air shall be supplied to the EQ chamber by properly sized positive displacement blowers in accordance with section 2.4 of this specification. Each blower shall provide 100% of the air required.

D. Concrete Aeration Basin

1. Flow will enter the aeration chambers from the EQ dosing pumps.

2. Precast concrete construction shall be designed per ASTM standard C-913-16 (Specification for Precast Concrete Water and Wastewater Structures). 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. The precast concrete tanks shall be manufactured by a Quality Certified Plant of the NPCA (National Precast Concrete Association). The Treatment

1 Plant shall be installed by a contractor with a minimum of 20 years' experience that is in good
2 standing (no citations or violations) with the LDEQ and LDH.

3 3. Primary treatment shall be accomplished in the aeration chamber of the facility. The
4 aeration compartment has sufficient capacity to provide at least 24 hours detention of the full
5 design flow and has a minimum of 80 cubic feet of volume per pound of BOD applied. Air is
6 introduced along one wall near the bottom, baffles are provided where necessary to insure rapid
7 circular flow without dead spots where sewage solids can accumulate and become septic. Two
8 thousand one hundred cubic feet of air shall be pumped into the aeration chamber for each pound
9 of BOD applied per day. The spiral rolling action created by the introduction of air shall insure
10 thorough mixing of the incoming organic material with the activated sludge present in the chamber.
11 In addition, the spiral flow pattern shall prevent short circuiting of the flow and assure adequate
12 retention of all organic materials.

13 4. Air shall be supplied to the Aeration chambers by properly sized positive displacement
14 blowers in accordance with section 2.4 of this specification. Each blower shall provide 100% of
15 the air required.

16 E. Concrete Settling Tank (Clarification Chamber)

17 1. Secondary treatment of the waste water shall be accomplished in a settling basin
18 (clarification chamber). Mixed liquors shall flow from the aeration chamber into the settling basin
19 by hydraulic displacement. The chamber shall be designed so that the clarifier will successfully
20 perform its function of solids separation without hydraulic upset even when the significant runoff
21 period is eight hours.

22 2. The final settling basin has sufficient volume to provide a retention time of four hours at
23 average daily flow. A baffle zone is provided at the inlet of the clarifier. The baffles performance
24 is adequate to eliminate all turbulence downstream from the baffle. The baffle extends above the
25 surface to entrap all floating material. Settling tank is formed by sloping the end wall of the plate
26 structure and by inclining in the opposite direction the partition wall between the settling tank and
27 the aeration compartment. The bottom of the tank is formed into an inverted pyramidal hopper or
28 hoppers. All side walls have a slope of at least 60 degrees. Flat bottom area of each hopper is the
29 minimum practicable and in no case greater than one square foot. After flowing through the final
30 settling tank the clarified liquid will pass over the edge of the effluent trough weir into the effluent
31 trough and through the effluent pipe to the settling tank outlet. There is an effluent baffle before
32 the weir extended no more than 3" above and below the water surface.

33 3. The sludge which settles to the bottom of the hopper or hoppers is returned (RAS)
34 continuously to the front of the Aeration Basin by means of the air lift placed in each hopper.
35 When TSS readings (MLSS) becomes more than desired the operator shall be able to manipulate
36 the air lift piping with valves in order to route waste sludge (WAS) to the sludge holding tank. The

surface area of the clarifier is as follows: (peak flow) (gpd) ÷ (clarifier surface area) (sq. ft.) ≤ 1,000.

4. Clarified liquids shall be contained in the settling zone above the hopper area for additional gravity settling. From here they shall be hydraulically displaced to the outlet zone. 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. Clarifiers should have a minimum surface overflow rate of 1000 GPD/SF calculated at peak flow. The overflow rate shall be calculated for each individual clarifier unit using the peak flow entering that particular unit. Peak flow shall be calculated per the following formula: $\text{Peak Flow} = (18 + \sqrt{P}) / (4 + \sqrt{P})$ where P is the population in thousands.

F. Sludge Holding Chamber

1. The chamber will be of the aerated type. The volume of the sludge holding chamber is based on 3 cu. ft. per dwelling. Diffused air will be supplied by the plant blower system supplying 30 CFM of air per 1000 cubic feet of volume. The diffusers will be located parallel to and near the bottom of the tank with a maximum of 6" off of the floor. A fixed supernatant decant pipe will be provided within this chamber and decant into the front aeration chambers of the plant as sludge is wasted to the sludge holding chamber.

2. Air shall be supplied to the Sludge Holding Chamber by properly sized positive displacement blowers in accordance with section 2.4 of this specification. Each blower shall provide 100% of the air required

G. 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 LF series tablet chlorinator to dose the chamber with chlorine. **Needs to have different tablet feeder sizes based on average plant flow.

2. There shall be a V-notch weir with marked flow delineations at the effluent of the chlorine contact chamber. An open channel flow meter or a Mag Flow Meter shall be used to measure effluent flow and will report to the control system.

2.2 AERATION SYSTEMS

A. General

1. This section of the specifications covers the materials, equipment, and construction procedures applicable to the aeration system in the EQ, Aeration and Sludge Holding 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.

1
2 B. Air Piping

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

6 2. Primary air distribution shall be provided through a galvanized air header. The air header
7 shall have individual drop pipes connected to the header assembly for air supply to individual
8 diffused assemblies. Each drop pipe shall be equipped with an air adjustment valve to control air
9 flow individually to each diffused assembly. In addition, a quick release coupling or union shall
10 be provided for each pipe diffuser assembly downstream from the air adjustment valve.

11 C. Air Diffusion Drop-Pipes and Diffusers

12 1. Each air diffusion device is connected to the air header with a 1-1/4" schedule 40 steel
13 drop-pipe. The drop-pipe is connected to the air header in a manner to permit raising the drop-pipe
14 and diffusion device above the water surface quickly and without disturbing air flow to the other
15 diffusers. The air diffusion devices are designed to distribute air over the entire length of the
16 aeration tank. The diffusers have an efficiency rating such that an adequate supply of oxygen is
17 maintained in the aeration tank to treat the sewage load for which the plant is designed. Diffusers
18 shall be constructed of SCH40 polyvinyl chloride plastic (PVC) and shall be designed to insure
19 uniform mixing within the aeration chamber. Fine air bubble distribution effected by the diffusers
20 shall be adequate to provide all oxygen necessary for the Aerobic Digestion process while
21 maintaining an acceptable dissolved oxygen level in the final plant effluent.

22 D. Sludge Return Air Lift(s)

23 1. One sludge return air lift(s) for each hopper is installed in the final settling tank of the
24 sewage treatment plant. The sludge return pipe is 3" schedule 80 PVC pipe and fittings. An air
25 control valve is furnished for each air lift. Plug valves are provided and placed in the sludge return
26 lines to allow the operator to manually direct the sludge to the head of the aeration compartment
27 or in the sludge holding tank.

28
29 E. Air Lift Skimmer(s)

30 1. An airlift skimming device is installed in the settling zone of each clarification basin
31 downstream of the scum baffle to remove floating material and discharge it by means of an air lift
32 to the aeration compartment of the sewage treatment plant. It consists of a drop-pipe or skimming
33 pipe mounted so that it can be raised or lowered with respect to the basin water surface by means
34 of an adjusting screw with hand knob. The air lift shall be equipped with a 1/2" diameter rubber air
35 line and an air control valve. A discharge pipe is installed from the skimmer air lift to the aeration

1 compartment. The skimming devices are constructed of 3" diameter PVC, Sch. 80 pipe with a
2 removable galvanized clean out. The line runs on top of the plant and returns back to the aeration
3 chamber for removal.

4 5 2.3 PUMPS

6 A. Pumps shall be in accordance with Specification Section 16 of the AP Subdivision
7 Construction Specifications. See "Section 16 – Submersible Sewage Pump Systems & Controls".

8 2.4 BLOWER PACKAGES

9 A. General

10 1. The DEVELOPER shall furnish, test, install and place in satisfactory operation in the
11 manner shown on the contract plans, EasyAir®X2 blower package with a Universal RAI® DSL
12 two lobe rotary positive displacement air blower(s) as manufactured by Howden Roots, or prior
13 approved equal.

14
15 2. All equipment specified in this section shall be designed and furnished by the blower
16 manufacturer, Howden Roots or prior approved equal, who shall be responsible for the suitability
17 and compatibility of all included equipment.

18 19 B. Manufacturer

20
21 1. The ROOTS™ blower/motor assemblies, all accessories, controls and other accessories
22 shall be supplied by a single manufacturer who is fully experienced, reputable and qualified in the
23 supply of the equipment specified. The manufacturer of the blower shall have at least ten (10)
24 installations of the ROOTS rotary lobe blower in operation for at least five years.

25
26 2. Technical data and dimensions for blowers contained in the specifications and drawings
27 are based on the use of the ROOTS™ EasyAir®X2 blower packages. The DEVELOPER may
28 submit alternate equipment for consideration provided that certified documentation stamped and
29 signed by a registered professional engineer, which shows compliance with, or an itemized list of
30 deviations/exceptions with technical justification of such to all performance, construction, service
31 and warranty requirements of this specification. This submittal shall be submitted by the blower
32 manufacturer or its authorized representative. Equipment must be conditionally approved by the
33 Parish Utilities Department and Engineer in writing prior to construction. In no case shall

equipment be accepted for this project if not approved by the Parish Utilities Department and Engineer in writing prior to construction. Pre-submittal data shall include, but not be necessarily limited to; submittal information required by section "D. Submittals and IOM Manuals", compliance documentation for all performance values described in section "H. Design Conditions" and service and warranty compliance documentation required by section "R. Warranty and Service".

C. Testing

1. A Package Performance Test Modified ISO-1217:2005(E) shall be provided. Standard mechanical run, noise and vibration test shall be included and shall be performed at design speed and pressure only. The test shall include flow and power readings and power shall be measured using poly phase wattmeter. Noise readings shall be calculated to free field environment per ISO-2151-2004 (sound pressure level only) test code with +/- 3 dBa tolerance. Blower manufacture's certification shall be provided.

D. Submittals and IOM Manuals

1. Submittals shall be provided prior to construction and shall include, but not limited to the following:

- a. Package data sheet
- b. Blower data sheet
- c. V-belt drive data
- d. General arrangement drawing
- e. Motor data sheet
- f. PRV sizing data sheet
- g. Instrumentation data sheets

E. Start-up and Training

1. The manufacturer or their representative shall furnish experienced start-up/service personnel to inspect the final installation and, if needed, supervise the field start-up of the equipment for (1) day.

F. Spare Parts

1. (1) spare filter elements
2. (1) spare set of v-belts for each blower
3. (1) Gallon ROOTS Synthetic oil

G. Configuration

1. The air blower(s) shall be of the two lobe rotary positive displacement type, and shall be constructed with inlet and discharge connections oriented as shown on the contract drawings. Each blower shall be equipped with detachable rugged steel mounting feet for mounting in horizontal configuration.

