TOWN OF LAKE HAMILTON
TOWN COUNCIL
REGULAR MEETING AGENDA
Tuesday, November 2, 2021
6:00 P.M.

The Town Council of the Town of Lake Hamilton will hold a Regular Council Meeting on Tuesday, November 2, 2021, at 6:00 PM at the Town Hall, 100 Smith Ave, Lake Hamilton, FL 33851.

1. **CALL TO ORDER BY THE MAYOR**
2. **INVOCATION**
3. **PLEDGE OF ALLEGIANCE**
4. **ROLL CALL OF COUNCIL MEMBERS BY THE CLERK**
5. **SCHEDULED PRESENTATIONS**
   - **a.** Chief Teague's Presentation-*no pages*
   - **b.** Town Hall Landscape Plan- *pages 1*
6. **CONSENT AGENDA**
   - **a.** October 5, 2021, Regular Council Meeting Minutes- *pages 2-7*
   - **b.** October 19, 2021, Special Meeting Minutes- *pages 8-10*

7. **RECOGNITION OF CITIZENS (Non-Agenda Items)**
8. **OLD BUSINESS-**
   - **a.** Future Planning Items
     - i. Update/Action on WUP/AWS/WW-*no pages*

- **Open Public Hearing**
   - **b.** Second reading of Ordinance O-21-20 Property Rights Amendment-*pages 11-12*
   - **c.** Second reading of Ordinance O-21-21 LH Self-Parking & Storage Comp Plan Amendment-*pages 13-16*
   - **d.** Second reading of Ordinance O-21-22 Robinson Comp Plan Amendment-*pages 17-20*
   - **e.** Second reading of Ordinance O-21-24 Rezoning of LH Self-Parking & Storage-*pages 21-23*
   - **f.** Second reading of Ordinance O-21-25 Rezoning of 221 Smith Ave-*pages 24-26*
   - **g.** Second reading of Ordinance O-21-26 Moratorium of Signs, Subdivision Marker & Billboards-*pages 27-29*
   - **h.** Second reading of Ordinance O-21-27 Repeal of Moratorium Ordinance- *pages 30-31*

9. **NEW BUSINESS-**
   - **a.** First reading of Ordinance O-21-28 Comp Plan Amendment for Palmdale Holdings LLC- *pages 32-35*
   - **b.** First reading of Ordinance O-21-29 Rezoning for Palmdale Holdings LLC- *pages 36-38*
   - **c.** First reading of Ordinance O-21-30 Planned Unit Development Regulations- *pages 39-50*
   - **d.** First reading of Ordinance O-21-31 Water Specifications Ordinance- *pages 51-369*

- **Close Public Hearing**
   - **e.** Resolution R-2021-14 Establish Subdivision of Crump Road Estates- *pages 370-372*
   - **f.** Resolution R-2021-15 FYE 2020-2021 Budget Amendment- *pages 373-375*
   - **g.** Resolution R-2021-16 Authorizing Eminent Domain- *pages 376-378*

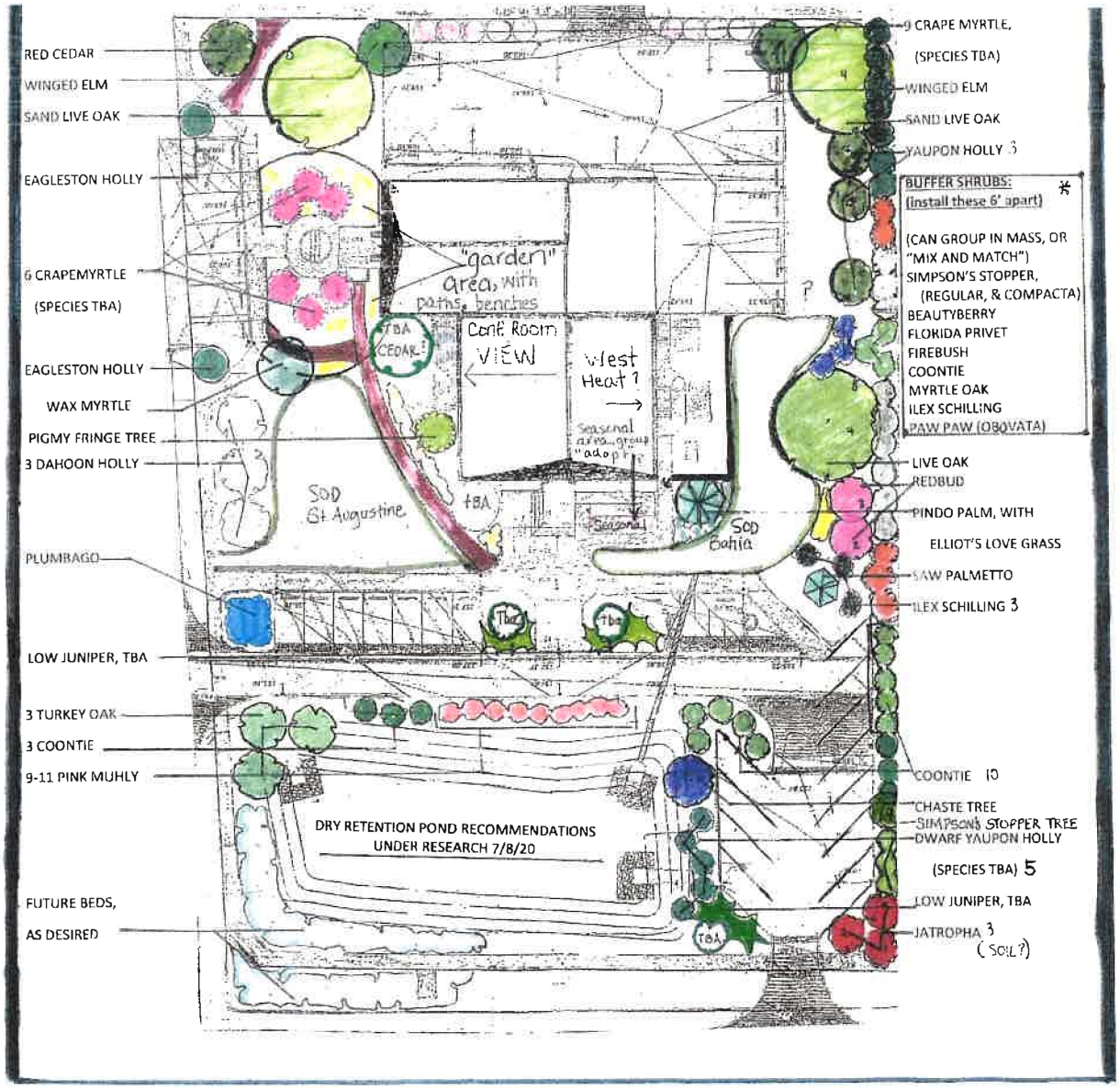
10. **STAFF REPORTS**
    - **a.** Town Administrator- *pages 379*
    - **b.** Town Clerk- *pages 380*
    - **c.** Police Department- *pages 381-392*
    - **d.** Code Enforcement- *no pages*
    - **e.** Community Development- *pages 393*
    - **f.** Public Works- *pages 394*
11. **ATTORNEY COMMENTS**
12. **COUNCIL MEMBERS COMMENTS**
13. **ADJOURNMENT**

IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT AND F. S. 286.26, PERSONS WITH DISABILITIES NEEDING SPECIAL ACCOMMODATIONS TO PARTICIPATE IN THESE PROCEEDINGS PLEASE CONTACT TOWN CLERK, BRITTNEY SANDOVALSOTO, TOWN HALL, LAKE HAMILTON, FL AT 863-439-1910 WITHIN TWO (2) WORKING DAYS OF YOUR RECEIPT OF THIS NOTIFICATION. IF A PERSON DESIRES TO APPEAL ANY DECISION MADE BY THE TOWN COUNCIL WITH RESPECT TO ANY MATTER CONSIDERED AT ITS MEETING, HE OR SHE WILL NEED A RECORD OF THE PROCEEDINGS, AND THAT, FOR SUCH PURPOSE, AFFECTED PERSONS MAY NEED TO ENSURE THAT A VERBATIM RECORD OF THE PROCEEDINGS IS MADE, WHICH RECORD INCLUDES THE TESTIMONY AND EVIDENCE WHICH THE APPEALS IS TO BE BASED. (F.S. 286.26.105)

Federal Financial Assistance Funding Opportunity Number: 20-DG-11083112-001 - A	Subrecipient FEIN: 591560134
Subrecipient Legal Name: Town of Lake Hamilton	Amount of Funds Requested: $18,125 (Matching Contribution: 30,000)

SITE PLAN

Landscape Planting Guide



This landscape concept design has been produced by Polk County Master Gardener Volunteers, under the supervision of Julie Schelb, Florida-Friendly Landscape™ Program Coordinator, through the Polk County UF/IFAS Cooperative Extension.

The design is a conceptual plan and not drawn to scale, and subject to change upon final post-construction site conditions.

TOWN OF LAKE HAMILTON
MINUTES
TOWN COUNCIL REGULAR MEETING
TUESDAY, OCTOBER 5, 2021
6:00 PM

The Town Council of Lake Hamilton held a Regular Meeting on Tuesday October 5, 2021, at 100 Smith Ave., Lake Hamilton, FL 33851.

CALL TO ORDER

Mayor Kehoe called the meeting to order at 6:02 p.m.

INVOCATION

Invocation was given by Angie Hibbard

PLEDGE OF ALLEGIANCE

Pledge of Allegiance was recited by all.

ROLL CALL

Tomlinson, Vice Mayor Wagner, and Mayor Kehoe were present. Roberson was absent. O'Neill arrived after roll call was taken. Town Administrator Irvine, and Town Clerk Sandovalsoto were present. Attorney Maxwell was present via virtual conference.

SCHEDULED PRESENTATIONS

Recognition of Town Administrator, Sara Irvine
Vice Mayor Wagner recognized Sara Irvine for her accomplishment of receiving the Nettie Draughon Award from the Ridge League of Cities.
Proclamation for Florida City Government Week-
Mayor read the proclamation for Florida City Government week proclaiming the week of October 18-24, 2021, as Florida city government week in Lake Hamilton.
Proclamation for Community Planning Month-
Mayor read the proclamation for Community Planning Month, proclaiming the month of October as Community Planning Month in Lake Hamilton.
Proclamation for National Code Compliance Month-
Mayor read the proclamation for National Code Compliance Month, proclaiming the month of October as National Code Compliance Month in Lake Hamilton.

CONSENT AGENDA

Motion made by Wagner and a second by O'Neill to approve consent agenda item a, b, c, d and e.
No comments.
Motion Passed 4-0.

RECOGNITION OF CITIZENS

Premnath Charran addressed the council regarding a high water bill he received and requested relief. Council directed staff to run a meter audit on the account and have Nathan Lewellen meet with the customer to explain the findings.

OLD BUSINESS

Future Planning Discussion- Update on WUP/AWS/WW – Administrator Irvine stated that she believes that being part of the co-op is the Town's alternative water source regarding the SFWMD permit, which they are still working on**.** They are still going forward with wastewater plans as discussed previously.

Road Design Review- Administrator Irvine stated that there is one million dollars for roads, and they wish to wait until the water project is complete. She asked Council how they wish to proceed, and a consensus was made to discuss the options on October 19th, at a workshop/ special meeting. A Workshop and Special meeting were scheduled for Tuesday, October 19th at 5:30 PM.

Resolution R-2021-13 Retirement Contribution-

Attorney Maxwell read the title for the record.

A Resolution of the Town of Lake Hamilton, Florida; amending the defined contribution retirement plan for the employees of Lake Hamilton, Florida; providing for correction of a scrivener's error correcting matching contributions; providing for conflicting resolutions; and providing an effective date.

Town Administrator Irvine said the previous Resolution that was adopted had an error in the percentage. It should have been 6% instead of 6.5%.

Motion made by O'Neill and a second by Tomlinson to approve Resolution R-2021-13.

No public comments were received.

A roll call vote was taken. Tomlinson aye, O'Neill aye, Wagner aye, Kehoe aye. **Motion Passed 4-0.**

Waiver request for Scenic Terrace South PUD-

Town Administrator Irvine noted that this item was tabled from the September meeting. Staff reviewed the requests, and the developer is requesting to change the lot ratio, setbacks and to waive water and wastewater requirements. O'Neill stated that he had been in meetings regarding the changes and the Town needs to be the provider of water and wastewater. Council was not interested in long term utilities outside of town. Town Administrator Irvine stated she spoke with James Keen from the City of Haines City, and they were not interested in providing solely the wastewater for the development. They are still willing to work with the septic to sewer project. Vice Mayor Wagner stated the Town has its own water plant to provide water to the development. Town Administrator Irvine recommended rejecting the utility plan as Haines City is not willing to do one utility only. The consultant was contacted, and they stated they could have a package plant done in 15 months. Staff recommends moving forward with the package plant. Direction was given to search for a parcel to place the package plant. Rennie Heath stated that they would like for Haines City to provide water and wastewater utilities to the development. Mayor Kehoe recommended to table the item for 2 weeks to give time for discussions. **Item tabled until special meeting.**

Mayor Kehoe closed the regular meeting at 6:51 PM and opened the public hearing.

Second reading of Ordinance O-21-16

Attorney Maxwell read the title for the record.
An ordinance of the Town Council of the Town of Lake Hamilton, Florida, adopting a planned unit development (PUD) named "Hamilton Bluff", located between Hatchineha Road on the south and Kokomo Road on the north with Scenic Highway (SR17) as its western boundary and its eastern boundary lying three-eighths (3/8) of a mile east of Detour Road in sections 10, 15 and 16, township 28 south, range 27 east, Polk County, Florida; repealing all ordinances in conflict herewith; providing for severability; and providing an effective date.
Motion made by O'Neill and a second by Wagner to approve Ordinance O-21-16
Town Administrator stated that this Ordinance carries the same idea regarding funding being received for signed connection fee agreements. Town Administrator Irvine stated she will have attorney Tom Cloud review it. For the record, 50 percent will be 40-foot lots and 50% will be 50-foot lots.
No public comment was received.
A roll call vote was taken, O'Neill aye, Wagner aye, Tomlinson nay, Kehoe aye. **Motion Passed 3-1.**
Second reading of Ordinance O-21-18-
Attorney Maxwell read the title for the record.
An ordinance of the Town of Lake Hamilton, Florida, amending the comprehensive plan of the Town of Lake Hamilton, Florida, said amendment being known as amendment 21S03, amending the future land use map classification from agricultural to residential lands – 5 for a 9.93 acre parcel of land located at the northwest corner of the intersection of Detour Road and White Clay Pit Road; and transmitting said amendment to the Department of Economic Opportunity for; providing for severability; and providing for an effective date.
No public comments were received.
Motion made by Wanger and a second by O'Neill to approve the second reading of Ordinance O-21-18. A roll call vote was taken, Wagner aye, Tomlinson nay, O'Neill aye, Kehoe aye.
Motion Passed 3-1.

Second reading of Ordinance O-21-19-
Attorney Maxwell read the title for the record.
An ordinance of the Town of Lake Hamilton, Florida establishing the Scenic Terrace South Community Development District pursuant to chapter 190, Florida statutes (2021); providing a title; providing findings; creating and naming the district; describing the external boundaries of the district; describing the functions and powers of the district; designating five persons to serve as the initial members of the district's board of supervisors; providing a severability clause; and providing an effective date.
Items pertaining to the Community Development District were provided for the record to be contained with this Ordinance: Exhibit A, consent and joinder to establishment of a community development district, Exhibit B an updated legal description, Exhibit C proof of publication, Exhibit D affidavit adopting pre-filed testimony, Exhibit E affidavit adopting pre-filed testimony, and Exhibit F affidavit adopting pre-filed testimony.
Motion made by O'Neill and second by Wagner to approve the second reading of Ordinance O-21-19 and amended such motion to include document exhibits: to be a part of the record.
No public comments were received.
A roll call vote was taken. Tomlinson aye, O'Neill aye, Wagner aye, Kehoe aye. **Motion Passed 4-0.**
Mayor Kehoe closed the public hearing at 7:05 PM.

NEW BUSINESS

First reading of Ordinance O-21-20-
Attorney Maxwell read the title for the record.

- The public hearing was opened at 7:05 PM as the New Business still required a public hearing.

An ordinance amending Ordinance 2011-03, the 2030 Lake Hamilton comprehensive plan, by adding a property rights element/policy as required by general law; providing for the administrative correction of scrivener's errors; repealing all ordinances in conflict herewith; providing for severability; and providing for an effective date.
No public comments were received.
CD Assistant Hibbard noted that this is required to add to the Comp plan.
Motion made by O'Neill and a second by Wagner to approve the first reading of Ordinance O-21-20.
The public hearing was closed at 7:05 PM and the regular meeting resumed. A roll call vote was taken. O'Neill aye, Wagner aye, Tomlinson aye, Kehoe aye. **Motion Passed 4-0**.

First reading Ordinance O-21-21-
Attorney Maxwell read the title for the record.
An ordinance of the Town of Lake Hamilton, Florida, amending the comprehensive plan of the Town of Lake Hamilton, Florida, said amendment being known as amendment 21S04, amending the future land use map classification from agricultural to industrial for a 10.17 acre parcel of land located on the west side of Detour Road 552 feet south of the intersection of Detour Road and Hatchineha Road; and transmitting said amendment to the Department of Economic Opportunity for compliance review; providing for severability; and providing for an effective date.
CD Assistant Hibbard stated that the business owners were present if anyone had any questions. It is to change the future land use map classification from ag to industrial.
No public comments were received.
Motion made by O'Neill and a second by Tomlinson to approve the first reading of Ordinance O-21-21. A roll call vote was taken. Tomlinson aye, O'Neill aye, Wagner aye, Kehoe aye.
Motion Passed 4-0.

First reading of Ordinance O-21-22-
Attorney Maxwell read the title for the record.
An ordinance of the Town of Lake Hamilton, Florida, amending the comprehensive plan of the Town of Lake Hamilton, Florida, said amendment being known as amendment 21S05, amending the future land use map classification from commercial service to retail/ office/ residential for a 0.34 acre parcel of land located on the northeast corner of Omaha Street s and Smith Avenue; and transmitting said amendment to the Department of Economic Opportunity for compliance review; providing for severability; and providing for an effective date.
Motion made by Wagner and a second by O'Neill to approve the first reading of Ordinance O-21-22.
No public comments were received.
A roll call vote was taken. Wagner aye, Tomlinson aye, O'Neill aye, Kehoe aye. **Motion Passed 4-0.**

First reading of Ordinance O-21-23-
Attorney Maxwell read the title for the record.

An ordinance of the Town of Lake Hamilton, Florida, amending the comprehensive plan of the Town of Lake Hamilton, Florida, said amendment being known as amendment 21S06, amending the future land use map classification from Residential lands 1 to residential lands M for a 1.14 acre parcel of land located on the northeast corner of the intersection of Main Street and Fifth Street; and transmitting said amendment to the Department of Economic Opportunity for compliance review; providing for severability; and providing for an effective date.
CD Assistant Hibbard stated the Owner, Perry Kemp was present if the council had any questions. He would like to subdivide the property in the future and build a single-family home on the back of the lot by the lake. Staff and planning commission recommend approval. The planning commission did have concerns about dividing them all into multi family. Owner, Perry Kemp, would like the current units to stay. There was a discussion regarding the technicalities regarding the comp plan amendment and rezoning of the property. Council advised the owner to get with staff to come up with an alternative plan.
No action was taken on this item.
First reading of Ordinance O-21-24-
Attorney Maxwell read the title for the record.
An ordinance of the Town of Lake Hamilton, Florida, rezoning a 10.17-acre parcel of land located on the west side of Detour Road 552 feet south of the intersection of Detour Road and Hatchineha Road from agriculture to m-i industrial zoning district; repealing all ordinances in conflict herewith; providing for severability; and providing for an effective date.
There were no council comments.
Motion made by O'Neill and a second by Wagner to approve the first reading of Ordinance O-21-24 with staff recommendations.
No public comments were received.
A roll call vote was taken. Wagner aye, Tomlinson aye, O'Neill aye, Kehoe aye. **Motion Passed 4-0.**
First reading of Ordinance O-21-25-
Attorney Maxwell read the title for the record.
An ordinance of the Town of Lake Hamilton, Florida, rezoning a 0.34 acre parcel of land located on the northeast corner of Omaha Street S and Smith Avenue from C-1 highway commercial to C-2 neighborhood commercial zoning district; repealing all ordinances in conflict herewith; providing for severability; and providing for an effective date.
Council asked what the plans were for the property. It was reported that they may put in a small apartment.
Motion made by O'Neill and a second by Wagner to approve the first reading of Ordinance O-21-25. No public comments were received.
A roll call vote was taken. Wagner aye, Tomlinson aye, O'Neill aye, Kehoe aye. **Motion Passed 4-0.**
Mayor Kehoe Closed the Public Hearing at 7:45 pm.
Review and approval of Town Administrator and Town Clerk evaluations-
No comments were received. **Motion made** by Wagner and a second by O'Neill to approve the Town Administrator and Town Clerk evaluations. No public comments were received. **Motion Passed 4-0.**
Review and consider for approval Safeguard against Covid-19 Policy-
Attorney and Council felt the policy is suitable. Public Works Director Nathan Lewellen questioned why a positive covid test could not be considered the same as a vaccination based on

recent studies and reports that show those who have had covid show antibodies. Irvine reported that it was drafted with guidance form the CDC website and town insurance sample policies. She and attorney will review what Mr. Lewellen is citing and make adjustments as necessary.

Staff Reports-

Town Administrator-
Town Clerk-
Police Department-
Code Enforcement-
Community development-
Public Works- Reported that the contractor is working on the final punch list. A request was given for a stop sign at the end of the parking lot.
ATTORNEY COMMENTS: None

COUNCIL COMMENTS: Councilmember Tomlinson has concerns about vehicles parking the wrong direction on Main Street.
Mayor Kehoe would like to schedule a workshop prior to the special meeting to be held on October 19th to discuss updating the Sign/Billboard Ordinance and to discuss the Zoning District Use Summary Table. Workshop was scheduled for 5:30 and Special Meeting set for 6:00 PM.
ATTORNEY COMMENTS: None
COUNCIL COMMENTS: Councilmember Tomlinson has concerns about vehicles parking the wrong direction on Main Street. Mayor Kehoe would like to schedule a workshop prior to the special meeting to be held on October 19th to discuss updating the Sign/Billboard Ordinance and to discuss the Zoning District Use Summary Table. Workshop was scheduled for 5:30 PM and Special Meeting set for 6:00 PM.

ADJOURNMENT:
Motion made by Wagner and a second by O'Neill to adjourn the meeting at 8:05 PM. **Motion Passed 4-0.**

ATTEST:

_____
Michael Kehoe, Mayor

_____
Brittney Sandovalsoto, Town Clerk

_____
Sara K. Irvine, Town Administrator

TOWN OF LAKE HAMILTON
MINUTES
TOWN COUNCIL WORKSHOP & SPECIAL MEETING AGENDA
TUESDAY, OCTOBER 19, 2021
5:30 PM

The Town Council of Lake Hamilton held a Workshop and a Special Meeting on Tuesday October 19, 2021, at 100 Smith Ave., Lake Hamilton, FL 33851.

CALL TO ORDER

Mayor Kehoe called the meeting to order at 5:36 p.m.

INVOCATION

Invocation was given by Angie Hibbard

PLEDGE OF ALLEGIANCE

Pledge of Allegiance was recited by all.

ROLL CALL

Roberson, O'Neil Vice Mayor Wagner, and Mayor Kehoe were present. Tomlinson was absent. Town Administrator Irvine, and Town Clerk Sandovalsoto were present. Attorney Maxwell was present via virtual conference.

OPEN WORKSHOP

Council and staff went over sections of the land use table to update the table.
CD Director Leonard guided Council through each item to share recommendations regarding changes to the table.

- The workshop was closed at 5:59 PM and the special meeting was opened at 6:00 PM.

SPECIAL MEETING BUSINESS

First reading of Ordinance O-21-26-
Attorney Maxwell read the title for the record.
An ordinance of the Town of Lake Hamilton, Florida, enacting the temporary moratorium in order to study, review and to amend the land development regulations for signs, residential subdivision markers and billboards located in the municipal limits of the Town of Lake Hamilton; providing for a six-month term to be extended if necessary, by the town council; providing for early termination if the project is complete; providing for the rescission or extension of said moratorium by the adoption of a subsequent ordinance, by an amendment to the town's land development regulations or as otherwise mandated by operation of law; providing for conflicts; providing for severability; providing an effective date.
O'Neill questioned what was happening to resolve the issues regarding the moratorium. He did not want to see the moratorium go on and on and nothing be resolved.
Mayor noted they were looking at amending the sign ordinance and reviewing other cities ordinances to make changes to the current ordinance.

Motion made by O'Neill and a second by Wagner to approve the first reading of Ordinance O-21-26.
No public comments were received.
A roll call vote was taken. Roberson aye, O'Neill aye, Wagner aye, Kehoe aye. **Motion Passed 4-0.**
First reading of Ordinance O-21-27-
Attorney Maxwell read the title for the record.
An Ordinance of the Town of Lake Hamilton, Florida, partially repealing the temporary moratorium adopted to study, review and to amend the land development regulations for certain non-residential land uses and commercial and industrial zoning districts; located adjacent to the State Road 17 transportation corridors; providing for early termination because the project is complete; providing for conflicts; providing for severability; providing an effective date.
Mayor Kehoe noted that the Moratorium is set to expire on December 8th, 2021. There were questions if there were any changes made to Highway 27. CD Director Leonard stated that they will bring a recommendation for an overlay district. O'Neill questioned how to make those changes mandatory instead of recommendations. **There was a consensus by the council to table the Ordinance.**
Tabled item request for waiver of certain conditions of Ordinance O-21-11 Scenic Terrace South PUD-
There is currently a realtor looking for parcels that could be used for a package plant and staff is looking into properties that are owned by the Town for consideration of placing a package plant. O'Neill stated that the developer wants to sell their lots quickly and that was very important to them. They are willing to sign and provide funding, but they do not have land for the package plant. They offered to pay for the package plant if the Town had the land to place it. They will pay 50% up front and the other half when the distribution lines are complete. They ask for control and partnership on engineering to keep the project moving swiftly. Staff understands that the council is not in favor of using town park property for placement of a temporary treatment plant.
Motion made by O'Neill and a second by Wagner to authorize staff to execute an agreement for purchase of a parcel and bring it back to Council for before closing.
No public comment was received.
Motion Passed 3-1.
Tabled item review and consider for approval safeguard against Covid-19 policy-
Town Administrator Irvine stated she took into consideration PW Director Lewellen's comments from the previous meeting and made changes to the policy. There was language added regarding those infected or vaccinated within the past 12 months were exempt. If they have or think they have COVID-19, they need to report it to their supervisor. Face coverings around other employees would be required if they are not vaccinated.
Motion made by Roberson and a second by Wagner to approve the safeguard against COVID-19 policy.
No public comment was received.
Motion Passed 4-0.
Update on 148 Orange Drive utility bill-
PW Director Lewellen noted that he gave the audit to the resident and explained in detail the audit. He added that it is the responsibility of the homeowner to monitor their water usage. Town Administrator Irvine will send the resident a letter regarding the water leak policy.

Town Clerk Sandovalsoto mentioned that the water and wastewater rates were set to increase in the next billing cycle per the policy and asked if Council would like to freeze the increase on the wastewater rates as they were already high.
Motion made by Wagner and a second by O'Neill to waive the increase of wastewater rates for the fiscal year 2021-2022. **Motion Passed 4-0.**
Future Planning Items-
CD Assistant Hibbard gave an update regarding the water use permit. She noted that they want it to be done by the year mark of the application.
Ordinance O-21-27-
CD Assistant Hibbard stated that there were businesses ready to build on Scenic Highway and are unable because of the moratorium. This item was brought back from the agenda after it was tabled. Changes were made by removing Highway 27 from the moratorium.
Motion made by Wagner and a second by Roberson to approve Ordinance O-21-27 with the changes of removing Highway 27 from the repeal and making changes to the Ordinance were stated to remove any language regarding the Highway 27 corridor.
No public comments were received.
A roll call vote was taken. Wagner aye, Roberson aye, O'Neill aye, Kehoe aye. **Motion Passed 4-0.**
Town Administrator Irvine noted that Attorney Tom Cloud was preparing a Resolution regarding Greenlefe.
The trunk or treat will be held on Saturday, October 23rd at Town Hall.
The special meeting was closed at 7:17 PM and the workshop reconvened.

REOPEN WORKSHOP

Council and staff continued to review the land use table and recommend changes.

ADJOURNMENT:

Motion made by Wagner and a second by Roberson to adjourn at 8:04 PM. **Motion Passed 4-0.**

ATTEST:

_____
Michael Kehoe, Mayor

_____
Brittney Sandovalsoto, Town Clerk

_____
Sara K. Irvine, Town Administrator

ORDINANCE O-21-20

AN ORDINANCE AMENDING ORDINANCE 2011-03, THE 2030 LAKE HAMILTON COMPREHENSIVE PLAN, BY ADDING A PROPERTY RIGHTS ELEMENT/POLICY AS REQUIRED BY GENERAL LAW; PROVIDING FOR THE ADMINISTRATIVE CORRECTION OF SCRIVENER'S ERRORS; REPEALING ALL ORDINANCES IN CONFLICT HEREWITH; PROVIDING FOR SEVERABILITY; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, Section 163.3167, Florida Statutes, requires Town of Lake Hamilton to maintain a comprehensive plan to guide its future development and growth; and

WHEREAS, Chapter 2021-195, Laws of Florida, requires each local government in Florida to include in its comprehensive plan a property rights element to ensure that private property rights are considered in local decision making; and

WHEREAS, this ordinance will amend the comprehensive plan by adding a property rights element; and (or the proposed amendment in this Ordinance addresses the above referenced Statute changes enacted by the Florida Legislature;)

WHEREAS, the Planning Commission heard public input and recommended that the Town Council amend the Town of Lake Hamilton's 2030 Comprehensive Plan as stated in this Ordinance; and

WHEREAS, the Town Council of the Town of Lake Hamilton, Florida, deems it appropriate to amend the Comprehensive Plan in order to further the public interest and the general welfare of the citizens of the Town of Lake Hamilton.

NOW THEREFORE, BE IT ENACTED BY THE TOWN COUNCIL OF THE TOWN OF LAKE HAMILTON, FLORIDA, AS FOLLOWS:

SECTION 1. COMPREHENSIVE PLAN TEXT AMENDMENT. Consistent with Section 163.3177(6)(i)1., Florida Statutes, the Town of Lake Hamilton amends the 2030 Comprehensive Plan by adding the property rights element:

OBJECTIVE 1.7: Property rights shall be considered in local decision making.

POLICY 1.7.1: The right of a property owner to physically possess and control his or her interests in the property, including easements, leases, or mineral rights.

POLICY 1.7.2: The right of a property owner to use, maintain, develop, and improve his or her property for personal use or for the use of any other person, subject to state law and local ordinances.

POLICY 1.7.3: The right of the property owner to privacy and to exclude others from the property to protect the owner's possessions and property.

POLICY 1.7.4: The right of a property owner to dispose of his or her property through sale or gift.

SECTION 2. **SEVERABILITY.** If any provision or portion of this Ordinance is declared by any court of competent jurisdiction to be void, unconstitutional, or unenforceable, then all remaining provisions and portions of this Ordinance shall remain in full force and effect.

SECTION 3. **ADMINISTRATIVE CORRECTION OF SCRIVENER'S ERRORS**. The correction of typographical and/or scrivener's errors which do not affect the intent may be authorized by the Town Administrator or designee, without need of public hearing, by filing a corrected or recodified copy of same with the Town Clerk.

SECTION 4. CONFLICTS WITH OTHER ORDINANCES. That portion of any Ordinance or Resolution which may be in conflict with this Ordinance is hereby repealed with the adoption of this Ordinance but only to the extent of such conflict.

SECTION 5. EFFECTIVE DATE. This Ordinance shall immediately take effect upon receipt of a "Final Order" issued by the Department of Economic Opportunity finding the amendment in compliance with Section163.3184, Florida Statutes.

INTRODUCED on first reading this ____day of _____ 2021.

PASSED on second reading this _____ day of _____, 2021.

TOWN OF LAKE HAMILTON, FLORIDA

_____

MICHAEL KEHOE, MAYOR

ATTEST:

_____

BRITTNEY SANDOVALSOTO, TOWN CLERK

Approved as to form:

_____

HEATHER R MAXWELL, ESQ., TOWN ATTORNEY

Record of Vote	**Yes**	**No**
Roberson	____	____
Tomlinson	____	____
O'Neill	____	____
Wagner	____	____
Kehoe	____	____

ORDINANCE O-21-21

AN ORDINANCE OF THE TOWN OF LAKE HAMILTON, FLORIDA, AMENDING THE COMPREHENSIVE PLAN OF THE TOWN OF LAKE HAMILTON, FLORIDA, SAID AMENDMENT BEING KNOWN AS AMENDMENT 21S04, AMENDING THE FUTURE LAND USE MAP CLASSIFICATION FROM AGRICULTURAL TO INDUSTRIAL FOR A 10.17 ACRE PARCEL OF LAND LOCATED ON THE WEST SIDE OF DETOUR ROAD 552 FEET SOUTH OF THE INTERSECTION OF DETOUR ROAD AND HATCHINEHA ROAD; AND TRANSMITTING SAID AMENDMENT TO THE DEPARTMENT OF ECONOMIC OPPORTUNITY FOR COMPLIANCE REVIEW; PROVIDING FOR SEVERABILITY; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, Section 163.3161 through 163.3215, Florida Statutes, empowers local governments to adopt and amend comprehensive plans, or elements or portions thereof, to guide their future development and growth; and

WHEREAS, in exercise of its authority the Town Council has determined it necessary to adopt amendments to the Town's Comprehensive Plan, which are attached hereto as **Map "A"** and by this reference made a part hereof, to ensure that the Comprehensive Plan is in full compliance with the laws of the State of Florida; and

WHEREAS, pursuant to Section 163.3184, Florida Statutes, the Town Council has held meetings and hearings on **Ordinance O-21-21**, the amendment to the Comprehensive Plan and made a part hereof; and the meetings were advertised and held with due public notice to obtain public comment; and having considered written and oral comments received during public hearings, find the amendment complete and appropriate to the needs of the Town.