H. Design Conditions

Common conditions for all blowers:

Inlet temperature 100 °F

Relative humidity 90 %

Barometer 14.7 PSIA

Inlet pressure at blower inlet connection 14.63 PSIA

Maximum blower speed 1800 RPM

Maximum free field noise level – at 1 meter with noise enclosure 70 dba

EQ Blowers (2 each)

Inlet volume at blower inlet connection XXX ICFM

Discharge pressure at blower discharge connection XX PSIG

Maximum BHP at blower shaft XX

Minimum motor HP XX

Maximum discharge temperature XXX °F

Minimum bearing B-10 life XXXXXXXX hrs

Aeration Blowers (2 each)

Inlet volume at blower inlet connection XXX ICFM

Discharge pressure at blower discharge connection XX PSIG

Maximum BHP at blower shaft XX

Minimum motor HP XX

Maximum discharge temperature XXX °F

Minimum bearing B-10 life XXXXXXXX hrs

Sludge Holding/Air Lift Pump Blowers (2 each)

Inlet volume at blower inlet connection XXX ICFM

Discharge pressure at blower discharge connection XX PSIG

Maximum BHP at blower shaft XX

Minimum motor HP XX

Maximum discharge temperature XXX °F

Minimum bearing B-10 life XXXXXXXX hrs

I. Construction

1. Casing: The blower casing shall be one piece, with separate head plates, and shall be made of ASTM A48 Class 30B close-grained cast iron. Each head plate shall incorporate a vent to atmosphere. In a pressure application this vent prevents pressurization of the oil chambers. In a vacuum application the vent prevents potential oil carry over to the air stream.

2. Impellers: Each impeller shall be made from high-strength cast iron, ASTM A48 Class 30B. The impellers shall be of the straight, two-lobe involute type, and shall operate without rubbing, liquid seals or lubrication. The assembly shall be dynamically balanced by removing metal from the impeller body, and shall be center-timed to permit rotation in either direction.

3. Shafts: The blower shafts shall be ASTM 108-90 and 311-90 or equal. The shafts shall be pressed through the impeller body with an interference fit, and pinned in place.

4. Bearings: Each impeller and shaft assembly shall be supported by oversized anti-friction bearings engineered for long service life and fixed to control the axial location of the impeller/shaft

1 in the unit. A cylindrical roller bearing shall be provided at the drive shaft designed to handle the
2 load of v-belt drive, while single-row ball bearings shall be used at all other locations.

3 5. Timing Gears: The impellers shall be timed by a pair of SAE 8620 carburized and ground
4 steel spur gears. The gears shall be hardened to 58-62 Rockwell hardness and mounted on the
5 shafts with a tapered fit and secured by a locknut.

6 6. Fasteners: High strength fasteners shall be used.

7 7. Lubrication: Each bearing housing shall include a positive radial lip type Viton oil seal. A
8 Buna N lip seal shall be installed on the drive end of the drive shaft. The drive end bearings shall
9 be splash oil lubricated. The timing gears and the gear end bearings shall be lubricated by splash
10 from the gears dipping into the oil.

11 8. The blower will be a ROOTS™ UNIVERSAL RAI®- DSL as manufactured by Howden
12 Roots.

13 J. Inlet Filter/Silencer

14 1. System shall include an inlet filter silencer for pressure applications. An inlet flexible
15 connector with clamps shall be used to mount the inlet filter silencer to the blower inlet connection.
16 The inlet filter silencer shall be carbon steel with paper filter elements. Inlet filters shall have front
17 access for element access. Filter shall provide 99% removal efficiency of 2 micron particle size
18 and larger. Vacuum filters, if required, to be installed inside of the noise enclosure. Howden Roots
19 shall supply the inlet filter silencer.

20 K. Combination Base

21 1. Base shall have combination type discharge silencer. A discharge flexible connector with
22 clamps shall be used between the blower discharge connection and the discharge silencer inlet
23 connection. The base/discharge silencer shall be manufactured using carbon steel, have plain pipe
24 stub connections and incorporate an oil pan in the design. The base/discharge silencer will have
25 connections for a pressure relief valve, pressure gauge, discharge temperature gauge, mechanical
26 unloading valve and ½" drain built into the silencer. Packed/absorptive type silencers are not
27 acceptable. The base/ discharge silencer will be supplied by Howden Roots. Vacuum filters, if
28 required, to be installed outside of the noise enclosure. Howden Roots shall supply the inlet filter
29 silencer.

30 L. Drive System

31 1. A v-belt drive will be provided. The v-belt drive system must incorporate a ROOTS™ v-
32 belt tension system. The belt tension device must be designed to allow the maintenance personnel
33 to replace the belts without exerting or lifting over 40 pounds (OSHA Limitation) without the use
34 of lifting, jacking or pulling tools. A minimum service factor of 1.4 shall be applied on all v-belt
35 systems. Drive selection calculations program shall be supplied to verify 1.4 minimum drive

service factor. For v-belt drives with more than two belts banded belts are required. Drive shall be selected to insure overhung load limits of motor and blower is not exceeded.

M. Belt Guard

1. Guard shall be designed into the noise enclosure and meet OSHA standards.

N. Drive Motor

1. The motor shall be sized for appropriate horsepower, RPM and other appropriate electrical characteristics as determined for the application. The brake horsepower requirement with relief valve fully open shall not exceed the motor nameplate horsepower. Motors operating in the service factor at design and or relief setting are not acceptable. Motors to be horizontal foot mounted ball bearings, heavy-duty steel or cast iron frame, gasketed conduit boxes and manufactured to NEMA or IP standards. Motors to be as manufactured by Baldor or GE. IEC motors are not acceptable.

- Motor RPM: 1800
- Motor Type: TEFC
- Motor Electrical: 3 Phase, 60 Hz, 230-460V
- Motor Service Factor: 1.15
- Motor Full Load Efficiency: Per NEMA Premium Standards

EQ Blowers

- Motor Horsepower: XX
- Motor Full Load Amps: XX

Aeration Blowers

- Motor Horsepower: XX
- Motor Full Load Amps: XX

Sludge Holding/Air Lift Pump Blowers

- Motor Horsepower: XX
- Motor Full Load Amps: XX

1
2
3 O. Standard Accessories

4 1. Oil fill container with a blower oil drain manifold.

5 2. The blower package shall include pressure/vacuum gauges on either the suction or
6 discharge of the blower. Gauges shall be mounted on the noise enclosure. All gauges shall be
7 supplied by Howden Roots as manufactured by Ashcroft model 1009SW with 2.5" dial.

8 3. The blower package will include a discharge temperature gauge mounted on the noise
9 enclosure. The discharge temperature gauge shall be supplied by Howden Roots as manufactured
10 by Weiss model 25UB3-5131 with 2.5" dial.

11 4. Blower package shall include an inlet filter differential pressure gauge mounted on the
12 noise enclosure to indicate filter change requirement. The inlet filter gauge shall be supplied by
13 Howden Roots as manufactured by Dwyer model 2-5040 Minihelic II with 2.5" dial.

14 5. A spring type large nozzle design bronze relief valve shall be included. The relief valve
15 shall be mounted in the discharge silencer for pressure applications and in the suction piping on
16 blowers for vacuum application. The relief valve shall be supplied by Howden Roots as
17 manufactured by Kunkle model 337 for pressure service and 215V for vacuum service.

18 6. Check valves shall be supplied for pressure and vacuum applications. The check valve shall
19 have plain end connections for 5" diameter and below. 6" through 10" are MNPT and 12" will be
20 wafer. Check valve shall be split disc type and valve body shall be cast iron or carbon steel with
21 silicone seal. Check valve ratings shall be 200 PSIG and 500° F. The blower manufacturer must
22 insure the valve is suitable for the application. Check valve to be supplied by Howden Roots as
23 manufactured by Flexi-Hinge.

24 7. Vibration mounts shall be supplied and capable of leveling the blower package to insure
25 proper oil level to increase service and longevity of the equipment. Vibration mounts to be supplied
26 by Howden Roots. The blower manufacture must insure proper selection for the specific blower
27 system offered.

28 8. A 70 dBA or less free field guaranteed noise enclosure should be provided for each blower
29 system. The enclosure outer material must be zinc coated steel with a surface preparation and paint
30 as follows: Powder coat with texture finish 40-100 microns (65 microns average) RAL 5015 blue
31 powder coat process to be proven to pass 500 hour salt spray test satisfactory with no rust evidence.
32 The enclosure must be suitable for outdoor installation, 20 lb per square foot snow load and 70
33 MPH wind speed. The enclosure shall include a vent system and (3) removable panels for easy
34 access and maintenance. The ventilation fan shall be mounted on blower drive shaft; separately
35 wired electric enclosure fans are not acceptable. The noise enclosure shall be provided with 1"

1 foam and the foam shall comply with UL94-HF 1 for flammability. The noise enclosure must be
2 supplied by Howden Roots.

3 9. Butterfly valves, shall be cast iron with locking lever and ship loose for field installation
4 into customer's piping. Threaded valves for 4" and below shall be supplied. Wafer style shall be
5 supplied for valves 6" and above. Butterfly valves shall be rated for 80 PSIG and higher with a
6 temperature rating of 450° F. Materials of construction shall be cast iron disc and body with 416
7 SS shaft and Viton™ O-ring or graphite Teflon® braid packing. The butterfly valves to be supplied
8 by Howden Roots & Gas as manufactured by Process Development & Controls Inc.

9 10. For outdoor installation, the enclosure shall incorporate inlet and discharge weather hoods.

10 P. Installation

11 1. All equipment will be factory painted in accordance with the manufacture's standard
12 procedures.

13 2. The contractor, in accordance with the manufacturer's instructions, shall install the blower
14 package and appurtenances.

15 Q. Warranty and Service

16 1. The entire package shall have an 18 month warranty from startup, or 24 months from
17 shipment. The blower shall have a 24 month warranty from startup, or 30 months from shipment.

18 2. The blower manufacturer shall have a factory trained and authorized factory service center
19 capable of completely servicing the proposed blowers and which routinely stocks blowers, rebuild
20 kits and spare parts for the proposed blowers within 100 miles of the Ascension Parish Utilities
21 Department at 9039 South St. Landry Road, Gonzales, LA 70737.

22 2.5 PLANT CONTROL PANEL

23 Scope: This section covers the WWTP control system complete including but not limited
24 to flow, pacing or dosing pumping, aeration blowers and VFD's, disinfection, metering, TSS, DO,
25 timers, flow monitoring, level monitoring, transducers and floats, probes, chemicals, cellular
26 modem with scada and all other process and equipment control as shown on the DRAWINGS, as
27 specified herein and/or as directed by the ENGINEER.

28 Quality Assurance and Qualifications:

29 A. The Supplier shall maintain quality in design and workmanship as well as materials used
30 in manufacture of equipment supplied. All equipment supplied under this Contract shall be of new
31 manufacture.

32 B. The Supplier shall be a firm that is engaged in the manufacturing of process control
33 systems. The system shall be in regular production with pre-designed hardware and software for

1 process control systems. When the specification conflicts with a manufacturer's standard system,
2 the standard system may be furnished if the intention of the specification is met.

3 C. System shall be a standard system. Custom one of a kind application software and
4 customized hardware components will not be accepted. A standard system is defined as one which
5 is available, at time of bid, with fully tested hardware and software, full documentation, and
6 prepared training classes such that no development must be done beyond system configuration.

7 D. Supplier shall be responsible for detailed engineering, manufacture, programming, test,
8 start-up and demonstration of all equipment and software programs to the Owner to provide a
9 complete operating system.

10 E. The manufacturer shall have been continuously involved in the design and manufacture of
11 control systems for the past ten (10) years. The manufacturer shall have successfully built and
12 placed into operation, systems similar to the one proposed herein and will furnish a list of at least
13 ten (10) operating installations upon request by the Engineer.

14 F. Provide all engineering and render coordination assistance, necessary for calibration of
15 overall control system and to resolve interface discrepancies between panels, equipment,
16 instrumentation and final control devices. Where interface conflicts exist, the Supplier shall
17 document conflicts in writing to the ENGINEER providing absolute information such as terminal
18 numbers, device name, tests performed and diagnosis of problem.

19 G. Equipment supplied shall be of the most current and proven design at the time of delivery.
20 The completed System and the equipment provided by the Supplier shall be compatible with the
21 functions required and shall be a complete working System.

22 H. Signal conditioning, setpoint, control, alternation, logic function, transducer, alarm and all
23 other control functions shall be performed by solid-state modules which shall be standard catalog
24 items of the system manufacturer, with proven field performance.

25 I. At least one module of each type used in the system shall be stocked by the system
26 manufacturer for system expansions or renewal parts purposes. The modules shall be of a
27 compatible, integrated control family with a full range of control/protective/alternation/telemetry
28 capabilities and associated housings, enclosure system and appurtenances to perform a variety of
29 functions required by this project and foreseeable expansion. It is the intention of this specification
30 to disallow non-standard, "one of a kind", experimental, unproven combinations of equipment.

31 Submittals: Submit at least the following product data.

32 A. The complete assembly shall be provided with job-specific wiring diagrams, parts lists,
33 enclosure dimensional and door layout drawings and instructions

34 B. Production Schematics shall be submitted for approval for all equipment herein specified.
35 The Production Schematics Submittal shall include a Document List. An Order Specification shall

1 be included which shall describe in detail the major functionality of the equipment being provided
2 as well as components used detailed down to major component level. Each panel shall be provided
3 with a job-specific wiring diagram, parts lists, enclosure door layout and enclosure dimension
4 drawing. Manufacturer's wiring diagrams that are not job-specific (standard drawings with options
5 crossed out, etc.) are not acceptable. The wiring diagram requirement applies to all field mounted
6 instrumentation and control equipment. Interconnection details shall be shown for all field
7 mounted instrumentation. A Description of Operation shall be provided detailing the operation of
8 the complete system, including the control and alarm handling.

9 C. Provide As-build Drawings and Instruction Manuals. These manuals shall include
10 corrected Shop Drawings. In addition, a detailed Programming and Operations Manual for the
11 Microprocessor-based Controller Unit shall be included. The manual shall include all information
12 as detailed for the shop drawings submittals above.

13 Selected Equipment/Approved Equal: The controls specified under this section are as
14 manufactured by Primex as locally represented by Gulf States Engineering Co., Inc. of Covington,
15 Louisiana (985-893- 3631). The naming of a manufacturer in this specification is not intended to
16 eliminate competition or prohibit qualified manufacturers from offering equipment. Rather, the
17 intent is to establish a standard of excellence for the material used, and to indicate a principle of
18 operation desired.

19 Operation and Maintenance Manuals: Complete Operation and Maintenance Manuals shall be
20 provided.

21 Startup Services: The services of a factory trained, qualified representative shall be provided to
22 inspect the completed installation, make all adjustments necessary to place the system in trouble-
23 free operation and instruct the operating personnel in the proper care and operation of the
24 equipment. After each system has been installed, the Supplier shall demonstrate with performance
25 of each unit, and document that the system operates properly as specified. The Supplier shall
26 provide systems training for operations staff totaling no less than 4 hours. All training shall be
27 conducted at the site. Travel expenses are the responsibility of the supplier.

28 Equipment Guaranty: Equipment shall be guaranteed against defects in material and workmanship
29 for a period of two (2) years from the date of Owner's final inspection and acceptance to the effect
30 that any defective equipment shall be repaired or replaced without cost or obligation to the Owner.

31 PRODUCTS

32 General Requirements:

33 A. U.L. Approval (508):

34 a. The control panel shall be constructed in compliance with Underwriter's Laboratories
35 Category 508 – "Enclosed Industrial Control Panel" listing and following-up service.

1 B. Wiring:

2 a. Wiring shall be minimum 600 volt UL type MTW or AWM and have a current carrying
3 capacity of not less than 125% of the full load current. The conductors shall be in complete
4 conformity with the national electric codes, state, local and NEMA electrical standards. For ease
5 of servicing and maintenance, all wiring shall be color-coded. The wire color code shall be clearly
6 shown on the drawings, with each wire's color indicated. In addition, the equipment wiring shall
7 be permanently marked with wire numbers that correspond to the system schematics. The
8 numbering convention shall comply with the municipal industry standard.

9 b. All low voltage (120 volt or less) control wiring shall be contained within plastic/PVC
10 wiring duct with covers. Where dimensional constraints prevent the use of wiring duct, wires shall
11 be trained to panel components in groupings. The wire groupings shall be bundled and tied not
12 less than every 3 inches with nylon self-locking cable ties as manufactured by Panduit or equal.

13 c. Every other cable tie shall be fastened to the enclosure door or inner device panel with a
14 cable tie mounting plate with pressure tape. Where wiring crosses hinged areas such as when
15 trained from the inner device panel to the enclosure door, spiral wrap shall be used.

16 C. Incoming Service and Lightning Arrestor: The incoming service for the Control Panel
17 shall be 240/460 VAC three phase as indicated on the plans. If 240 VAC single phase is provided
18 as supply power, the Developer shall use VFDs in place of across the line starters. An appropriate
19 surge protective device shall be supplied in the control panel and connected to a circuit breaker, as
20 indicated. The arrestor shall protect the control system against damage as the result of transient
21 voltage surges caused by lightning interference, switching loads and power line interferences. It
22 shall withstand repeated transient voltage pulse currents up to 30,000 amperes.

23 D. Nameplates: All major components and sub-assemblies shall be identified as to function
24 with laminated, engraved bakelite nameplates, or similar approved means.

25 Control System Functional Requirements:

26 A. A Siemens IntraLink LC2000 controller with a Maple Systems 12" High Resolution Touch
27 Screen Operator Interface Terminal (OIT) shall be provided for local control. The Treatment Plant
28 shall operate as follows:

29 a. Mode of Operation: Sewer will flow into the EQ Basin. The EQ Basin Blowers will operate
30 continuously and alternate based on time. The Dosing Pumps are located in the EQ Basin and will
31 be operated in a Flow Averaging method with VFDs based on level in the basin. As the level
32 increases, a pump will start at minimum speed and operate until the level reaches the off level. If
33 the level continues to rise, the pump speed will increase to the maximum speed. If the level
34 continues to rise the lag pump will start at full speed. As the level begins to fall, the lag pump will
35 stop, and the lead pump will begin to slow down to minimum speed as the level allows. At the end

1 of each cycle, and/or based on Time, the pumps shall alternate. There will also be a backup float
2 system to operate the pumps in the event of a transducer failure.

3 The Dosing Pumps lift the flow and splits the flow evenly into the Aeration Basins. The Aeration
4 Basins share a pair of Aeration Blowers which operate based on Time and Dissolved Oxygen.
5 There are DO Probes located in each Aeration Basin train. The two DO readings shall be averaged
6 in the PLC and a PID loop shall provide a speed set point to the VFD for the Aeration Blowers.
7 For plants with a single aeration train, averaging is not required. The PLC will call for an Aeration
8 Blower based on an adjustable timer cycle. When the Aeration Blower starts, an adjustable setpoint
9 DO will be maintained. The Aeration Blower will stop at the end of the Time cycle. The Blowers
10 shall alternate each cycle.

11 There are a pair of Sludge Holding Blowers, which also provide air for the Air Lift Pumps and
12 where applicable, the Post Aeration. One blower shall operate continuously and they shall alternate
13 based on Time.

14 There will be a TSS Probe (Total Suspended Solids) located in each Aeration Basin train. This
15 will provide an easy indication of the Aeration MLSS and help determine the Sludge waste cycle.

16 An Effluent Flow Meter will be located at the V-Notch Weir in the Chlorine Contact Chamber. A
17 channel flow meter or Mag meter will be used to measure effluent flow. The meter will provide
18 the effluent flow to the PLC. Where applicable, the PLC will provide a start command and flow
19 paced signal for the Chlorine Metering Pumps, as well as a signal to the Chart Recorder.

20 A cellular modem shall be provided with a SCADA System for monitoring of the WWTP
21 Operation. The SCADA system shall be web based and allow the operator to monitor all the
22 blowers and pumps operation, EQ Basin Level, Aeration Basin DO Level, and Effluent Flow. The
23 SCADA System shall call the operator (and send an email) when any abnormal condition or alarm
24 occurs.

25 All of this electrical equipment will be installed in a Treatment Plant Control Panel (TPCP). The
26 panel will include a NEMA 4X Stainless Steel enclosure and will be mounted on a panel rack, or
27 mounted directly to a slab with floor stand kit The control panel shall be located at the effluent
28 side of the WWTP, or at least 20 feet away from the headworks and/or aeration basins. Panel
29 location shall be as shown on the plans. The panel shall include a main breaker, an emergency
30 breaker and emergency receptacle, all blower and pump breakers, and NEMA 4X rack mounted
31 VFDs shown on the plans.

32 Disconnects shall be provided at each of the pump and blower locations to allow safe disconnection
33 of the power for maintenance requirements.

34 b. All system alarms, events and control variables shall be viewable and adjustable (setpoints)
35 via the OIT.

c. I/O Listing – Type designations are as follows: AI=Analog Input, DI=Discrete Input, AO=Analog Output, DO=Discrete Output.

WWTP - TPCP

Type	Device	Source/Destination	Function
AI	EQ Basin	Transducer/PLC	4-20 mA Level
DI	EQ Basin	Float/PLC	Pump Stop
DI	EQ Basin	Float/PLC	High Level-Start Lead Pump
DI	EQ Basin	Float/PLC	High High Level-Start Lag Pump
AI	Aeration Basin 1	Probe/PLC	DO
AI	Aeration Basin 1	Probe/PLC	TSS
AI	Aeration Basin 2	Probe/PLC	DO
AI	Aeration Basin 2	Probe/PLC	TSS
AI	CL2 Contact Chamber	Flow Meter/PLC	Effluent Flow
DO	SO2 Chamber	PLC/Metering Pump	Dechlor Injection
DO	CL2 Chamber	PLC/Metering Pump	Chlorine Injection
DO	Dosing Pump 1	PLC/Dosing VFD 1	Pump 1 Required
AO	Dosing Pump 1	PLC/Dosing VFD 1	Pump 1 Speed Required
DI	Dosing Pump 1	Dosing VFD 1/PLC	Pump 1 Run
DI	Dosing Pump 1	Dosing VFD 1/PLC	Pump 1 in Auto
DI	Dosing Pump 1	Dosing VFD 1/PLC	Pump 1 VFD Fault
DO	Dosing Pump 2	PLC/Dosing VFD 2	Pump 2 Required
AO	Dosing Pump 2	PLC/Dosing VFD 2	Pump 2 Speed Required
DI	Dosing Pump 2	Dosing VFD 2/PLC	Pump 2 Run
DI	Dosing Pump 2	Dosing VFD 2/PLC	Pump 2 in Auto
DI	Dosing Pump 2	Dosing VFD 2/PLC	Pump 2 VFD Fault
DO	EQ Blower 1	PLC/Eq Blower 1 ATL	EQ Blower 1 Required
DI	EQ Blower 1	Eq Blower 1 ATL/PLC	EQ Blower 1 Run
DI	EQ Blower 1	Eq Blower 1 HOA/PLC	EQ Blower 1 in Auto