NOW THEREFORE, BE IT ENACTED BY THE TOWN COUNCIL OF THE TOWN OF LAKE HAMILTON, FLORIDA, AS FOLLOWS:

SECTION 1. RECITALS. The provisions set forth in the recitals of this Ordinance (whereas clauses) are hereby adopted by the Town Council as legislative findings and intent of the Ordinance.

SECTION 2. AMENDMENT TO THE COMPREHENSIVE PLAN. The Town of Lake Hamilton Comprehensive Plan, Future Land Use Map is hereby amended as set forth in Exhibit "A".

SECTION 3. SEVERABILITY. If any provision or portion of this Ordinance is declared by any court of competent jurisdiction to be void, unconstitutional, or unenforceable, then all remaining provisions and portions of this Ordinance shall remain in full force and effect.

SECTION 4. COPY OF ORDINANCE ON FILE. A copy of this Ordinance shall be kept on file in the office of the Lake Hamilton Town Clerk.

SECTION 5. CONFLICTS WITH OTHER ORDINANCES. That portion of any Ordinance which may be in conflict with this Ordinance is hereby repealed with the adoption of this Ordinance.

SECTION 6. EFFECTIVE DATE. The effective date of this plan amendment, if the amendment is not timely challenged, shall be 31 days after the state land planning agency notifies the local government that the plan amendment package is complete. If timely challenged, this amendment shall become effective on the date the state land planning agency, or the Administration Council enters a final order determining this adopted amendment to be in compliance. No development orders, development permits, or land uses dependent on this amendment may be issued or commence before it has become effective. If a final order of noncompliance is issued by the Administration Council, this amendment may nevertheless be made effective by adoption of a resolution affirming its effective status, a copy of which resolution shall be sent to the state land planning agency.

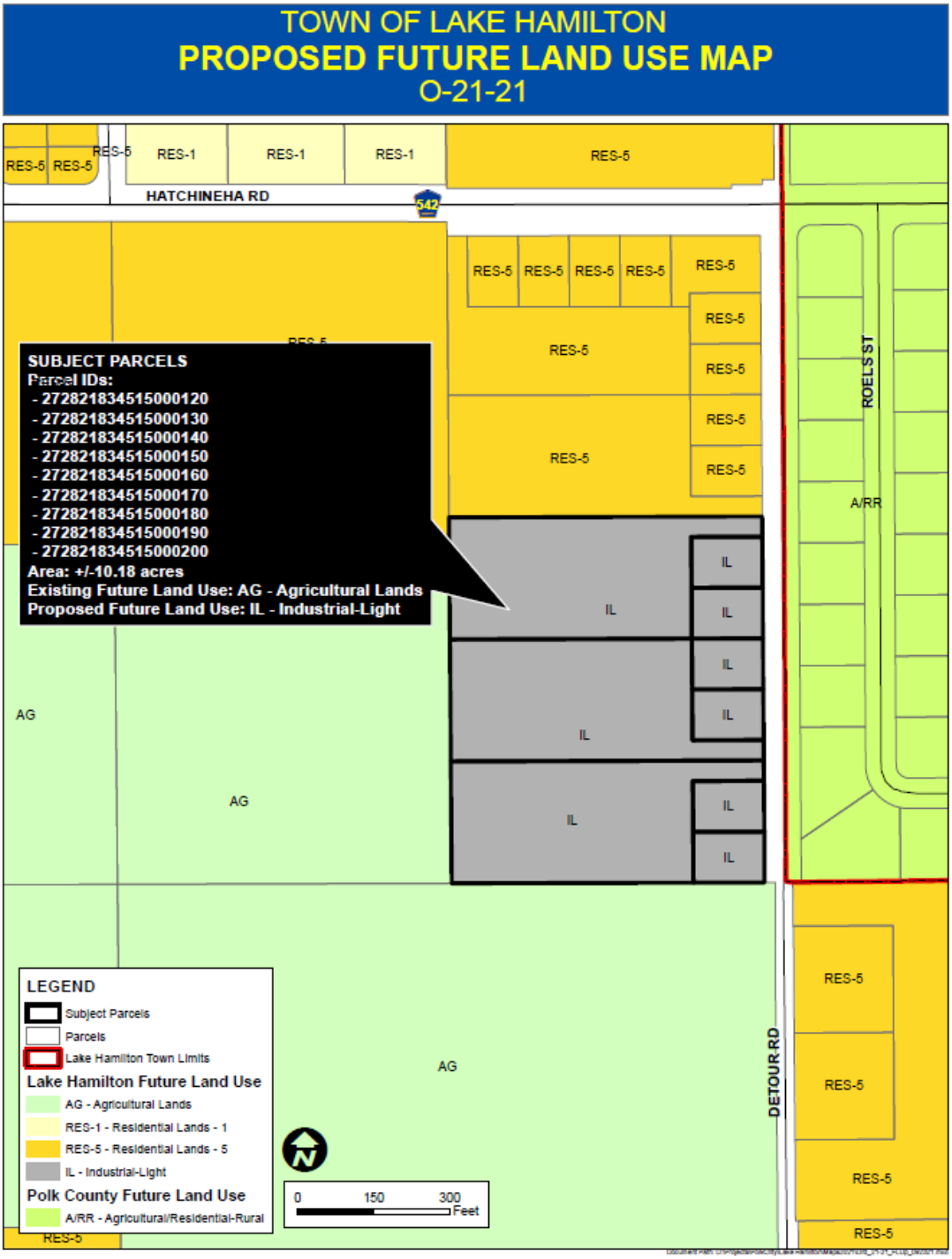
SECTION 7. INCORPORATION INTO COMPREHENSIVE PLAN. It is the intention of the Town Council that the provisions of this Ordinance shall become and be made a part of the Comprehensive Plan of the Town; and that sections of this Ordinance may be renumbered or relettered and the word "ordinance" may be changed to "chapter", "section", "article", or such other appropriate word or phrase in order to accomplish such intentions; and regardless of whether such inclusion in the Comprehensive Plan is accomplished, sections of this Ordinance may be renumbered or relettered and the correction of typographical and/or scrivener's errors which do not affect the intent may be authorized by the Town Administrator or her designee, without need of public hearing, by filing a corrected or recodified copy of same with the Town Clerk.

Map A

Legal Descriptions: Lake Hamilton Hills Plat Book 152 Page 3, Lots 12 through 20

Parcel ID Numbers: 272821-834515-000120 through and including 272821-834515-000200

Future Land Use Map Amendment:



INTRODUCED and PASSED on first reading this ____ day of _____, 2021.
PASSED AND ADOPTED on second reading this ____day of _____, 2021.

TOWN OF LAKE HAMILTON, FLORIDA

_____
MICHAEL KEHOE, MAYOR

ATTEST:

_____
BRITTNEY SANDOVALSOTO, TOWN CLERK

Approved as to form:

_____
HEATHER R. MAXWELL, ESQ., TOWN ATTORNEY

Record of Vote	**Yes**	**No**
Roberson	____	____
Tomlinson	____	____
O'Neill	____	____
Wagner	____	____
Kehoe	____	____

ORDINANCE O-21-22

AN ORDINANCE OF THE TOWN OF LAKE HAMILTON, FLORIDA, AMENDING THE COMPREHENSIVE PLAN OF THE TOWN OF LAKE HAMILTON, FLORIDA, SAID AMENDMENT BEING KNOWN AS AMENDMENT 21S05, AMENDING THE FUTURE LAND USE MAP CLASSIFICATION FROM COMMERCIAL SERVICE TO RETAIL/ OFFICE/ RESIDENTIAL FOR A 0.34 ACRE PARCEL OF LAND LOCATED ON THE NORTHEAST CORNER OF OMAHA STREET S AND SMITH AVENUE; AND TRANSMITTING SAID AMENDMENT TO THE DEPARTMENT OF ECONOMIC OPPORTUNITY FOR COMPLIANCE REVIEW; PROVIDING FOR SEVERABILITY; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, Section 163.3161 through 163.3215, Florida Statutes, empowers local governments to adopt and amend comprehensive plans, or elements or portions thereof, to guide their future development and growth; and

WHEREAS, in exercise of its authority the Town Council has determined it necessary to adopt amendments to the Town's Comprehensive Plan, which are attached hereto as **Map "A"** and by this reference made a part hereof, to ensure that the Comprehensive Plan is in full compliance with the laws of the State of Florida; and

WHEREAS, pursuant to Section 163.3184, Florida Statutes, the Town Council has held meetings and hearings on **Ordinance O-21-22**, the amendment to the Comprehensive Plan and made a part hereof; and the meetings were advertised and held with due public notice to obtain public comment; and having considered written and oral comments received during public hearings, find the amendment complete and appropriate to the needs of the Town.

NOW THEREFORE BE IT ENACTED BY THE TOWN COUNCIL OF THE TOWN OF LAKE HAMILTON, FLORIDA, AS FOLLOWS:

SECTION 1. RECITALS. The provisions set forth in the recitals of this Ordinance (whereas clauses) are hereby adopted by the Town Council as legislative findings and intent of the Ordinance.

SECTION 2. AMENDMENT TO THE COMPREHENSIVE PLAN. The Town of Lake Hamilton Comprehensive Plan, Future Land Use Map is hereby amended as set forth in Exhibit "A".

SECTION 3. SEVERABILITY. If any provision or portion of this Ordinance is declared by any court of competent jurisdiction to be void, unconstitutional, or unenforceable, then all remaining provisions and portions of this Ordinance shall remain in full force and effect.

SECTION 4. COPY OF ORDINANCE ON FILE. A copy of this Ordinance shall be kept on file in the office of the Lake Hamilton Town Clerk.

SECTION 5. CONFLICTS WITH OTHER ORDINANCES. That portion of any Ordinance which may be in conflict with this Ordinance is hereby repealed with the adoption of this Ordinance.

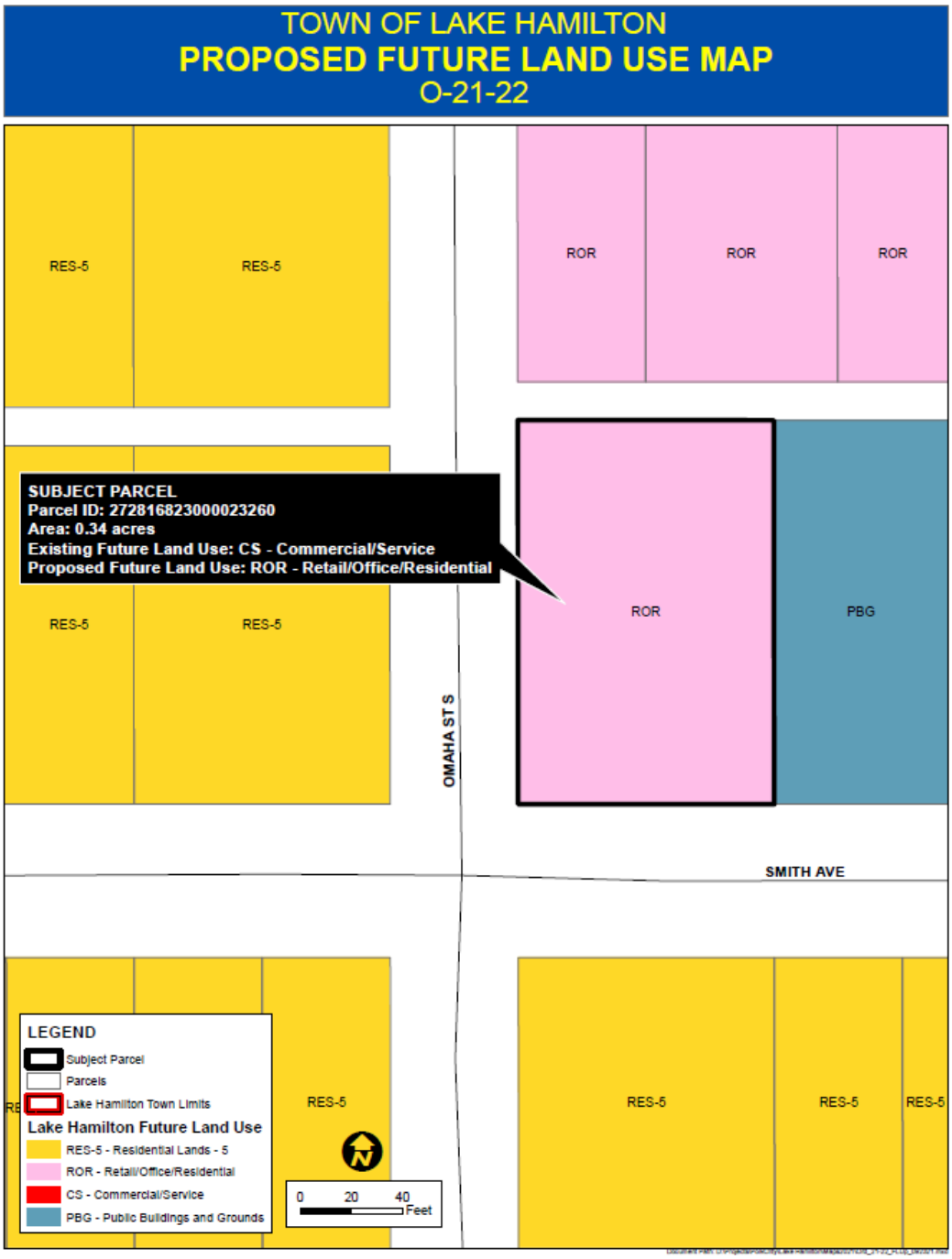
SECTION 6. EFFECTIVE DATE. The effective date of this plan amendment, if the amendment is not timely challenged, shall be 31 days after the state land planning agency notifies the local government that the plan amendment package is complete. If timely challenged, this amendment shall become effective on the date the state land planning agency, or the Administration Council enters a final order determining this adopted amendment to be in compliance. No development orders, development permits, or land uses dependent on this amendment may be issued or commence before it has become effective. If a final order of noncompliance is issued by the Administration Council, this amendment may nevertheless be made effective by adoption of a resolution affirming its effective status, a copy of which resolution shall be sent to the state land planning agency.

SECTION 7. INCORPORATION INTO COMPREHENSIVE PLAN. It is the intention of the Town Council that the provisions of this Ordinance shall become and be made a part of the Comprehensive Plan of the Town; and that sections of this Ordinance may be renumbered or relettered and the word "ordinance" may be changed to "chapter", "section", "article", or such other appropriate word or phrase in order to accomplish such intentions; and regardless of whether such inclusion in the Comprehensive Plan is accomplished, sections of this Ordinance may be renumbered or relettered and the correction of typographical and/or scrivener's errors which do not affect the intent may be authorized by the Town Administrator or her designee, without need of public hearing, by filing a corrected or recodified copy of same with the Town Clerk.

MAP "A"

Legal Descriptions: LAKE HAMILTON PB 3A PG 34 BLK 23 LOTS 26 & 27**Parcel ID Numbers:** 272816-823000-023260

Future Land Use Map Amendment:



INTRODUCED and PASSED on first reading this ____ day of October, 2021.

PASSED and ADOPTED on second reading this ____ day of _____, 2021.

TOWN OF LAKE HAMILTON, FLORIDA

_____
MICHAEL KEHOE, MAYOR

ATTEST:

_____
BRITTNEY SANDOVALSOTO, TOWN CLERK

Approved as to form:

_____
HEATHER R. MAXWELL, ESQ., TOWN ATTORNEY

Record of Vote	**Yes**	**No**
Roberson	____	____
Tomlinson	____	____
O'Neill	____	____
Wagner	____	____
Kehoe	____	____

ORDINANCE O-21-24

AN ORDINANCE OF THE TOWN OF LAKE HAMILTON, FLORIDA, REZONING A 10.17 ACRE PARCEL OF LAND LOCATED ON THE WEST SIDE OF DETOUR ROAD 552 FEET SOUTH OF THE INTERSECTION OF DETOUR ROAD AND HATCHINEHA ROAD FROM AGRICULTURE TO M-I INDUSTRIAL ZONING DISTRICT; REPEALING ALL ORDINANCES IN CONFLICT HEREWITH; PROVIDING FOR SEVERABILITY; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, there has been a request for approval of a rezoning of the property described below; and

WHEREAS, the change will further the general health, safety, and welfare and be a benefit to the Town as a whole; and

WHEREAS, the zoning change requested by the applicant is consistent with the Future Land Use Element of the Lake Hamilton Comprehensive Plan.

NOW THEREFORE, BE IT ENACTED BY THE TOWN COUNCIL OF THE TOWN OF LAKE HAMILTON, FLORIDA, AS FOLLOWS:

1. The parcel is located 552 feet south of the intersection of Hatchineha and Detour Roads on the west side of Detour Road as shown on Map "A", which is attached hereto, and consists of a total of approximately 10.17 acres, and is described as follows:

   LAKE HAMILTON HILLS SUBDIVISION, LOTS 12 THROUGH AND INCLUDING LOT 20, PLAT BOOK 152, PAGE 3

2. The parcel, as platted and described above, constitutes less than five percent (5%) of the municipally zoned area of the Town.

3. Said property is hereby rezoned from AG Agriculture Zoning District to M-1 Industrial zoning District and the regulations of that District contained in the Land Development Code shall govern further public review and development of the property within this District with the following specific conditions:

   a. That any section, paragraph, or portion which may be deemed illegal or unconstitutional shall not affect any other section of this ordinance.

   b. That all other ordinances or parts of ordinances in conflict herewith are hereby repealed.

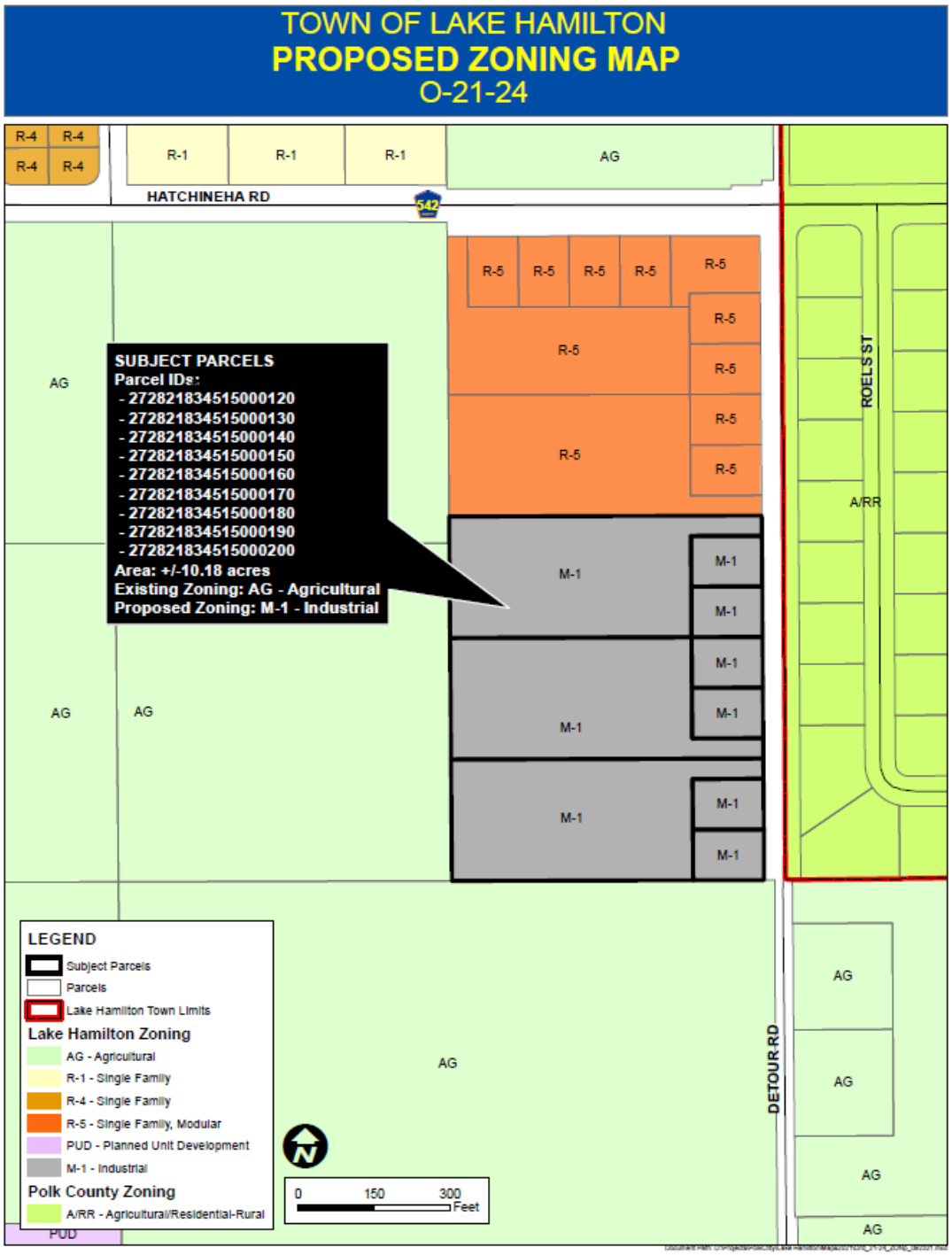
   c. This ordinance shall take effect immediately upon adoption after second reading.

4. A certified copy of this Ordinance, as well as a copy of the Land Development Code shall be located in the Office of the Town Clerk of Lake Hamilton.

MAP A

Legal Descriptions: Lake Hamilton Hills Plat Book 152 Page 3, Lots 12 through 20

Parcel ID Numbers: 272821-834515-000120 through and including 272821-834515-000200



INTRODUCED and PASSED on first reading this 5th day of October, 2021.

PASSED and ADOPTED on second reading this ____ day of _____, 2021.

TOWN OF LAKE HAMILTON, FLORIDA

_____

MICHAEL KEHOE, MAYOR

ATTEST:

_____

BRITTNEY SANDOVALSOTO, TOWN CLERK

Approved as to form:

_____

HEATHER R. MAXWELL, ESQ., TOWN ATTORNEY

Record of Vote	**Yes**	**No**
Roberson	____	____
Tomlinson	____	____
O'Neill	____	____
Wagner	____	____
Kehoe	____	____

ORDINANCE O-21-25

AN ORDINANCE OF THE TOWN OF LAKE HAMILTON, FLORIDA, REZONING A 0.34 ACRE PARCEL OF LAND LOCATED ON THE NORTHEAST CORNER OF OMAHA STREET S AND SMITH AVENUE FROM C-1 HIGHWAY COMMERCIAL TO C-2 NEIGHBORHOOD COMMERCIAL ZONING DISTRICT; REPEALING ALL ORDINANCES IN CONFLICT HEREWITH; PROVIDING FOR SEVERABILITY; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, there has been a request for approval of a rezoning of the property described below; and

WHEREAS, the change will further the general health, safety, and welfare and be a benefit to the Town as a whole; and

WHEREAS, the zoning change requested by the applicant is consistent with the Future Land Use Element of the Lake Hamilton Comprehensive Plan.

NOW THEREFORE BE IT ENACTED BY THE TOWN COUNCIL OF THE TOWN OF LAKE HAMILTON, FLORIDA, AS FOLLOWS:

1. The parcel is located 552 feet south of the intersection of Hatchineha and Detour Roads on the west side of Detour Road as shown on **Map "A",** which is attached hereto, and consists of a total of approximately 10.17 acres, and is described as follows:

   LAKE HAMILTON HILLS SUBDIVISION, LOTS 12 THROUGH AND INCLUDING LOT 20, PLAT BOOK 152, PAGE 3

2. The parcel, as platted and described above, constitutes less than five percent (5%) of the municipally zoned area of the Town.

3. Said property is hereby rezoned from AG Agriculture Zoning District to M-1 Industrial zoning District and the regulations of that District contained in the Land Development Code shall govern further public review and development of the property within this District with the following specific conditions:

   a. That any section, paragraph, or portion which may be deemed illegal or unconstitutional shall not affect any other section of this ordinance.

   b. That all other ordinances or parts of ordinances in conflict herewith are hereby repealed.

   c. This ordinance shall take effect immediately upon adoption after second reading.

4. A certified copy of this Ordinance, as well as a copy of the Land Development Code shall be located in the Office of the Town Clerk of Lake Hamilton.

PASSED on first reading this 5th day of October 2021.

PASSED and ADOPTED on second reading this 2nd day of November 2021.

TOWN OF LAKE HAMILTON, FLORIDA

_____

MICHAEL KEHOE, MAYOR

ATTEST:

_____
BRITTNEY SANDOVALSOTO, TOWN CLERK

Approved as to form:

_____
HEATHER R. MAXWELL, ESQ., TOWN ATTORNEY

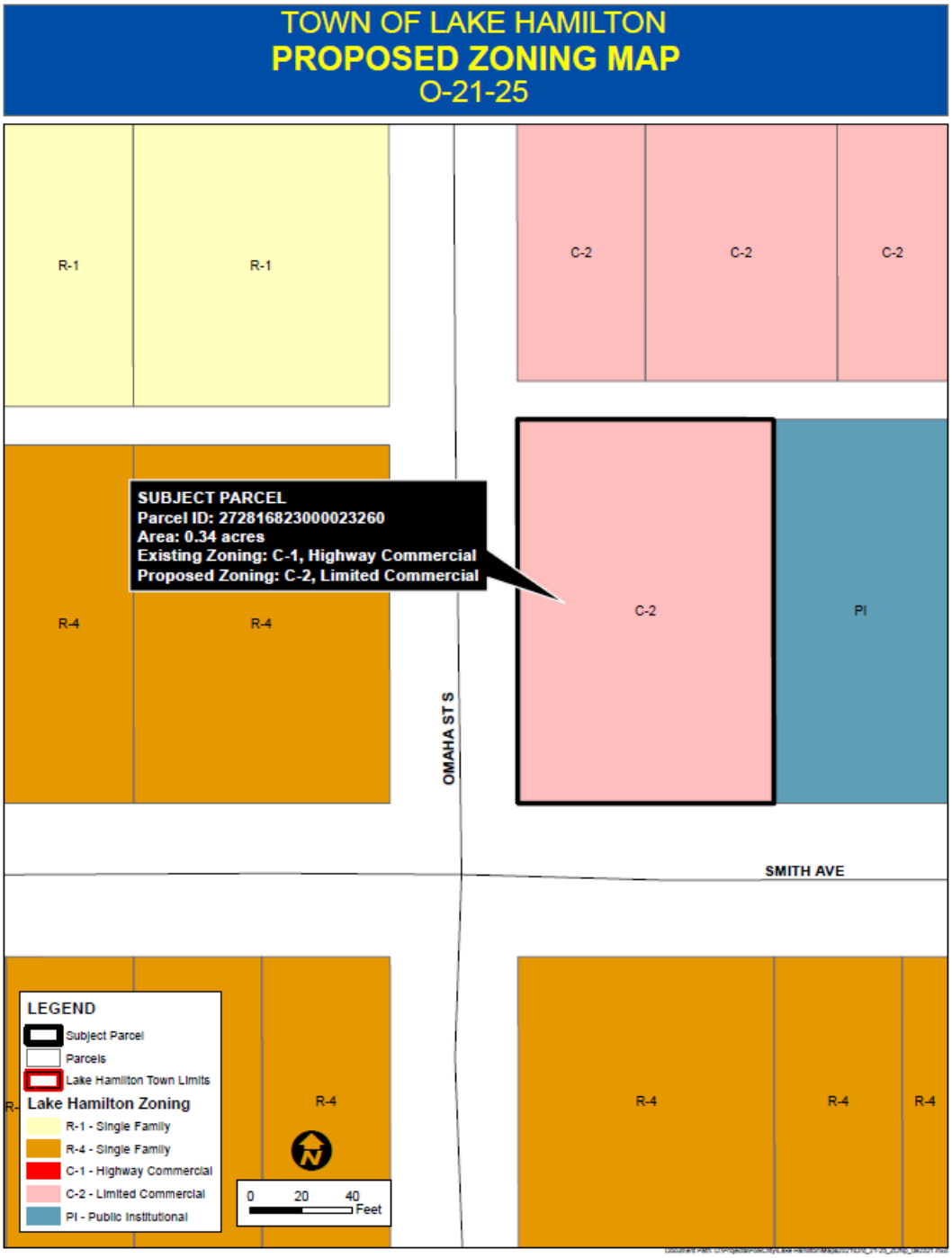
Record of Vote	**Yes**	**No**
Roberson	____	____
Tomlinson	____	____
O'Neill	____	____
Wagner	____	____
Kehoe	____	____

MAP A

Legal Descriptions: Lake Hamilton PB 3A PG 34 BLK 23 LOTS 26 & 27

Parcel ID Numbers: 272816-823000-023260

Future Land Use Map Amendment:



ORDINANCE O-21-26

AN ORDINANCE OF THE TOWN OF LAKE HAMILTON, FLORIDA, ENACTING THE TEMPORARY MORATORIUM IN ORDER TO STUDY, REVIEW AND TO AMEND THE LAND DEVELOPMENT REGULATIONS FOR SIGNS, RESIDENTIAL SUBDIVISION MARKERS AND BILLBOARDS LOCATED IN THE MUNICIPAL LIMITS OF THE TOWN OF LAKE HAMILTON; PROVIDING FOR A SIX-MONTH TERM TO BE EXTENDED IF NECESSARY, BY THE TOWN COUNCIL; PROVIDING FOR EARLY TERMINATION IF THE PROJECT IS COMPLETE; PROVIDING FOR THE RESCISSION OR EXTENSION OF SAID MORATORIUM BY THE ADOPTION OF A SUBSEQUENT ORDINANCE, BY AN AMENDMENT TO THE TOWN'S LAND DEVELOPMENT REGULATIONS OR AS OTHERWISE MANDATED BY OPERATION OF LAW; PROVIDING FOR CONFLICTS; PROVIDING FOR SEVERABILITY; PROVIDING AN EFFECTIVE DATE.

WHEREAS, pursuant to Section 2(b), Article VII of the Florida Constitution and Chapter 166 of the Florida Statues, the Town of Lake Hamilton possesses the powers to enact ordinance to protect the health, safety, and welfare of the Town's citizens and residents; and

WHEREAS, the Town Council determines that it is in the best interest of its residents, businesses and visitors to enact sufficient regulations to protect the public health, safety and welfare; and

WHEREAS, the Town Council of the Town of Lake Hamilton has adopted and enforced ordinance that pertain to and regulate the location, character, design, and operation of signs and billboards, but now finds that a thorough review of the Land Development Code is necessary to preserve and protect the value and character of existing and future development in the Town; and

WHEREAS, a moratorium is needed in order to review, study, hold public hearings, and prepare and adopt an amendment or amendments to the Lake Hamilton Land Development Code, Chapter 16-334 of the Code of Ordinances; and

WHEREAS, the Town Council for the Town of Lake Hamilton, Florida finds and declares that this ordinance is in the best interest of the public health, safety and welfare of the citizens and residents of the Town of Lake Hamilton, Florida and that it advances a significant and important governmental interest.

WHEREAS, The Town Council determined that a temporary moratorium on signs, residential subdivision markers and billboards located in the municipal limits of the Town of Lake Hamilton would allow the Town a sufficient period of time to determine how best to formulate land development regulations that appropriately govern the use and construction of any sign, display or device which advertises or otherwise identifies a place or product.

NOW, THEREFORE, BE IT ENACTED BY THE TOWN COUNCIL OF THE TOWN OF LAKE HAMILTON, FLORIDA THAT:

SECTION 1. Purpose

The purpose of this ordinance is to enable the Town of Lake Hamilton sufficient time to review, hold public hearings and adopt an amendment or amendments to the Town of Lake Hamilton Land Development Code and/or Code of Ordinances, relating to the location, design, and operation of signs, residential subdivision markers, and billboards. The Town will not approve any application or issue any permits for such structures, devices or displays while the moratorium is in effect.

SECTION 2. Imposition of Temporary Moratorium

A temporary moratorium is hereby imposed to study, hold public hearings and amend the Land Development Code and/or Code of Ordinances. No application for permit, authorization or any other official action of the Town having the effect of permitting or processing of applications for the issuance of new permits, or any other official action of the Town of Lake Hamilton permitting sign or billboard modifications, except as may be required by applicable law.

SECTION 3. Term

The moratorium imposed by this ordinance is temporary and, unless repealed earlier by the Town, shall automatically dissolve in six (6) months from the effective date of this ordinance, unless extended in accordance with applicable law. This moratorium may be reasonably extended, if necessary, by ordinance of the Town Council.