1	DI	EQ Blower 1	Eq Blower 1 OL/PLC	EQ Blower 1 OL Fault
2	DO	EQ Blower 2	PLC/Eq Blower 2 ATL	EQ Blower 2 Required
3	DI	EQ Blower 2	Eq Blower 2 ATL/PLC	EQ Blower 2 Run
4	DI	EQ Blower 2	Eq Blower 2 HOA/PLC	EQ Blower 2 in Auto
5	DI	EQ Blower 2	Eq Blower 2 OL/PLC	EQ Blower 2 OL Fault
6	DO	Aeration Blower 1	PLC/Aeration VFD 1	Aeration Blower 1 Required
7	AO	Aeration Blower 1	PLC/Aeration VFD 1	Aeration Blower 1 Speed Required
8	DI	Aeration Blower 1	Aeration VFD 1/PLC	Aeration Blower 1 Run
9	DI	Aeration Blower 1	Aeration VFD 1/PLC	Aeration Blower 1 in Auto
10	DI	Aeration Blower 1	Aeration VFD 1/PLC	Aeration Blower 1 VFD Fault
11	DO	Aeration Blower 2	PLC/Aeration VFD 2	Aeration Blower 2 Required
12	AO	Aeration Blower 2	PLC/Aeration VFD 2	Aeration Blower 2 Speed Required
13	DI	Aeration Blower 2	Aeration VFD 2/PLC	Aeration Blower 2 Run
14	DI	Aeration Blower 2	Aeration VFD 2/PLC	Aeration Blower 2 in Auto
15	DI	Aeration Blower 2	Aeration VFD 2/PLC	Aeration Blower 2 VFD Fault
16	DO	Sludge Blower 1	PLC/Sludge B1 ATL	Sludge Blower 1 Required
17	DI	Sludge Blower 1	Sludge B1 ATL/PLC	Sludge Blower 1 Run
18	DI	Sludge Blower 1	Sludge B1 ATL/PLC	Sludge Blower 1 in Auto
19	DI	Sludge Blower 1	Sludge B1 OL/PLC	Sludge Blower 1 OL Fault
20	DO	Sludge Blower 2	PLC/Sludge B2 ATL	Sludge Blower 2 Required
21	DI	Sludge Blower 2	Sludge B2 ATL/PLC	Sludge Blower 2 Run
22	DI	Sludge Blower 2	Sludge B2 ATL/PLC	Sludge Blower 2 in Auto
23	DI	Sludge Blower 2	Sludge B2 OL/PLC	Sludge Blower 2 OL Fault

24

25 Control System and Control Panel:

26 A. Enclosure:

27 a. Control and PLC enclosures shall be NEMA type 4X stainless steel specifically designed
 28 for mounting in an unprotected outdoor location. Outer door latch shall be a 3 point latch with

1 rotating handle. It shall have a gasketed, hinged, front weather door with locking capability and
2 an internally mounted hinged dead front panel so that all the components normally actuated by
3 Operating Personnel are accessible without opening the dead front . Enclosures shall be fabricated
4 from a minimum of 14-gauge steel. All enclosures shall be UL listed.

5 b. Enclosure shall have interior LED lighting above panel doors. Interior and Exterior panel
6 doors shall have door stops.

7 c. Supervisory controls shall operate from a source of 120 volts, 1 phase, 60 Hz. All controls
8 shall be protected from lightning or other transient voltages by a lightning arrestor.

9 d. Condensation protection shall be provided. Enclosure shall have a heater that operates
10 continuously to prevent condensation build-up. A freeze protective heater and thermostat shall also
11 be provided at those outdoor locations containing hydraulics or sensitive electronic equipment
12 subject to freezing conditions.

13 e. All power supplies required for operation shall be provided. Power supplies shall be sized
14 to have a minimum of 40% spare capacity providing increased reliability and allowing for the
15 addition of future equipment.

16 B. Incoming Power Connections: The control panel shall include a power distribution
17 terminal block for connection of the incoming service.

18 C. Branch Circuit Breakers: Motor Circuits shall be protected by a properly sized E frame
19 molded case circuit breaker. Each pole of these breakers shall provide inverse time delay overload
20 protection and instantaneous short circuit protection by means of a thermal magnetic element. The
21 breaker shall be operated by a toggle type handle and shall have a Quick-make, Quick-break over
22 center switching mechanism that is mechanically trip free from the handle so that the contacts
23 cannot be held closed against short circuits and abnormal currents. Tripping due to overload or
24 short circuit shall be clearly indicated by the handle automatically assuming a position midway
25 between the manual "ON" and "OFF" position. The minimum interrupting rating of the breaker
26 shall be 42,000 amps at 460 VAC. Pump motor circuit breaker toggle shall be operable through a
27 cutout in the inner door.

28 D. Emergency Power:

29 a. The control panel shall include a second circuit breaker mechanically interlocked with the
30 main breaker to function as an emergency power interrupt and manual transfer switch. The
31 breakers shall allow the control panel to be powered by either commercial power or the owner's
32 portable emergency power generator. The interlock shall be padlock-able with both breakers in
33 the "off" position. The breakers shall be operable from the control panel operator's door.

34 b. A generator receptacle with angled backbox shall be provided and mounted on the side of
35 the enclosure by the panel manufacture. The Generator receptacle shall be of the metallic NEC

style configured to UL 1686 specifications. Receptacle must be suitable for NEMA 4X environments. Caps shall be of "Breech-Lock" design capable of being used as a flip lid or screw cover. Cable clamps must be of contoured smooth 2-screw design. Wire terminals must be of the increased safety design.

c. The receptacle shall be per parish standard and shall be Crouse-Hinds, or prior approved equal.

E. Selector Switches and Run Lights:

a. Selector switches shall be 30.5mm diameter, industrial rated heavy duty NEMA Type 4X with modular contact block assemblies. Contact Blocks shall be stacking screw together type with parallel double break contacts with wiping action. Contact blocks shall be rated NEMA A600, 600 Volt, 10A continuous duty, 7200VA make, 720VA break AC. Contacts shall have compression type screw terminals with self-lifting spring washers to insure that the wire remains secure even under sever vibration. Snap together contact blocks are not acceptable. All pilot devices specified herein are to be Siemens, AllenBradley, Square-D Class 9001 or equal.

b. Unless specified otherwise, Selector Switch(s) shall be of the maintained position type.

c. Indicating Lights shall be 30.5mm diameter, full-voltage, push-to-test with colored lens (green for run and red for fail) and replaceable bulbs. All pilot devices specified herein are to be Siemens, Allen-Bradley, Square-D Class 9001 or equal.

d. Lights and switches shall be mounted on the inner door.

F. Battery Back-Up System:

a. Included with each PLC, and working in conjunction with the unit's DC power supply, shall be an intelligent battery back up system including voltage converter, battery health logic module, charger and sufficiently sized battery. Battery system shall provide a seamless switchover to battery upon detection of main DC power supply failure. Once main DC power is restored, the unit shall provide seamless switchback to normal DC power source and recharge the battery. Battery health logic module shall individually monitor main DC power supply, battery and converter voltages for low voltage conditions, and provide low voltage cutoff to protect battery from an unrecoverable depletion. An on board LED, or local Operator Interface (OI) if provided shall locally indicate detection of an alarm condition. In addition to local indication, all battery health and voltage information shall be transmitted to the Master PLC for centralized monitoring and alarm detection.

b. Battery system shall be of sufficient capacity to provide a minimum of four (4) hours of backup in the event of a failure of the main power source. To avoid battery damage and erroneous data transmissions when operating on battery, should the battery voltage drop below 10.8 V, the PLC shall be inhibited from operation. Recovery shall be automatic upon restoration of normal

1 power. The intelligent battery back up system shall be able to source 5 Amps allowing operation
2 of mission critical components including; sensors, local alarm and communication equipment
3 during a power failure condition.

4 G. PLC Control System:

5 a. General

6 i. The PLC shown on the plan drawings and as described herein shall be of the PLC type with
7 adequate memory and instruction sets required to make the unit perform all of the functions
8 required by this specification. Units shall be configured for future communications with other
9 distributed control PLC panels.

10 ii. Units shall be furnished completely configured and tested providing the specified
11 communication, monitoring, display, input/output, annunciation, computational and other
12 requirements for operation of the Control System. Any additional components required for
13 operation, whether specifically referenced herein or not, shall be provided.

14 iii. The PLC system shall be based on a scalable modular multi-use open architecture platform
15 that can be efficiently applied to perform the necessary functions at each location. Each
16 controller/telemetry unit shall be a modular hardware style PLC consisting of a CPU with adequate
17 memory and instructions, power supply, local and remote input/output modules, communications
18 ports, and all other components required to make the unit perform all of the functions required in
19 this specification.

20 iv. It is required that the same model PLC device be used throughout the control system sites
21 providing a complete solution with one common technology. This is to insure complete system
22 continuity, compatibility between like devices, enhancing overall system efficiency by the reduced
23 need to learn, maintain, support and carry spare parts for multiple technologies.

24 v. The PLC system shall support true system open architecture allowing use of “specialized
25 for water and wastewater” hardware and software and full integration of other third party generic
26 hardware/software devices. The architecture shall meet the requirements as herein defined and
27 allow economical expansion of function and features based on new and evolving technologies.
28 Systems using non-scalable and/or closed proprietary architectures shall not be acceptable.

29 b. Hardware

30 i. The PLC system shall be based on a robust, field proven, current technology hardware
31 platform allowing utilization of the latest advances in technology and permitting the most open
32 programming and communication architectures. The PLC system shall be modular and scalable to
33 be efficiently applied at each of the specified sites within the system.

- 1 ii. The PLC system shall include a real time of day time clock w/battery back up for time
2 stamping of data log records and scheduling of periodic time of day based events. Clock shall not
3 require reset after a site power failure has occurred.
- 4 iii. The PLC shall store system parameters including, logic configuration, setpoints, time
5 delays, alarm and event data, counters and totalizers, etc. in field programmable (FLASH) non-
6 volatile memory. Sufficient non-volatile memory must be provided to protect at least 8,000
7 variables. The PLC shall also provide enough protected memory for time stamped data logging of
8 up to 200,000 process values. This data shall be unaffected by power interruptions.
- 9 iv. The PLC shall have enough processing power and working (DRAM) memory to enable
10 high level programs such as Internet Web Servers to operate efficiently without affecting other
11 simultaneous multitasking operations.
- 12 v. The PLC shall be furnished with a minimum of 6 communication ports with true
13 multitasking and allow simultaneous support of all ports. Ports can be configured for local I/O,
14 Operator Interface/display support, LAN/WAN, etc.
- 15 vi. The PLC processor shall meet the following as a minimum:
- 16 1. CPU – True 32 Bit running at 50 MHz.
- 17 2. 16MB – 32 bit Dynamic RAM
- 18 3. 8 MB FLASH
- 19 4. 512 KB Static RAM
- 20 5. 1 (One) Ethernet 10/100 BaseT port (RJ45)
- 21 6. 2 (Two) RS-232 Serial Communications (115 KB PS) (RJ45)
- 22 7. 1 (One) RS485 Serial Multi-Drop Communications
- 23 8. 1 (One) Local I/O port
- 24 9. 1 (One) Display Serial Communications Port
- 25
- 26 vii. The PLC shall not require any specialized tools for removal of the unit. System components
27 including PLC, power supplies, etc. shall be DIN rail mounted. Terminations shall be via plug in
28 connectors facilitating quick field replacement.
- 29 viii. PLC's and associated I/O modules shall meet national and international safety standards
30 including UL, CSA, CE, DNV and Zone 2 Rated. In addition to the safety standards PLC system
31 components shall also meet IEEE-472 (ANSI C37.90) surge withstand and IEC68-2-6 Vibration
32 standards.

ix. The PLC shall operate from a 10-30 VDC power source. A battery and charger as previously specified shall be supplied to power the master & remote unit during 120 Volt service power outage conditions.

x. The PLC's shall have an operational temperature range of -40°C to 70°C (- 40°F to 158°F) under relative humidity conditions of 5 to 95% non-condensing. Storage temperature range up to 85°C (185°F)

c. Software:

i. The PLC shall have a high performance open source software architecture that utilizes a true multitasking operating system running a combination of standard and specially designed for water and wastewater application software modules. The system provided shall utilize an integrated system approach providing a comprehensive common configuration tool for all components within the system including I/O, Processor, Communications, and Operator Interface Display. The architecture shall permit all system components to be configured, simulated, tested and downloaded from one terminal to all system components.

ii. The operating system shall be multitasking and allow a minimum of two separate programs to run simultaneously without affecting each other.

iii. To provide for and insure multiple source support, the PLC system shall utilize industry standard programming language certified by the PLC open committee for all five languages supported by the IEC 61131-3 standard including; Sequential Function Chart, Ladder Diagram, Structured Text, Instruction List and Function Block Diagram. All five languages must be included. Any one or a combination of the aforementioned programming languages can be used to implement the system strategy. The programming software must be Windows[®] based and be able to operate on Windows[®] 95, 98, NT, 2000, Millennium and XP operating systems.

iv. PLC's provided under this specification shall be capable of performing the necessary logic to control the system as previously defined. These capabilities shall include, but not be limited to the following:

1. Discrete input/output
2. Analog input
3. Analog Output
4. Timers
5. Pump Controller
6. Pump Alternation
7. Mathematical Function Blocks

8. Stage Blocks
9. Trending
10. Latch/unlatch relays
11. Counters
12. Comparators
13. Ladder Logic
14. Flow Totalization/Integration
15. Intrusion Detection
16. Time of Day Control w/Lockout
17. Ramp Blocks
18. Data Logging

v. PLC's shall be capable of performing diagnostic functions.

vi. Each PLC shall have memory protected built in historical archiving/data logging of system alarms & events and process variables. Data logger shall be able to log data based on time or an event. PLC shall have enough memory allocated to allow 200,000 time and date stamped discrete and/or analog values to be archived. The historical archive shall allow the oldest data to roll off the system as memory is used keeping the 200,000 most current data points available. Process point time stamping frequency shall be selectable within the configuration software. It shall be possible for the archived data to be exported in CSV format allowing use with standard spreadsheet and data base software applications.

d. Communications:

i. The PLC telemetry system shall utilize Siemens Water Technologies "open" industry non licensed standard communications protocol that will permit interface with other equipment that may not be supplied by the same manufacture. Protocols that are proprietary and closed ended will not be acceptable. Upon request by the end user, the system supplier shall provide, to the owner, documentation describing the supplied communications protocol so that it may be used in future telemetry additions to insure interface-ability of other third party RTUs and or PLCs.

ii. The system must be able to simultaneously support multiple communications protocols. The system supplied, as a minimum shall be able to supply Siemens Water Technologies "open" and Modbus RTU/ASCII (Remote/Slave) output data via RS-232, 485 & Ethernet format thus insuring a primary means of interfacing with non-related equipment.

1 e. I/O Systems:

2 i. The PLC system shall have I/O resources to support a wide variety of applications without
3 needing to depend upon alternate technologies to meet various system data requirements. Each
4 PLC shall be supplied with the required I/O to meet the specified requirements and allow for a
5 minimum of 100% spare capacity for future expansion. The PLC system shall be easily scaled
6 from a stand alone unit capable of supporting up to 1,024 local, 1,024 remote I/O, and 10,000
7 Ethernet networked I/O points or one of 254 RTUs with a total system data handling capability of
8 50,000 points.

9 ii. The PLC system shall support a wide variety of modular I/O with various configurations
10 to permit the most efficient use of I/O hardware and panel space. I/O modules shall be available
11 for local I/O (within control panel), remote I/O (RS-485 based distributed outside of the control
12 panel) and Ethernet based I/O (Distributed I/O on high speed in plant network or wireless
13 Ethernet). Each I/O module shall be DIN rail mounted, have compression wire type terminals
14 capable of accepting 14 AWG wire, have wire identification markers and I/O wiring diagram. Each
15 module shall include diagnostic LEDS indicating module operational and I/O status. Each I/O
16 module shall be electrically isolated, meet IEEE-472 (ANSI C37.90) surge withstand certification,
17 shall be removable under power and easily field replaced with a spare module requiring no
18 software/hardware reconfiguration adjustments. Each module shall be safety keyed to insure
19 proper installation. I/O modules shall permit installation and operation in hazardous locations as
20 classified under UL, CSA Class 1, Div. 2, Groups A, B, C & D.

21 iii. Local I/O modules shall be connected to the PLC by a dedicated high speed serial
22 communications port and shall allow local networking of 128 I/O modules for a total of 1024 I/O
23 points via 2 twisted shielded wire pairs separated by up to 50 Ft. Local I/O to PLC update time
24 shall not exceed 150 mS.

25 iv. Remote I/O modules shall be connected to the PLC by a dedicated high speed isolated
26 serial communications port and shall allow networking of 32 I/O modules directly or with up to 4
27 gateway I/O expansion modules allow 128 I/O modules for a total of 1,024 I/O points via RS-485
28 multidrop communications network separated by up to 10,000 ft. Remote I/O modules shall
29 support multiple communications protocols including Modbus ASCII and RTU allowing
30 connection to any device supporting these protocols.

31 v. Ethernet I/O modules shall be connected to the PLC by on board Ethernet 10/100 BaseT
32 connection port. Ethernet I/O modules shall support multiple communications including TCP/IP
33 and Modbus ASCII and RTU allowing connection to any device supporting these protocols over
34 standard Ethernet backplane.

35 vi. PLC shall be IntraLink LC2000 and Ethernet I/O as manufactured by Primex or pre-
36 approved equal.

f. Operator Interface Panel:

i. A 12" TFT Color Operator Interface Touchscreen Display shall be supplied for the Control Panel and is to be mounted on the inner door of the enclosure. Keypad/Display shall allow the Operator to view and modify system variables within the PLC. Keypad/Display shall be NEMA 4 rated.

ii. Operator interface shall have the following characteristics:

1. Input Power: 24 VDC

2. CPU: 32 Bit RISC 800 MHz

3. Memory: 256 MB Flash, 256 SDRAM

4. Connectivity: (2) Serial, (1) Ethernet, (1) USB

5. Touchscreen: Analog Resistive

6. Operating Temperature: 0-50 Celsius

iii. The system display shall be preconfigured to reflect system parameters. The system shall employ a hierarchical security password system affording a minimum of twelve (12) levels of password protected access to the system.

iv. The display system shall incorporate a trending package that allows both real-time and historic data. The data shall be capable of being saved in CSV format for later retrieval. The system shall allow trend display of any data point in the system.

v. The display system shall be able to display current and historical alarms and events. Upon the occurrence of a new unacknowledged alarm, the display shall show the date and time stamp of the unacknowledged alarm. Acknowledging the alarm via the display keyboard shall also be date and time stamped. Alarm notifications shall be available to be sent out via email.

vi. The Operator Interface shall be capable of remote connectivity allowing monitoring and control via laptop computer and cell phone/smart device using VNC. This operation needs to have security for the remote connection using a VPN firewall appliance.

vii. The operator interface display shall be based on Maple Systems.

g. Variable Frequency Drives (VFD's):

General:

i. Furnish complete VFD as specified herein or in the equipment schedule for loads designated to be variable speed. VFD's shall be user-selectable for either constant or variable torque loads.

1 ii. The VFD shall convert incoming fixed frequency three-phase AC power into a variable
2 frequency and voltage for controlling the speed of three-phase AC induction motors. The VFD
3 shall be a six-pulse input design, and the input voltage rectifier shall employ a full wave diode
4 bridge; VFD's utilizing controlled SCR rectifiers shall not be acceptable. The output waveform
5 shall closely approximate a sine wave. The VFD shall be of a PWM output design utilizing current
6 IGBT inverter technology and voltage vector control of the output PWM waveform.

7 iii. The VFD shall be provided with an enclosure that is rated Nema Type 4X/IP-66. A VFD
8 that is mounted in a separate enclosure is not be acceptable. The enclosure shall be suitable for
9 installations that require protection against windblown dust and rain or splashing water. All cast
10 aluminum parts shall be powder-coated with a durable epoxy that is capable of withstanding harsh
11 environments.

12 iv. The manufacturer of the VFD shall demonstrate a continuous period of manufacturing and
13 development of VFD's for a minimum of 40 years. VFD's that are brand-labeled are not
14 acceptable.

15 v. The VFD shall produce an output waveform capable of handling maximum motor cable
16 distances of up to 1,000 ft. (unshielded) without tripping or derating.

17 vi. The VFD shall utilize VVCPLUS, an output voltage-vector switching algorithm, or
18 equivalent, in both variable and constant torque modes. VVCPLUS provides rated RMS
19 fundamental voltage from the VFD. This allows the motor to operate at a lower temperature rise,
20 extending its thermal life. VFD's that cannot produce rated RMS fundamental output voltage or
21 require the input voltage to be increased above motor nameplate value to achieve rated RMS
22 fundamental output voltage are not acceptable. VFD's that utilize Sine-Coded PWM or Look-up
23 tables shall not be acceptable.

24 vii. An Automatic Energy Optimization (AEO) selection feature shall be provided in the VFD
25 to minimize energy consumption in variable torque applications. This feature shall optimize motor
26 magnetization voltage and shall dynamically adjust output voltage in response to load, independent
27 of speed. Output voltage adjustment based on frequency alone is not acceptable for single motor
28 VT configurations.

29 viii. An Automatic Motor Adaptation (AMA) function shall measure motor stator resistance
30 and reactance to optimize performance and efficiency. It shall not be necessary to spin the motor
31 shaft or de-couple the motor from the load to accomplish this optimization. Additionally, the
32 parameters for motor resistance and motor reactance shall be user-programmable.

33 ix. The VFD selected must be able to source the motor's full load nameplate amperage
34 (fundamental RMS) on a continuous basis, and be capable of running the motor at its nameplate
35 RPM, voltage, current, and slip without having to utilize the service factor of the motor.

- x. The VFD shall offer a programmable motor parameter that allows the total number of poles of a motor to be programmed to optimize motor performance.
- xi. VFD shall automatically boost power factor at lower speeds.
- xii. The VFD will be capable of running either variable or constant torque loads. In variable torque applications, the VFD shall provide a CT-start feature and be able to provide full torque at any speed up to the base speed of the motor. In either CT or VT mode, the VFD shall be able to provide its full rated output current continuously and 110% of rated current for 60 seconds.
- xiii. Switching of the input power to the VFD shall be possible without interlocks or damage to the VFD at a minimum interval of 2 minutes.
- xiv. The VFD shall have temperature controlled cooling fans for quiet operation, minimized internal losses, and greatly increased fan life.
- xv. The VFD shall include an integral RFI filter conforming to the A2 standard as a minimum. VFD enclosures shall be made of metal to minimize RFI and provide additional immunity.
- xvi. VFD shall provide full galvanic isolation with suitable potential separation from the power sources (control, signal, and power circuitry within the drive) to ensure compliance with PELV requirements and to protect PLC's and other connected equipment from power surges and spikes.
- xvii. All inputs and outputs shall be optically isolated. Isolation boards between the VFD and external control devices shall not be required.
- xviii. There shall be six fully programmable digital inputs for interfacing with the systems external control and safety interlock circuitry. Two of these inputs shall be programmable as inputs or outputs.
- xix. The VFD shall have two analog signal inputs. Inputs shall be programmable for either 0 - 10V or 0/4-20 mA.
- xx. The VFD shall have an option to add an additional I/O board that adds 3-digital inputs, 2-digital outputs, 2-analog inputs, and 1-analog output.
- xxi. One programmable analog output shall be provided for indication of the drive status. This output shall be programmable for output speed, voltage, frequency, motor current and output power. The analog output signal shall be 0/4-20 mA.
- xxii. The VFD shall provide two user programmable relays with 75 selectable functions. Two form 'C' 230VAC/2A rated dry contact relay outputs shall be provided.
- xxiii. The VFD shall have an option to add a relay board that includes three additional Form 'C' 240V relays that is mounted inside the drive.