SECTION 4. Early Termination

The moratorium imposed by this ordinance shall terminate prior to its six (6) month period upon the passage of ordinances regulating permitting or allowing the construction of signs, development monuments or billboards, provided that:

1. Specific language terminating the moratorium is contained within said enacted ordinance; or by
2. Passage of another ordinance providing for termination by the Town Council.

SECTION 5. Repeal of Laws in Conflict

All local laws and ordinances in conflict with any provision of this ordinance are hereby repealed to the extent of any conflict.

SECTION 6. Effective Date

This ordinance shall take effect immediately upon passage after second reading/public hearing.

PASSED on first reading this 19th day of October 2021.

PASSED and ADOPTED on second reading this 2nd day of November, 2021.

TOWN OF LAKE HAMILTON, FLORIDA

_____

MICHAEL KEHOE, MAYOR

ATTEST:

_____

BRITTNEY SANDOVALSOTO, TOWN CLERK

Approved as to form:

_____

HEATHER R. MAXWELL, ESQ., TOWN ATTORNEY

Record of Vote	**Yes**	**No**
Roberson	____	____
Tomlinson	____	____
O'Neill	____	____
Wagner	____	____
Kehoe	____	____

ORDINANCE O-21-27

AN ORDINANCE OF THE TOWN OF LAKE HAMILTON, FLORIDA, PARTIALLY REPEALING THE TEMPORARY MORATORIUM ADOPTED TO STUDY, REVIEW AND TO AMEND THE LAND DEVELOPMENT REGULATIONS FOR CERTAIN NON-RESIDENTIAL LAND USES AND COMMERCIAL AND INDUSTRIAL ZONING DISTRICTS; LOCATED ADJACENT TO THE STATE ROAD 17 TRANSPORTATION CORRIDOR; PROVIDING FOR EARLY TERMINATION BECAUSE THE PROJECT IS COMPLETE; PROVIDING FOR CONFLICTS; PROVIDING FOR SEVERABILITY; PROVIDING AN EFFECTIVE DATE.

WHEREAS, pursuant to Section 2(b), Article VIII of the Florida Constitution and Chapter 166 of the Florida Statutes, the Town of Lake Hamilton possesses the powers to enact ordinances in order to protect the health, safety, and welfare of the Town's citizens and residents; and

WHEREAS, the Town Council of the Town of Lake Hamilton has adopted and enforced ordinances that pertain to and regulate the location, character, design and operation of commercial, industrial and all other non-residential land uses, and because of the rate of development adopted a moratorium to conduct a thorough review of the Land Development Code in order to preserve and protect the value and character of existing and future development in the State Road 17 transportation corridor of the Town: and

WHEREAS, the review of the land development regulations has been completed and new regulations adopted for commercial, industrial and all other non-residential land uses in the State Road 17 transportation corridor of the Town; therefore, the Town Council intends to repeal the moratorium prior to December 8, 2021, the date set by the adoption of Ordinance O-21-13 for the expiration of said moratorium; and

WHEREAS, the Town Council for the Town of Lake Hamilton, Florida finds and declares that this ordinance is in the best interest of the public health, safety and welfare of the citizens and residents of the Town of Lake Hamilton, Florida and that it advances a significant and important governmental interest.

NOW, THEREFORE, BE IT ENACTED BY THE TOWN COUNCIL OF THE TOWN OF LAKE HAMILTON, FLORIDA THAT:

SECTION 1. Purpose

The purpose of this ordinance is to repeal the temporary moratorium established by Ordinance O-20-14, adopted December 8, 2020, and amended by Ordinance O-21-05 adopted February 16, 2021, and extended for six (6) months by Ordinance O-21-13 adopted June 8, 2021, to enable the Town of Lake Hamilton to review and adopt amendments to the Town of Lake Hamilton Land Development Code and/or Code of Ordinances,

SECTION 2. Repeal of Temporary Moratorium

The Town Council has adopted ordinances relating to the location, design and operation of commercial, industrial, and other non-residential land uses in the State Road 17 Transportation corridor of the Town. The moratorium was temporary and would have automatically dissolved in

six (6) months from the effective date of Ordinance O-21-13, which was adopted June 8, 2021. In accordance with Section 4 of the Ordinance, the moratorium is hereby repealed early on the effective date of this ordinance and the Town will be accepting applications for development approvals.

SECTION 3. Repeal of Laws in Conflict

All local laws and ordinances in conflict with any provision of this ordinance are hereby repealed to the extent of any conflict.

SECTION 4. Effective Date

This ordinance shall take effect immediately upon passage after second reading/public hearing.

INTRODUCED and PASSED on first reading this 19th day of October 2021.

PASSED and ADOPTED on second reading this 2nd day of November 2021.

TOWN OF LAKE HAMILTON, FLORIDA

_____

MICHAEL KEHOE, MAYOR

ATTEST:

_____

BRITTNEY SANDOVALSOTO, TOWN CLERK

Approved as to form:

_____

HEATHER R. MAXWELL, ESQ., TOWN ATTORNEY

Record of Vote	**Yes**	**No**
Roberson	____	____
Tomlinson	____	____
O'Neill	____	____
Wagner	____	____
Kehoe	____	____

ORDINANCE O-21-28

AN ORDINANCE OF THE TOWN OF LAKE HAMILTON, FLORIDA, AMENDING THE COMPREHENSIVE PLAN OF THE TOWN OF LAKE HAMILTON, FLORIDA, SAID AMENDMENT BEING KNOWN AS AMENDMENT 21S06, AMENDING THE FUTURE LAND USE MAP CLASSIFICATION FROM RESIDENTIAL LANDS 1 TO RESIDENTIAL LANDS M FOR A 1.14 ACRE PARCEL OF LAND LOCATED ON THE NORTHEAST CORNER OF THE INTERSECTION OF MAIN STREET AND FIFTH STREET; AND TRANSMITTING SAID AMENDMENT TO THE DEPARTMENT OF ECONOMIC OPPORTUNITY FOR COMPLIANCE REVIEW; PROVIDING FOR SEVERABILITY; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, Section 163.3161 through 163.3215, Florida Statutes, empowers local governments to adopt and amend comprehensive plans, or elements or portions thereof, to guide their future development and growth; and

WHEREAS, in exercise of its authority the Town Council has determined it necessary to adopt amendments to the Town's Comprehensive Plan, which are attached hereto as **Exhibit "A"** and by this reference made a part hereof, to ensure that the Comprehensive Plan is in full compliance with the laws of the State of Florida; and

WHEREAS, the Planning Commission held a public meeting on September 14, 2021 where they discussed and recommended the change of use to the Town Council for approval; and

WHEREAS, pursuant to Section 163.3184, Florida Statutes, the Town Council has held meetings and hearings on **Ordinance O-21-28**, the amendment to the Comprehensive Plan and made a part hereof; and the meetings were advertised and held with due public notice to obtain public comment; and having considered written and oral comments received during public hearings, find the amendment complete and appropriate to the needs of the Town.

NOW THEREFORE BE IT ENACTED BY THE TOWN COUNCIL OF THE TOWN OF LAKE HAMILTON, FLORIDA, AS FOLLOWS:

SECTION 1. RECITALS. The provisions set forth in the recitals of this Ordinance (whereas clauses) are hereby adopted by the Town Council as legislative findings and intent of the Ordinance.

SECTION 2. AMENDMENT TO THE COMPREHENSIVE PLAN. The Town of Lake Hamilton Comprehensive Plan, Future Land Use Map is hereby amended as set forth in Exhibit "A".

SECTION 3. SEVERABILITY. If any provision or portion of this Ordinance is declared by any court of competent jurisdiction to be void, unconstitutional, or unenforceable, then all remaining provisions and portions of this Ordinance shall remain in full force and effect.

SECTION 4. COPY OF ORDINANCE ON FILE. A copy of this Ordinance shall be kept on file in the office of the Lake Hamilton Town Clerk.

SECTION 5. CONFLICTS WITH OTHER ORDINANCES. That portion of any Ordinance which may be in conflict with this Ordinance is hereby repealed with the adoption of this Ordinance.

SECTION 6. EFFECTIVE DATE. The effective date of this plan amendment, if the amendment is not timely challenged, shall be 31 days after the state land planning agency notifies the local government that the plan amendment package is complete. If timely challenged, this amendment shall become effective on the date the state land planning agency, or the Administration Council enters a final order determining this adopted amendment to be in compliance. No development orders, development permits, or land uses dependent on this amendment may be issued or commence before it has become effective. If a final order of noncompliance is issued by the Administration Council, this amendment may nevertheless be made effective by adoption of a resolution affirming its effective status, a copy of which resolution shall be sent to the state land planning agency.

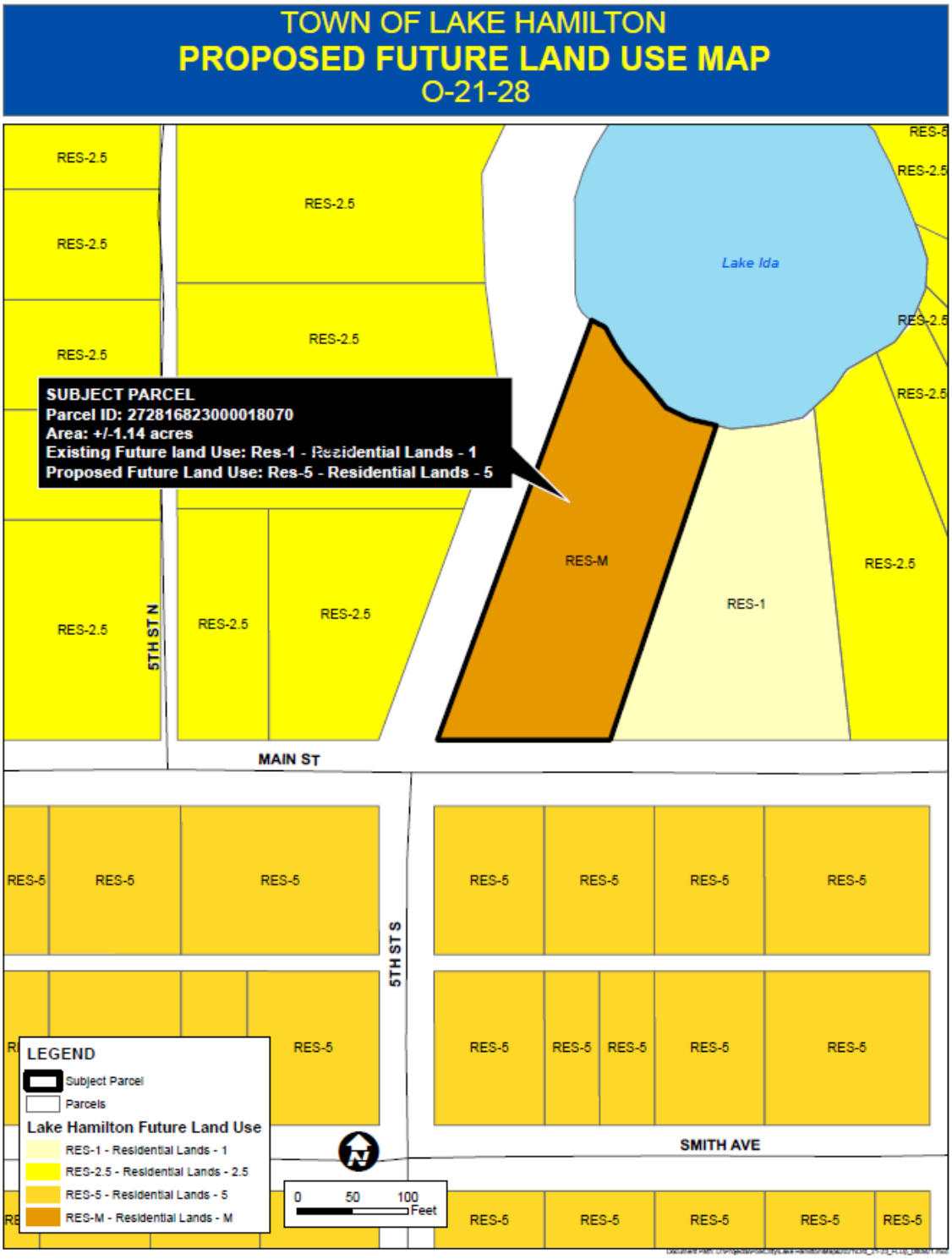
SECTION 7. INCORPORATION INTO COMPREHENSIVE PLAN. It is the intention of the Town Council that the provisions of this Ordinance shall become and be made a part of the Comprehensive Plan of the Town; and that sections of this Ordinance may be renumbered or relettered and the word "ordinance" may be changed to "chapter", "section", "article", or such other appropriate word or phrase in order to accomplish such intentions; and regardless of whether such inclusion in the Comprehensive Plan is accomplished, sections of this Ordinance may be renumbered or relettered and the correction of typographical and/or scrivener's errors which do not affect the intent may be authorized by the Town Administrator or her designee, without need of public hearing, by filing a corrected or recodified copy of same with the Town Clerk.

MAP A

Legal Descriptions: Lake Hamilton LAKE HAMILTON PB 3A PG 34 BLK 18 LOT 7

Parcel ID Numbers: 27-28-16-823000-018070

Future Land Use Map Amendment:



INTRODUCED and PASSED on first reading this ____ day of November, 2021.

PASSED and ADOPTED on second reading this ____ day of _____, 2021.

TOWN OF LAKE HAMILTON, FLORIDA

_____
MICHAEL KEHOE, MAYOR

ATTEST:

_____
BRITTNEY SANDOVALSOTO, TOWN CLERK

Approved as to form:

_____
HEATHER R. MAXWELL, ESQ., TOWN ATTORNEY

Record of Vote	**Yes**	**No**
Wagner	____	____
Roberson	____	____
Tomlinson	____	____
O'Neill	____	____
Kehoe	____	____

ORDINANCE O-21-29

AN ORDINANCE OF THE TOWN OF LAKE HAMILTON, FLORIDA, REZONING A 1.14 ACRE PARCEL OF LAND LOCATED ON THE NORTHEAST CORNER OF THE INTERSECTION OF MAIN STREET AND FIFTH STREET FROM R-1 - SINGLE FAMILY RESIDENTIAL TO R-4 - SINGLE FAMILY RESIDENTIAL ZONING DISTRICT; REPEALING ALL ORDINANCES IN CONFLICT HEREWITH; PROVIDING FOR SEVERABILITY; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, there has been a request for approval of a rezoning of the property described below; and

WHEREAS, the change will further the general health, safety, and welfare and be a benefit to the Town as a whole; and

WHEREAS, the Planning Commission held a public meeting on September 14, 2021 where they discussed and recommended the zoning change to the Town Council for approval; and

WHEREAS, the zoning change requested by the applicant is consistent with the Future Land Use Element of the Lake Hamilton Comprehensive Plan.

NOW THEREFORE BE IT ENACTED BY THE TOWN COUNCIL OF THE TOWN OF LAKE HAMILTON, FLORIDA, AS FOLLOWS:

1. The parcel is located at the intersection of Main Street and 5th Street on the northeast side as shown on Map "A", which is attached hereto, and consists of a total of approximately 1.14 acres, and is described as follows:

   LAKE HAMILTON PB 3A PG 34 BLK 18 LOT 7

2. The parcel, as platted and described above, constitutes less than five percent (5%) of the municipally zoned area of the Town.

3. Said property is hereby rezoned from R-1 - Single Family Zoning District to R-4 - Single Family Zoning District and the regulations of that District contained in the Land Development Code shall govern further public review and development of the property within this District with the following specific conditions:

   a. That any section, paragraph, or portion which may be deemed illegal or unconstitutional shall not affect any other section of this ordinance.

   b. That all other ordinances or parts of ordinances in conflict herewith are hereby repealed.

   c. This ordinance shall take effect immediately upon adoption after second reading.

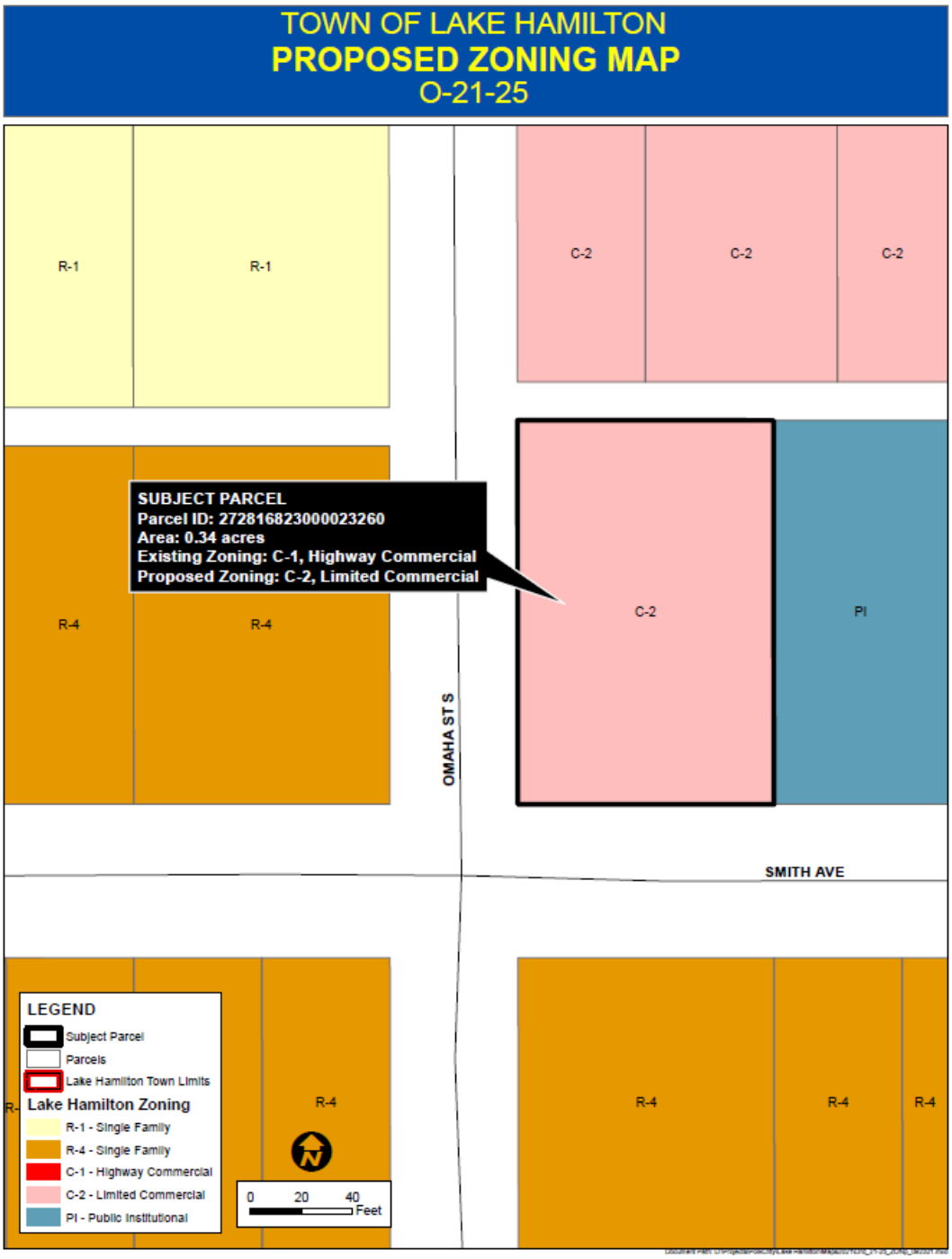
4. A certified copy of this Ordinance, as well as a copy of the Land Development Code shall be located in the Office of the Town Clerk of Lake Hamilton.

MAP A

Legal Descriptions: Lake Hamilton LAKE HAMILTON PB 3A PG 34 BLK 18 LOT 7

Parcel ID Numbers: 27-28-16-823000-018070

Future Land Use Map Amendment:



INTRODUCED and PASSED on first reading this 2nd day of November, 2021.

PASSED and ADOPTED on second reading this ____ day of _____, 2021.

TOWN OF LAKE HAMILTON, FLORIDA

_____
MICHAEL KEHOE, MAYOR

ATTEST:

_____
BRITTNEY SANDOVALSOTO, TOWN CLERK

Approved as to form:

_____
HEATHER R. MAXWELL, ESQ., TOWN ATTORNEY

Record of Vote	**Yes**	**No**
Wagner	____	____
Roberson	____	____
Tomlinson	____	____
O'Neill	____	____
Kehoe	____	____

ORDINANCE O-21-30

AN ORDINANCE AMENDING CHAPTER 16, LAND DEVELOPMENT CODE; AMENDING ARTICLE II, ADMINISTRATION AND ENFORCEMENT, SECTION 16-42, DEVELOPMENT REQUIRING SITE PLAN APPROVAL; AMENDING ARTICLE III, LAND USE, AMENDING SECTION 16-111, PUD PLANNED UNIT DEVELOPMENT; CREATING DIVISION 3, PLANNED UNIT DEVELOPMENT DISTRICT REGULATIONS AND PROCEDURES; CREATING SECTION 16-112, PURPOSE AND INTENT; CREATING SECTION 16-113, APPLICABILITY; CREATING SECTION 16-114, APPROVAL PROCEDURES; CREATING SECTION 16-115, PUD STANDARDS; CREATING SECTION 16-116, APPLICATION CONTENT AND SUBMITTAL REQUIREMENTS; CREATING SECTION 116-117, EFFECT OF APPROVAL OF PLAN; RENUMBERING SECTION 16-112, MEDICAL MARIJUANA TREATMENT CENTER DISPENSING FACILITIES; RENUMBERING SECTION 16-113 – 16-135, RESERVED; RENUMBERING DIVISION 3, HEIGHT, AREA AND BULK REGULATIONS; RENUMBERING DIVISION 4, REQUIREMENTS FOR SPECIFIC USES; AMENDING ARTICLE IV, SUBDIVISIONS, CREATING SECTION 16-206, SUBDIVISIONS OF 50 OR MORE LOTS; RENUMBERING SECTION 16-206 – 16-233, RESERVED, OF THE CODE OF ORDINANCES OF THE TOWN OF LAKE HAMILTON FLORIDA; PROVIDING FOR SEVERABILITY; REPEALING ALL ORDINANCES IN CONFLICT HEREWITH; AND PROVIDING FOR AN EFFECTIVE DATE.

Whereas, Section 163.3167(c), Florida Statutes, empowers the Town to adopt land development regulations to guide the growth and development of the Town, and to amend such regulations from time to time; and

Whereas, the Town Council of the Town of Lake Hamilton has determined it necessary and desirable to revise and amend the regulations encompassed by the Land Development Code of the Town; and

Whereas, pursuant to Section 166.041(c) 2, Florida Statutes, the Town Council has held two public hearings to amend the Land Development Code of the Town of Lake Hamilton; and

Whereas, the public hearings were advertised and held with due public notice to obtain public comment; and having considered all written and oral comments received during the public hearings, the Town Council finds that the changes are necessary and appropriate to the needs of the Town.

NOW, THEREFORE, BE IT ENACTED BY THE TOWN COUNCIL OF THE TOWN OF LAKE HAMILTON, FLORIDA:

Section 1. Chapter 16, Land Development Code, of the Code of Ordinances is amended as follows:

Sec. 16-42. - Development requiring site plan approval.

Site plan approval shall be required prior to the issuance of a building permit for the following:

(1) A parcel of land proposed for a nonresidential use, including hotels, motels, and RV parks.

(2) A parcel of land proposed for multiple-family residential use of four dwelling units or more, or a mobile home park.

(3) Assisted living facilities and group homes housing more than five residents.

(4) Clubhouses or similar facilities built on common property within a subdivision.

(5) Division of an existing non-residential development site (such a division shall result in a new or modified site plan for previously existing development, in addition to a separate plan for new development).

(6) An expansion or reconfiguration of any of those types of development which are subject to site plan requirements.

(7) A change in the use of an existing development site from one land use category to another, as listed in Table 16-103.1(A), which would result in development subject to this section.

(8) Any other type of development that the town planner, or his or her designee, determines to be appropriate for the site plan review process in order to protect the public health, safety and welfare.

(9) Developments of 50 or more lots or dwelling units may additionally require review and approval as a Planned Unit Development (PUD), in accordance with article III, division 3 of this chapter.

***Sec. 16*-111. - PUD Planned Unit Development. Reserved.**

~~(a) This section applies to planned unit developments. The purpose of this district is to provide a "floating" district which is not placed on the official zoning maps of the town. This zone allows any mix of uses and flexibility of design, subject to the approval of the town council and compliance with all existing regulations.~~

~~(b) Concept/tentative approval is reviewed, approved or denied based upon the same procedure for a zone change request. This level of approval does not provide mapping on the official zoning maps of the town.~~

~~(c) Final approval is granted by the town council in the same way final approval is granted or denied for a final plat, but in addition must meet all terms and conditions placed upon them by the town council.~~

DIVISION 3. – PLANNED UNIT DEVELOPMENT DISTRICT REGULATIONS AND PROCEDURES

Sec. 6-112. Purpose and Intent.

The purpose of this district is to provide flexible land use and design regulations and to allow planned diversification and integration of uses and structures, while retaining to the town the authority to establish limitations and regulations thereon for the benefit of the public health, safety, and welfare. It is the intent of the planned unit development (PUD) processes to reduce improvement costs through a more efficient use of land, to preserve natural amenities and environmental assets by permitting a more economical and concentrated use of building areas, to provide maximum opportunity for the application of innovative concepts and generally more flexibility for sound planning than may be achieved in other zoning districts. This district is a "floating" district which is not placed on the official zoning map of the town until application is made and a rezoning and plan of development are approved by the town council in accordance with the requirements of this division.

Sec. 6-113. Applicability.

(a) A PUD may be required for any unified development of 50 or more lots or dwelling units. An applicant for such development may request that the development director determine whether or not to require PUD review and approval based on the project's location, size, site features, and other existing and proposed developments in the vicinity of the proposed project.

(b) A PUD may be requested for any development of at least two acres.

Sec. 6-114. Approval procedures.

(a) *In general.* The following steps shall be followed to request a change in zoning to PUD (planned unit development) based upon an approved development plan. A PUD zoning map amendment shall not be established unless and until an associated development plan is approved by the town council.

(b) *Referral to planning commission.* After receipt of the application and confirmation that said application is consistent with the comprehensive plan, the development director shall refer the application and written comments to the planning commission for consideration. The development director shall ensure the application is placed on the planning commission agenda for a public hearing and that due public notice thereof is published in accordance with this Code, including written notice by mail. Written notice by certified mail must be made by the property owner or by the owner's agent to all abutting and adjoining property owners at least 15 days prior to the planning commission hearing with an affidavit submitted to the development director or Town staff verifying the owners were properly noticed.

(c) *Review by planning commission.* The planning commission shall review same for compliance with this Code and, after a hearing with due public notice, the development director shall forward in writing the planning commission's recommendations to the town council with respect to the application. These recommendations shall include a statement as to the compliance of the development plan with each of the standards found in section

16-115 and any changes suggested by the planning commission to carry out the intent of this article, the Code and the comprehensive plan.

(d) *Review and final action by the town council.* The development director shall place the PUD application on the town council's agenda for final consideration at a public hearing and shall publish due public notice thereof in accordance with the Code. The town council, after considering the planning commission's recommendations and the materials in the application, may by ordinance amend the zoning district to PUD and by separate Order approve, or approve with conditions the development plan, including the PUD concept plan and development standards; or it may deny the application, in which case it shall take no further action on another application for substantially the same proposal, on the same site, until 12 months after the date of the prior denial.

Sec. 6-115. PUD standards.

(a) *Generally.* A PUD shall be permitted only upon an order of the town council approving the development plan which includes approval of the PUD concept plan and development standards. No PUD development plan shall be approved unless it complies with the eligibility standards in this division and all relevant provisions in this Code.

(b) *Standards that may be varied.* Development standards that depart from certain standards of this Code may be proposed and approved through the PUD process in consideration of unique, innovative, and superior project design. Where not specified in the PUD, the applicable standards of this Code shall apply. Standards that may be varied shall include the following:

(1) Setbacks.

(2) Lot coverage.

(3) Height.

(4) Landscaping.

(5) Internal buffering.

(6) Off-street parking.

(7) Signage.

(c) *Standards that may not be varied.* The following standards may not depart from the requirements of this Code or of the Comprehensive Plan:

(1) All standards and requirements of the Comprehensive Plan including but not limited to use, density, and intensity.

(2) Concurrency.

(3) Utilities.

(4) Subdivision design.

(5) Environment and natural resource protection.

(6) Historic preservation.

(7) Flood resistant development.

(8) Building codes.

(d) *Standards applicable to all PUDs.* The following development standards shall apply to all PUDs and must be identified in the development plans and standards for the project:

(1) *Neighborhood amenities.* Residential PUD developments shall be planned as neighborhoods and shall include provisions for the development of other nonresidential uses such as schools, recreation/open space, and/or public facilities and the designation of areas for neighborhood commercial uses provided that these activities are compatible with the adjacent land uses. One or more of these amenities planned to serve the entire development shall be substantially completed prior to the issuance of building permits of more than 40 percent of the total number of authorized dwelling units in the development. As an alternative, the applicant may post a bond, letter of credit, or other security acceptable by the town equal to the cost of completion of such amenities prior to the issuance of building permits of more than 40 percent of the total number of authorized dwelling units.

Common area, recreation facilities, and other neighborhood amenities planned to serve a phase of a multi-phased development shall be completed prior to the issuance of building permits or the recording of any final plat within that phase. As an alternative, the applicant may post a bond, letter of credit, or other security acceptable by the town equal to the cost of completion of such amenities prior to the issuance of building permits or the recording of any final plat within that phase.

(2) *Compatibility.* The proposed PUD shall be sensitive to the context of its surroundings and be compatible with existing adjacent uses and uses allowable in adjacent zoning districts. Compatibility shall be based on the following factors:

a. The existing development pattern, considering the street system, lot size, dimension, layout, and blocks.

b. The scale and dimensions of buildings, considering height, length, and overall mass.

c. Density and housing type for residential development.

d. Intensity of nonresidential uses, as measured by floor area ratio.

e. Extent, location, and design of off-street parking.

f. Amount, location, design, and direction of outdoor lighting.

g. The extent, type, and location of open space and civic space.

h. The location of accessory structures such as dumpsters, recreational equipment, swimming pools, or other structures likely to generate negative impacts such as noise, lights, or odors.

(3) *Open space in residential developments.* Open space and recreation space shall be provided and shall be adequate in size and location to serve the residents of the planned development, and excess open space to be set aside shall be dedicated to an

approved public entity to allow for an overall plan for clustering or clustering of development to the upland portions of the site to preserve site development rights.

(4) *Access.* An application for PUD development may be approved only where the property proposed for development abuts, has paved access or proposes to construct paved access to a paved roadway.

(5) *Project phasing.* A PUD may be developed in one or more phases and may allow for the future submittal of site plans and/or preliminary plats which shall be subject to the review requirements of this Code and the standards of the approved PUD. However, no subdivision of a PUD shall be permitted until subdivision approval for the portion or portions of the site being subdivided has been granted in accordance with article IV of this chapter.

(6) *Concurrent reviews of subdivisions and site plans.* Site plans and/or preliminary plats that are contained within a PUD may be reviewed concurrently with a PUD development plan, subject to the review requirements of this Code and the standards of the PUD.

(7) D*ensity.* Within any PUD density shall be consistent with the comprehensive plan. Density shall be reviewed based on the entire site if the other provisions of this article are followed.

(8) *Conservation.* The natural topography, soils, and vegetation on the site shall be preserved and utilized, where possible, through the careful location and design of circulation ways, buildings and structures, parking areas, recreation areas, open space, and drainage facilities, including the setback of all buildings and structures from the mean high-water line of any body of water.

(8) *Landscaping.* Landscaping consisting of trees, shrubs, vines, ground cover, or any combination thereof shall be installed. Irrigation facilities shall be installed in all open areas. Special attention shall be given to the location and type of planting in and around parking areas, around refuse storage areas and in building setback and separation areas, to achieve proper screening of these areas from occupied buildings and exterior roadways.

(9) *Structure location.* The proposed location and arrangement of structures shall not be detrimental to existing or prospective adjacent land uses or to the existing or prospective development of the internal and external neighborhood.

(10) *Streets.* Streets and driveways shall be constructed in accordance with adopted road design and construction specifications and shall provide for the safe and free movement of vehicular traffic, and safe, efficient, and convenient access to land uses within the development and to roadways adjacent to the development. The local, collector and arterial street system must provide adequate access to and through the development, and properly accommodate traffic generated by the development. Local streets shall provide access within the planned development in a manner that will discourage through traffic in residential areas and provide for convenient accessibility to parking areas. Local streets shall be so located that future development will not require their conversion to arterial routes. Collector and arterial streets shall be free of backing movement from adjoining parking areas.

(11) *Parking.* Entrances to parking areas shall be easily accessible and identifiable from local streets and drives and shall not interfere with traffic movement on adjoining streets. Public rights-of-way shall not be improved as parking areas. Parking areas shall be surfaced with a durable dustless material designed for pedestrian safety and constructed for long term, low maintenance use. Grassed parking areas may be permitted where frequency of use does not destroy ground cover. Parking areas with permeable surfaces are encouraged to prevent excessive runoff and where soil and water table conditions permit, water conservation and filtration devices shall be provided to reduce runoff and increase percolation.

(12) *Pedestrian facilities.* Wherever practicable, all vehicular and pedestrian passageways shall be separated. A system of walkways and bicycle or golf cart paths between buildings, common open spaces, recreation areas, community facilities and parking areas shall be distinctively designed, and adequately lighted where appropriate for nighttime use.

(13) *Utilities.* Water systems, sewage systems, stormwater management systems, utility lines and easements shall be provided in accordance with this Code and other applicable regulations. The property proposed for PUD shall only be located in an area where there is adequate infrastructure in existence or where the infrastructure is programmed to be provided as needed to serve the PUD. Where infrastructure would be needed beyond the time frame of current facility programming, the PUD may provide its own infrastructure or may be phased so that future phases can be reviewed against future facility programming prior to final approvals. Where a PUD proposes to provide its own infrastructure, the proposal must indicate that the public facility improvements shall be reviewed and meet the criteria within the capital improvements element of the comprehensive plan.

Sec. 6-116. Application contents and submittal requirements.

(a) *Contents of a complete application.* A complete application shall include the following information.

(1) *Owners and developers.* Identification of the present ownership and the developers of all land included in the development.

(2) *Consultants.* Identification of the consultants involved in the plan preparation, including engineers, architects, and other technical advisors.

(3) *Applicant's interest.* A statement of the applicant's interest in the property to be rezoned PUD, including a copy of the last recorded warranty deed, and:

a. If joint and several ownerships, a written consent to the rezoning petition by all owners of record.

b. If a contract purchase, a copy of the purchase contract and written consent of the seller/owner.

c. If an authorized agent, a copy of the agency agreement or written consent of the principal/owner.

d. If a corporation or other business entity, the name of the officer or person responsible for the application and written proof that said representative had the delegated authority to represent the entity or, in lieu thereof, written proof that the person is in fact an officer of the corporation.

(4) *Adjacent properties.* A complete list of all abutting and adjoining property owners and their mailing addresses, as recorded in the latest official tax rolls at the county property appraiser's office.

(5) *Filing fee.* Payment of the filing fee set by the town council to cover administrative expenses, including the costs of advertising.

(6) *Statement by applicant.* A statement signed by the applicant under penalty of perjury that the information submitted is true and correct to the best of his knowledge and belief, and that the proposed development shall be in accordance with the provisions of the application and all materials submitted therewith, and with any modifications as may be required.

(b) *Existing conditions maps.*

(1) *Location map.* A location map showing land use and zoning classifications of parcels within 1,000 feet of the site's perimeter.

(2) *Boundary survey.* A boundary survey and legal description of the site reviewed and prepared by a surveyor registered in the state. The survey shall include the location of existing property and right-of-way lines and pavement widths for all private and public property, streets, buildings, watercourses, transmission lines, sewers, bridges, culverts, drainpipes, water mains and public utility easements.

(3) *Features map.* A map showing for the site and parcels within 500 feet of the site:

a. Wooded areas, streams, lakes, wetlands, marshes and any other physical conditions affecting the site; mean high-water elevations shall be shown for each water body, and 100-year floodplain elevations shall be clearly delineated throughout the site.

b. Existing topographic contours shown at contour interval of one foot.

(4) *Soils.* A soils map and detailed soils report based on the findings of a recognized and registered soils expert identifying all soil types and characteristics and the depth of all muck and peat areas.

(5) *Streets and rights-of-way.* The location and names of surrounding streets with right-of-way and pavement widths.

(c) *PUD concept plan.* A development plan (Sheet Size: 24" x 36”). The proposed development plan shall include the following:

(1) Because the PUD is a mechanism for innovative design and an increased opportunity for preservation of sensitive resources through clustering and provides that all minimum requirements for protection or enhancement of significant natural areas shall be met and exceeded, the applicant must show how the design will exceed these standards.

(2) A specific delineation of the location, size, and description of each proposed land use component.

(3) A specific delineation, use, location, size, and staging of development for each common open space, recreational area, and public or semipublic area, with the amount of each open space type expressed as a percentage of the total site area.

(4) The location of proposed major streets and other vehicular and pedestrian circulation systems, including traffic controls, rights-of-way, and typical cross sections.

(5) A traffic circulation plan detailing methods of handling high traffic flow areas such as major entrances, and ingress and egress to adjacent public roads or rights-of-way.

(6) The layout of proposed bike and pedestrian ways with typical cross sections.

(7) Conceptual landscape plans per the requirements of this Code.

(8) Conceptual drainage plans that identify locations and dimensions of proposed major drainage facilities and stormwater conveyances.

(9) Conceptual utilities services plan that identifies the location, size, and specific delineation of sewage treatment plants and water plants, and description of sewage collection systems and water distribution systems.

(10) Conceptual utilities plans showing existing and proposed utility systems including the proposed location and widths of all utility easements and rights-of-way.

(d) *PUD development standards.*

(1) A statistical table that describes the total site and each component of the site in terms of acreage and percentage of total site area, land uses, number of dwelling units, square feet of all nonresidential buildings, residential density, and other information that is descriptive of the proposal.

(2) A description of the primary, accessory and, if applicable, prohibited uses for each component of the project.

(3) Proposed development standards for each component of the project including building setbacks, building coverage, building height, and maximum impervious areas.

(4) Parking standards for each component and/or land use proposed for the project.

(5) Special design standards, if any, for each component of the project and for proposed common areas and rights-of-way, such as architectural, sign, enhanced landscaping, and buffering standards.

(6) The substance of covenants, grants, easements, dedications, or other restrictions to be imposed on the use of the land, buildings, and structures, including proposed easements for public and private utilities.

(7) A sequence of development for the entire site, including improvements, and any separate phases of the site.

(e) *Transportation plan.* An analysis of impacts to public transportation facilities for each phase of development, and a description of anticipated measures or development conditions necessary to address these impacts.

(f) *Utilities plan.* Supporting documentation necessary to establish clearly the feasibility of the proposed water, sewage, and storm drainage concepts, including special safeguards to prevent public health hazards or environmental degradation.

Sec. 6-117. Effect of approval of plan.

(a) *In general.* A PUD development plan establishes the development standards and conditions applicable to a site. Approval of a PUD development plan does not convey any rights for development. Development shall only occur after site plan, preliminary plat, concurrency, and/or other development approvals and permits, as applicable, consistent with the requirements of the approved PUD, this Code, and the Comprehensive Plan, have been granted.

(b) *Revocation for deviation from plan.* Any unapproved deviation from the approved development plan shall cause the Development Director to immediately revoke the development plan approval until such time as the deviations are corrected or revisions approved.

(c) *Periodic review.* The town council may initiate a review of the PUD and may revise the plan and specifications as needed to protect the public health, safety, or welfare and to ensure compliance with the comprehensive plan and this Code.

(d) *Minor revisions of plan.* Changes to an approved development plan that are minor in nature are changes which do not affect the overall character of the PUD. Minor revisions of a PUD development plan may be approved administratively by the development director. The following shall be presumed to be minor revisions: changes in alignment location direction, or length of local streets which do not substantially alter traffic circulation within the project; changes to building setbacks or building heights of not more than 10 percent or changes to accessory uses.

(e) *Substantial revisions of plan.* Substantial revisions to an approved development plan are changes which affect the overall character of the PUD. Substantial revisions to a PUD development plan shall require submittal of a new PUD application meeting the requirements of section 16-114 of this Code. The following shall be presumed to be substantial revisions: any changes involving additional acreage or to the dimensions or boundaries of the PUD: any increases in density or intensity; any change in the approved land use(s) including the amount, configuration, and location thereof; any decreases in open space; any proposed principle uses not previously considered; minor street relocation or any change to streets significantly altering the general distribution of traffic; any change affecting a condition of approval made by the town council; changes to building setbacks or building heights of more than ten percent; or any other changes deemed to have a substantial impact to surrounding properties or to public facilities.

Sec. 16-~~112~~ 118. - Medical marijuana treatment center dispensing facilities.

(a) *Prohibition*. Medical marijuana treatment center dispensing facilities are prohibited and shall not be located within the boundaries of the town. The town shall not accept, process or approve any request or application for a development order, building permit or other approval associated with a proposed medical marijuana treatment dispensing facility.

(b) *Definition*. For the purposes of this section, the term "medical marijuana treatment center dispensing facility" means any facility where medical marijuana or any product derived therefrom is dispensed at retail.

(c) *Interpretation*. This section and the terms used herein shall be interpreted in accordance with F.S. § 381.986 and Ch. 64-4 of the Florida Administrative Code. The intent of this section is to ban medical marijuana treatment center dispensing facilities from being located within the boundaries of the town as authorized by F.S. § 381.986(11).

Secs. 16-~~113~~ 119—16-135. - Reserved.

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DIVISION ~~3~~ 4. – HEIGHT, AREA AND BULK REGULATIONS

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DIVISION 4 5. – REQUIREMENTS FOR SPECIFIC USES

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Sec. 16-206. – Subdivisions of 50 or more lots.

Subdivisions of 50 or more lots may additionally require review and approval as a Planned Unit Development (PUD), in accordance with article III, division 3 of this chapter.

Secs. 16-~~206~~ 207—16-233. - Reserved.

Section 2. All existing ordinances of the Town of Lake Hamilton in conflict with this Ordinance are repealed to the extent necessary to give this ordinance full force and effect.

Section 3. If any provision or portion of this ordinance is declared by a court of competent jurisdiction to be void, unconstitutional, or unenforceable, then all remaining portions, provisions, and regulations of this ordinance shall remain in full force and effect.

Section 4. This Ordinance shall take effect immediately upon its passage and approval as a non-emergency ordinance at two regular meetings of the Town Council.

INTRODUCED and PASSED on first reading this 2nd day of November, 2021.

PASSED and ADOPTED on second reading this ____ day of _____, 2021.

TOWN OF LAKE HAMILTON, FLORIDA

_____
MICHAEL KEHOE, MAYOR

ATTEST:

_____
BRITTNEY SANDOVALSOTO, TOWN CLERK

Approved as to form:

_____
HEATHER R. MAXWELL, ESQ., TOWN ATTORNEY

Record of Vote	**Yes**	**No**
Wagner	____	____
Roberson	____	____
Tomlinson	____	____
O'Neill	____	____
Kehoe	____	____

ORDINANCE O-21-31

AN ORDINANCE OF THE TOWN OF LAKE HAMILTON, FLORIDA, RELATING TO WATER AND SEWER UTILITIES; AMENDING THE CODE OF ORDINANCES OF THE TOWN OF LAKE HAMILTON, FLORIDA (THE "CODE"); AMENDING CHAPTER 32 OF THE CODE ENTITLED "TOWN OF LAKE HAMILTON UTILITIES CODE", TO ADD SECTION 32-17, ENTITLED "WATER UTILITIES MANUAL OF STANDARDS AND SPECIFICATIONS FOR DESIGN AND CONSTRUCTION"; PROVIDING FOR CODIFICATION; PROVIDING FOR CONFLICTS; PROVIDING FOR SEVERABILITY; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, Chapter 180, Florida Statutes, empowers municipalities with certain powers and authority to own and operate municipal public works; and

WHEREAS, Chapter 180.02, Florida Statutes, allows a municipality to execute all powers granted under Chapter 180, Florida Statutes within its corporate limits; and

WHEREAS, Chapter 180, Florida Statutes, also permits a municipality to execute all of its corporate powers for the accomplishment of said Chapter outside of its corporate limits, as provided in said Chapter, and as may be desirable or necessary for the promotion of the public health, safety, and welfare or for the accomplishment of the purposes of said Chapter; and

WHEREAS, The Town's water and wastewater facilities provides public health benefits to the community; and

WHEREAS, the Town Council has determined it is in the best interests of the Town's current and future utility customers to adopt a technical specifications manual setting forth minimum acceptable standards for the design and construction of water distribution and transmission facilities and wastewater collection and transmission facilities within the Town of Lake Hamilton service area.

NOW, THEREFORE, BE IT ENACTED BY THE TOWN COUNCIL OF THE TOWN OF LAKE HAMILTON, FLORIDA AS FOLLOWS:

SECTION 1. REVISIONS TO CHAPTER 32, LAKE HAMILTON CODE. Chapter 32 of the Code of Ordinances of the Town of Lake Hamilton, Florida (the "Lake Hamilton Code") is hereby amended to add Section 32-17, entitled "Water Utilities Manual of Standards and Specifications for Design and Construction" (attached hereto at Composite Exhibit "A"), as follows:

Chapter 32 – UTILITIES; SEC 32-17 – Water Utilities Manual of Standards and Specifications for Design and Construction.

(a) The Town Council hereby adopts by reference the Water Utilities Manual of Standards and Specifications for Design and Construction, and the appendices thereto, as amended and supplemented from time to time by Ordinance of the Town Council, which are reflected in this section as the Town's Code and the governing law setting forth the minimum acceptable standards for the design and construction of water distribution and transmission facilities and

wastewater collection and transmission facilities within the Town of Lake Hamilton service area. Such facilities include water mains, gravity sewers, wastewater force mains, wastewater pump stations, and miscellaneous related appurtenances associated with such systems.

(b) An updated version of the Water Utilities Manual of Standards and Specifications for Design and Construction shall be kept on file with the Town Clerk and shall be made available on the Town Website

SECTION 2. CODIFICATION. The Town Council intends that this Ordinance be made part of the Lake Hamilton Code, and that sections of this Ordinance can be renumbered or re-lettered to the appropriate word or phrase to accomplish codification, and regardless of whether this Ordinance is ever codified, the Ordinance can be renumbered or re-lettered and typographical errors and clarification of ambiguous wording that do not affect the intent can be corrected with the authorization of the Town Administrator without the need for a public hearing.

SECTION 3. CONFLICTS. The provisions of this Ordinance shall supersede any provisions or existing ordinances in conflict herewith to the extent of said conflict.

SECTION 4. SEVERABILITY. In the event that any portion of this Ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such portion shall be deemed a separate, distinct and independent provision, and such holding shall not affect the validity of the remaining portions of this Ordinance.

SECTION 5. EFFECTIVE DATE. This Ordinance shall take effect immediately upon its adoption by the Town Council.

PASSED on first reading this 2nd day of November 2021.

PASSED and ADOPTED on second reading this __ day of _____ 2021.

TOWN OF LAKE HAMILTON, FLORIDA

_____

MICHAEL KEHOE, MAYOR

ATTEST:

_____

BRITTNEY SANDOVALSOTO, TOWN CLERK

Approved as to form:

_____
HEATHER R. MAXWELL, ESQ., TOWN ATTORNEY

Record of Vote	**Yes**	**No**
Roberson	____	____
Tomlinson	____	____
O'Neill	____	____
Wagner	____	____
Kehoe	____	____

Composite Exhibit A

WATER DISTRIBUTION
&
WASTEWATER COLLECTION

WATER UTILITIES MANUAL
of
SPECIFICATIONS

Town of Lake Hamilton
100 Smith Ave.
Lake Hamilton, FL 33851

Last updated: November 19, 2018

INTRODUCTION

INTRODUCTION

DOCUMENT TITLE

The title of this document is "Water Utilities Manual of Standards and Specifications for Design and Construction".

JURISDICTION

This Chapter shall apply to all proposed water, wastewater mains to be owned, operated or maintained by the Town of Lake Hamilton, Water Distribution and Wastewater Collection Division. In addition, other permittingand regulatory agencies may have jurisdiction, and regulations which supplement or supplant therequirements outlined in this manual.

PURPOSE

These standards and specifications are adopted to establish minimum acceptable standards for the design and construction of water distribution and transmission facilities and wastewater collection and transmission facilities within the Town of Lake Hamilton service area. Such facilities include water mains, gravity sewers, wastewater force mains, wastewater pump stations, and miscellaneous related appurtenances associated withsuch systems.

SCOPE

This Document is divided into three parts. Part 1 - Standards includes Divisions I and II. Division I presents general requirements governing review and approval of plans, and construction inspection and acceptance. Division II presents design standards for wastewater, and water main facilities.

Part 2 of this document, Specifications, includes Division III, IV and V. These three Divisions contain detailed technical specifications governing construction of water and wastewater main facilities within the Town of Lake Hamilton.

Part 3 of this document is Standard Details. This part contains drawings showing standard details associated with the installation of wastewater and water main facilities.

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Last Updated: November 22, 2018

SECTION 1.2.
DEFINITIONS

1.2. **DEFINITIONS**

Except where specific definitions are used within a specific section, the following terms, phrases, words, and their derivation shall have the meaning given herein when consistent with the context. Words used in the present tense include the future tense, words in the plural number include the singular number and words in the singular number include the plural number. The word Ashall@ is mandatory, and the word Amay@ is permissive.

AASHTO - means American Association of State Highway and Transportation Officials. Any reference to AASHTO standards shall be taken to mean the most recently published revision unless otherwise specified.

ANSI - means American National Standards Institute. Any reference to ANSI standards shall be taken to mean the most recently published revision unless otherwise specified.

ASTM - means American Society for Testing Materials. Any reference to ASTM standards shall be taken to mean the most recently published revision unless otherwise specified.

AWWA - means American Water Works Association. Any reference to AWWA Standards shall be taken to mean the most recently published revision unless otherwise specified.

CITY - means the Town of Lake Hamilton , Florida.

CONTRACTOR - means the person, firm, or corporation with whom the Owner, the Developer or the CITY has made the contract for work.

DEVELOPER - means the person, firm, or corporation engaged in developing or improving real estate for use or occupancy.

DEVELOPER=s ENGINEER - means an engineer or engineering firm registered with the State of Florida Department of Professional Regulation, retained by the DEVELOPER to provide professional engineering services for a project.

DIPRA - means Ductile Iron Pipe Research Association.

DIRECTOR - means the Public Services Director of the Town of Lake Hamilton, Florida, acting directly or through an assistant or other representative authorized by him.

DRAWINGS - means engineering drawings prepared by an ENGINEER to show the proposed construction.

ENGINEER - means an engineer or engineering firm registered with the State of Florida Department of Professional Regulation.

FDOT - means the Department of Transportation, State of Florida.

GEOTECHNICAL/SOILS ENGINEER - means a Registered Florida Engineer who provides services related to terrain evaluation and site selection, subsurface exploration and sampling, determination of soil and rock properties, foundation engineering, settlement and seepage analysis, design of earth and earth retaining structures, the design of subsurface drainage systems and the improvement of soil properties and foundation conditions, and testing and evaluation of construction materials.

MANUAL - means this Town of Lake Hamilton Manual of Standards and Specifications forWastewater, reuse water and Water Main Construction.

MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES - means the United States Department of Transportation Manual on Traffic Control Devices, latest edition.

NEMA - means National Electrical Manufactures Association. Any reference to NEMA Standards shall be taken to mean the most recently published revision unless otherwise specified.

NSF - means National Sanitation Test Laboratory Foundation. Any reference to NSF Standards shall be taken to mean the most recently published revision unless otherwise specified.

TOWN OF LAKE HAMILTON - means Town of Lake Hamilton , Florida.

OSHA - means the Federal Occupational Safety and Health Administration.

OWNER - means the person, firm, corporation, or governmental unit holding right of possession of the real estate upon which construction is to take place.

PLANS - means DRAWINGS as defined herein above.

STANDARDS - means the minimum design standards contained in Part 1 of the MANUAL.

STANDARD DRAWINGS - means the detailed drawings in Part 3 of this MANUAL related to water, reuse and wastewater main materials and installation.

STANDARD SPECIFICATIONS - means the Department of Transportation, State of Florida, Standard Specification for Road and Bridge Construction, latest edition.

SUBDIVISION REGULATIONS - means the Town of Lake Hamilton Subdivision Regulations,latest edition, or in the absence of such document, the combination of State Regulation and Directive from the Town Planner and/or Public Services Director.

TRAFFIC CONTROL AND SAFE PRACTICES MANUAL - means the State of Florida Department of Transportation Manual on Traffic Control and Safe Practices for Street and Highway Construction, Maintenance and Utility operation, latest edition

UTILITY ACCOMMODATION GUIDE - means the State of Florida Department of Transportation Utility Accommodation Guide, latest edition.

WATER MAINS - means water transmission mains, distribution mains, pipes, fittings, valves, hydrants, services, meters and miscellaneous related appurtenances.

WASTEWATER MAINS - means wastewater gravity sewers, force mains, pump stations, fittings, valves, service laterals, and miscellaneous related appurtenances.

WORK - means the labor, materials, equipment, supplies, services and other items necessary for the execution, completion and fulfillment of the contract.

SECTION 1.3.

PLAN REVIEW, APPROVAL, CONSTRUCTION, AND ACCEPTANCE OF WATER AND WASTEWATER IMPROVEMENTS

1.3.1. **PLANS AND SPECIFICATIONS**

1.3.1.1. GENERAL

All submitted plans shall be standard size sheet (24" x 36" and on a CD in PDF format) with title block. Graphic scale (s) shall be provided on each sheet and all lettering shall be 1/8" or larger to permit photographic reproduction. Submittal of specifications is required. ALL PLANS sheets and the title page of submitted specifications must be signed, Sealed and dated by the DEVELOPER's ENGINEER.

The city shall be notified in advance of proposed construction of streets and utility improvements or stages thereof within the subdivision or development. During construction, designated city inspectors shall visit the project at appropriated stages to assure that construction is in accordance with plans and specifications, and may halt construction until defects of defaults are corrected to their satisfaction. Should construction continue without city approval, the contractor and developer shall be subject to legal action as provided for in the Land Development Regulations.

CONTRACTOR's are required to have a complete set of signed approved plans and permits by the CITY on site at all time for the duration of the project.

1.3.1.2. MASTER PLAN

Whenever possible, the entire water and wastewater systems shall be shown on a single Master Plan. The Master Plan shall indicate the general locations of all mains, manholes, valves, hydrants, services and service laterals with respect to the proposed development improvements and the existing water, reuse and wastewater systems. Main sizes shall be indicated in the Master Plan.

1.3.1.3. PLAN AND PROFILE

All mains shall be drawn in plan and profile.

Whenever possible, on-site water, reuse and wastewater systems shall be shown on the same PLANS sheet. As a minimum, the plan and profile drawings shall include the following information:

a. General information such as north arrow, names of designer and engineer, revision block with dates, graphic scale (s) and sheet number.

b. Profiles with elevations at 100 foot interval, or more frequently if required by good design practice.

c. Development layout with horizontal and vertical controls.

d. All conflicts with other utility and drainage systems.

e. All manhole locations and rim elevations for manholes.

f. Pipe data including size, lengths, material, and slopes.

g. Size, type, and locations of fittings, valves, hydrants, air release/vacuum relief, and other related appurtenance.

h. Limits of pipe deflection.

i. Limits of special exterior coatings.

j. Limits of special bedding requirements.

k. Pipe restraint requirements.

l. Details of connection to existing systems.

m. Locations (s) and general layout of wastewater pumping station.

n. Construction notes regarding cover, horizontal and vertical control, special construction requirements, and references to standard and special details.

o. Other details and notes required to construct utilities.

1.3.1.4. DETAILS

The Plans shall include the latest revision and/or latest edition of the STANDARD DETAILS as shown in Part 3 of this MANUAL. Special details shall be prepared by the DEVELOPERs ENGINEER for aerial and underwater crossings of rivers, streams, canals and ditches. Other special details shall be prepared by the DEVELOPER's ENGINEER as required.

1.3.1.5. SCALE

The master plan shall be prepared at a scale not to exceed 1" to 200'. Plan and profile sheets shall not exceed a scale of 1" to 50'. Special details shall be of sufficiently large scale to show pertinent construction information.

1.3.2. SUBDIVISION RELATED WATER AND WASTEWATER IMPROVEMENTS

1.3.2.1. GENERAL

This section covers all water, reuse and wastewater improvements that are dedicated to Town of Lake Hamilton and constructed in compliance with Town of Lake Hamilton land Development Regulations.

1.3.2.2. DESIGN AND PLAN REVIEW

Design of water, and wastewater improvements associated with Town of Lake Hamilton approved subdivisions shall be in compliance with the applicable City or County design. Standards and the specifications outlined in Divisions III, IV, and V of this MANUAL. PLANS will be reviewed and approved by the Town of Lake Hamilton as part of the subdivision review and approval process. Refer to the applicable subdivision regulations for other requirements governing plan review and approval.

1.3.2.3. CONSTRUCTION INSPECTION

Inspection of improvements shall be in accordance with criteria established in the Water Utilities Manual. The designated representative of the Water Distribution and Wastewater Collection Division shall inspect the water, reuse, and wastewater improvements to ensure their compliance with requirements in Divisions II, III, IV and V of this MANUAL.

1.3.2.4. APPROVAL AND ACCEPTANCE

Approval and acceptance of water reuse and wastewater improvements shall be in accordance with the criteria established in this manual and miscellaneous requirements of the Town of Lake Hamilton Subdivision Regulations.

1.3.3. WATER AND WASTEWATER IMPROVEMENTS ASSOCIATED WITH SITE DEVELOPMENT WITHIN THE TOWN OF LAKE HAMILTON SERVICE AREA

1.3.3.1. GENERAL

All water and wastewater improvements that are to be dedicated to Town of Lake Hamilton shall be designed, reviewed, constructed and accepted in accordance with the criteria established in this manual.

1.3.3.2. DESIGN AND PLAN REVIEW

Design of water and wastewater improvements shall be in compliance with the design standards in Division II and the specifications outlined in Divisions III, IV and V of this MANUAL. PLANS will be reviewed and approved by the Town of Lake Hamilton Engineering Division (internal, or external engineer hired for this purpose). Any changes done to the PLANS after construction has started must be resubmitted for approval to the CITY, before they will be allowed to be used on the construction site.

1.3.3.3. CONSTRUCTION INSPECTION

The DIRECTOR or his designated representative (s) shall periodically inspect all construction subject to these standards and specifications.
After all required improvements have been installed and tested, the DEVELOPER's ENGINEER shall submit certification to the CITY that the improvements have been constructed substantially according to approved plans and specifications. Non-compliance with approved plans or specifications or evidence of faulty materials or workmanship shall be called to the attention of the DEVELOPER or DEVELOPER's ENGINEER and if not corrected in an expeditious manner, all work on the project will be suspended and/or water services withheld. Additional laboratory tests shall be required when appropriate.

1.3.3.4. MAINTENANCE, MATERIALS, AND WORKMANSHIP WARRANTY BOND

A letter of credit or bond shall be posted by the DEVELOPER and executed by a company authorized to do business in the State of Florida that is satisfactory to the CITY, payable to Town of Lake Hamilton in the amount of ten (10) percent of the estimated construction cost of all required water and wastewater improvements to be owned and maintained by the CITY. Such bond shall guarantee maintenance of all improvements intended to be owned and maintained by the CITY for a one (1) year period, and the materials, workmanship and structural integrity of water, reuse and wastewater systems, and miscellaneous related facilities, excluding mechanical equipment for a one (1) year period, commencing after Certificates of Completion and Project Acceptance have been issued by the CITY.

See Appendix A for required forms. The manufacturer's warranty will be acceptable for mechanical equipment. As an alternative to the provision of a surety bond, the DEVELOPER may provide for the deposit of cash in an escrow account or a letter of credit acceptable to the CITY.

1.3.3.5. CERTIFICATE OF COMPLETION/APPROVAL FOR MAINTENANCE

After successful completion of all water and wastewater improvements, and after receipt of the required documents outlined in Appendix A, page A-3, the CITY will provide a "Certificate of Completion" verifying the satisfactory construction of all improvements intended to be owned and maintained by the CITY. After the one (1) year Warranty Period and verification by the CITY of satisfactory performance of all water and wastewater improvements, the CITY will issue the "Approval for Maintenance", thereby releasing the DEVELOPER from further responsibilities. See form on page A-4 in Appendix A.

1.3.4. MISCELLANEOUS WATER, REUSE AND WASTEWATER IMPROVEMENTS

All water, reuse and wastewater improvements constructed which are intended to be owned, operated or maintained by the CITY, excluding the improvements discussed in Sections 1.2 and 1.3, shall be designed, reviewed, inspected and accepted in strict compliance with the criteria established in Section 1.3.3,.

1.3.5. COMPLIANCE WITH OTHER REGULATORY REQUIREMENTS

It shall be the responsibility of the DEVELOPER to obtain and comply with all applicable Federal, State and Local regulatory, and Right-of-Way Utilization permits.

1.3.6. RECORD DRAWINGS

The DEVELOPER's ENGINEER shall submit a certified set of Record Drawings to the CITY prior to issuance of Certificate of Completion for the improvements. The DEVELOPER's ENGINEER shall be responsible for recording information on the approved PLANS concurrently with construction progress. Record Drawings submitted to the CITY, as part of the project acceptance shall comply with the following requirements:

1. Drawings shall be legibly marked to record actual construction.

2. Drawings shall show actual location of all underground and above ground water, reuse and wastewater piping related appurtenances. All changes to piping location including horizontal and vertical locations of utilities and appurtenances shall be clearly shown and referenced to permanent surface improvements. Drawings shall also show actual installed pipe material, class, etc.

3. Drawings shall clearly show all field changes of dimension and detail including changes made by field order or by change order.

4. Drawing shall clearly show all details not on original contract drawings but constructed in the field. All equipment and piping relocation shall be clearly shown.

5. Location of all manholes, hydrants, valves, and valve boxes shall be shown. All valves shall be referenced from at least two preferably three permanent points.

6. Dimensions between all manholes shall be field verified and shown. The inverts and grade elevation of all manholes shall be shown.

7. Each sheet of the PLANS shall be signed, sealed and dated by the DEVELOPER's ENGINEER as being "As-Builts" or "Record Drawings". Construction PLANS simply stamped "As-Builts" or "Record Drawings" and lacking in above requirements will not be accepted, and will be returned to the DEVELOPER's ENGINEER. The "Certificate of Completion" will not be issued until correct "Record Drawings" have been submitted.

8. The DEVELOPER's ENGINEER shall provide two complete set of "Record Drawings", also a complete set of record documents, in computerized form to the CITY. This documentation shall be on compact disk (CD) in AUTOCAD version 14 or above or DXF format and in **FLORIDA STATE PLAIN PLAIN (NAD83 WEST)** in addition to the compact disk the engineer shall provide a document listing the layers and color/linetype utilized in preparation on the drawing. These computer files shall contain all the information shown on the "Record Drawings"

9. The DEVELOPER's ENGINEER shall provide ESRI shape files on compact disk (CD) for the Water valves, Sewer manholes, and Sewer service laterals, Storm water manholes, and Force main valves. In **FLORIDA STATE PLAIN (NAD83 WEST)** projection.

1.3.7 LIST OF MATERIAL AND APPROVED MANUFACTURERS

A list of Materials and Approved Manufacturers for the various products specified in this MANUAL is included in Appendix 'B'. It is the intent of the CITY to review and update Appendix 'B' as appropriate to ensure efficient operation of the services and facilities under the jurisdiction of this MANUAL. For this purpose, the CITY shall evaluate technical submittals from interested manufacturers or suppliers at least once every three years.

DIVISION II

DESIGN STANDARDS

SECTION 1.4 GRAVITY SEWERS

Sec. 1.4.1. GENERAL CONSIDERATIONS

1.4.1.1. TYPE OF SEWERS

The CITY will approve PLANS for new sewer systems and extensions only when designed as separate system in which precipitation, runoff and groundwater are excluded.

1.4.1.2. DESIGN PERIOD

Sewer systems should be designed for the estimated ultimate tributary population, as delineated in the approved Town of Lake Hamilton Wastewater Master Plan (latest edition) except in considering parts of the systems that can be readily increased incapacity.

1.4.1.3. LOCATION

Gravity sewers shall be located in dedicated right-of ways or utility easements. Whenever possible, sewers shall be located under pavement in dedicated right-of ways. All sewers located outside of dedicated right-of-ways shall require a minimum 15 foot easement. Additional easement widths shall be provided when the pipe size or depth of cover so dictate. If a gravity sewer is located adjacent to a road right-of-way, a minimum 10 foot easement shall be provided. Additional easement widths shall be provided if the pipe size or depth of cover is so dictated. No gravity sewers shall be placed under retention ponds, tennis courts, or other structures. In general, gravity sewers shall not be located along side or rear lot lines. Placement of a gravity sewer along side or rear lot line may be allowed on a case by case basis if such a sewer configuration results in efficient placement and utilization of the sewer system. This criteria shall also apply to sewer placement in retention pond berms. In any event, no manholes shall be placed along side or rear lot lines.

Sec 1.4.2. DESIGN BASIS

1.4.2.1. AVERAGE DAILY FLOW

The gravity sewer design shall be based on full ultimate development as known, or projected. Average daily wastewater flow shall be calculated by the current Town of Lake Hamilton assigned engineer.

1.4.2.2. PEAK DESIGN FLOW

Gravity sewers shall be designed on the basis of ultimate development maximum rates of flow, which shall be the product of selected peak factors times the accumulative average daily flow as calculated above.

In general, the following minimum peak factors shall be applicable for the range of average daily flow rates.

Flow Range	Minimum Peak Factor
Flows to 100,000 GPD	4.0
100,000 GPD 250,000 GPD	3.5
250,000 GPD to 1,000,000 GPD	3.0
Flows greater than 1,000,000 GPD	2.5

For design average daily flows above 2,000,000 GPD, peaking factors less than 2.5 may be considered if substantiated by extensive data. Under no circumstances shall peaking factors less than 2.0 be allowed.

1.4.2.3. DESIGN CALCULATIONS

DEVELOPER=s ENGINEER shall submit signed, sealed and dated design calculations with the PLANS for all sewer projects. Calculations shall show that sewers will have sufficient hydraulic capacity to transport all design flows.