- xxiv. The VFD shall have an option to add a relay board that includes: seven Digital inputs, four additional Form 'C' 240V relays, and 2 Analog outputs that is mounted inside the drive.
- xxv. An embedded cascade pump controller shall be included to provide lead pump alternation and provide control for up to 3 total pumps. The VFD Pump and 2 other pumps can be controlled either by a starter or soft starter.
- xxvi. The VFD shall have an option to include an integral pump controller to automatically stage and de-stage up to five (5) pumps in either standard cascade or leader follower mode, utilizing the VFD's PID loop controller feature to regulate either pressure, level, or flow in a system. The controller shall be compatible with systems having multiple VFD's, or with a VFD "master" and either soft starter or across-the-line follower units.
- xxvii. The VFD shall have an option to include an integral pump controller to automatically stage and de-stage up to eight (8) pumps in either standard cascade or leader follower mode, utilizing the VFD's PID loop controller feature to regulate either pressure, level, or flow in a system. The controller shall be compatible with systems having multiple VFD's, or with a VFD "master" and either soft starter or across-the-line follower units. An integral motor alternation function shall be provided to enable the output of the drive to alternate between two motors. The alternation interval shall be user-programmable in hours. This function shall operate external relays as required to control the motor alternation sequence. A dwell time shall be integral to the function and can prevent damage to the motor contactors.
- xxviii. The VFD shall accept a N.C. motor over-temperature switch input, as well as possess the capability to accept a motor thermistor input.
- xxix. The VFD shall have an option to accept up to 3, 2 or 3 wire, Pt100/1000 sensor inputs.
- xxx. Run permissive circuit shall be provided to accept a "system ready" signal to ensure that the VFD does not start until isolation valves, seal water pumps or other types of auxiliary equipment are in the proper state for VFD operation. The run permissive circuit shall also be capable of sending an output signal as a start command to actuate external equipment before allowing the VFD to start.
- xxxi. The VFD shall be equipped with a standard RS-485 serial communications port and front-of-drive accessible USB port. Danfoss FC or ModBus RTU communications shall be integrally mounted.
- xxxii. The VFD shall offer an option to add one or more of the following communication protocols: Device Net, Ethernet/IP, Profibus, Profinet, or Modbus TCP.
- xxxiii. A Windows® compatible software program to display all monitoring, fault, alarm, and status signals shall be available. This software program shall allow parameter changes, storage of

all VFD operating and setup parameters, and remote operation of the VFD. The software shall connect to the VFD with a standard USB cable.

xxxiv. VFDs shall be as follows:

Danfoss VLT® Aqua Series VFD (NEMA 4X enclosure)

Harmonics:

i. The VFD shall provide internal DC link reactors to minimize power line harmonics and to provide near unity power factor. DC Link reactor shall be installed so that power fluctuations to the DC Capacitors shall be reduced to increase Capacitor life. VFD's without a DC link reactor shall provide a 5% impedance line side reactor and provide spare capacitors.

Protective Features:

i. VFD shall have input surge protection utilizing MOV's, spark gaps, and Zener diodes to withstand surges of 2.3 times line voltage for 1.5 msec.

ii. Printed Circuit boards shall be conformal coated to reduce the corrosion effect from environmental gases and other conditions. The conformal coating must meet IEC 61721-3-3, Class 3C2.

iii. VFD shall include current sensors to monitor all three-output phases to detect and report phase loss or unbalance or other power issues to the motor. The VFD will identify which of the output phases is low or lost.

iv. VFD shall auto-derate the output voltage and frequency to the motor if an input phase is lost. This result will maintain operation without decreasing the life expectancy of the VFD. The use of this feature shall be user selectable and export a warning during the event.

v. VFD shall auto-derate the output voltage and frequency to the motor in the presence of sustained ambient temperatures higher than the normal operating range, so as not to trip on an inverter temperature fault. The use of this feature shall be user-selectable and a warning will be exported during the event. Function shall reduce switching frequency before reducing motor speed.

vi. VFD shall auto-derate the output frequency by limiting the output current before allowing the VFD to trip on overload. The speed of the load can be reduced, but not stopped.

Interface Features:

i. VFD shall provide an alphanumeric backlit display keypad (LCP) which may be remotely mounted using a standard 9-pin cable. VFD may be operated with keypad disconnected or removed entirely. Keypad may be disconnected during normal operation without the need to stop the motor or disconnect power to the VFD.

- 1 ii. VFD Keypad shall feature an INFO key that, when pressed, shall display the contents of
2 the programming manual for the parameter that is currently viewed on the display. The description
3 shall explain the feature and how the settings can be made by the operator.
- 4 iii. VFD shall display all faults in plain text; VFD's which can display only fault codes are not
5 acceptable.
- 6 iv. The keypad shall feature a 6-line graphical display and be capable of digitally displaying
7 up to five separate operational parameters or status values simultaneously (including process
8 values with the appropriate engineering unit) in addition to Hand/Off/Auto, Local/Remote, and
9 operating status.
- 10 v. Two lines of the display shall allow "free text programming" so that a site description or
11 the actual name of the equipment being controlled by the VFD can be entered into the display.
- 12 vi. Keypad shall provide an integral H-O-A (Hand-Off-Auto) and Local-Remote selection
13 capability, and manual control of speed locally without the need for adding selector switches,
14 potentiometers, or other devices.
- 15 vii. All VFD's shall be of the same series, and shall utilize a common control card and LCP
16 (keypad/display unit) throughout the rating range. The control cards and keypads shall be
17 interchangeable through the entire range of drives used on the project.
- 18 viii. VFD keypad shall be capable of storing drive parameter values in non-volatile RAM
19 uploaded to it from the VFD, and shall be capable of downloading stored values to the VFD to
20 facilitate programming of multiple drives in similar applications, or as a means of backing up the
21 programmed parameters.
- 22 ix. VFD Display shall have the ability to display 5 different parameters pertaining to the VFD
23 or the load including: current, speed, DC bus voltage, output voltage, input signal in mA, or other
24 values from a list of 92 different user-selectable parameters.
- 25 x. VFD display shall indicate which digital inputs are active and the status of each relay.
- 26 xi. It shall be possible to toggle between three status read-out screens by pressing the [Status]
27 key. Various operating variables, even with different formatting, can be shown in each status
28 screen.
- 29 xii. VFD display shall indicate the value of any voltage or current signal, including the
30 engineering units of measurement, connected to the analog input terminals.
- 31 xiii. VFD display shall indicate the value of the current at the analog output terminals, including
32 the engineering units of measurement.

- xiv. A red FAULT light, a yellow WARNING light and a green POWER-ON light shall be provided. These indications shall be visible both on the keypad and on the VFD when the keypad is removed.
- xv. Two-level password protection shall be provided to prevent unauthorized changes to the programming of the VFD. The parameters can be locked via a digital input and/or the unit can be programmed not to allow an unauthorized user to change the parameter settings.
- xvi. A quick setup menu with factory preset parameters shall be provided on the VFD to facilitate commissioning. Use of macros shall not be required.
- xvii. A digital elapsed time meter and kilowatt hour meter shall be provided in the display.
- xviii. VFD shall offer as standard an internal clock. The internal clock can be used for: Timed Actions, Energy Meter, Trend Analysis, date/time stamps on alarms, Logged data, Preventive maintenance, or other uses. It shall be possible to program the clock for Daylight Saving Time / summertime, weekly working days or non-working days including 20 exceptions (holidays, etc.). It shall be possible to program a Warning in case the clock has not been reset after a power loss.
- xix. The VFD shall have an option to add a battery back-up to maintain internal clock operation during power interruptions. Battery life shall be no less than 10 years of normal operation.
- xx. Option: VFD shall accept an external 24 VDC power connection to keep control logic powered in the event of a power failure. Back-up power shall keep communications, PID Loops, and drive logic operational until main power is restored.
- xxi. The VFD shall store in memory the last 10 faults with time stamp and recorded data.
- Software Features:
- i. The VFD shall have an adjustable output switching frequency.
- ii. Four complete programming parameter setups shall be provided, which can be locally selected through the keypad or remotely selected via digital input(s), allowing the VFD to be programmed for up to four alternate control scenarios without requiring parameter changes.
- iii. In each programming set up, independent acceleration and deceleration ramps shall be provided. Acceleration and deceleration time shall be adjustable over the range from 0 to 3,600 seconds to base speed.
- iv. The VFD shall have four programmable "Bypass frequencies" with adjustable bandwidths to prevent the driven equipment from running at a mechanically resonant frequency. The feature shall offer a Semi-Automatic program to simplify the set-up.
- v. In each programming setup, independent current limit settings, programmable between 50% and 110% of the drives output current rating, shall be provided.

- vi. PID parameter settings shall be adjustable while the VFD is operating, to aid in tuning the control loop at start up. The VFD will also be capable of simultaneously displaying set-point reference and feedback values with appropriate engineering units, as well as output frequency, output current, and run status while programming the PID function.
- vii. The VFD will include a “loss of follower” function to detect the loss of process feedback or reference signals with a live-zero value and a user-selectable choice of responses (go to set speed, min speed, max speed, stop, stop, and trip).
- viii. A Sleep Mode function shall be provided to reduce wear and heating of the pump and other equipment in periods where system demand is minimal. This function will operate in both open and closed loop modes:
- a. In closed loop process control, when the output speed drops to a user-programmed minimum value (“sleep frequency”) for a specified time (“sleep mode timer”), the drive will enter a sleep mode and either go into standby, or boost mode before entering standby. The drive shall automatically restart the motor once the output of the PID processor exceeds a programmable value “wake up frequency”.
- i. Boost mode shall prevent short-cycling of the motor by temporarily adjusting the set-point by a user-programmable percentage. Upon reaching this value, the unit will go into standby.
- b. In open loop, the drive shall be capable of entering sleep mode if the input reference drops below a user-programmable value. When the input reference increases above a user-programmable reference, the drive will automatically start.
- ix. An initial ramp function shall be available to provide a user-selectable ramp, up to 60 seconds, for applications requiring a faster or slower ramp than the normal ramp.
- x. A Dual Ramp feature shall include a Check Valve Ramp and a final Ramp feature. The Check Valve Ramp shall be programmable to gently seat a check valve and reduce the potential of damage from excess pressure while shutting-down the system. Both time and end speed shall be programmable. On the Final Ramp, the VFD shall be programmable to quickly stop the motor after seating of a check valve or for a more rapid stopping than the normal ramp down setting.
- xi. VFD shall offer up to 4 separate PID controllers. One controller shall operate the drive in closed loop, while the other 3 provide control signals to other equipment. VFD’s with PI controllers only are not acceptable.
- xii. An Autotuning PI controller output feature shall provide automated PI controller settings. Once the user accepts the settings, the VFD will save the settings to memory.
- xiii. An empty pipe fill mode shall be available to fill an empty pipe in a short period of time, and then revert to the PID controller for stable operation. Pipe fill mode shall have a programmable time to reduce water hammer in the system or fill the pipe at a unit per time rate.

- xiv. Automatic “No-Flow Detection” shall be available to detect a no-flow situation in pump systems where all valves can be closed. This shall be functional in closed loop control or when controlled by an external signal.
- xv. Dry-pump detection shall be available to detect if the pump has run dry. If this condition occurs, the drive will be safely stopped. A timer shall be included to prevent nuisance tripping.
- xvi. End-of-Pump curve detection shall stop motor when the pump is operating outside of its programmed pump curve.
- xvii. Deragging Function shall offer the option to rotate the impeller in the opposite direction to help dislodge rags or strings or other solids on the impeller. The duration and speed of the deragging shall be programmable.
- xviii. VFD shall provide a flow compensation program to reduce energy by adjusting the Setpoint to match changes in flow (friction loss). Flow compensation shall also operate in Cascade control mode.
- xix. The VFD shall have a motor preheat function with the ability to be programmed to induce a small amount of current to the motor whenever it is at rest. This will prevent condensation inside the motor and help to extend its life without the need for space heaters or other external equipment.
- xx. The VFD will include a user-selectable Auto-Restart function that enables the VFD to power up in a running condition after a power loss, to prevent the need to manually reset and restart the VFD.
- xxi. The VFD will include a user-selectable Reset function, which enables the selection of between zero and twenty restart attempts after any self-clearing fault condition (under-voltage, over-voltage, current limit, inverter overload, and motor overload), or the selection of an infinite number of restart attempts. The time between restart attempts shall be adjustable from 0 through 600 seconds.
- xxii. An automatic “on-delay” function may be selected from 0 to 120 seconds.
- xxiii. VFD shall catch a rotating motor operating either in forward or reverse at up to full speed.
- Service Conditions:
- i. The ambient operating temperature of the VFD shall be -10°C to 50°C (14 to 122°F), with a 24-hour average not to exceed 45°C. Storage temperatures shall be -13° F (-25° C) to 149/158° F (65/70° C).
 - ii. 0 to 95% relative humidity, non-condensing.
 - iii. Elevation to 3,300 feet (1000 meters) without derating.

iv. VFD shall provide full torque to the motor, given input voltage fluctuations of up to +10% to -15% of the rated input voltage (525 to 690VAC, 380 to 480VAC, or 200 to 240VAC). Line frequency variation of $\pm 2\%$ shall be acceptable.

v. No side clearance shall be required for cooling of the units.

Submittals:

i. Submit manufacturer's performance data including dimensional drawings, power circuit diagrams, installation and maintenance manuals, warranty description, VFD's FLA rating, certification agency file numbers, catalog information and catalog cut-sheets for all major components.

ii. All drawings shall be in an 8.5 X 11" reproducible format, and incorporate the manufacturer's title block on the drawing.

iii. This specification lists the minimum VFD performance requirements for this project. Each supplier shall list any exceptions to the specification. If no departures from the specification are identified, the supplier shall be bound by the specification.

iv. Three copies of all submittals shall be provided.

v. Submit a computer generated Harmonic Distortion Analysis for the jobsite location.

Quality Assurance:

i. The manufacturer shall be both ISO-9001 and ISO-14001 certified.

ii. All products shall be CE marked; UL labeled, and meet the requirements of UL-508C and maintain cUL.

iii. To ensure quality and minimize infant-mortality failures on the jobsite, each VFD shall be completely tested by the manufacturer. The VFD shall operate a dynamometer at full load and speed under elevated temperature conditions.

iv. All optional features shall be functionally tested at the factory for proper operation.

v. Factory test documentation shall be available upon request.

Examination:

i. Contractor to verify that job site conditions for installation meet factory recommended and code-required conditions for VFD installation prior to start-up, including clearance spacing, temperature, contamination, dust, and moisture of the environment. Separate EMT conduit installation of the motor wiring, power wiring, and control wiring, and installation per the manufacturer's recommendations shall be verified.

1 ii. The VFD is to be covered and protected from installation dust and contamination until the
2 environment is cleaned and ready for operation. The VFD shall not be operated while the unit is
3 covered.

4 Warranty:

5 i. A 6-year on-site warranty shall be provided such that the owner is not responsible for any
6 warranty costs including travel, labor, parts, or other costs for a full 6 years from the date of
7 manufacture of the Drive. The warranty shall cover all Drive failures including line anomalies –
8 including lightning strikes, load anomalies, accidental exposure to moisture or corrosives and
9 accidental collision of other physical damage; product misapplications, vandalism and chronic
10 problems due to the misapplication are not covered. The cost of the warranty shall be included in
11 the bid.

12 Auxiliary Devices:

13 A. MJK Expert 3400 Submersible Level Transducer:

14 a. The liquid level of the wet well shall be sensed by a submersible level transducer. The
15 transducer shall be a 2-wire type to operate from the level controller's regulated loop power supply
16 and produce an instrumentation signal (4-20mA) in direct proportion to the measured level
17 excursion over a factory-calibrated range of zero to (30) feet of water.

18 b. The transducer shall be of the ceramic capacitive, relative pressure sensing type, suitable
19 for continuous submergence and operation and shall be installed in accordance with
20 manufacturer's instructions. The bottom diaphragm face of the sensor shall be installed
21 approximately 6 inches above the wet well floor. The sensor shall be hung in the wet well using a
22 cable bracket including two sliding cable locking jaws in a location in the wet well and as shown
23 on the job plans.

24 c. The transducer housing shall be fabricated of PPS (polyphenylene sulfide) with a ceramic
25 bottom diaphragm.

26 d. The transducer element shall incorporate high over-pressure protection and be designed to
27 withstand intermittent overpressures (10) times the full-scale range being sensed. Metallic
28 diaphragms shall not be acceptable in that they are subject to damage or distortion. Sensing
29 principles employing LVDTs, resistive or pneumatic elements shall not be acceptable.

30 e. The internal pressure of the lower transducer assembly shall be relieved to atmospheric
31 pressure through a heavy-duty urethane jacketed hose/cable assembly and a slack PVC bellows
32 mounted in the control panel. The sealed breather system shall compensate for variations in
33 barometric pressure and expansion and contraction of air due to temperature changes and altitude
34 as well as prevent fouling from moisture and other corrosive elements.

1 f. The transducer assembly shall be installed where directed by the ENGINEER and
2 connected with other system elements and placed in successful operation.

3 g. The transducer shall have a programming feature using a standard USB interface and a
4 laptop computer, the servicing transmitter can be programmed on-the-fly to the required measuring
5 range. The design without sharp edges prevents aprticles, textiles and paper from sticking to the
6 housing or the diaphragm. The transducer shall be surge resistant.

7 h. The transducer power cable shall be steel reinforced PUR cable with high tensile strength
8 (2,000 lb).

9 B. Back-Up Level Control: Backup EQ Basin level controls shall be a float system operated
10 by three (3) float switches. The float switches shall be utilized for pump stop, lead pump start/high
11 water level and lag pump start. The float switches shall be mechanical type switch, potted in a
12 solid polyurethane float, with two (2) conductor No. 16 flexible cord (Type SJOW). Float switches
13 shall be normally open type with contacts rated at 3 amps for 115 or 230 volts.

14 C. Dissolved Oxygen (DO) / TSS Analyzer:

15 a. The dissolved oxygen measurement system for continuous monitoring in situ. The
16 dissolved oxygen measurement system shall be a component of a process monitoring system
17 capable of monitoring up to 20 parameters simultaneously on each controller. Measurement
18 locations shall be networked together in a linear, star, or branched topology with a single 2-wire
19 cable that distributes 12 V power and communications.

20 b. Measurement principle shall be optical by means of the technology frequency domain
21 lifetime-based luminescence quenching and signal processing.

22 c. Connect dissolved oxygen sensor assembly to field-mounted junction box or expansion
23 modules with sensor connecting cable specified herein.

24 d. DO sensor shall be YSI Model FDO 700 IQ – Optical DO probe for IQ System, 0-20 mg/l,
25 or prior approved equal.

26 e. Total suspended solids measurement system for continuous monitoring in situ. Total
27 suspended solids measurement system shall be a component of a process monitoring system
28 capable of monitoring up to 20 parameters simultaneously on each controller. Measurement
29 locations shall be networked together in a linear, star, or branched topology with a single 2-wire
30 cable that distributes 12 V power and communications.

31 f. Measurement principle shall be optical based on the reflectance of light from a near infrared
32 light source.

33 g. Connect total suspended solids sensor to field-mounted junction box or expansion modules
34 with sensor connecting cable as specified herein.

h. TSS Sensor shall be YSI Model ViSolid 700 IQ Suspended Solids probe for IQ System, or prior approved equal.

i. Process monitoring system universal controllers shall be Multi-parameter universal controllers as part of a process monitoring system that includes display terminals, and associated modules that control, indicate, record, and transmit signals from multiple online sensors in water resource recovery facilities.

j. Process monitoring controller shall be YSI Model DIQ/S 284-CR6, System 284 IQ Sensor Net Controller capable of operating up to 4 sensors, 6 current output, 6 relays, 3 IQ sensor net connections. Controller shall be mounted on the side of Ditch 1 as shown on electrical plans. The MIQ/JB shall be mounted on the side of Ditch 2 as shown on the electrical plans.

k. TSS & DO sensors shall be mounted to handrails with YSI Model 2458000Y SMK quick release stainless steel handrail mounting brackets w/1.5" mounting adapter.

D. Electromagnetic Flow Meter:

a. The electromagnetic flow meter shall be an MJK MagFlux system with MJK Magflux Flow Sensor, MJK MagFlux Flow Converter and MJK MagFlux Display Unit with manufacturer recommended accessories.

b. The electromagnetic flow measurement system shall consist of a Flow Sensor which uses Faradays law of electromagnetic induction along with a microprocessor based Flow Converter and Display. The flow meter shall have built in self-diagnostics, technician service functions and be suitable for use with the manufacturer's system certifying kit to confirm meter's sensor functions, accuracy of electronics including a calibration check of electronics at a zero flow and a mid-range flow rates, and for confirming all components meet factory specifications for accuracy and feature operation.

c. Operating Principle: Utilizing Faraday's Law the sensor converts the liquid flow through the sensor into electrical voltage proportional to the velocity of the flow.

d. Construction: The sensor shall be produced from 304 stainless steel pipe, coils, 316L stainless steel electrodes and a hard rubber liner, soft rubber liner, or PTFE liner as required for compatibility with the media. The sensor shall have a stainless steel outer jacket or carbon steel outer jacket, carbon steel or stainless steel ANSI 150 psi or optionally ANSI 300 psi, ANSI Class D or ANSI Class E flanges. Carbon steel exterior components as well as the exterior of the flow tube shall be protected with two part epoxy coating for corrosion resistance.

e. Installation: A minimum of 3 pipe diameters up stream and 2 pipe diameters down stream of straight smooth pipe are recommended.

f. Flow Sensor Operating Temperature shall be: Media Temperature -10°C to 80°C (15°F to 175°F), Ambient Temperature 10°C to 60°C (15°F to 140°F).