Sec. 1.4.3. DETAILS OF DESIGN AND CONSTRUCTION

1.4.3.1. MINIMUM SIZE

No gravity sewer main conveying wastewater shall be less than 8 inches in diameter.

1.4.3.2. MINIMUM COVER

The minimum cover over gravity sewers shall be no less than 3 feet calculated from the finished grade. Exceptions to this requirement may be made for a short length of pipe where structural considerations are incorporated in the design.

1.4.3.3. SLOPE

All sewers shall be designed and constructed to give minimum velocities, when flowing full*, of not less than 2.0 feet per second. The following minimum slopes shall be provided; however, slopes greater than these are desirable:

* Gravity main capacity for design purposes shall be calculated at 50% full for pipe up to 15 inch diameter and 75% for pipe 18 inch diameter and greater.

Sewer Size	Minimum Slope in Feet Per 100 Feet
6 inch	0.57
8 inch	0.40
10 inch	0.24
12 inch	0.19
15 inch	0.15
18 inch	0.11
21 inch	0.09
24 inch	0.08
27 inch	0.07
30 inch	0.06
36 inch	0.05

Sewers shall be laid with uniform slope between manholes.

1.4.3.4. SIZE AND ALIGNMENTS

Size conversion between manholes shall not be allowed. All sewers shall be laid with straight alignment and uniform slope between manholes.

1.4.3.5. ADDITIONAL REQUIREMENTS

Main drain and backwash systems for pools and spas and storm drain systems shall not connect to the gravity sewer system.

In general, all sewer extensions for future connections shall terminate at a manhole. The City may allow such extensions without a terminal manhole on a case by case basis subject to all of the following conditions:

1. Total sewer extension length shall be limited to 50 feet.

2. Sewer extension location at the initiating manhole shall be mechanically plugged to the satisfaction of the CITY.

3. Such sewer extensions shall not be a part of the accepted sewer facilities. This shall be clearly delineated on the PLANS.

4. All such sewer extensions shall be inspected and accepted as part of the future construction phase.

Sec. 1.4.4. MANHOLES

1.4.4.1. LOCATION

Manholes shall be installed at the end of each gravity sewer; at all changes in grade, size or alignment; at all sewer intersections; and at distances not greater than 400 feet. Private sewer systems must be separated from the CITY sewer system by a manhole located at the right-of-way line.

Collection manholes are required at the end of the gravity system, before the wastewater pump station. **(See STANDRAD DETAIL NUMBER 950300)**

1.4.4.2. TYPE

A drop manhole connection as shown on the STANDARD DETAILS shall be provided for a sewer entering a manhole where its invert elevation is 24 inches or more above the exiting invert.

Where the difference in elevation between the incoming sewer invert and the manhole invert is less than 24 inches, the manhole invert shall be filleted to prevent solids deposition.

1.4.4.3. DIAMETER

For sewer 24 inches in diameter and smaller, the minimum inside diameter of manholes shall be 48 inches. For sewers greater than 24 inches and up to 36 inches, the minimum inside diameter shall be 60 inches. For sewers larger than 36 inches in diameter, a 72 inch inside diameter manhole shall be provided.

Minimum manhole inside diameter shall be 48 inches for up to 12 feet deep, 60 inches for up to 18 feet deep, 72 inches for greater depths.

A minimum overall access opening diameter of 30 inches shall be provided.

Access cover shall be double cover style; center access cover shall be 20" minimum diameter.

1.4.4.4. FLOW CHANNEL

The flow channel through manholes shall be made to conform in shape and slope to that of the sewers. Flow direction changes in excess of 90 degrees shall not be included in sewer alignments without special consideration. When directional changes exceeding 45 degrees occur, an additional flow line elevation drop of 0.1 foot across manholes shall be provided. Benching shall be provided which shall have a minimum slope of 2 inches per foot. At all changes in pipe sizes, the crown elevations of the pipes shall match.

1.4.4.5. MATERIALS

Manholes shall be constructed of precast units as specified in Section 9.16. Brick manholes shall not be permitted. Cast-in-place manholes may be accepted on a case by case basis for conflict resolution.

1.4.4.6. CASTINGS

Cast iron frames and covers shall be as specified in Section 9.16.3. Bolt down and /or gasket covers shall be provided where manholes are allowed by the City to be located in areas subject to ponding of flooding.

1.4.4.7. ACCESS

A 10 foot wide access road shall be provided for all manholes which are located outside of roadways. The top A8" inches of the access road shall be stabilized to a Florida Bearing value of 50 psi, and compacted to 95% of AASHTO T-180.

Sec. 1.4.5. SERVICE CONNECTIONS

1.4.5.1. GENERAL

Service connection shall be through a lateral and miscellaneous appurtenances, as shown on the STANDARD DETAILS, to connect the gravity sewer to the house or establishment served.

1.4.5.2. SIZE AND LENGTH

Service laterals and fittings shall be a minimum of 6 inches in diameter. All service laterals shall be less than 50 feet in length.

1.4.5.3. SLOPE

Service laterals shall have a minimum slope of 1%.

1.4.5.4. CONNECTION

In general, service laterals shall not be allowed to discharge into sanitary manholes, except at terminal manholes.

Sec. 1.4.6. GREASE TRAPS AND INTERCEPTORS

1.4.6.1. GENERAL

All Food Preparation/Service Establishments shall have outside grease traps sized as discussed herein. All wastewater flow from the kitchen areas of these establishments must flow through approved grease traps prior to entering the CITY system.

Grease traps and interceptors shall be provided when they are necessary for the proper handling of wastes containing ingredients harmful to the public sewer or sewage treatment plant or processes.

The minimum grease trap size shall be 750 gallons, two compartment type, as shown in the STANDARD DETAILS.

Interceptors shall be required for all automobile service/repair establishments, car wash and car wash structures, gasoline service stations, businesses or industries that use petroleum based, metal or sand products in their day to day activities, where a hazard exists, or where oils or other flammable items can be introduced or admitted into the sewer system by accident or otherwise.

The minimum interceptor size shall be 750 gallons, two compartment type with vent as shown in the STANDARD DRAWINGS.

All grease traps and interceptors shall be provided with an approved sampling station located down stream of the grease trap or interceptor and prior to connection with human waste lines.

The owner shall be responsible for proper and regular maintenance. The owner shall provide ingress and egress to the City for periodic inspection of the industrial waste system.

1.4.6.2. FAST FOOD RESTAURANTS

Grease trap capacity shall be 5 gallons per seat.

1.4.6.3 GENERAL RESTAURANTS

Grease trap capacity shall be sized at the rate of 10 gallons per seat.

1.4.6.4. 24-HOUR RESTAURANTS

Grease trap capacity shall be sized at the rate of 15 gallons per seat.

1.4.6.5. CONVENTION CENTER/MANUFACTURING CAFETERIAS

Single grease trap capacity shall be sized at the rate of 1.5 gallons, per meal.

1.4.6.6. MISCELLANEOUS FOOD PREPARATION/SERVICE ESTABLISHMENTS

Grease trap capacity shall be sized at the rate of 1.5 gallons per meal.

1.4.6.7. LOCATION

Each grease trap or interceptor shall be so located as to provide ready accessibility to the cover and means for servicing and maintaining the structure in working and operating condition.

1.4.6.8. GRIT INTERCEPTORS

Sand and mud traps shall be a minimum of 4' in diameter and constructed as shown in the STANDARD DETAILS.

1.4.6.9. LAUNDRIES

Commercial laundry and Laundromats shall be equipped with lint traps or their interceptors shall have a removal basket, or similar device, that will prevent strings, rags, buttons, or other material detrimental to the sewer system from passing into the City wastewater system.

1.4.6.10. HAZARDOUS MATERIALS

Any establishment that used hazardous material for all or any portion of its day-to-day operation is required to submit two (2) copies of the Materials Safety Data sheet for each hazardous product in use on site and two (2) copies of the proposed method of pre-treatment for review and approval.

In no case shall corrosive liquids, spent acids, or other harmful or hazardous waste which may destroy or injure the sewer system, or which might create noxious or toxic fumes, discharge into the City sewer system without being thoroughly diluted or neutralized by passing through a properly constructed and acceptable dilution or neutralizing device.

This Department and the appropriate Fire Department Official shall be immediately notified when an unauthorized discharge occurs which becomes reportable under State, Federal, and/or local regulations, or if people, animal, plants or the environment are otherwise possibly at risk.

Sec. 1.4.7. MATERIALS, INSTALLATION AND TESTING

Applicable provisions or Article 5, 6, and 7 shall apply.

SECTION 1.5. WASTEWATER FORCE MAINS

Sec. 1.5.1. GENERAL CONSIDERATIONS

1.5.1.1. DESIGN PERIOD

Force main systems shall be designed for the estimated ultimate tributary population, as delineated in the approved Town of Lake Hamilton Wastewater Master Plan latest edition except in considering parts of the systems that can be readily increased in capacity. In absence of a plan the assigned City engineer will determine the appropriate design.

1.5.1.2. LOCATION

Force mains shall be located in dedicated rights-of-ways or utility easements. When installed in rights-of-way, force mains shall maintain a consistent alignment with respect to the centerline of the road. All force mains located outside of dedicated rights-of-way shall require a minimum 15 foot easement. Additional easement widths shall be provided when the pipe size or depth of cover so dictate. If a force main is located adjacent to a road right-of-way, a minimum 10 foot easement shall be provided. Additional easement widths shall be provided if the pipe size or depths of cover so dictate. Force mains shall not be placed under retention ponds, tennis courts or under structures. In general force mains shall not be located along side or rear lot lines. Placement of a force main along side or rear lot line may be allowed on a case by case basis if such a force main configuration results in efficient placement and utilization of the sewer system. These criteria shall also apply to force mains in retention pond berms.

1.5.1.3 REPLACEMENT OF LINE

If the existing force main is NOT made of AWWA standard C900 or Ductile Iron Pipe (DIP) the CONTACTOR shall be required to replace the existing line within the project limits. Valves shall be installed at each end of the line to be replaced.

Sec. 1.5.2. DESIGN BASIS

1.5.2.1. AVERAGE DAILY FLOW

Provisions of Section 1.6.2.2.2. shall apply.

1.5.2.2. PEAK DESIGN FLOWS

Provision of Section 1.6.2.1. shall generally apply. Consideration must be given to a 2 fps minimum velocity and a compatible head pressure for manifolded systems.

1.5.2.3. DESIGN OR CALCULATIONS

DESIGN or DEVELOPER's ENGINEER shall submit signed, sealed and dated design calculations with the PLANS for all force main projects. Calculations shall show that force mains will have sufficient hydraulic capacity to transport all design flows.

Sec. 1.5.3. DETAILS OF DESIGN AND CONSTRUCTION

1.5.3.1. VELOCITY AND DIAMETER

At design pumping rates, a cleansing velocity of at least 2 feet per second should be maintained. Maximum velocity at design pumping rates should generally not exceed 7 feet per second. The minimum force main diameter shall be 4 inches. Only 4", 6", 8", 10", 12", 16", 20", 24", 30", 36", 42", 48" and 54" diameter force mains shall be permitted.

1.5.3.2. DESIGN FRICTION LOSSES

Friction losses through force mains shall be based on the Hazen and Williams formula. In the use of Hazen and Williams formula, the value for "C" shall be 100.

When initially installed, force mains may have a significantly higher "C" factor. The higher "C" factor should be considered only in calculating maximum power requirements and duty cycle time of the motor.

1.5.3.3. DESIGN PRESSURE AND RESTRAINT

The force main and fittings, including all restrained joint fittings shall be designed to withstand pump operating pressures and pressure surges, but not less than 100 psi.

Only restrained joint devices shall generally be allowed. The number of restrained joints shall be calculated by a professional engineer, registered in the State of Florida or shall be in accordance with the "Restrained Joint Table" on the Standard Details.

1.5.3.4. TERMINATION

Force mains shall not terminate directly into a gravity sewer line. Force mains shall enter the gravity sewer system at a drop type connection to a manhole as shown on the Standard Details. Lined two manholes down stream

1.5.3.5. AIR RELEASE AND VACUUM RELIEF VALVES

Air release valves, or air/vacuum relief valves, shall be provided, as necessary, to prevent air locking and vacuum formation. All such valves shall be clearly delineated on the force main plan and profile in the DRAWINGS. The DEVELOPER's ENGINEER shall submit calculations to the CITY justifying the valve sizing. See additional requirements in Section 9.19.6.

1.5.3.6. AERIAL CROSSINGS

STRUCTURAL SUPPORT

Support shall be provided for all joints in pipes utilized for aerial crossings. The supports shall be designed to prevent overturning and settlement.

EXPANSION PROTECTION

Expansion joints shall be provided as required.

FLOOD CLEARANCE

For aerial stream crossings, the impact of flood waters and debris shall be considered. The bottom of the pipe shall be placed no lower than 1 foot above the 100 year flood elevation.

PIPE MATERIAL AND JOINTS

Flanged joints shall be used. Pipe and flange material shall be ductile iron, minimum class 53. All above ground pipe shall be painted as specified in Section 1.19.4.4. for aboveground wastewater force mains. Use of epoxy coated steel pipe may be allowed on a case by case basis.

VALVES

Underground valves shall be provided at both ends of the crossing so that the section can be isolated for testing or repair. The valves shall be easily accessible and not subject to flooding. An air release/vacuum relief valve shall be installed at the high point of the crossing.

GUARDS

Appropriate guards shall be installed at both ends of the crossing to prevent pipe access to the public.

PERMITS AND REQUIREMENTS OF OTHER AGENCIES

It shall be the responsibility of the DEVELOPER to obtain all applicable regulatory permits. When the Aerial Crossing is accomplished by attachment to a bridge or drainage structure, the DEVELOPER shall meet all requirements of the Agencies who own or have jurisdiction over such structures.

1.5.3.7. UNDERWATER CROSSINGS

PIPE MATERIAL AND COVER

A minimum cover of three feet plus a 6" concrete slab shall be provided over the pipe. The pipe material shall meet appropriate AWWA Standards for use in submerged conditions.

VALVES

Valves shall be provide at both ends of the water crossings so that the section can be isolated for testing or repair. The valves shall be easily accessible, and not subject to flooding. Both valves shall be provided in a manhole or a valve vault.

PERMITS

It shall be the responsibility of the DEVELOPER to obtain all applicable regulatory permits, including dredge and fill permits.

1.5.3.8. VALVES

Sufficient valves shall be provided on force main systems to facilitate effective isolation of the pipe system for repairs and maintenance. On straight runs of force mains, valve spacing shall not exceed 2000 feet. Additional valves shall be provided at inlets of fittings where force mains intersect to facilitate isolation of pipe segments.

Sec. 1.5.4. MATERIAL, INSTALLATION AND TESTING

Applicable provisions of Article 4, 5, and 6 shall apply.

Sec. 1.5.5. LOCATION AND IDENTIFICATION

A means for locating and identifying all force mains and valves shall be provided in accordance with the provisions in Article 6. and the STANDARD DETAILS.

Sec. 1.5.6. ADDITIONAL REQUIREMENTS

While designing force main systems, consideration shall be given to possible future connecting pumping stations. If applicable, this requirement shall be reviewed with the CITY prior to finalization of the design

SECTION 1.6 WASTEWATER PUMP STATIONS

Sec. 1.6.1. GENERAL REQUIREMENTS

The design standards outlined in this section apply to wastewater pump stations discharging a peak flow of 3000 gallons per minute or less. All such pump stations shall be a submersible. For designing pump stations discharging more than 3000 gallons per minute, the type of pump station and the Basis of Design shall be reviewed with the CITY and approval obtained before proceeding with the design.

Sec. 1.6.2 DESIGN BASIS

1.6.2.1. DESIGN FLOWS

Design flow shall be based upon the total ultimate development flow from all contributory areas to the pump station. The design average daily flow shall be computed as outlined in Section 1.2.1. The design pumping capability of the station shall be based upon the peak design flow which shall be calculated by multiplying the design average flow with the applicable minimum peaking factors as outlined below:

Design Average Daily Flow	Minimum Peaking Factor For Peak Design Flow
Flows to 100,000 GPD	4.0
100,000 GPD to 250,000 GPD	3.5
250,000 GPD to 1,000,000 GPD	3.0
Flows greater than 1,000,000 GPD	2.5

For design average daily flows above 2,000,000 GPD, peaking factors less than 2.5 may be considered if substantiated by extensive data. Under no circumstances shall peaking factors less than 2.0 be allowed.

1.6.2.2. NUMBER OF PUMPS

For pump stations with a peak design flow of 1500 GPM or less, a minimum of two pump units shall be provided. Where the peak design flow exceeds 1500 GPM, three or more units shall be provided. See Section 1.2.2.1.3. for standby requirements.

1.6.2.3. PUMP AND MOTOR SELECTION

Pump station shall be capable of pumping the peak design flow with the largest pumping unit out of service. Pumps shall be capable of meeting all system hydraulic conditions without overloading the motors. In addition, a minimum 5 HP motor shall be required. Total dynamic head and flow capacity curves shall be prepared and submitted to the CITY along with the pump station plans.

Such curves shall be based upon the static head friction losses outlined in Section 1.3.2. of these specifications. Head capacity curves shall verify that the pumps are operating at peak efficiency and are suitable for the design flow application. Pump and motor selection and total dynamic head and flow capacity curves shall reflect hydraulic conditions in cases where receiving force main systems are interconnected to additional pumping stations.

1.6.2.4. DESIGN CALCULATION

DEVELOPER=s ENGINEER shall submit signed, sealed and dated design calculations for all wastewater pump stations. Calculations shall include total dynamic head and flow capacity curves with copies of manufacturers pump curves, hydraulic analysis of force main system, operating cycle calculations with wet well sizing, and buoyancy calculations.

Sec. 1.6.3. DETAILS OF DESIGN AND CONSTRUCTION

1.6.3.1. FLOODING

Wastewater pumping station structures and electrical and mechanical equipment shall be protected from physical damage by the 100 year flood. Wastewater pumping stations should remain fully operational and accessible during the 100-year flood. Regulations of Local, State and Federal agencies regarding flood plain obstructions shall be considered.

1.6.3.2. ACCESSIBILITY

The pumping station shall be readily accessible by maintenance vehicles during all weather conditions. The access road to the pumping station shall be paved. The facility shall not be located in road rights-of-way.

In a phased development, a stabilized access road may be accepted during the initial phase with paving to be accomplished in the later phase.

1.6.3.3. BUOYANCY

Buoyancy of the pump station structures shall be considered and adequate provisions shall be made for protection against flotation.

1.6.3.4. PUMP REQUIREMENTS

Submersible wastewater pump stations shall comply with the requirements spelled out in Section 1.21. Only approved pumps listed in Appendix D shall be allowed. Submersible pumps and motors shall be designed specifically for raw sewage use, including totally submerged operation during a portion of each pumping cycle. Submersible pumps shall be readily removable and replaceable without dewatering the wet well or disconnecting any piping in the wet well.

Pumps shall be capable of handling raw sewage and passing spheres of at least 3 inches in diameter. Pump suction and discharge openings shall be at least 4 inches in diameter.

1.6.3.5. WET WELL REQUIREMENTS

Wet well shall be minimum 6-foot diameter and shall have a minimum 4.5 foot depth below the inlet invert. Additional depth shall be provided based on station design and cycle time, and potential.

Pumping levels shall be set to provide a minimum capacity between operational water levels sufficient to allow a minimum of five (5) minutes between successive starts of the pump.

Pump-off water levels shall provide adequate submergence to preclude pump inlet vortexing, or air binding. Operational maximum water levels shall not exceed the invert elevation of the influent pipe.

The wet well floor shall have a minimum slope of 1 to 1 to the hooper bottom The horizontal area of the hopper bottom shall be no greater than necessary for proper installation and function of the pump inlet.

No interior ladders shall be permitted in the wet well.

Only one inlet connection shall be permitted to a wet well. Provide a tee on the inlet, to direct the influent downward.

1.6.3.6. PUMP STATION WATER SYSTEM

All wastewater pump stations shall be provided with a water system with adequate capacity and pressure for station wash down and other requirements. The station water system shall be completely separated from the potable water supply by means of a reduced pressure type backflow preventer or other CITY approved system.

1.6.3.7. ELECTRICAL EQUIPMENT, POWER SUPPLY AND POWER CORDS

Requirements in Sections 1.21 and 1.22 shall apply.

1.6.3.8. CONTROLS

Requirements in Section 1.22 shall apply.

1.6.3.9. SITE SIZING AND EASEMENT REQUIREMENTS

Pump station sites shall be sized as delineated on the Lift Station Yard Plan in the DRAWINGS. The DEVELOPER shall dedicate pump station site by warranty deed or plat to the CITY. Dedicated easements shall also be required around the site as delineated on the Lift Station Yard Plan in the DRAWINGS. In general, the site for the paved access road shall also be dedicated to the CITY by Warranty deed or plat. An exception to this requirement may be allowed on a case by case basis in the form of an ingress/egress easement for the access road.

1.6.3.10. SITE FENCING

Fencing at the pump station site perimeter shall comply with the technical criteria established in Section 1.20. In general, all pump station sites shall be fenced. However, exception to this requirement may be made for pump stations serving residential areas only, on a case by case basis and subject to sufficient landscape screening.

Sec. 1.6.4. FLOW METER

Indicating, totalizing and recording flow measurement shall be provided at pumping stations designed to handle peak flows of 1500 GPM or more. Applicable provisions of Section 1.20. shall apply.

Bypass piping around the meter shall be provided for all stations with flow meters to facilitate meter maintenance.

Sec. 1.6.5. EMERGENCY OPERATION

All wastewater pump stations shall be provided with stand-by emergency diesel generators. Such stand-by generator shall comply with the requirements spelled out in Section 1.20. All such generators shall be rated and designed to operate the pump station under design conditions. (See appendix B for generator suppliers)

Sec. 1.6.6. ODOR CONTROL

An odor control system shall be provided for all pump stations over 1500 GPM peak flow.

Sec. 1.6.7 COLLECTION MANHOLE

Requirements in Section 1.4 shall apply.

SECTION 1.7 WATER MAINS

Sec. 1.7.1. GENERAL CONSIDERATIONS

1.7.1.1. TYPE OF WATER MAINS

The CITY will approve PLANS for water supply mains and extensions only when such mains are designed and constructed in accordance with the criteria set forth in this MANUAL.

1.7.1.2. DESIGN PERIOD

Water mains should be designed for the estimated ultimate tributary population, as delineated in the approved Town of Lake Hamilton Water Master Plan (latest edition) except in considering parts of the system that can be readily increased in capacity.Water systems shall be designed to satisfy the domestic water demand and fire protection requirements for the area.

.7.1.3. LOCATION

Water mains shall be located in dedicated rights-of-way or utility easements. When installed in rights-of-way, water mains shall, in general, maintain a consistent alignment with respect to the centerline of the road. All water mains located outside of dedicated rights-of-way shall require a minimum 15 foot easement. Additional easement widths shall be provided when the pipe size or depth of cover so dictate. If a water main is located adjacent to a road right-of-way, a minimum 10 foot easement shall be provided abutting the right-of-way. Additional easement widths shall be provided if the pipe size or depth of cover so dictate. Water mains shall not be placed under retention ponds, tennis courts, or other structures. In general, water mains shall not be located along side or rear lot lines. Placement of a water main along side or rear lot line may be allowed on a case by case basis if such a water main configuration results in efficient placement and utilization of the water main network. The criteria shall also apply to water mains in retention pond berms.

1.7.1.4. REPLACEMENT OF LINE

If the existing water main is NOT made of AWWA standard C900 or Ductile Iron Pipe (DIP) the CONTACTOR shall be required to replace the existing line within the project limits. Valves shall be installed at each end of the line to be replaced. If the existing line is on the opposite side of the road NO replacement is required.

Sec. 1.7.2. DESIGN BASIS

1.7.2.1. AVERAGE DAILY FLOW AND PEAK FLOWS

Average daily water flow shall be calculated by referencing the flow rates as outlined in Appendix A. Appendix A is subject to revision. Maximum daily and peak hourly water flow rates shall be calculated by referencing the service area peaking factors in Appendix B.

1.7.2.2. FIRE FLOW REQUIREMENTS

Fire flow requirements shall be determined in accordance with applicable City or County Fire Department Codes. Where fire flow requirements exceed the anticipated available fire flow from the central water system, on-site fire protection system or other Fire Department approved mitigation measures shall be utilized. (Minimum requirement as per AWWA M31 is 500 gpm at a residual pressure of 20psi).

Sec. 1.7.3. DETAILS OF DESIGN AND CONSTRUCTION

1.7.3.1. DESIGN PRESSURE AND RESTRAINT

The water main and fittings, including all restrained joint fitting shall be designed to withstand pump operating pressures and pressure surges, but not less than 150 psi.

Only restrained joint devices shall generally be allowed. The number of restrained joints shall be calculated by a Professional Engineer, registered in the State of Florida or shall be in accordance with the “Restrained Joint Table” in the STANDARD DETAILS.

1.7.3.2. DIAMETER

Only 4", 6", 8", 10", 12", 16", 20", 24", 30", 36", 42", 48" and 54" diameter water mains shall be permitted. At the end of cul-de-sac areas, a 4" looped connection as shown on the STANDARD DETAILS will be allowed to prevent dead ends. As a minimum, six (6) inch looped systems shall be required in low density residential projects. Where looping of mains is not practical, minimum eight (8) inch mains shall be required, unless detailed calculations are submitted to substantiate the sufficiency of a 6 inch main.

In commercial, industrial, and high density residential areas, minimum eight (8) inch looped mains shall be required. Larger size mains shall be required if necessary to allow the withdrawal of the required fire flow while maintaining the minimum residual pressure specified in Section 21.

1.7.3.3. FIRE HYDRANT LOCATION AND SPACING

As a minimum, specifications outlined in the latest version of Town of Lake Hamilton Land Development Regulations and applicable Town of Lake Hamilton Fire Departments Codes shall apply. As a minimum, hydrants shall be placed at 500 foot intervals toprovide for proper flushing for all off-site mains.

1.7.3.4. DEAD ENDS

In order to provide increased reliability of service and reduce head loss, dead ends shall be minimized by making appropriate tie-ins whenever practical, as determined by the CITY. Where dead-end mains occur, they shall be provided with a fire hydrant or with an approved blow-off for flushing purposes. No flushing device shall be directly connected to any sewer.

1.7.3.5. VALVES

Sufficient valves shall be provided on water mains so that inconvenience and sanitary hazards will be minimized during repairs. Valves shall be located at not more than 500 foot intervals in commercial, industrial and high density residential areas and at not more than 1000 foot intervals in all other areas. Appropriate valving shall also be provided at the downstream sides of tees and crosses to ensure effective isolation of water lines for repair, maintenance or future extension. This shall include all sides of tees and crosses within looped systems, where flow is potentially multidirectional.

1.7.3.6. SEPARATION OF WATER MAINS AND SEWERS

Refer to Section 1.5.3.7 of these specifications for applicable requirements. No water pipe shall pass through or come in contact with any part of a sewer manhole.

Extreme caution should be exercised when locating water mains at or near certain sites such as sewer treatment plants or industrial complexes. Individual septic tanks must be located and avoided.

1.7.3.7. SURFACE WATER CROSSINGS

The CITY shall be consulted before final PLANS are prepared. Requirements outlined in Sections 1.5.3.6 and 1.5.3.7 shall apply. All above ground pipe shall be painted as specified in Section 1.23.4.4. for water mains.

1.7.3.8. AIR RELIEF VALVES

At high points in water mains where air can accumulate, provisions shall be made to remove the air by means of automatic air relief valves. Automatic air relief valves shall not be used in situations where flooding of the manhole or chamber may occur. See details in STANDARD DETAILS.

1.7.3.9. CHAMBER DRAINAGE

Chambers, pits or manholes containing valves, blow-offs, meters, or other such appurtenances to a distribution system shall not be connected directly to any storm drain or sanitary sewer, nor shall blow-offs or air relief valves be connected directly to any sewer.

1.7.3.10. DISINFECTION FOLLOWING REPAIR OR REPLACEMENT

Any part of the CITY water system, which has direct contact with, finished water and has been out of service for repair, alteration, or replacement shall be disinfected as outlined in Section 1.24.6 of these specifications.

Sec. 1.7.4. WATER SERVICES AND CONNECTIONS

Water services and connections shall conform to the applicable provisions of Section 50 and 51 and the STANDARD DETAILS. Only 3/4", 1", 1-1/2", 2", 3", 4", 6", 8" and 12" services will be permitted. Where water services greater than 12" are required dual services shall be provided.

Sec. 1.7.5. WATER METERING

1.7.5.1. GENERAL

All water service connections shall be metered. In general, the method of metering will follow the guidelines listed below. However, the DEVELOPER's ENGINEER must obtain approval before finalizing the design of the metering system.

1.7.5.2. SINGLE FAMILY, DUPLEX, AND MULTI-FAMILY SUBDIVISION WITH PUBLIC RIGHTS OF WAY

Each unit shall be individually metered. Single and Double services shall be installed at property lines as indicated by the STANDARD DETAILS.

1.7.5.3. SINGLE FAMILY AND DUPLEX SUBDIVISIONS WITH PRIVATE STREETS

Individual meters may be permitted in accordance with Section 1.7.5.2 if the private streets are designed to CITY Standards and easements are dedicated over the entire private street common areas. In addition, sufficient area must be available outside of paved areas to locate water mains, services, and meters. If the above criteria cannot be met, the subdivision shall be metered pursuant to Section 1.7.5.5.

1.7.5.4. COMMERCIAL, INDUSTRIAL, AND INSTITUTIONAL PROJECTS WITHOUT PRIVATE FIRE LINES

Each building shall be individually metered. Meter (s) shall be located in the public rights of way at the property line.

1.7.5.5. COMMERCIAL, INDUSTRIAL, INSTITUTIONAL, MULTI-FAMILY WITH PRIVATE STREETS, APARTMENTS, AND CONDOMINIUM PROJECTS WITH PRIVATE FIRE LINES

In general, all such projects shall require installation of a fire line master meter. Where on-site fire systems contain less than 75 feet of main, a dual system (separate domestic and fire lines) may be considered. Dual systems shall require installation of a detector check or double detector check as determined by the CITY. Individual meters to each unit may be considered on a case-by-case basis subject DEVELOPER executing a Meter Installation and Easement Agreement.

1.7.5.6. SHOPPING CENTERS

In general, shopping centers shall require installation of a fire line master meter. Individual meters to each unit will be considered subject to the DEVELOPER executing an Easement Agreement.

1.7.5.7. METER INSTALLATION

All meters will be installed by the CITY after payment of applicable fees and charges. All meters less than two inch in size will be installed underground in an approved meter box. Meters two inch and larger shall be installed above ground and as shown in the STANDARD DETAILS. In general, meters two inch and larger shall be located in a meter easement located adjacent to the public right of way.

1.7.5.8. METER SIZING

Size of all meters shall be determined by the Developer. The DEVELOPER's ENGINEER shall provide sufficient information on estimated peak flows and low flows so that meter size can be verified correct. The DEVELOPER's ENGINEER shall include head losses through metering device when designing the water system.

Sec. 1.7.6. MATERIAL, INSTALLATION AND TESTING

Applicable provisions of Divisions III, IV, and V shall apply.

Sec. 1.7.7. LOCATION AND IDENTIFICATION

A means for locating and identifying all water mains and valves shall be provided in accordance with Sections 1.23, 1.24 and the STANDARD DETAILS.

Sec. 1.7.8 CROSS CONNECTION CONTROL

1.7.8.1. GENERAL

In order to protect the public water supply system from contamination due to cross-connections, the DEVELOPER shall install CITY approved backflow prevention devices where there is the potential of a non-potable substance coming into contact with the public water system, for services over 3/4". Some of the common instances requiring installation of the cross connection control devices are listed below. However, the DEVELOPER's ENGINEER must obtain CITY approval before finalizing the design of a Cross Connection Control Device. The City provides double-check backflow preventers for 3/4" domestics services only.

1.7.8.2. COMMERCIAL, INDUSTRIAL AND MULTI-FAMILY RESIDENTIAL

All commercial and industrial projects shall, as a minimum, require installation of approved double check valve assembly. Projects with a higher degree of hazard may be required to install an approved reduced pressure principle assembly.

All projects with fire sprinkler and standpipe systems, and projects with extensive on-site water systems shall be required, as a minimum, to install an approved double check detection assembly.

All systems shall be designed in accordance with the latest edition of the Town of Lake Hamilton's "Cross-Connection Control Manual".

1.7.8.3. IRRIGATION SYSTEMS

Pressure-type vacuum breakers or reduced pressure principle (RPZ) assembly shall be utilized on all irrigation systems.

1.7.8.4. LOCATION AND INSTALLATION

In general, all backflow prevention devices are to be located directly following the water meter on DEVELOPER's property. Backflow prevention devices shall be installed to facilitate maintenance and testing. It shall be the DEVELOPER's responsibility to pay for and install all backflow prevention devices. Referto the STANDARD DETAILS for specific recommended installation of various services.

GENERAL

Sec. 1.8.1. GRADES, SURVEY LINES, AND PROTECTION OF MONUMENTS

1.8.1.1. GRADE

All work shall be constructed in accordance with the lines and grades shown on the PLANS. The full responsibility for keeping alignment and grade shall rest upon the CONTRACTOR.

Maximum distance between temporary Bench Marks is one thousand (1,000) feet, and shall be in close proximity to construction.

All bench Marks shall be clearly marked and protected thought-out construction. Make no changes or relocations without prior written notice to engineer.

Surveyor shall replace any control points which may be lost or destroyed at no additional cost to the City. Establish all replacement points based on original control.

1.8.1.2. SURVEYS

The CONTRACTOR shall furnish and maintain, at his own expense, stakes and other such materials and give such assistance, including qualified helpers, for setting reference marks to the satisfaction of the CITY and the ENGINEER. The CONTRACTOR shall check such reference marks by such means as he may deem necessary and, before using these, shall call the CITY=s attention to any inaccuracies. The CONTRACTOR shall, at his own expense, establish all working or construction lines and grades as required from the reference marks and shall be solely responsible for the accuracy thereof. The CONTRACTOR shall, however, be subject to the check and review of the CITY.

1.8.1.3. MONUMENT PRESERVATION

Property corners and survey monuments (including G.I.S. Monuments) shall be preserved using care not to disturb or destroy them. If a property corner or survey monument is disturbed or destroyed during construction, for any reason said property corner or survey monument shall be restored by a land surveyor registered in the State of Florida. All costs for this work shall be paid for by the CONTRACTOR.

Sec. 1.8.2. UTILITY COORDINATION

1.8.2.1. LOCATION OF UTILITIES

Prior to proceeding with trench excavation, the CONTRACTOR shall contact all utility companies in the area to aid in locating their underground services. It shall be the CONTRACTORS responsibility to contact utility companies at least three (3) normal

working days before starting construction. The CONTRACTOR shall proceed with caution in the excavation and preparation of the trench so that the exact location of underground utilities may be determined.

The CONTRACTOR shall take all reasonable precautions against damage to existing utilities. However, in the event of a break in an existing water and reuse mains, gas main, sewer or underground cable, the CONTRACTOR shall immediately notify the responsible official of the organization operating the interrupted utility. The CONTRACTOR shall lend all possible assistance in restoring services and shall assume all costs, charges, or claims connected with the interruption and repair of such services.

1.8.2.2. DEVIATIONS OCCASIONED BY STRUCTURES OR UTILITIES

Wherever obstructions are encountered during the progress of the WORK and interfere to such an extent that an alteration in the PLANS is required, the CITY shall have the authority to order a deviation from the line and grade or arrange with the owners of the structures for the removal, relocation or reconstruction of the obstructions.

Where gas, water, telephone, electrical or other existing utilities are an impediment to the vertical or horizontal alignment of the proposed pipe line, the CITY shall order a change in grade or alignment or shall direct the CONTRACTOR to arrange with the owners of the utilities for their relocation. If a change in line or grade of a gravity sewer is necessary, the CITY will require the addition of any manholes needed to maintain the integrity of the sewer system.

1.8.2.3. TEST PITS

Test pits for the purpose of locating underground pipeline, utilities, or structures in advance of the construction shall be excavated and backfilled by the CONTRACTOR. Test pits shall be backfilled immediately after their purpose has been satisfied and maintained in a manner satisfactory to the authority having jurisdiction. The costs for such test pits shall be borne by the CONTRACTOR.

Sec. 1.8.3. MAINTENANCE OF TRAFFIC AND CLOSING OF STREETS

The CONTRACTOR shall carry on the WORK in a manner which will cause a minimum of interruption to traffic. Where traffic must cross open trenches, the CONTRACTOR shall provide suitable bridges at street intersections and driveways. The CONTRACTOR shall post suitable signs indicating that a street is closed and necessary detour signs for the proper maintenance of traffic. Prior to closing of any streets, CONTRACTOR shall notify and obtain the approval of responsible authorities and the CITY.

Unless permission to close a street is received in writing from the proper authority (CITY, COUNTY, FDOT, etc.), all excavated material shall be placed so that vehicular and pedestrian traffic may be maintained at all times. If the CONTRACTORS operations cause traffic hazards, he shall repair the road surface, provide temporary ways, erect wheel guards or fences, or take other measures for safety satisfactory to the authority having jurisdiction.

Detours around construction will be subject to the approval of the authority having jurisdiction and the CITY. Where detours are permitted, the CONTRACTOR shall provide all necessary barricades and signs as required to divert the flow of traffic. While traffic is detoured, the CONTRACTOR shall expedite construction operations.

Periods when traffic is being detoured will be strictly controlled by the CITY. It shall be the sole responsibility of the CONTRACTOR to take precautions to prevent injury to the public due to open trenches. Night watchmen may be required where special hazards exist, or police protection provided for traffic while work is in progress. The CONTRACTOR shall be fully responsible for damage or injuries whether or not police protection has been provided.

Sec. 1.8.4. PROTECTION OF PUBLIC AND PROPERTY

1.8.4.1. BARRICADES, GUARDS AND SAFETY PROVISIONS

The CONTRACTOR shall be solely responsible for adhering to the rules and regulations of OSHA and other appropriate authorities regarding safety provisions. To protect persons from injury and to avoid property damage, adequate barricades, construction signs, lights and guards as required shall be placed and maintained by the CONTRACTOR at his expense during the progress of the WORK and until it is safe for traffic to use the roads and streets.

All material piles, equipment and pipe which may serve as obstructions to traffic shall be enclosed by fences or barricades and shall be protected by proper lights when the visibility is poor.

All signage and barricades shall be in accordance with the MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES and the TRAFFIC CONTROL AND SAFE PRACTICES MANUAL.

1.8.4.2. PROTECTION OF UTILITY STRUCTURES

Temporary support, adequate protection and maintenance of all underground and surface utility structures, including drains, sewers, manholes, hydrants, valves, valve covers, power poles and miscellaneous other utility structures encountered in the progress of the WORK shall be furnished by the CONTRACTOR at his expense. Any such structures which may have been disturbed shall be restored upon completion of the WORK.

1.8.4.3. OPEN EXCAVATION

All open, excavations shall be adequately safeguarded by providing temporary barricades, caution signs, lights and other means to prevent accidents to persons and damage to property. The CONTRACTOR shall, at his own expense, provide suitable and safe bridges with hand railings and other crossings for accommodating travel by pedestrians and workmen. Bridges provided for access to private property during construction shall be removed when no longer required.

The length of open trench will be controlled by the particular surrounding conditions, but shall be limited to 300 feet unless otherwise approval by the CITY. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, the CITY may require special construction procedures, such as limiting the length of open trench, fencing, prohibiting excavated material in the street and requiring that the trench shall not remain open overnight. The CONTRACTOR shall take precautions to prevent injury to the public due to open trenches. All trenches, excavated material, equipment or other obstacles which could be dangerous to the public shall be well lighted at night.

1.8.4.4. PROTECTION OF TREES AND SHRUBS

All trees and shrubs not shown to be removed on the PLANS shall be protected by the CONTRACTOR at his expense. No excavated materials shall be placed so as to injure such trees or shrubs. Trees or shrubs destroyed by negligence of the CONTRACTOR or his employees shall be replaced by him with new stock of similar size and age at the sole expense of the CONTRACTOR.

1.8.4.5. PROTECTION OF LAWN AREAS

Lawn areas shall be left in as good or better condition as before starting of the WORK. Where sod is to be removed, it shall be carefully restored with new sod of the same type.

1.8.4.6. RESTORATION OF FENCES

Any fence, or part thereof, that is damaged or removed during the course of the WORK shall be replaced or repaired by the CONTRACTOR and shall be left in as good a condition as before the starting of the WORK. The manner in which the fence is repaired or replaced and the materials used shall be subject to the approval of the CITY.

1.8.4.7. PROTECTION AGAINST SILTATION AND BANK EROSION

The CONTRACTOR shall arrange his operations to minimize siltation and bank erosion on construction sites and on existing or proposed water courses and drainage ditches. The CONTRACTOR, at his own expense, shall remove any siltation deposits and restore to original grade.

Sec. 1.8.5. ACCESS TO THE PUBLIC SERVICES

Neither the materials excavated nor the materials or equipment used in the construction of the WORK shall be so placed as to prevent free access to public services. All excavated material shall be piled in a manner that will not endanger the WORK and that will avoid obstructing streets, sidewalks and driveways. Excavated material suitable for backfilling shall be stockpiled separately on the site. No material shall be placed closer than 2' 0" from the edge of an excavation. Fire hydrants under pressure, valve pit covers, valve boxes, curb stop boxes, or other utility controls shall be left unobstructed and accessible until the WORK is completed.

Gutters shall be kept clear or other satisfactory provisions make for street drainage. Natural water courses shall not be obstructed or polluted. Surplus material and excavated material unsuitable for backfilling shall be transported and disposed of off the site in disposal areas obtained by the CONTRACTOR.

Sec. 1.8.6. PUBLIC NUISANCE

The CONTRACTOR shall not create a public nuisance including but not limited to encroachment on adjacent lands, flooding of adjacent lands, or excessive noise or dust. The CONTRACTOR shall eliminate noise to as great an extent as practicable at all times.

Sec. 1.8.7. CONSTRUCTION HOURS

No WORK shall be done between the hours of 7:00 p.m. and 7:00 a.m., or on Saturday, Sundays and legal holidays of the City unless the proper and efficient prosecution of the WORK requires operations during the night, weekend or holidays. Written notification for doing untimely WORK shall be provided to the CITY a minimum 24 hours before starting such items of the WORK for emergency purposes and 2 weeks for scheduled WORK.

Sec. 1.8.8. CONSTRUCTION IN EASEMENTS AND RIGHTS-OF-WAY

1.8.8.1. CONSTRUCTION IN EASEMENTS

In easements across private property, the CONTRACTOR shall confine all operations within the easement area and shall be responsible and liable for all damage outside of the easement area. Trees, fences, shrubbery or other type of surface improvements located in easements will require protection during construction. Precautions shall be taken by adequate sheeting or other approved method to prevent any cave-in or subsidence beyond the easement limits or damage to improvements within the easement. In general, the easement area is intended to provide reasonable access and working area for efficient operation by the CONTRACTOR. Where easement space for efficient operation is not provided, the CONTRACTOR shall be responsible for organizing his operations to perform within the restrictions shown on the PLANS.

1.8.8.2. CONSTRUCTION IN FLORIDA DEPARTMENT OF TRANSPORTATION RIGHT-OF-WAY

The CONTRACTOR shall strictly adhere to the requirements of the Florida Department of Transportation where construction work is in a right-of-way under the jurisdiction of the State of Florida and shall take care to avoid any unreasonable traffic conflicts due to the WORK in road right-of-way.

1.8.8.3. CONSTRUCTION IN POLK COUNTY RIGHT-OF-WAY

WORK shall be governed by the Polk County right-of-way regulations.

1.8.8.4. CONSTRUCTION IN CITY RIGHT-OF-WAY

Work shall be governed by the Town of Lake Hamilton, Public Works Department regulations.

Sec. 1.8.9. SUSPENSION OF WORK DUE TO WEATHER

During inclement weather, all WORK which might be damaged or rendered inferior by such weather conditions shall be suspended. During suspension of the WORK from any cause, the WORK shall be suitably covered and protected so as to preserve it from injury by the weather or otherwise.

Sec. 1.8.10. USE OF CHEMICALS

All chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, reactant, or of other classification, must show approval of either United States Environmental Protection Agency or United States Department of Agriculture. Use of all such chemicals and disposal of residues shall be in strict conformance with label instructions.

Sec. 1.8.11. COOPERATION WITH OTHER CONTRACTORS AND FORCES

During construction progress, it may be necessary for other contractors and persons employed by the CITY to work in or about the site. The CITY reserves the right to put such other contractors to work and to afford such access to the construction site and at such times as the CITY deems proper. The CONTRACTOR shall not impede or interfere with the work of such other contractors and shall cooperate with the other contractor (s) for proper prosecution of the work.

Sec. 1.8.12. SUBSURFACE EXPLORATION

The CONTRACTOR shall make such subsurface explorations as he believes necessary to perform the WORK.

Sec. 1.8.13. CLEANING

1.8.13.1. DURING CONSTRUCTION

During construction, the CONTRACTOR shall, at all times, keep the construction site and adjacent premises as free from material, debris and rubbish as is practicable and shall remove the same from any portion of the site if, in the opinion of the CITY, such material, debris, or rubbish constitutes a nuisance or is objectionable.

1.8.13.2. FINAL CLEANING

At the conclusion of the WORK, all tools, temporary structures and materials belonging to the CONTRACTOR shall be promptly taken away. The CONTRACTOR shall remove and promptly dispose of all water, dirt, rubbish or any other foreign substances.

Sec. 1.8.14. SALVAGE

Any existing CITY-owned equipment or material including but not limited to valves, pipes fittings, couplings, etc., which is removed or replaced as a result of construction may be designated as salvage by the CITY and, if so, shall be carefully excavated if necessary and delivered to the CITY at a location within the City.

Sec. 1.8.15. UTILITY SERVICE INTERRUPTION

No foreseeable work shall interrupt customer service without prior approval and direct coordination by the City. Written proposal shall be provided to the City for approval a minimum 96 hours before the proposed work. The Contractor shall notify in writing all affected customers a minimum 48 hours before the proposed work. The City shall maintain the ultimate authority to cease the work and reinstate customer service at any time during the shutdown if the approved scope of the work is not strictly adhered to.

Sec. 1.8.16. SHOP DRAWING AND SAMPLES

Prior to construction the CONTRACTOR shall submit three (3) copies of the shop drawings, signed by the DEVELOPER′S ENGINEER, to the CITY. The data shown on the shop drawings shall be complete with respect to dimensions, design criteria, materials of construction and the like to enable review of the information as required.

The CONTRACTOR shall, if requested by the CITY, furnish certificates, affidavits of compliance, test reports, or samples for check analysis for any of the materials specified in this MANUAL.

SECTION 1.19. WASTEWATER FORCE MAINS

Sec. 1.19.1. GENERAL

These specifications cover the pipe, fittings, and accessory items used for wastewater force main systems.

Pipe used in wastewater force main systems shall be either Polyvinyl Chloride (PVC), or Ductile Iron Pipe (DIP). Above ground pipe and buried pipe with less than 30" of cover or 6" of clearance shall be ductile iron.

The CONTRACTOR shall be responsible for all materials furnished and stored, until the date of project completion. He shall replace at his expense all materials found to be defective or damaged in handling or storage. The CONTRACTOR shall, if requested by the CITY, furnish certificates, affidavits of compliance, test reports, or samples for check analysis for any of the materials specified herein. All pipe delivered to project site for installation is subject to random testing for compliance with the designated specifications.

Sec. .19.2. PIPE INSPECTION AND TEST

Requirements specified in Article 6 shall apply.

Sec. 1.19.3. PVC PIPE

1.19.3.1. PVC PIPE

Shall not be allowed; except on side streets and exclusive easements.

All PVC pipe of nominal diameter four (4) through twelve (12) inches shall be manufactured in accordance with AWWA standard C900. The PVC pipe shall have a minimum working pressure rating of 100 psi and shall have a dimension ration (DR) of 25. Pipe shall have the same O.D. as ductile iron pipe.

1.19.3.2. JOINTS

PVC pipe shall be integral bell, push on, type joints.

1.19.3.3. FITTINGS

Fittings used with PVC pipe shall conform to Section 9.19.4.

Sec. 1.19.4. DUCTILE IRON PIPE AND FITTINGS

1.19.4.1. DUCTILE IRON PIPE

All ductile iron pipe of nominal diameter four (4) through fifty four (54) inches shall conform to ANSI/AWWA A21.51/C151. A minimum of pressure Class 150 pipe shall be supplied for all sizes of pipe unless a higher class pipe is specifically called out in the DRAWINGS, or required by the CITY.

1.19.4.2. FITTINGS

All fittings shall be mechanical joint ductile iron or gray iron conforming to ANSI/AWWA A21.10/C110, 250 psi minimum pressure rating, or ductile iron compact fittings four (4) through twelve (12) inches in accordance with ANSI/AWWA A21.53/C123.

1.19.4.3. JOINTS

Joints for ductile iron pipe shall be push-on or mechanical joints and joints for fittings shall be mechanical joints conforming to ANSI/AWWA A21.11/C111, unless otherwise called for on the DRAWINGS. Where called for on the Drawings, restrained or flanged joints shall be provided. Above ground joints shall be flanged with galvanized bolts, nut and washers. Flanged joints shall conform to ANSI Standard B16.1-124 LB. Restrained joints shall conform to Article 5 of these STANDARDS.

1.19.4.4. COATINGS AND LININGS

Where ductile iron pipe and fittings are to be below ground or installed in a casing pipe the coating shall be a minimum 1.0 mil thick in accordance with ANSI/AWWA A21.51/C151. Where ductile iron pipe and fittings are to be installed above ground, pipe, fittings are to be installed above ground, pipe, fittings and valves shall be thoroughly cleaned and given one field coat (minimum 1.5 mils dry thickness) of rust inhibitor primer.

Intermediate and finished field coats of Alkyd shall also be applied by the CONTRACTOR (minimum 1.5 mils dry thickness each coat). Primer and field coats shall be compatible and shall be applied in accordance with the manufacturers recommendations. (See approved manufacturers' list in appendix.) Final field coat color shall be as directed by the CITY.

All ducticle iron pipe and fittings shall have an interior protective lining of "Protecto 401" epoxy or equal with a minimum dry film thickness of 40 mils applied by the pipe manufacturer.

1.19.4.5. POLYETHYLENE ENCASEMENT

The pipe shall be polyethylene encased (8 mil) where shown on the DRAWINGS, in accordance with ANSI/AWWA A21.51/C105.

Sec. 1.19.5. PIPE HANDLING

Requirements specified in Section 1.24.2. shall apply.

Sec. 1.19.6. AIR AND VACUUM RELEASE VALVES

.19.6.1. GENERAL

Wastewater force mains shall be equipped with air/vacuum release valves located at piping high points immediately upstream of dips, or other elevation declines. Valves shall be located in an enclosure as shown on the STANDARD DETAILS.

The valves shall be as described below.

1.19.6.2. WASTEWATER AIR/VACUUM VALVE

The valve body shall be of cast iron; the floats float guide and stem shall be of stainless steel. The valve shall be suitable for 100 psi working pressure. Valve shall have standard two (2) inch NPT inlet and outlet ports unless otherwise shown on the DRAWINGS. Provide back-flushing accessories.

Sec. 1.19.7. NOTIFICATION AND CONNECTION TO EXISTING MAINS

Sec. 1.19.8. VALVES

1.19.8.1. GENERAL

Valves smaller than 24" shall be resilient wedge gate valves.

Valves 24" and larger shall be resilient faced, eccentric valves.

Valves shall hold the test pressure, when applied in either direction.

All valves for Force Mains must have stainless steel stems and bonnet bolts.

1.19.8.2. VALVE CONSTRUCTION

1.19.8.2.1. Resilient Wedge Gate Valves shall be in accordance with AWWA C509.

* Shall have fusion bond epoxy coating.
* Shall have a synthetic rubber encapsulated gate.
* Shall have oil impregnated bronze mechanical components, for permanent lubrication.
* Shall have stainless steel stems and bonnet bolts.

Above ground service - flanged, O.S. & Y, handwheel.

Buried service - mechanical joint, NRS and nut.

Submerged or otherwise inaccessible, above ground service - flanged, NRS, floor stand or suitable operator.

1.19.8.2.2. Resilient Faced Eccentric Valves shall be in accordance with AWWA C-540 and C-507.

* Shall have a synthetic rubber encapsulated plug.
* Shall be permanently lubricated.
* Shall have welded, highnickel content, seat overlay.

Above ground service - flanged, handwheel.

Buried service - mechanical joint, totally enclosed operator, nut with extension.

Submerged or otherwise inaccessible, above ground.

Service - flanged, totally enclosed operator, floor stand or suitable equal.

Sec. 1.19.9. VALVE BOXES

Sec. 1.19.10. SEPARATION OF FORCE MAINS AND WATER MAINS

Requirements 10 feet horizontally from pipes carrying raw wastewater or storm water.

Sec. 1.19.11. FORCE MAIN CONSTRUCTION

Requirements specified in Section 1.23.5. shall apply.

Sec. 1.19.12. HYDROSTATIC TESTS

Requirements specified in Section 1.24.5. shall apply except that all pipe sections to be tested shall be subjected to a hydrostatic pressure of 150 psi.

Sec. 1.19.13. FINAL CLEANING

Prior to final inspection and acceptance of the force main by the CITY, CONTRACTOR shall remove all parts of the system. Flushing and cleaning shall remove all accumulated foreign material from the sewer system.

Sec. 1.19.14. LOCATION AND IDENTIFICATION

All force mains shall be installed with a continuous, insulated 10 gauge solid copper wire (Tracer Wire) taped directly on top of the pipe for location purposes. Terminate insulated locator wires, capable of extending 12 inches above top of box, at each valve box pad.

All force mains shall be green in color or marked with a continuous stripe located within the top 90 degrees of the pipe. Said stripe shall be a minimum 2 inches in width and shall be green in color. Paint should be touch-dry before backfilling. Warning tape shall be placed 12 to 18 inches above all pipe.

SECTION 1.10. EXCAVATION, BACKFILL, COMPACTION AND GRADING

Sec. 1.10.1. GENERAL

This Section covers excavation, backfill, fill and grading associated with utility trench and structural construction. All such WORK shall be performed by the CONTRACTOR concurrently with the WORK specified in Divisions IV and V of these specifications. The CONTRACTOR shall furnish all labor, materials, equipment and incidentals necessary to perform all excavation, backfill, fill, compaction, grading and slope protection required to complete the WORK shown on the DRAWINGS and specified herein. The WORK shall include, but not necessarily be limited to: pump stations, manholes, vaults, conduit, pipe, roadways and paving; all backfilling, fill and required borrow; grading; disposal of surplus and unsuitable materials; and all related WORK such as sheeting, bracing water handling.

Sec. 1.10.2. SOIL BORINGS AND SUBSURFACE INVESTIGATIONS

The CONTRACTOR shall examine the site and undertake subsurface investigations, including soil borings, before commencing the WORK. The CITY will not be responsible for presumed or existing soil conditions in the WORK area.

Sec. 1.10.3. EXISTING UTILITIES

CONTRACTOR shall locate existing utilities in the areas of WORK. If utilities are to remain in place, the CONTRACTOR shall provide adequate means of protection during earthwork operations. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, the CONTRACTOR shall consult the owner of such piping or utility immediately for directions. Payment for damage and repair to such piping or utilities is the CONTRACTORS responsibility. Refer to Section 1.8.2 for utility coordination requirements.

Sec. 1.10.4. MATERIAL

1.10.4.1. GENERAL

Materials for use as bedding and backfill, whether instituted or borrow, shall be as described under this section. The CONTRACTOR shall, upon request by the CITY, make an appropriate sample of this material available for testing by the CITY or its designated representative.

1.10.4.2 STRUCTURAL FILL

Materials for structural fill shall be bedding rock or select common fill as specified herein or other suitable material as approved by the CITY.

1.10.4.3. COMMON FILL

Shall be local materials as defined in the Florida Department of Transportation, Standard Specifications for Road and Bridge Construction, Section 902, Article 902-6.

Material falling within the above specifications, encountered during the excavation, may be stored in segregated stockpiles for reuse. All Material which, in the option of the CITY, is not suitable for reuse, shall be spoiled as specified herein for disposal of unsuitable materials.

1.10.4.4. SELECT COMMON FILL

Select common fill shall be as specified above from common fill, except that the material shall contain no stones larger than 2 inch in largest dimension, and shall be no more than 5 percent by weight finer than the No. mesh sieve.

1.10.4.5. BEDDING ROCK

Shall be FDOT, size no. 89 as defined in the Florida Department of Transportation, Standard Specifications for Road and Bridge Construction, Section 901, Article 901-1.4, Table 1.

Sec. 1.10.5. SHEETING AND BRACING IN EXCAVATIONS

1.10.5.1. GENERAL

If required to support the sides of excavations, to prevent any movement which could in any way diminish the width of the excavation below that necessary for proper construction and to protect adjacent structures, existing piping and/or foundation material from disturbance, undermining or other damage, the CONTRACTOR shall construct and maintain sheeting and bracing. Care shall be taken to prevent voids outside of the sheeting, but if voids are formed, they shall be immediately filled and rammed.

1.10.52 MISCELLANEOUS REQUIREMENTS

For trench sheeting for pipes, no sheeting is to be withdrawn if driven below mid-diameter of any pipe and no wood sheeting shall be cut off at a level lower than one foot above the top of any pipe unless otherwise directed by the CITY. If, during the progress of the WORK, the CITY decides that additional wood sheeting should be left in place, it may direct the CONTRACTOR to do so. If steel sheeting is used for trench sheeting, removal shall be as specified above, unless written approval is given by the CITY for an alternate method of removal. All sheeting and bracing not left in place shall be carefully removed in such a manner as not to endanger the construction of other structures, utilities, existing piping or property. Unless otherwise approved or indicated on the Drawings or in the Specifications, all sheeting and bracing shall be removed after completion of the substructure. All voids left or caused by withdrawal

of sheeting shall be immediately refilled with sand be ramming with tools specially adapted to that purpose, by watering or otherwise as may be directed.

The operations shall not cause injury to any portion of the WORK completed, or in progress, or to the surface of streets, or to private property. The dewatering operation shall comply with the requirements of appropriate regulatory agencies. Additionally, where private property will be involved, advance permission shall be obtained by the CONTRACTOR. Permission shall be obtained prior to discharging into storm drains. Discharging into sanitary sewer systems shall not be permitted.

1.10.5.3. ADDITIONAL REQUIREMENTS

The CONTRACTOR shall, at all times during construction, provide and maintain proper equipment and facilities to remove promptly and dispose of properly all water entering excavations and keep such excavations dry so as to obtain a satisfactory undisturbed subgrade foundation condition until the fill, structure, or pipes to be build thereon have been completed to such extent that they will not befloated or otherwise damaged by allowing water levels to return to natural elevations.

Dewatering shall at all times be conducted in such a manner as to preserve the natural undisturbed bearing capacity of the subgrade soils at proposed bottom of excavation.

It is expected that well points will be required for predrainage of the soils prior to final excavation for some of the deeper in-ground structures, or piping and for maintaining the lowered groundwater level until construction has been completed to such an extent that the structure, pipeline or fill will not be floated ro otherwise damaged. Well points shall be surrounded by suitable filter sand and negligible fines shall be removed by pumping.

The CONTRACTOR shall furnish all materials and equipment and perform all work required to install and maintain the drainage systems for handling groundwater and surface water encountered during construction of structures, pipelines and compacted fills.

During structure construction and backfilling, water levels shall be measured in observation wells located as directed by the ENGINEER.

The right of the CITY to order sheeting and bracing left in place shall not be construed as creating any obligation on its part to issue such orders, and its failure to exercise its right to do so shall not relieve the CONTRACTOR from liability for damages to persons or property occurring from or upon the work occasioned by negligence or otherwise, growing out of a failure on the part of the CONTRACTOR to leave in place sufficient sheeting and bracing to prevent any caving or moving of the ground.

The CONTRACTOR shall construct the cofferdams and sheeting outside the neat lines of the foundation unless indicated otherwise to the extent he deems it desirable for his method of operation. Sheeting shall be plumb and securely braced and tied in position.

Sheeting, bracing and cofferdams shall be adequate to withstand all pressures to which the structure will be subjected. Pumping, bracing and other work within the cofferdam shall be done in a manner to avoid disturbing any construction already performed. Any movement or bulging which may occur shall be corrected by the CONTRACTOR at his own expense so as to provide the clearances and dimensions.

Sec. 1.10.6 DEWATERING, DRAINAGE AND FLOTATION

1.10.6.1. GENERAL

The CONTRACTOR shall excavate, construct and place all pipelines, concrete work, fill, and bedding rock, in-the-dry. Pipe trenches and other construction excavations shall be kept dry by well pointing, rim ditch and sump, bedding rock and sump or other methods as allowed by the permitting authorities and approved by the City. For purposes of these specifications Ain-the-dry@ shall be considered as no standing water and no loose saturated soils.

Discharge water shall be clear, with no visible soil particles. Stilling ponds or other methods of filtering silt may be necessary for sumping operations. Discharge from dewatering shall be disposed of in such a manner that it will not interfere with the normal drainage of the area in which the WORK is being performed, create a public nuisance, or form ponding.

Continuous pumping will be required as long as water levels are require to be natural levels.

Electric pumps shall be utilized where practicable, in order to minimize noise. Residential type mufflers shall be used on all piston driven pumps or generators.

Sec. 1.10.7 EXCAVATION

1.10.7.1. GENERAL

Excavation consists of removal and storage or disposal of material encountered when attaining required grade elevations and in accordance with the notes shown in the Drawings.

Authorized earth excavation includes removal and disposal of pavements and other obstructions visible on ground surface, underground structures and utilities indicated to be demolished and removed, and other materials encountered that are not classified as rock excavation or unauthorized excavation. Unauthorized excavation consists of removal of material beyond the limits needed to establish required grade and subgrade elevations without specific direction of the CITY. Unauthorized excavation, as well as remedial work directed by the CITY shall be at the CONTRACTORS expense. Such remedial work shall be performed as directed by the CITY.

If requested by the CITY, when excavation has reached required subgrade elevations, a Geotechnical/Soils Engineer shall make an inspection of conditions. If the subgrade is unsuitable, CONTRACTOR shall carry excavation deeper and replace excavated material with select common fill or bedding rock, as directed by the CITY.

If the CONTRACTOR excavates below grade through error or for his own convenience or through failure to properly dewater the excavation or disturbs the subgrade before dewatering is sufficiently complete, he may be directed by the CITY to excavate below grade and refill the excavation using select common fill or bedding rock.

Sloped sides of excavations shall comply with local codes and ordinances, and with OSHA requirements. CONTRACTOR shall shore and brace where sloping is not possible due to space restrictions or instability of the material being excavated. Shoring and slopes shall be maintained in a safe condition until completion of the work.

CONTRACTOR shall stockpile satisfactory excavated materials at a location approved by the CITY until required for backfill and fill. When needed in the WORK, material shall be located and graded at the direction of a Geotechnical/Soils Engineer.

Stockpiles shall be placed and graded for proper drainage. All soil materials shall be located away from the edge of excavations. All surplus and/or unsuitable excavated material shall be legally disposed of by the CONTRACTOR. Any permits required for the hauling and disposing of this material shall be obtained by the CONTRACTOR prior to commencing hauling operations.

1.10.7.2. EXCAVATION FOR STRUCTURES

All such excavations shall conform to the elevations and dimensions shown on drawing within a tolerance of plus or minus 0.10 feet and extending a sufficient distance from footings and foundations to permit placing and removing form work, installation of services and other construction, inspection or as shown on the Drawings. In excavating for footings and foundations, care shall be exercised not to disturb the bottom of the excavation. Bottoms shall be trimmed to required lines and grades to leave a solid base to receive concrete.

1.10.7.3. TRENCH EXCAVATION

Excavation for all trenches required for the installation of utility pipes shall be made to the depths indicated on the Drawings and in such manner and to such widths as will give suitable room for laying the pipe within the trenches, for bracing and supporting and for pumping and drainage facilities.

The bottom of the excavations shall be firm and essentially dry and in all respects acceptable to the CITY.

Where pipes are to be laid in bedding rock, select common fill or encased in concrete, the trench may be excavated to or just below the designated subgrade. The material remaining in the bottom of the trench shall be no more than slightly disturbed.

Where the pipes are to be laid directly on the trench bottom, bell holes shall be made as required.

Sec. 1.10.8. BEDDING AND BACKFILL

1.10.8.1. GENERAL

Material placed in fill areas under and around structures and pipelines shall be deposited within the lines and to the grades shown on the DRAWINGS or as directed by the CITY, making due allowance for settlement of the material. Fill shall be placed only on properly prepared surfaces which have been inspected and approved by the CITY. If sufficient select common or common fill material is not available from excavation on site, the CONTRACTOR shall provide fill as may be required.

Fill shall be brought up in substantially level lifts starting in the deepest portion of the fill. The entire surface of the WORK shall be maintained free from ruts and in such condition that construction equipment can readily travel over any section.

Fill shall be placed and spread in 8" to 12" layers unless otherwise specified. Prior to the process of placing and spreading, all materials not meeting those specified under Section 9.4 shall be removed from the fill areas. The CONTRACTOR shall assign a sufficient number of men to this WORK to insure satisfactory compliance with these requirements.

If the compacted surface of any layer of material is determined to be too smooth to bond properly with the succeeding layer, it shall be loosened by harrowing or by another approved method before the succeeding layer is placed.

All fill materials shall be placed and compacted Ain-the-dry@. The CONTRACTOR shall dewater excavated areas as required to perform the work and in such a manner as to preserve the undisturbed state of the natural inorganic soils.

Prior to filling, the ground surface shall be prepared by removing vegetation, debris, unsatisfactory soil materials. CONTRACTOR shall plow, strip or break up sloped surfaces steeper than one vertical to four horizontal so that fill material will bond with the existing surface. When existing ground surface has a density less than that specified under Section 10.9 for the particular area classification, CONTRACTOR shall break up the ground surface, pulverize, moisture-condition to the optimum moisture content and compact to required depth and percentage of maximum density.

Material which is too wet shall be spread on the fill area and permitted to dry, assisted by harrowing if necessary, until the moisture content is reduced to allowable limits. If added moisture is required, water shall be applied by sprinkler tanks or other sprinkler

systems, which will insure uniform distribution of the water over the area to be treated and give complete and accurate control of the amount of water to be used. If too much water is added, the area shall be permitted to dry before compaction is continued. The CONTRACTOR shall supply all hose, piping, valves, sprinklers, pumps, sprinkler

tanks, hauling equipment and all other materials and equipment necessary to place water in the fill in the manner specified. CONTRACTOR shall compact each layer to required percentage of maximum dry density or relative dry density in accordance with Section 10.9. Backfill or fill material shall not be placed on surfaces that are muddy, frozen or contain frost or ice. When unavoidable wet conditions exist, bedding rock shall be used for backfilling.