- g. Flow Sensor shall be capable of being installed for permanent burial or submergence up to 30 ft. (IP 68/NEMA 6P) using manufacturer's submergence and waterproofing kits. Flow sensor shall be capable of temporary (30 minutes) submergence up to 3 ft. (IP 67/NEMA 4) without a submergence kit.
- h. Flow Sensor shall be full bore internal diameter throughout to reduce liner erosion and reduce turbulence at high flow ranges. Sensor shall be factory calibrated and wet tested to deliver $\pm 0.25\%$ reading accuracy when the flow sensor is sized so that velocity through the sensor is 0.2-10m/s. Accuracies will be NIST Traceable. Sensor shall be delivered with a calibration certificate for verification of performance. The Flow Sensor shall have calibration and flow set up data marked on the sensor.
- i. Flow sensor shall be capable of being mounted at angles up to 45° from vertical around the center axis of a horizontal pipe and shall be capable of being installed in any direction without regard to flow direction.
- j. The Flow Sensor shall also include a grounding electrode to eliminate the need for grounding rings in wastewater applications (except when using non-conducting pipe).
- k. Flow Converter shall have an enclosure rating of IP 67 (NEMA 6) with a measurement accuracy of $\pm 0.1\%$.
- l. Flow Converter shall energize and detect signals generated at the Flow Sensor electrodes and self-adjust frequency and amplitude to maximize accuracy across a wide range of flow velocities. Converter shall include program for periodic self-cleaning of Flow Sensor electrodes using cyclic reverse polarization systems to prevent material attachment and to detach plated materials.
- m. Flow Converter shall be capable of measuring fluid velocities in low ranges from 0 to 0.2m/s (0.6ft/sec.) and up to a maximum velocity up to 10m/s (30ft/sec). Maximum accuracies shall be achieved from 2% of the flow sensors maximum flow rate up through the sensors maximum flow rate.
- n. Flow Converter shall be a flow rate transmitter with a fully scaleable 4-20mA output proportional to all or part of the full-scale flow rate and capable of transmitting with a maximum line load of 800 Ω . The Flow Converter shall be capable of transmitting a 4-20mA output proportional to the flow in either direction, or 4-20 mA proportional to flow in both directions, selectable after installation. Flow Converter shall have one voltage free electromechanical relay rated for a maximum of 50VDC at 1 Amp and one optically isolated relay rated for 50VAC/VDC 120mA max. Both relays are programmable for totalizer counter output, batch counters, high/low flow alarm, system error, empty pipe alarm, and flow direction indication.
- o. The Flow Converter shall accept one external digital input rated at a maximum of 30VDC with a signal less than 5VDC registered as = 0 and a signal greater than 10 VDC as registered as

1 = 1. Minimum pulse length 100ms. Digital input can be used for reset of batch counters, start and
2 stop batches or alarm acknowledgement.

3 p. The Flow Converter shall be capable of reading flow in both directions and have three re-
4 settable totalizers and three non-resettable totalizers capable of totalizing the total flow or net flow
5 in both directions.

6 q. The Flow Converter shall have two batch counters utilizing dynamic adaptive batch
7 counting to minimize under shooting and over shooting of batch volume by self-adjusting the batch
8 cycle based on actual batch size measurement results. Flow Converter shall have a MODBUS
9 RTU-mode for control and communication using either the MJK MagFlux Display unit or for
10 communication with a PLC. The manufacturer shall supply a document with the list of program
11 registers upon request. Flow Converter shall use an RS 485 communication interface capable of
12 transmitting up to 3000 ft. the controls and data in the MODBUS RTU mode to a PLC or MJK
13 Display Unit.

14 r. Flow Converter shall be capable of operating without a display, with a remote display, with
15 an integral display or as a member of a group of two to four converters working from a single
16 display. Flow converter shall be capable of being operated remote to the Flow Sensor.

17 s. Flow converter shall have user adjustable low flow cut off for automatic zeroing of flow
18 rate, totalizing and mA output. No external switching shall be required to achieve zero flow. Flow
19 Converter and must be capable of interchanging with any other flow sensor from the same
20 manufacturer, without the use of electronic memory media exchange. Flow Converter must be
21 capable of being remote mounted up to 150 ft from the flow sensor and require only one set of
22 communication cabling to the sensor for operation.

23 t. Display Unit shall be a white dot matrix 64 x128 pixel graphic backlit display and shall
24 allow up to four lines of customizable text with automatic font scaling allowing maximum size up
25 to ½ an inch for the primary measurement parameter. Unit shall indicate flow, flow direction,
26 volume, totalizers, configuration, and set-up operations in plain English text. The Display Unit
27 shall display a graphical trend line of the flow history which can be expanded to show greater
28 detail down to 5 minutes increments of flow rates.

29 u. The Display Unit shall communicate with the Flow Converter using a MODBUS RTU
30 mode using RS485 communications on standard twisted wires for distances up to 3000 ft. The
31 Display Unit shall be capable of controlling, configuring, and data logging for up to four Flow
32 Converters and flow sensors at the same time with simultaneous displays of measurements. The
33 Display unit shall also have options for Modbus or Profibus data transmission in addition to the
34 Converter communications modes.

35 v. The Display Unit shall hold all settings in a flash memory in the event of a power outage.
36 Battery back-up is not acceptable. The Display Unit shall have a USB port for connection or

options for Blue Tooth communication to a personal computer for downloading data in CSV file types suitable for use with commonly available spreadsheet and data management software. The USB port shall also be capable of letting the operator store all flow meter settings as a file on a PC, configure the flowmeter converter from a PC, upload software updates, and upload standard configurations. The Display Unit shall be able to be remote mounted up to 3000 feet from Flow Converters.

w. The Display Unit shall have four keypad buttons for configuration and operation by the user and for use as a digital input for control and shall be capable of showing 'pop-up' alarm messages which shall persist as long as the alarm condition exists and will disappear 5 minutes after.

E. Open Channel Flow Meter: Flow Measuring System shall be MJK Model 713, or approved equal, as indicated below:

a. System consisting of the open channel flow converter and ultrasonic sensor shall locally measure and indicate flow with accuracy of better than $\pm 0.53\%$ of range based on 0-12 inch level measurement and accuracy of better than $\pm 0.3\%$ based on 0-3 feet level measurement.

b. System shall produce a linear and isolated 4-20mA signal proportional to the measured flow rate over a measurement range of zero to the maximum flow rate of the primary device. The signal shall be transmitted to a remote location as shown.

c. The flow measurement system shall consist of an ultrasonic pulse generating and receiving sensor with a no more than 3° beam angle spread and flow converter.

d. Sensor shall measure level 0 to 4 inches through 0-10 feet with a 15" blocking zone, and better than ± 0.04 inch accuracy.

e. The flow converter shall display flow rate accurate to better than $\pm 0.2\%$ of adjusted range, average flow rate for last hour, average flow rate for the current day, and for the previous day.

f. The flow converter shall display total flow since start-up, total flow for the past hour, total flow rate for the current day, total flow for the previous day, and total flow for previous 99 days.

g. The flow converter must not use a battery for memory back up. All settings, flow rates and alarm information shall be stored in an EE prom.

h. The flow converter shall have a power monitor system, where power interruptions are indicated as an alarm.

i. The flow converter shall display up to nine alarm events triggered by either high or low flow rate, high or low hourly flow rate, high or low daily flow rate or power failure. All alarms shall be indicated with the time and date for appearance and disappearance. The alarm in the list shall be unalterable.

- j. The flow converter shall have 100mS to 10S adjustable duration optically coupled, 36VDC 50mA totalizer output user programmable to almost any flow volume.
- k. The flow converter shall have four dry contact SPDT relays, rated to six amperes resistive, 100W inductive load, user programmable for alarms, initial flow, as a counter, or to control a composite sampler or chemical feed device based on flow volume.
- l. Flow converter shall have preset flow rate calculations for 15 sizes of Parshall Flumes, 11 sizes of Palmer Bowlus Flumes, 22.5° through 122° “V” Notch Weirs, Rectangular Weirs with and without contraction, accept 10 known user-supplied height/flow rate relationships and extrapolate a Q(h) linearization curve for flow indication and transmission, and accept user defined optional exponents and K factors for $Q(h) = Kh^X$ flow rate calculations.
- m. Flow converter shall have ambient operating temperature range of -5° to 150°F.
- n. Flow converter shall be enclosed in a NEMA 4X housing.
- o. Flow convertor shall be UL and cUL listed.
- p. System shall include mounting sensor brackets, sun/rain shield, and/or panel mounting brackets.

2.6 MISCELANEOUS

A. Fiberglass Grating

1. DEVELOPER shall provide fiberglass grating over all plant openings and shall be secured as described above.

B. Sampling Port

1. 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.

C. Fencing and Gates

1. General

Fence shall be plumb and level to the owners satisfaction. Fence design shall be board on board.

2. Fence Posts

Fence posts shall be 2 inch schedule 40 galvanized pipe. Fence posts shall be 8 feet long. 2.5 feet of each post shall be below grade inside of an 8 diameter hole 2.5 feet deep. The hole shall be filled with 4000 psi concrete. All fence posts shall have galvanized dome caps.

3. Fencing

Runner Boards: Runner boards shall be 2x4 treated pine. Three (3) runners shall be provided. Runner boards shall be secured to each fence post with a galvanized lag bolts. Each post shall have three (3) lag bolts attaching runner boards.

Fence Boards: Fence boards shall be 6 foot long, grade #2 cedar fence boards, or better. Fence board design shall be board on board. A spacer shall be used during installation and the first set of picket boards nailed to runners shall have a 3 inch gap between boards. The second row of picket boards shall be centered over each 3 inch gap. Six (6) stainless steel ring shank nails shall be used to nail each fence board.

4. Gates

Posts: The post that will have the gate hinges shall be 3 inch schedule 40 galvanized pipe.

Hinges: All gates shall have two (2) bulldog type galvanized hinges secured to a 3 inch gate post.

Gates: All gates shall have a welded galvanized tubed frame that is attached to bulldog hinges. Runner boards shall be attached to the welded gate frame. Cedar fence boards with board on board design shall be secured to the runner boards.

Cane Bolts: One (1) heavy duty cane bolt shall be installed on each gate. If concrete pad or drive is not already underneath gate, then at least a 12in x 12in x 4in deep concrete pad shall be poured under the cane bolt. The center of the concrete pad shall have a hole drilled out in the center to receive the cane bolt.

Handles and Latches: One (1) handle and one (1) latch shall be installed on each gate. Latch shall be pad-lockable.

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, 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

- 1 a. Certified dimensional drawing of cabinet.
2 b. One-line diagram of wiring and interconnection.
3

4 B. The DEVELOPER shall provide complete as-built construction drawings after
5 construction.
6

7 Sec. 2 - This ordinance shall take effect five (5) days after its publication in the Official Journal.
8

9 Introduced by: Parish President Kenneth Havard at the special meeting of the West Feliciana
10 Parish Council on the 15th day of July, 2021.
11

12 Publication of Summary and Notice of Public Hearing on _____.
13

14 Full reading and passage _____.
15

16 Moved for adoption by _____. Seconded by _____.
17

18
19 FOR:

20
21 AGAINST:

22
23 ABSTAIN:

24
25 ABSENT:

26
27 ATTEST:

28
29 _____
30 John Thompson DATE
31 WEST FELICIANA PARISH COUNCIL CHAIR
32

33
34 _____
35 Emily Cobb DATE
36 WEST FELICIANA PARISH COUNCIL SECRETARY