1.10.8.2 BEDDING AND BACKFILL FOR STRUCTURES

Bedding rock shall be used for bedding under all precast structures as indicated on the STANDARD DETAILS. The CONTRACTOR shall take all precautions necessary to maintain the bedding in a compacted state and to prevent washing, erosion or loosening of this bed. Appropriate fill shall be used as backfill against the exterior walls of the structures. Fill shall be compacted sufficiently in accordance with Section 10.9.2. of these specifications.

Backfilling shall be carried up evenly on all walls of an individual structure. No backfilling shall be allowed against walls until the walls and their supporting slabs, if applicable, have attained sufficient strength.

In locations where pipes pass through building walls, the CONTRACTOR shall take precautions to consolidate the fill up to an elevation of at least one (1) foot above the bottom of the pipes. Structural fill in such areas shall be placed for a distance of not less than three (3) feet either side of the center line of the pipe in level layers not exceeding eight (8) inches in depth.

The surface of filled areas shall be graded to smooth true lines, strictly conforming to grades indicated on the DRAWINGS. No soft spots or uncompacted areas will be allowed in the WORK.

Temporary bracing shall be provided as required during construction of all structures to protect partially completed structures against all construction loads, hydraulic pressure and earth pressure. The bracing shall be capable of resisting all loads applied to the walls as a result of backfilling.

1.10.8.3. BEDDING AND BACKFILL FOR PIPES

Bedding for pipe shall be as shown on the PLANS and detailed on the STANDARD DETAILS. The CONTRACTOR shall take all precautions necessary to maintain the bedding in a compacted state and to prevent washing, erosion or loosening of this bed.

Backfilling over and around pipes shall begin as soon as practicable after the pipe has been laid, jointed and inspected. All backfilling shall be prosecuted expeditiously and as detailed on the STANDARD DETAILS.

Any space remaining between the pipe and sides of the trench shall be carefully backfilled and spread by hand or approved mechanical device and thoroughly compacted with a tamper as fast as placed, up to a level of one (1) foot above the top of the pipe. The filling shall be carried up evenly on both sides. Compaction shall be in accordance with the STANDARD DETAILS and Section 10.9.

The remainder of the trench above the compacted backfill, as just described above, shall be filled and throughly compacted in uniform layers. Compaction shall be in accordance with the STANDARD DETAILS and Section 10.9.

Sec. 1.10. 9. COMPACTION

1.10. 9.1. GENERAL

The CONTRACTOR shall control soil compaction during construction to provide the percentage of maximum density specified. The CONTRACTOR shall be provided copies of all soils testing reports, prepared by a GETECHNICAL/SOILS ENGINEER, demonstrating compliance with these SPECIFICATIONS.

The following minimum soils compaction requirements are applicable to all WORK unless a greater degree of compaction is required by the permitting authority or special requirement of the Engineer.

1.10. 9.2. PERCENTAGE OF MAXIMUM DENSITY REQUIREMENTS

When existing trench bottom has a density less than 95% of the maximum dry density as determined by AASHTO/T-180, the CONTRACTOR shall compact to required percentage of maximum density.

Fill or undisturbed soil from the bottom of the pipe trench to grade shall be densified to a minimum density of 95% of the maximum dry density as determined by AASHTO T-180.

Fill under and around structures and paving, and to the extent of the excavation shall be densified to a minimum density of 98% of the maximum dry density as determined by AASHTO T-180.

1.10. 9.3. COMPACTION TESTS

In general, one compaction test shall be taken for each 12" layer of fill for each 300 feet of pipe and for every 100 square feet of backfill around structures. The CITY may determine that more compaction tests are required to certify the installation depending on field conditions.

CONTRACTOR shall be liable for all costs associated with retesting of soils on Capital Projects, and Developer shall be responsible for these costs on private development projects.

Sec. 1.10.10. GRADING

All areas within the limits of construction, including transition areas, shall be uniformly graded to produce a smooth uniform surface. Areas adjacent to structures or paved surfaces shall be graded to drain away from structures and pavement. Ponding shall be prevented. The area shall be compacted to the specified depth and percentage of maximum density.

No grading shall be done in areas where there are existing utilities that may be uncovered or damaged until such lines have been relocated or otherwise protected.

Sec. 1.10.11 MAINTENANCE

CONTRACTOR shall protect his graded areas from traffic and erosion and keep them free of trash and debris. CONTRACTOR shall repair and reestablish grades in settled, eroded and rutted areas.

Sec. 1.10.12. INSPECTION AND QUALITY ASSURANCE

1.10.12.1. INSPECTION

CONTRACTOR shall examine the areas and conditions under which excavating, filling and grading are to be performed, and shall not proceed until disputed conditions have been resolved. CONTRACTOR shall examine existing grade prior to commencement of WORK and report to the CITY if elevations or existing grade vary from elevations shown on DRAWINGS.

1.10.12.2. QUALITY ASSURANCE

All work shall be performed in compliance with applicable requirements of governing authorities having jurisdiction.

The CITY shall be responsible for costs associated with soils testing and geotechnical inspection services on Capital projects. The Developer shall be responsible for costs associated with soils testing and geotechnical inspection services on private development projects.

Quality assurance testing shall be performed during construction to ensure compliance with the Contract. CONTRACTOR shall provide all assistance necessary to allow the testing service to inspect and approve fill materials and fill layers before further construction is performed. The CONTRACTOR shall at all times demonstrate compliance with the compaction requirements stipulated in the MANUAL.

SECTION 1.11. BORING AND JACKING

Sec. 1.11.1. GENERAL

The installation of a casing pipe by the method of boring and jacking shall be covered by these specifications. The overall work scope shall include, but not limited to, boring and jacking pits and equipment, sheeting, steel casing pipe, skid, steel straps, coatings, location signs as required, miscellaneous appurtenances to complete the entire WORK as shown on the STANDARD DETAILS, and restoration. Applicable provisions of Division III, IV, and V shall apply concurrently with these specifications. Boring and jacking operations shall be performed within the right-of way and/or easements shown on the DRAWINGS.

Sec. 1.11.2. PIPE MATERIALS

1.11.2.1. STEEL CASING

Steel casings shall conform to the requirements of ASTM Designation A139 (straight seam pipe only) Grade "B" with a minimum yield strength of 35,000 psi. Minimum casing pipe size and wall thickness shall be as indicated in the following table, where Polk County and D.O.T. requirements are for road crossings and CSX Transportation requirements are for railroad crossings, unless otherwise shown or specified:

F.D.O.T./Polk County		CSX Railroad		
O.D.	Wall	O.D.	Coated	Noncoated
12"	0.188"	12"	0.188"	0.251"
14"	0.188"	14"	0.219"	0.282"
16"	0.188"	16"	0.219"	0.282"
24"	0.250"	24"	0.344"	0.407"
30"	0.312"	30"	0.406"	0.469"
36"	0.375"	36"	0.469"	0.532"
42"	0.500"	42"	0.500"	0.563"

Field and shop welds of the casing pipes shall conform with the American Welding Society (AWS) standard specifications. Field welds shall be complete penetration, single-bevel groove type joints. Weld shall be airtight and continuous over the entire circumference of the pipe and shall not increase the outside pipe diameter by more than 3/4 inch.

1.11.2.2. CARRIER PIPE

The carrier pipe shall be a minimum pressure class 150 ductile iron pipe, greater if otherwise indicated. Ductile iron pipe shall comply with all areas of these specifications. Carrier pipe joints shall be individually restrained.

1.11.2.3. INSPECTION

All casing pipe to be installed may be inspected at the site of manufacture for compliance with these Specifications by an independent laboratory selected and paid for by the CITY. The manufacturer's cooperation shall be required in these inspections.

All casing pipe shall be subjected to a careful inspection prior to being installed. If the pipe fails to meet the specifications it shall be removed and replaced with a satisfactory replacement at no additional expense to the CITY.

1.11.2.4. CERTIFICATION

All casing pipe shall be accompanied by manufacturer's certification that casing meets all specified standards, with an enumeration of each parameter specified herein and such other parameters as required by the permitting authority.

Sec. 1.11.3. PIPE HANDLING

Care shall be taken in loading, transporting, and unloading to prevent injury to the pipe or coatings. Pipe shall not be dropped. All pipe shall be examined before laying, and no piece shall be installed which is found to be defective. Any damage to the pipe or coatings shall be repaired to the satisfaction of the CITY.

Sec. 1.11.4. CONSTRUCTION REQUIREMENTS

1.11.4.1. WORK COORDINATION

It shall be the CONTRACTOR's responsibility to perform the boring and jacking work in strict conformance with the requirements of the agency in whose right of way or easement the work is being performed. Any special requirements of the agency such as insurance, flagmen, etc., shall be strictly adhered to during the performance of WORK. The special requirements shall be performed by the CONTRACTOR.

1.11.4.2. DEWATERING

Dewatering through the casing during construction shall not be permitted. All dewatering methods shall be as specified in Section 1.10.

1.11.4.3. CARRIER PIPE SUPPORT

The carrier pipes shall be supported within the casing pipes so that the pipe bells do not rest directly on the casing. The load of the carrier pipes shall be distributed along the casing by casing spacers.

1.11.4.4. JACKING PITS

Excavation adjacent to the roads shall be performed in a manner to adequately support the roads. Bracing, shoring, sheeting or other supports shall be installed as needed. CONTRACTOR shall install suitable reaction blocks for the jacks as required. Jacking operations shall be continuous and precautions shall be taken to avoid interruptions which might cause the casing to "freeze" in place. Upon completion of jacking operations, the reaction blocks, braces, and all other associated construction materials shall be completely removed from the site.

1.11.4.5. MISCELLANEOUS REQUIREMENT

Correct line and grade shall be carefully maintained. Earth within the casing shall not be removed too close to the cutting edge in order to prevent the formation of voids outside the casing. If voids are formed, they shall be satisfactorily filled with grout by pumping.

The sections of steel casing shall be field welded in accordance with the applicable portions of AWWA C206 and AWS D7.0 for field welded pipe joints. CONTRACTOR shall wire brush the welded joints and paint with Inertol Quick-Drying Primer 626 by Koppers Company or approved equal. After completion of jacking, CONTRACTOR shall clean the interior of the casing of all excess material.

SEC. 1.11.5 DIRECTIONAL BORE DESIGN, REQUIREMENTS, AND POST-CONSTRUCTION STANDARDS

1.11.5.1 DESIGN / PRECONSTRUCTION REQUIREMENTS

The purpose of this standard is to provide guidelines for use by the development community and others during the design and installation of underground water mains and wastewater force mains using horizontal directional bores integral to the development of commercial, industrial, or residential subdivision properties.

1.11.5.1.1 REFERENCES

References for horizontal directional drilling include Mini-Horizontal Directional Drilling Manual (1995), North American Society of Trenchless Technology (NASTT), Chicago, IL; PPI Handbook of Polyethylene Piping (1998), Plastics Pipe Institute, Washington, D.C.; PLEXCO Polyethylene Industrial Piping Systems; "Technical Information; Technical Note: Horizontal Directional Drilling
(Guided Bore) with PLEXCO Pipe", et al.

1.11.5.1.2 ENGINEER RESPONSIBILITIES

The design ENGINEER assumes all responsibility for proper design of the directional bore.

The ENGINEER should determine if the soils at the site are suitable for directional drilling based on previous experience with the site soils or a geotechnical investigation. All existing utilities, surface and subsurface structures must be located (in three dimensions) for the design.

1.11.5.1.2.1 MINIMUM GROUND COVER

The minimum ground cover over a directionally bored water or wastewater utility line shall be 36 inches. There shall be at least 18 inches vertical clearance when crossing under any existing water main with a wastewater force main.

1.11.5.1.2.2 DESIGN CALCULATIONS

The ENGINEER should limit curvature in any direction to lessen force on the pipe during pullback. Ideally, the directional bore should lie in a vertical plane.

The ENGINEER shall submit, as part of the permits application plans submittal package, design calculations indicating predicted / permissible (maximum safe) pull force, pipe pull rating, and minimum permissible pipe bend radius. Maximum safe pull force shall be shown on the project design drawings. Some factors to be considered in calculating the safe pull force follow. Additional

discussion can be found in Appendix A. The pullback force is calculated at the leading end of the pipe behind the pulling head. The frictional resistance is highest just prior to movement and decreases with movement. When pullback ceases, frictional forces and drag forces increase due to the thixotropic nature of drilling mud. The mud starts to gel when it is undisturbed. Buoyant force pushes the pipe up against the top of the borehole, creating frictional drag between the pipe and the borehole.

Minimum curvature at the entry and exit pits is limited by the steering capabilities of the boring equipment. When the bending radius is too small, the safe pulling strength of **HDPE** pipe may be significantly reduced by the additional tensile stresses due to curvature. All bending stresses due to various curvatures in the boring path are additive and should be subtracted from the safe pull force. The "safe" pull-load is time dependent.

The ENGINEER must show the directional bore in profile view on the plans, showing the pipe as it should be installed. Maximum pull strength and minimum radius of curvature shall be listed. All existing utilities shall be shown on the plans. The ENGINEER shall provide signed and sealed "As-Built" drawings of the constructed bore path, including any abandoned in place bores. The ENGINEER shall certify that the pipe was installed within acceptable limits per the pipe specifications.

1.11.5.1.3 CONTRACTOR RESPONSIBILITIES

The CONTRACTOR shall supplyall labor, supervision, tools and equipment, and materials necessary to install carrier pipe by directional bore method for potable water or wastewater systems. Installation of the carrier pipe system includes the installation of water mains or wastewater force mains and/or any other devices or materials deemed necessary for the respective systems. For CITY projects, materials may be supplied by the City.

The CONTRACTOR shall provide experienced operators to perform directional boring. The operator shall have performed at least three directional bores of similar pipe diameter and bore length.

The CONTRACTOR shall be fully responsible for placement of the pipe per the ENGINEER's specifications. See Paragraph 2.2.7 for tolerances.

The CONTRACTOR shall supply experienced persons who have received proper training in the use of the fusion equipment according to the recommendations of the pipe manufacturer and fusion equipment supplier to perform thermal fusion of the specific HDPE pipe to be used.

1.11.5.1.4 EQUIPMENT

The directional drilling equipment shall consist of a directional-drilling rig of sufficient capacity to perform the bore and pull back the pipe.

The steerable, directional-boringequipment shall produce a stable fluid lined tunnel with a minimum burial depth of 36-inches for the carrier pipe installation.

The tunneling equipment shall employ a fluid cutting technique. The soil shall be cut by small diameter, high-pressure jets of drilling fluid. The jets shall cut the soil in advance of the boring tool, impregnating and lining the tunnel wall with drilling fluid. The drilling fluid shall be inert and pose no environmental risk, such as bentonite or a polymer-surfactant mixture producing a slurry of proper consistency.

The hydraulic power system shall be self-contained and free of leaks, with sufficient pressure and volume to power the drilling operation. Calibration of the electronic detection system shall be verified by uncovering the tool (head) at the first ten (10) foot point. The boring tool (head) shall be remotely steerable by means of an electronic detection system. The tool (head) location shall be monitored in three dimensions and logged every 10 feet from the drilling rig. The boring tool shall pull the carrier pipe through the fluid lined tunnel as it traverses the surface being crossed.

The rig shall have means to monitor and record the maximum pullback force during the pullback operation. The pulling strength of the boring equipment shall not exceed the HDPE pipe safety pull strength as per the manufacturer's recommendation.

1.11.5.1.4.1 BUTT FUSION

The butt fusion machine used to join sections of HDPE pipe shall have controls and gauges for setting pressures and temperatures used for facing, heating, and fusing.

Facing should be conducted at a pressure that produces properly faced pipe ends

Heating pressure should be set so that the pipe ends maintain contact against the heater, but are not forced against the heater (zero contact pressure).

Fusing pressure shall be as recommended by the pipe manufacturer and fusion equipment supplier.

Heater surfaces must be clean and free of contaminants such as dirt, oil, grease, and melted or charred plastic. To clean the heater, only wooden implements and clean, dry, lint-free non-synthetic cloths should be used. The heater should be checked periodically for uniform surface temperature using a surface pyrometer.

1.11.5.1.5 DIRECTIONAL BORE MATERIAL

1.11.5.1.6.1 PIPE

Pipe shall be High Density Polyethylene (HDPE) as per AWWA C906.

Carrier: HDPE pipe shall be DR 11, working pressure rating of 160 psi. The following are approved pipe manufacturers:

CRS, PolyPipe PE 3408, 4" to 24" diameter.
Plexco PE 3 408, 4" to 24" diameter.
Driscopipe 4000 Series, 4" to 24" diameter.

Material for pipes to be used for potable water application shall be approved by the National Sanitation Foundation (NSF).

All material must be inspected by Water Utilities Engineering 48 hours (two working days) before the bore begins.

1.11.5.1.6.2 FITTINGS

All fittings, sizes 4 inch and larger shall meet the requirements of AWWA Standard C 906-90 (or most recent revision).

All fittings shall be ductile iron pipe size.

All fittings shall meet the requirements of ANSI NSF Standard 61.

All fittings shall be made of materials conforming to polyethylene code designation PE 3408.

Standard dimension ratio shall be DR11.

Pressure class shall be 160 psi.

1.11.5.1.6.3 COLOR CODING

The piping shall be permanently coded to provide service identification. Stripes along the entire outside length of the pipe, 120 degrees apart, shall be made by co-extrusion or impregnation in accordance with the following schedule. Fully colored pipe co-extruded from permanently pigmented HDPE is also acceptable.

SERVICE	STRIPED PIPE	SOLID COLORED PIPE
Potable Water	Blue stripes	Blue
Reclaimed Water	Purple stripes	Purple
Wastewater	Green stripes	Green

Markings on the pipe shall include the following:

Nominal size and OD base.
Standard material code designation.
Dimension.
Pressure class.
AWWA designation (AWWA C906). Material test category of pipe.

1.11.5.1.7 TRACER WIRE

All piping shall be installed with a continuous, insulated, solid #10 gauge copper wire for water main or force main location purposes by means of an electronic line tracer.

The wire insulation shall be solid color in accordance with the coding described in 1.6.4 above. Blue coated (for water mains), or green coated (for wastewater), number 10 gauge UF (Underground Feeder per National Electric Code Article 339) solid tracer wire must be taped along all pipes. Sections of wire shall be spliced together using Pro-Trace TW Connectors. **Twisting the wires together is not acceptable.** Spools of #10 wire are available in 500-foot rolls.

Upon completion of the directional bore, the CONTRACTOR shall demonstrate to the CITY that the wire is continuous and unbroken through the entire run of the pipe by providing full signal conductivity (including splices) when energizing for the entire run in the presence of the INSPECTOR. If the wire is broken, the CONTRACTOR shall repair or replace it.

1.11.5.1.8 FITTINGS AND RESTRAINERS

1.11.5.1.8.1 PIPE FLANGE JOINTS

Pipe flange joints shall be made using a flange adapter which is butt fused to the HDPE pipe.

A back-up ring shall be fitted behind the flange adapter sealing surface flange for bolting to the mating flange. Standard back-up rings shall be AWWA C207 Class D for 160 psi and lower pressure ratings.

One edge of the back-up ring must be chamfered to fit up against the back of the sealing surface flange.

1.11.5.1.8.2 MECHAINCAL JOINTS

Mechanical joints to polyethylene pipe shall be fully constrained by compressing the pipe OD against a rigid tube or stiffener in the pipe bore. The stiffener shall be stainless steel.

Approved joint restraining devices are Mega-Lug and MJR.

1.11.5.1.9 MAINTENANCE OF TRAFFIC

The maintenance of traffic, in accordance with the governing right-of-way authority, shall be the responsibility of the CONTRACTOR.

If the CONTRACTOR has the capability within his organization, he shall provide the necessary personnel and equipment for maintenance of traffic. Persons participating in maintenance of traffic operations must be FDOT qualified and copies of their certificates verifying their qualifications shall be provided to Water Utilities Engineering prior to start of the directional work.

If the CONTRACTOR is unable to provide the required maintenance of traffic, he shall subcontract the work to supply the necessary personnel and equipment. The use of a subcontractor's personnel and equipment shall in no way transfer the responsibility for the maintenance of traffic from the CONTRACTOR.

1.11.5.2 CONSTRUCTION REQUIREMENTS

1.11.5.2.1 GENERAL

All directional bore operations shall be contained within right-of-way and / or easements shown on the DRAWINGS.

Work shall not start until the CONTRACTOR has all necessary permits from the appropriate governing regulatory agencies, including the Town of Lake Hamilton Public WorksEngineering group, and not until Water Utilities Engineering has been given 48 hours (twoworking days) prior notification to inspect construction materials. Any material may berejected if out of specification or damaged (i.e. out-of-round, deep cuts, etc.).

CONTRACTOR shall not begin drilling operation until the INSPECTOR is present. The INSPECTOR must be present during the entire boring operation once the ground is penetrated.

1.11.5.2.1.2 INSPECTION SCHEDULES

The CONTRACTOR is to schedule the directional bore such that the INSPECTOR is on site. Boring operations will not begin before 8:00AM and the commencement of boring operations will not start after 1:00PM all boring are to be completed before 4:00PM unless approved by Town of Lake Hamilton Water Utilities Department. **There will be no boring operations allowed on Friday, Saturday, Sunday or holidays.**

1.11.5.2.2 CONTRACTOR RESPONSIBILITIES

The CONTRACTOR shall provide the following materials and services for directional bore unless otherwise specified by OWNER / DEVELOPER:

Traffic control.
Tracer wire for carrier pipe (#10 gauge or larger, solid), per standards.
Site preparation and excavation.
Dewatering – Groundwater Pump or Well Point System as needed.
Sheeting and shoring, as necessary.
All fusion welding.
Preliminary site restoration (fill open pits, grading).
Site cleanup including removal and proper disposal of all waste materials and drilling fluid.

The CONTRACTOR shall record data on the bore log (see section 1.11.5.2.2.1) and shall also ensure the following items are monitored and controlled:

Calibrate locator/tracking system
Field verify calibration by field measurement of actual location of first rod
Ensure that the flow of bentonite is continuous
Ensure pulling pressure does not exceed pipe manufacturer's specifications
Fusing of pipe is within pipe manufacturer's specifications
Cool down time is calculated and complied with
Pipe is fused prior to start of extended bores (ie. Greater than 100 linear feet).

1.11.5.2.2.1 MEASUREMENT RECORDING

The CONTRACTOR shall record location and depth measurements every ten (10) feet over the course of the bore and provide that data to the CITY. Data collected by the City inspector does notrelieve the Contractor from the responsibility of recording his own data. The CONTRACTOR shall log all necessary data from the locator / tracking system:

Position. Roll Angle. Tilt Angle.
Depth – Every ten (10) feet. Temperature of Data
Transmitter. Remaining Battery Life.
Pull Back Force (Maximum pull back force shall be recorded).

1.11.5.2.2.2 MATERIALS

CONTRACTOR shall supply the following materials:

All HDPE fittings, couplings, and carrier pipe (unless otherwise specified). Final site restoration (sod, seed, mulch, concrete/ asphalt repair).
Required Right-Of-Way Permits.

1.11.5.2.2.3 PERMITS AND INSPECTIONS

An INSPECTOR for the CITY shall witness and verify the CONTRACTOR'S logging of pertinent data. The INSPECTOR may log his own data in the Department's own Directional Bore Log sheet for the City's use.

CONTRACTOR shall notify all involved agencies prior to start of construction. The CONTRACTOR is responsible for verifying that all permits are current and not expired. The CONTRACTOR shall notify the ENGINEER of Record and the CITY if expired.

The CONTRACTOR shall call "Sunshine State One-Call" (phone number: 800-432-4770) 48 hours prior to performing any excavation. The CONTRACTOR shall confirm the location of utilities before starting the directional bore.

1.11.5.2.2.4 DRAWINGS

The CONTRACTOR shall perform directional bore in accordance with the approved project DRAWINGS. In no case shall the bore extend into private property unless an easement is provided prior to start of construction. Vertical tolerances shall be plus or minus 1 foot of elevations shown on drawings. Horizontal tolerances shall be plus or minus 2 feet of alignment shown in drawings. These tolerances shall be met unless required separations for other utilities must be met and puts the bore in conflict. Failure to meet tolerances, if not preapproved by ENGINEER, may be grounds for rejecting the bore. The CONTRACTOR may, at the discretion of the ENGINEER, be required to abandon the bore and re-drill a new one at CONTRACTOR's own expense.

1.11.5.2.2.5 SAFETY AND DUE CARE

The CONTRACTOR shall provide all structures, safety equipment, and professional services required for the health and safety of the general public and of personnel involved in directional boring work in accordance with the requirements of the Federal, State, and Local Authorities. This includes proof of construction personnel certificates of trench safety training at the time of construction.

The CONTRACTOR shall take all measures necessary to protect surrounding public and private property, adjacent buildings, roads, drives, sidewalks, drains, sewers, utilities, trees, structures, and appurtenances from damage due to directional bore work.

The CONTRACTOR shall exercise due care at all times and shall not apply more than the safe pull force to the carrier pipe recommended by the ENGINEER.

1.11.5.2.2.6 TRACER WIRE

The CONTRACTOR shall install a blue coated #10 gauge solid tracer wire on all water carrier pipe and green coated #10 gauge solid tracer wire on all wastewater force main carrier pipe. The CONTRACTOR will be responsible to provide a tracer wire that test positive and negative for continuity for the entire length.

The CONTRACTOR shall perform a 12-volt DC electrical continuity test on each of the wire. Test each wire with both positive and negative charge. No more than one volt of loss per 1000 feet of wire will be acceptable. The locator wire system shall pass the 12-volt DC electrical continuity test for at least one wire prior to final acceptance of the pipeline. Any cuts or breaks in the wire shall be repaired by the Contractor at his expense. Section of wire shall be spliced together using Pro-Trace TW Connectors. **Twisting the wires together is not acceptable.**

1.11.5.2.2.7 INSPECTION NOTIC

CONTRACTOR shall give 48-hour (two working days) advance notice to CITY prior to start of work. The INSPECTOR is required to inspect materials **prior to the bore** and to be on site during the boring operation and installation of the pipe.

1.11.5.2.2.8 SURFACE DEFECTS

The CONTRACTOR shall be fully responsible for all steerable, fluid lined directional boring operation. Any noticeable surface defects resulting from operation of this boring equipment shall be repaired by the CONTRACTOR at his expense. The CONTRACTOR is recommended to take preconstruction videos of the construction site to avoid unwarranted claims for damages resulting from the construction.

1.11.5. 2.2.9 INSURANCE

The CONTRACTOR shall meet all CITY insurance requirements, as defined by the City's Risk Management Department, when working in a right-of-way, using a right-of-way use permit.

1.11.5.2.3 DRILLING REQUIREMENTS

The horizontal alignment shall be as shown on the drawings, plus or minus 2 feet. The vertical alignment shall be as shown on the drawings, plus or minus 1 foot. If the CONTRACTOR cannot meet these tolerances for whatever reason, he shall confer with the ENGINEER prior to the start of the bore and the ENGINEER shall approve any changes.

The pipe shall have a minimum cover of 36 inches.

Compound curvatures should be minimized as the safe pulling strength of the pipe may be significantly reduced by the additional tensile stresses due to curvatures. This is limited by the maximum deflection as set forth by the HDPE pipe manufacturer or AWWA Standards, whichever is more stringent.

The entry angle should be 12º to 14º ideally (not to exceed 15º). Exit angle should be 6º to 12º to facilitate the pullback operation.

Erosion and sedimentation control measures and on-site containers shall be installed to prevent drilling mud from spilling out of entry and/or exit pits.

Drilling mud shall be disposed of off-site in accordance with applicable local, State and Federal requirements and/or permit conditions.

Pilot holes shall be drilled on bore path with no deviation greater than plus or minus 1 foot from the design depth over a length of 100 feet. In the event that the allowable deviation is exceeded, **the CONTRACTOR shall notify the ENGINEER/CITY, and the CITY may require the ENGINEER/DEVELOPER/CONTRACTOR to pull back and re-drill from a location along the bore path before the deviation.**

Upon successful completion of the pilot hole, the borehole shall be reamed to a minimum of 25 percent greater than the outside diameter of the pipe being installed. For bores with more than two radii of curvature (entrance and exit), the borehole should be reamed up to 50 percent larger than the outside diameter of the carrier pipe.

The CONTRACTOR shall not attempt to ream at a rate greater than the drilling equipment and mud system are designed to safely handle.

In the event of a drilling hole blowout, the CONTRACTOR shall be responsible for restoring to original condition any damaged property and cleaning up the environment in the vicinity of the blowout.

1.11.5.2.4 PIPE INSTALLTION

After reaming the borehole to the required diameter, the pipe shall be pulled through the hole. In front of the pipe shall be a swivel and barrel reamer to compact the borehole walls.

Once pullback operations have commenced, the operation shall continue without interruption until the pipe is completely pulled into the borehole. The frictional resistance is the highest just prior to movement and decreases with movement. When pullback ceases, frictional forces and drag forces increase due to the thixotropic nature of drilling mud. The mud starts to gel when it is undisturbed. Therefore, PULLBACK SHALL NEVER BE STOPPED, EXCEPT FOR DRILLING ROD REMOVAL, UNTIL THE PIPE IS COMPLETELY PULLED INTO ITS PERMANENT POSITION.

Adequate lengths of pipe shall be provided at both the launching and receiving ends to facilitate service connection assemblies.

After pullback, pipe may take several hours to recover from the axial strain. When pulled from the reamed borehole, the pull-nose should be pulled out 3-4 percent longer than the total length of the pull to avoid having the pull-nose sucked back below the borehole exit level due to stretch recovery and thermal contraction to an equilibrium temperature.

The pipe entry area shall be graded as needed to provide support for the pipe and to allow free movement into the borehole. The pipe shall be guided into the borehole to avoid deformation of, or damage to, the pipe.

The pipe shall be installed in a manner that does not cause upheaval, settlement, cracking, and movement or distortion of surface features. Any damages caused by the CONTRACTOR's operations shall be corrected by the CONTRACTOR.

In the event that unexpected subsurface conditions impeding drilling operations are encountered, the procedure shall be stopped and not continued until the CITY has been consulted. The pipe shall be pulled back through the borehole using the wet insertion construction technique.

If the final grade of the finished bore is not satisfactory to the CITY or any other jurisdictional entity, the pipe shall be abandoned, **full pressure grouted in place in accordance with the jurisdictional entity**, and an alternate installation shall be made. The abandoned pipe shall be properly shown on "as-built" drawings to be submitted following conclusion of the construction work.

The INSPECTOR shall inspect the installed pipe for roundness and / or damage. Evidence of over-pulling or significant surface scratching shall be brought to the attention of the ENGINEER and the CITY. Deformations of more than 10 percent may be grounds to abandon the bore and have the CONTRACTOR re- drill another line.

1.11.5.2.5 BUTT FUSION PROCEDURES

Fusion welds shall be performed by an experienced technician that has been properly trained to meet the pipe manufacturer's procedures. All welds shall meet the pipe manufacturer's recommendations.

The CONTRACTOR may do a preliminary pressure test on the completed string of pipe prior to installation. A pressure test shall be required on the completed directional bore prior to final acceptance.

1.11.5.2.5.1 PIPE JOINING

As the pipe ends are melted against the heater during the heating period, the molten plastic will swell and form melt beads around the pipe ends. The melt beads should be the same size on both pipe ends, and uniformly sized all the way around.

After melting has been completed, the ends should be separated just enough to remove the heater, observed for uniformity of the beads and quickly (within three seconds) brought together with the recommended pressure. If melted plastic sticks to heater, the two ends should not be joined. The ends should be allowed to cool and the procedure started over. Excess pressures should not be used as this will squeeze too much melt out of the fusion area and result in a weakened joint.

1.11.5.2.6 CONNECTING TWO SECTIONS OF DIRECTIONALLY BORED PIPE

If the overall length of the required utility installation can not be safely pulled using one directional bore, then the CONTRACTOR shall be required to make more than one pull to accomplish the installation.

Where two adjacent pulls meet, the CONTRACTOR shall dig a pit and join the two sections together at the elevation of the two segments as if it were a continuous pull-in.

The two sections of HDPE shall be joined together using an electrofusion coupling per the coupling manufacturer's recommendations.

1.11.5.3 POST-CONSTRUCTION

The as-built variance from the specified bore path shall not exceed plus or minus 1 foot in the vertical plane and plus or minus 2 feet in the horizontal plane.

The CONTRACTOR shall be considered as having completed the requirements of the directional bore when he has successfully completed the work, including pressure testing, to the satisfaction of the DEVELOPER/OWNER's ENGINEER and the CITY INSPECTOR.

The completed HDPE water main or force main shall be pressure tested at 150 psi minimum for two hours for final acceptance and the pressure shall not fall below 150 psi during the test period.

1.11.5.3.1 AS-BUILTS

When the directional bore is completed, the CONTRACTOR shall provide data log sheets and marked up as built drawings to the INSPECTOR, and the DEVELOPER/OWNER's ENGINEER, as required.

APPENDIX A
DIRECTIONAL BORE DESIGN FACTORS

Calculations for computing the maximum safe pullback force should be submitted with the project design package.

The following equations from the PLEXCO Polyethylene Industrial Piping Systems; "Technical Information; Technical Note: Horizontal Directional Drilling (Guided Bore) with PLEXCO Pipe", are presented for estimating **some** of the factors to be considered in designing a successful directional bore. They are based upon approximations and are for "ideal" conditions. They are by no means all of the considerations to be used in designing a directional bore.

The designer is totally responsible for the design of the directional bore and use of the following shall not transfer any of that responsibility to the CITY. The CITY makes no claim to the accuracy or completeness of the equations.

(a) PULLBACK FORCE: The pullback force is calculated at the leading end of the pipe behind the pulling head. For pipe pulled in straight level bores, the frictional resistance or required pulling force, F_p, is approximated by:

$F_P = \mu \times W_B \times L$,
Where μ is the coefficient of friction between pipe and ground;
w_B is the net downward or upward force on the pipe (lb/ft); and L is length (ft).

(b) FRICTIONAL RESISTANCE OF DRILLINGMUD: The frictional resistance is highest just prior to movement and decreases with movement. When pullback ceases, frictional forces and drag forces increase due to the thixotropic nature of drilling mud. The mud starts to gel when it is undisturbed. Therefore, pullback should never be stopped, except for drilling rod removal, until the pipe is completely pulled into its permanent position.

(c) BOUYANT FORCE: The pullback force will depend on whether the pipe is full deliberately weighted to reduce buoyancy. Buoyant force pushes the pipe up against the top of the borehole, creating frictional drag between the pipe and the borehole. The buoyant weight of the pipe is, Where: D = pipe outside diameter, γ_b = specific weight of the mud slurry (lb/ft^3), and w_a = weight of empty pipe.

(d) MINIMUM RADIUS OF CURVATURE: Drill path curvature, at the entry and exit pits, is limited by the steering capabilities of the boring equipment. Drilling rod typically has a recommended bend radius of 1200 x D_{ROD}, where D_{ROD} is the nominal rod diameter. When the bending radius is around 150 x D_{PIPE} or less, the safe pulling strength of PE pipe may be significantly reduced by the additional tensile stresses due to curvature.

(e) CAPSTAN EFFECT: For pipe pulled around a curve (vertical or horizontal) creating an angle, Θ (in radians), the capstan effect,
Where: μ = coefficient of friction between pipe and slurry or pipe and ground,
w_b = net downward (or upward) force on pipe (lb/ft),
e=natural logrithn base (e= 2.71828), and
L = length (ft).

(f) SAFE PULL FORCE: The safe pull stress, $\sigma_{SP,}$ may be calculated by subtracting the bending stress due to curvature the allowable tensile stress:

$$\sigma_{SP,} = \sigma_{allow} - \frac{(E \times D).}{2r}$$

The "safe pull force" can be found by multiplying the safe pull stress by the cross-sectional area of the pipe.

Where:, σ_{allow} = allowable tensile stress (psi), D = outer diameter of pipe (in), DR = Dimension Ratio, and E = time-dependent modulus of elasticity (psi) from tables.

(g) NET SAFE PULL FORCE: All bending stresses due to various curvatures in the boring path are additive and should be subtracted from the safe pull force.

(h) TIME DEPENDENCE: The "safe" pull-load is time dependent. See ASTM F-1804 for safe pullback values for PE pipe, less bending stresses.

For additional sources of information, the designer is referred to the following reference sources

Mini-Horizontal Directional Drilling Manual (1995), North American Societyof Trenchless Technology (NASTT), Chicago, IL

PPI Handbook of Polyethylene Piping (1998), Plastics Pipe Institute, Washington, D.C.

APPENDIX B
DIRECTIONAL BORE GUIDELINES

Directional Bore – Safe Pull Strength (for DR11, DIP Size HDPE)

Pipe Size (inches)	Safe Pull	Minimum Bend Strength (lbs.) Depth	Wall Thickness Radius (inches)	Maximum Defect
4	7600	96	0.36	38367
6	15800	138	0.55	38362
8	27200	181	0.73	5/32
10	41000	222	0.91	38426
12	57900	264	1.1	38355

Schedule:

Schedule the bore with Water Utilities 48 hours (2 working Days) prior to boring if bore is over 100 linear feet, contractor needs to fuse pipe together the day before. Contractor needs to physically locate existing utilities, following the 48 hour sunshine One-Call Guidelines Material Inspection to be done before the bore is scheduled. Surface cuts or scratches greater or equal to maximum defect depth are not acceptable.

Blue Strip for Water
Green Strip for Sewer
#10 gauge wire attached to pipe

Preforming the Bore:

Set up the Bore Log.
Calibrate Contractor's locator with actual depth measurements - Check the depth of the first rod.
Ream the bore hole.
Check the flow of bentonite - Must be continuous. Check the pulling pressure.
Do not allow operator to exceed safe pull strength. Mark up drawing with "As-Built" data.
Record pull back pressure.
Fuse DR11 together - minimum 440° F to maximum 460. F

Cool down time equals: Diameter ÷2

Directional Bore Log

Page:_____of _____

Project Name: _____

Project Number:_____Date:_____

Contractor / Site Representative: _____

Bore Location / Number:_____Size / Material: _____

Starting Location:_____Bore Rod Length: _____

	Total Length Bored*	Distance From Start Point	Depth	Comments
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

*Lengths to be measured in rod length increments

Inspector / City Representative:_____Contractor: _____

SECTION 1.12. PRESSURE PIPE RESTRAINT

Sec. 1.12.1. GENERAL

All pressure pipe and fittings shall be restrained as specified in Section 1.12.2. Use of thrust blocks for pressure pipe shall generally not be allowed.

Sec. 1.12.2. RESTRAINED JOINT CONSTRUCTION

Sections of piping requiring restrained joints shall be constructed using pipe and fittings with restrained "Locked-type" joints manufactured by the pipe and fitting manufacturer and other means of mechanical restraint retainer including retainer glands, push joint restraining gaskets, etc., and the joints shall be capable of holding against withdrawal for line pressures equivalent to the test pressure. Any restrained joints that allow for elongation upon pressurization will not be allowed in those locations where the pipe comes out of the ground.

Restrained pipe joints that achieve restraint by incorporating cut out sections in the wall of the pipe shall have a minimum wall thickness at the point of cut out that corresponds with the minimum specified wall thickness for the test of the pipe.

The minimum number of restrained joints required for resisting forces at fittings and changes in direction of pipe shall be determined from the length of restrained pipe on each side of fittings and changes in direction necessary to develop adequate resisting friction with the soil.

The required number of restrained joints shall be determined by the ENGINEER or as shown in a tabular form depicted on the ARestrained Joint Table@ in the STANDARD DETAILS.

Wherever 2-45E bends are used in place of a 90E bend and the minimum restrained joints required from one 45E bend extend beyond the other 45E bend, the 2-45E bends will be considered as though a 90E bend were located midway between the 2-45E bends.

SECTION 1.13. PRESSURE CONNECTION

Sec. 1.13.1. GENERAL

Installation of pressure connections 4" and larger shall be made in accordance with this section

Sec. 1.13.2. TAPPING SLEEVES

1.13.2.1. GENERAL

Tapping sleeves shall be mechanical joint sleeves or fabricated steel sleeves as specified below. **No size on size taps shall be allowed to existing main lines.**

1.13.2.2. MECHANICAL JOINT SLEEVES

Sleeves shall be cast of gray-iron or ductile iron or ductile iron and have an outlet flange with the dimensions of the Class 125 flanges shown in ANSI B16.1 properly recessed for tapping valve. Glands shall be gray-iron or ductile iron. Gaskets shall be vulcanized natural or synthetic rubber. Bolts and nuts shall comply with ANSI A21.11/AWWA C111. Sleeves shall be capable of withstanding a 200 psi working pressure.

1.13.2.3. STEEL TAPPING SLEEVES

Sleeves shall be fabricated of minimum 3/8" carbon steel meeting ASTM A285 Grade C. Outlet flange shall meet AWWA C-207, Class “D” ANSI 150 lb. drilling and be properly recessed for the tapping valve. Bolts and nuts shall be high strength low alloy steel to AWWA C111 (ANSI A21.11). Gasket shall be vulcanized natural or synthetic rubber. Sleeve shall have manufacturer applied fusion bonded epoxy coating, minimum 12 mil thickness.

1.13.2.4. TAPPING VALVES

Tapping valves shall meet the requirements of Section 1.25.2 except that units shall be flange by mechanical joint ends. Valves shall be compatible with tapping sleeves as specified above and specifically designed for pressure connection operations.

Sec. 1.13.3. NOTIFICATION AND CONNECTION TO EXISTING MAINS

All connections to existing mains shall be made by the CONTRACTOR only after the connection procedure and his work scheduling has been reviewed and approved by the CITY.

The CONTRACTOR shall submit a written request to the CITY a minimum of five (5) working days prior to scheduling said connections. In his request he shall outline the following:

1. Points of Connection, fittings to be used, and method of flushing and disinfection if applicable.

2. Estimated construction time for said connections.

The CITY shall review the submittal within three (3) working days after receiving it and inform the CONTRACTOR regarding approval or denial of his request. If his request is rejected by the CITY, the CONTRACTOR shall resubmit his request modifying it in a manner acceptable to the CITY.

All connections shall only be made on the agreed upon date and time. All materials required to make the connection must be onsite prior to beginning the work. If the CONTRACTOR does not initiate and complete the connection work in the agreed upon manner, he shall be required to reschedule the said connection by following the procedure outlined above.

The CONTRACTOR shall not operate any valves in the system.

Sec. 1.13.4. INSTALLATION

1.13.4.1. EXCAVATION, BACKFILL, COMPACTION AND GRADING

The applicable provisions of Section 1.10 shall apply.

1.13.4.2. CONSTRUCTION DETAILS

Sufficient length of main shall be exposed to allow for installation of the tapping sleeve and valve and the operation of the tapping machinery. The main shall be supported on concrete pedestals or bedding rock at sufficient intervals to properly carry its own weight, plus the weight of the tapping sleeve valve and machinery. Any damage to the main due to improper or insufficient supports shall be repaired at the CONTRACTOR's expense.

The inside of the tapping sleeve and valve, the outside of the main, and the tapping machine shall be cleaned and swabbed or sprayed with 10% liquid chlorine prior to beginning installation for water system pressure connections.

After the tapping sleeve has been mounted on the main, the tapping valve shall be bolted to the outlet flange, making a pressure tight connection. Prior to beginning the tapping operation, the sleeve and valve shall be leak tested at the specified test pressure to ensure that no leakage will occur.

For pressure connections through 12" diameter or less the minimum diameter cut shall be 2" less than the nominal diameter of the pipe to be attached.

For 14" through 20" installations the minimum diameter shall be 1-1/2" less; for larger taps the allowable minimum diameter shall be 2" to 3" less than the nominal diameter of the pipe being attached. After the tapping procedure is complete the CONTRACTOR shall submit the coupon to the CITY.

Restrained joint fillings shall be provided on the branch to prevent movement of the installation when test pressure is applied. Provisions of Section 1.12 shall apply.

SECTION 1.14 PIPE MATERIAL FOR GRAVITY SEWERS

Sec. 1.14.1. GENERAL

Pipe used in gravity sewer construction shall be polyvinyl chloride (PVC) or ductile iron pipe (DIP). Where reference is made to an ASTM, or AASHTO designation, it shall be the latest revision.

The CONTRACTOR shall be responsible for all materials furnished and storage of same, until the date of substantial completion. He shall replace at his expense all materials found to be defective or damaged in handling or storage. The CONTRACTOR shall, if requested by the CITY, furnish certificates, affidavits of compliance, test reports, or samples for check analysis for any of the materials specified herein. All pipe delivered to project site for installation is subject to random testing for compliance with the designated specifications.

Sec. 1.14.2. PIPE MATERIALS

1.14.2.1. PVC GRAVITY SEWER PIPE

PVC Gravity Sewer Pipe (4"-15"), ASTM D3034, SDR 35. Uniform minimum Apipe stiffness@ at five (5) percent deflection shall be 46 psi. The joints shall be integral bell elastomeric gasket joints manufactured in accordance with ASTM D3212 and ASTM F477. Applicable UNI-Bell Plastic Pipe Association standard is UNI-B-4.

PVC Gravity Sewer Pipe (18"-27"), ASTM F679, SDR 35. Uniform Minimum Apipe stiffness@ at five (5) percent deflection shall be 46 psi. The joints shall be integral bell elastomeric gasket joints manufactured in accordance with ASTM D3212 and STM F477. Applicable UNI-Bell Plastic Pipe Association standard is UNI-B-7.

All PVC pipe shall bear the NSF-DW seal. The minimum standard length of pipe shall be thirteen (13) feet.

Deep Burial gravity sewer pipe shall not exceed the depth limits set by the manufacturer. Pipe wall thickness shall be upgraded accordingly.

1.14.2.2. DIP GRAVITY SEWER PIPE

Ductile iron pipe shall conform to ANSI/AWWA A21.51/C150, class thickeness designed per ANSI/AWWA A21.50/C150, with push on joints. An interior protective lining of AProtecto 401" epoxy, or equal, with a minimum dry film thickness of 40 mils. Piping with less than 3 feet of cover shall be ductile iron pipe.

1.14.2.3. PIPE MARKINGS

All pipe shall have a homing mark on the spigot provided by the manufacture. On field cut pipe, CONTRACTOR shall provide homing mark on the spigot in accordance with manufacturers recommendations. Pipe shall be light green in color or shall have a continuous 2" wide, light green stripe painted on top.

Sec. .14.3. JOINT MATERIALS

1.14.3.1. PVC PIPE

PVC sewer pipe joints shall be flexible elastomeric seals per ASTM D3212.

1.14.3.2. DUCTILE IRON PIPE

Ductile iron pipe and fitting joints shall be Apush-on@ or mechanical joints conforming to ANSI A21.11.

1.14.3.3. JOINTS FOR DISSIMILAR PIPE

Joints between pipes of different materials shall be made with a flexible mechanical compression coupling with No. 304 stainless steel bands. (See approved manufacturer=s list in appendix.)

Sec. 1.14.4. FITTINGS

Unless otherwise specified, wye branches shall be provided in the gravity sewer main for service lateral connections. Branches shall be minimum six (6) inches inside diameter, unless otherwise approved by the CITY. All fittings, including adaptors, shall be of the same material as the pipe being installed.

Plugs for stub outs shall be of the same material as the pipe, and gasketed with the same gasket material as the pipe joint, or be of material approved by the CITY. The plug shall be secured to withstand test pressures specified in Section 1.18 of these specifications.

Sec. 1.14.5. INSPECTION AND TESTING

1.14.5.1 GENERAL

Each length of pipe shall bear the name or trademark of the manufacturer, the location of the manufacturing plant, and the class or strength classification of the pipe. The markings shall be plainly visible on the pipe barrel. Pipe which is not marked clearly is subject to rejection. All rejected pipe shall be promptly removed from the project site by the CONTRACTOR.

1.14.5.2. MISCELLANEOUS INSPECTION AND TESTING REQUIREMENTS

All pipe and accessories to be installed under this Contract shall be inspected and tested at the place of manufacture by the manufacturer as required by the Standard Specifications to which the material is manufactured.

Each length of pipe shall be subject to inspection and approval at the factory, point of delivery, and site of work. If requested by the CITY, a sample of pipe to be tested shall be selected at random by the CITY or the testing laboratory hired by the CITY

When the specimens tested conform to applicable standards, all pipe represented by such specimens shall be considered acceptable based on the test parameters measured. Copies of test reports shall be available before the pipe is installed in the project.

In the event that any of the test specimens fail to meet the applicable standards, all pipe represented by such tests shall be subject to rejection. The CONTRACTOR may furnish two additional test specimens from the same shipment or delivery, for each specimen that failed and the pipe will be considered acceptable if all of these additional specimens meet the requirements of the applicable standards. All such retesting shall be at the CONTRACTOR=s expense.

Pipe which has been rejected by the CITY shall be removed from the site of the work by the CONTRACTOR and replaced with pipe which meets these specifications.

SECTION 1.15 GRAVITY SEWER PIPE LAYING, JOINTING, AND MISCELLANEOUS CONSTRUCTION DETAILS

Sec. 1.15.1. SURVEY LINE AND GRADE

The CONTRACTOR shall set Temporary Bench Marks (TBM=S) at a maximum 500 foot interval. The CONTRACTOR shall constantly check line and grade of the pipe by laser beam method. In the event line and grade do not meet specified limits described hereinafter, the WORK shall be immediately stopped, the CITY notified, and the cause remedied before proceeding with the WORK.

Sec. 1.15.2. PIPE PREPARATION AND HANDLING

All pipe and fittings shall be inspected prior to lowering into trench to insure no cracked, broken, or otherwise defective materials are being used. The CONTRACTOR shall clean ends of pipe thoroughly and remove foreign matter and dirt from inside of pipe and keep clean during and after laying.

Proper implements, tools, and facilities shall be used for the safe and proper protection of the WORK. Pipe shall be lowered into the trench in such a manner as to avoid any physical damage to the pipe. Pipe shall not be dropped or dumped into trenches under any circumstances.

Sec. 1.15.3. SEWER PIPE LAYING

Laying of sewer pipe shall be accomplished to line and grade in the trench only after it has been dewatered and the trench has been prepared in accordance with specifications outlined in Division III. Refer to Section 1.15.4. for additional bedding requirements. Mud, silt, gravel and other foreign material shall be kept out of the pipe and off the jointing surface. All pipe laid shall be retained in position so as to maintain alignment and joint closure until sufficient backfill has been completed to adequately hold the pipe in place. All pipe shall be laid to conform to the line and grade shown on the PLANS.

Variance from established line and grade, at any point along the length of the pipe, shall not be greater than one thirty-second (1/32) of an inch per inch of pipe diameter and not to exceed one-half (2) inch, provided that any such variation does not result in a level or reverse sloping invert.

The sewer pipe, unless otherwise approved by the CITY, shall be laid up grade from point of connection on the existing sewer or from a designated starting point. The sewer pipe shall be installed with the bell end forward or upgrade. When pipe laying is not in progress the open end of the pipe shall be kept tightly closed with an approved temporary plug. Pipe laying shall not begin until approved temporary plug is on site.

All PVC pipe shall be installed in accordance with the pipe manufacturer=s written recommendations as approved by the CITY. Laying of Ductile Iron Pipe shall conform to the specifications outlined in Section 1.24.4.7.

Sec. 1.15.4. TRENCH PREPARATION AND PIPE BEDDING

1.15.4.1. TRENCH EXCAVATION, DEWATERING, BEDDING MATERIAL, BACKFILL, COMPACTION, FILL AND GRADING

Applicable provisions of Section 1.10. shall apply. Also refer to STANDARD DETAILS.

1.15.4.2. PLACEMENT OF PIPE BEDDING MATERIAL

CONTRACTOR shall hand-grade bedding to proper grade ahead of pipe laying operation. Bedding shall provide a firm, unyielding support along the entire pipe length.

If without direction from the CITY, the trench has been excavated below the required depth for pipe bedding material placement, CONTRACTOR shall fill the excess depth with pipe bedding material to the proper grade.

CONTRACTOR shall excavate bell holes at each joint to permit proper assembly and inspection of the entire joint.

1.15.4.3. DEPTH OF BEDDING MATERIAL

CONTRACTOR shall provide pipe bedding material in accordance with the STANDARD DETAILS.

Sec. 1.15.5. GRAVITY PIPE AND WATER SEPARATION

Gravity sewers that are laid in the vicinity of pipe lines designated to carry potable or reuse water shall meet the conditions set forth in Section 1.24.3.

Sec. 1.15.6. PLUGS AND CONNECTIONS

Plugs for pipe branches; stubs or other open end which are not to be immediately connected shall be made of an approved material and shall be secured in place with a joint comparable to the main line joint.

Sec. 1.15.7 PIPE JOINTING

All pipes shall be installed to the homing mark on the spigot. The City shall be given an opportunity to check all joints in this manner before backfilling. Type of joint to be used will conform to the requirements of Sections 1.14.3. All pipe and jointing for gravity sewers shall be subject to the tests specified in Section 1.18.

SECTION 1.17. SERVICE LATERALS

Sec. 1.17.1. GENERAL

A service lateral is a branch gravity sewer constructed from the main gravity sewer to the right-of-way line or to a point established by the CITY.

The general requirements for construction of gravity sewers in Sections 1-14 and 1-15 of these Specifications shall apply for service laterals unless they are inconsistent with the provisions of this section.

Service laterals and fittings shall be a minimum of 6 inches in diameter. All service laterals shall be less than 50 feet in length.

Sec. 1.17.2. MATERIALS

PIPE, FITTINGS, AND JOINTS

Pipe, fittings and joints shall be PVC or DI pipe and shall conform to the requirement for gravity sewer construction in Section 1-14 of these specifications.

Service laterals shall be connected to the wye, provided in the gravity sewer where such is available, utilizing approved fittings or adapters.

On existing mains where no wye is provided or cut-in suitable, connection shall be made by either a machine-made tap and saddle, or a cast-in-place manhole as referenced in Section 1.4.4.

Sec. 1.17.3. CONSTRUCTION DETAILS

1.17.3.1. GENERAL

Service lateral connections shall conform to these specifications and the STANDARD DETAILS. All necessary approvals for service sewer construction shall be obtained prior to beginning the work.

1.17.3.2. EXCAVATION AND BACKFILL

Excavation and backfilling for service sewers shall conform to the requirements of Section 1.10. and 1.15. excepting that no backfill in excess of that required to hold the pipe in true alignment shall be placed prior to inspection.

1.17.3.3. PIPE LAYING AND JOINTING

Pipe laying and jointing, except as hereinafter provided, shall in general conform to the requirements of Section 1.15. During the pipe laying and jointing, the service lateral shall be kept free of any water, dirt or objectionable matter.

1.17.3.4. LINE AND GRADE

Pipe shall be laid with a minimum gradient of one foot per 100 feet. The CONTRACTOR shall establish such alignment and grade control as is necessary to properly install the service sewer. Pipe shall be laid in a straight line at a uniform grade between fittings.

Sec. 1.17.4. TERMINATION OF SERVICE LATERALS

Service laterals shall terminate at the right-of-way line in accordance with the STANDARD DETAILS. Water-tight factory made plug (s) shall be installed at the end of each service lateral.

Sec. 1.17.5. INSPECTION

Service sewers shall meet the inspection requirements specified in Section 1.14.

Sec. 1.17.6. RESTORATION, FINISHING AND CLEANUP

The CONTRACTOR shall restore all paved surface, curbing, sidewalks or other surfaces to their original condition in such manner as to meet the requirements established in Division III of these specifications. All surplus material and temporary structures, as well as all excess excavation shall be removed and the entire site shall be left in a neat and clean condition.

Sec. 1.17.7 LOCATION

The exact location of the termination point of each installed service lateral shall be marked. On curbed streets the exact location for each installed service shall be marked by indenting the letter “S” into the wet concrete curb. **No Saw Cuts** will be allowed to indicate location of service. Where no curb exists, locations shall be adequately marked by a 4" x 4" x 18" concrete marker with “S” indented into the top of the wet concrete pad **No Saw Cuts** will be allowed to indicate service.

SECTION .18. TESTING AND INSPECTION FOR ACCEPTANCE OF GRAVITY SEWERS

Sec. 1.18.1. GENERAL

Before Gravity sewer testing can be done road base MUST be in place.
All gravity sewers shall be tested for alignment, deflection and integrity prior to acceptance. In addition, a leakage test shall be required for gravity sewers. The leakage testing shall be performed by the CONTRACTOR who shall be responsible for furnishing all necessary labor and equipment to conduct such testing. In unusual situations where the new sewer main must necessarily be connected to active service as it is being installed, alignment, deflection and integrity testing shall be witnessed by the CITY.

Sec. 1.18.2. TESTING FOR LEAKAGE

1.18.2.1. TYPE OF TEST

Gravity sewers shall be required to pass a leakage test before acceptance. Leakage tests shall be by the low-pressure air test as described below.

1.18.2.2. SELECTION OF TEST SECTIONS

Each section shall be tested between consecutive manholes.

1.18.2.3. PREPARATION AND COORDINATION FOR TESTING

The CONTRACTOR shall flush all sewers with water sufficient in volume to obtain free flow through each line. Flushing water and debris shall not enter any pump station wet well or existing sewer. Water will be pumped from the sewer system during flushing to an acceptable discharge location. A visual inspection shall be made and all obstructions removed.

The CONTRACTOR shall notify the CITY Inspector 48 hours to schedule any leakage testing.

1.18.2.4. LEAKAGE TEST

Leakage testing shall be conducted in accordance with the procedure for “Recommended Practice For Low Pressure Air Testing of Installed Sewer Pipe” as established by the Uni-Bell PVC Pipe Association.

Sec. 1.18.3. INSPECTION FOR ALIGNMENT, DEFLECTION AND INTEGRITY

A video inspection shall be used to check for cracked, broken or otherwise defective pipe, and overall pipe integrity.

The first inspection will be within 30 days after the installation of the gravity sewer pipe, provided the road base is in place and the manhole rings and covers are to grade. The requirement of road base being in place shall be waived if the top of the sewer is 12 feet below the finished grade. In such cases, the video inspection shall be performed once the trench has been compacted up to the road base. A video inspection of the gravity sewer pipe may also be performed before the end of the one year warranty period.

If any video inspection reveals cracked, broken, or defective pipe, pipe misalignment, or sags in excess of ½" and in the case of PVC pipe a ring deflection in excess of 5%, the CONTRACTOR shall be required to repair or replace the pipeline. The CITY reserves the right to pass a mandrel through the PVC pipe to determine ring deflection.

Successful passage of the leakage test and/or the video inspection is required before acceptance by the CITY. Video inspection shall be provided on Digital Compact Disk (DVD) for review.

Prior to repair or replacement of failed sewer pipe, the method of repair or replacement shall be submitted to the CITY for approval. Pressure grouting of pipe or manholes shall not be considered as an acceptable method of repair. Repair clamps shall not be considered an acceptable method of repair.

SECTION 1.19. WASTEWATER FORCE MAINS

Sec. 1.19.1. GENERAL

These specifications cover the pipe, fittings, and accessory items used for wastewater force main systems.

Pipe used in wastewater force main systems shall be either Polyvinyl Chloride (PVC), or Ductile Iron Pipe (DIP). Above ground pipe and buried pipe with less than 30" of cover or 6" of clearance shall be ductile iron.

The CONTRACTOR shall be responsible for all materials furnished and stored, until the date of project completion. He shall replace at his expense all materials found to be defective or damaged in handling or storage. The CONTRACTOR shall, if requested by the CITY, furnish certificates, affidavits of compliance, test reports, or samples for check analysis for any of the materials specified herein. All pipe delivered to project site for installation is subject to random testing for compliance with the designated specifications.

Sec. 1.19.2. PIPE INSPECTION AND TEST

Requirements specified in Article 6 shall apply.

Sec. 1.19.3. PVC PIPE

1.19.3.1. PVC PIPE

Shall not be allowed; except on side streets and exclusive easements.

All PVC pipe of nominal diameter four (4) through twelve (12) inches shall be manufactured in accordance with AWWA standard C900. The PVC pipe shall have a minimum working pressure rating of 100 psi and shall have a dimension ration (DR) of 25. Pipe shall have the same O.D. as ductile iron pipe.

1.19.3.2. JOINTS

PVC pipe shall be integral bell, push on, type joints. **NO pipe Deflection, must use fittings**

1.19.3.3. FITTINGS

Fittings used with PVC pipe shall conform to Section 1.19.4.

Sec. 1.19.4. DUCTILE IRON PIPE AND FITTINGS

1.19.4.1. DUCTILE IRON PIPE

All ductile iron pipe of nominal diameter four (4) through fifty four (54) inches shall conform to ANSI/AWWA A21.51/C151. A minimum of pressure Class 150 pipe shall be supplied for all sizes of pipe unless a higher class pipe is specifically called out in the DRAWINGS, or required by the CITY.

1.19.4.2. FITTINGS

All fittings shall be mechanical joint ductile iron or gray iron conforming to ANSI/AWWA A21.10/C110, 250 psi minimum pressure rating, or ductile iron compact fittings four (4) through twelve (12) inches in accordance with ANSI/AWWA A21.53/C123.

1.19.4.3. JOINTS

Joints for ductile iron pipe shall be push-on or mechanical joints and joints for fittings shall be mechanical joints conforming to ANSI/AWWA A21.11/C111, unless otherwise called for on the DRAWINGS. Where called for on the Drawings, restrained or flanged joints shall be provided. Above ground joints shall be flanged with galvanized bolts, nut and washers. Flanged joints shall conform to ANSI Standard B16.1-124 LB. Restrained joints shall conform to Article 5 of these STANDARDS.

1.19.4.4. COATINGS AND LININGS

Where ductile iron pipe and fittings are to be below ground or installed in a casing pipe the coating shall be a minimum 1.0 mil thick in accordance with ANSI/AWWA A21.51/C151. Where ductile iron pipe and fittings are to be installed above ground, pipe, fittings are to be installed above ground, pipe, fittings and valves shall be thoroughly cleaned and given one field coat (minimum 1.5 mils dry thickness) of rust inhibitor primer.

Intermediate and finished field coats of Alkyd shall also be applied by the CONTRACTOR (minimum 1.5 mils dry thickness each coat). Primer and field coats shall be compatible and shall be applied in accordance with the manufacturers recommendations. (See approved manufacturers' list in appendix.) Final field coat color shall be as directed by the CITY.

All ducticle iron pipe and fittings shall have an interior protective lining of "Protecto 401" epoxy or equal with a minimum dry film thickness of 40 mils applied by the pipe manufacturer.

1.19.4.5. POLYETHYLENE ENCASEMENT

The pipe shall be polyethylene encased (8 mil) where shown on the DRAWINGS, in accordance with ANSI/AWWA A21.51/C105.

Sec. 1.19.5. PIPE HANDLING

Requirements specified in Section 1.24.2. shall apply.

Sec. 1.19.6. AIR AND VACUUM RELEASE VALVES

1.19.6.1. GENERAL

Wastewater force mains shall be equipped with air/vacuum release valves located at piping high points immediately upstream of dips, or other elevation declines. Valves shall be located in an enclosure as shown on the STANDARD DETAILS.

The valves shall be as described below.

1.19.6.2. WASTEWATER AIR/VACUUM VALVE

The valve body shall be of cast iron; the floats float guide and stem shall be of stainless steel. The valve shall be suitable for 100 psi working pressure. Valve shall have standard two (2) inch NPT inlet and outlet ports unless otherwise shown on the DRAWINGS. Provide back-flushing accessories.

Sec. 1.19.7. NOTIFICATION AND CONNECTION TO EXISTING MAINS

Sec. 1.19.8. VALVES

1.19.8.1. GENERAL

Valves smaller than 24" shall be resilient wedge gate valves.

Valves 24" and larger shall be resilient faced, eccentric valves.

Valves shall hold the test pressure, when applied in either direction.

All valves for Force Mains must have stainless steel stems and bonnet bolts.

1.19.8.2. VALVE CONSTRUCTION

1.19.8.2.1. Resilient Wedge Gate Valves shall be in accordance with AWWA C509.

* Shall have fusion bond epoxy coating.
* Shall have a synthetic rubber encapsulated gate.
* Shall have oil impregnated bronze mechanical components, for permanent lubrication.
* Shall have stainless steel stems and bonnet bolts.

Above ground service - flanged, O.S. & Y, handwheel.

Buried service - mechanical joint, NRS and nut.

Submerged or otherwise inaccessible, above ground service - flanged, NRS, floor stand or suitable operator.

1.19.8.2.2. Resilient Faced Eccentric Valves shall be in accordance with AWWA C-540 and C-507.

* Shall have a synthetic rubber encapsulated plug.
* Shall be permanently lubricated.
* Shall have welded, highnickel content, seat overlay.

Above ground service - flanged, handwheel.

Buried service - mechanical joint, totally enclosed operator, nut with extension.

Submerged or otherwise inaccessible, above ground.

Service - flanged, totally enclosed operator, floor stand or suitable equal.

Sec. 1.19.9. VALVE BOXES

Sec. 1.19.10. SEPARATION OF FORCE MAINS AND WATER MAINS

Requirements 10 feet horizontally from pipes carrying raw wastewater or storm water.

Sec. 1.19.11. FORCE MAIN CONSTRUCTION

Requirements specified in Section 1.23.5. shall apply.

Sec. 1.19.12. HYDROSTATIC TESTS

Requirements specified in Section 1.24.5. shall apply except that all pipe sections to be tested shall be subjected to a hydrostatic pressure of 150 psi.

Sec. 1.19.13. FINAL CLEANING

Prior to final inspection and acceptance of the force main by the CITY, CONTRACTOR shall remove all parts of the system. Flushing and cleaning shall remove all accumulated foreign material from the sewer system.

Sec. 1.19.14. LOCATION AND IDENTIFICATION

All force mains shall be installed with a continuous, insulated 10 gauge solid copper wire (Tracer Wire) taped directly on top of the pipe for location purposes. Terminate insulated locator wires, capable of extending 12 inches above top of box, at each valve box pad.

All force mains shall be green in color or marked with a continuous stripe located within the top 90 degrees of the pipe. Said stripe shall be a minimum 2 inches in width and shall be green in color. Paint should be touch-dry before backfilling. Warning tape shall be placed 12 to 18 inches above all pipe.

SECTION 1.20. WASTEWATER PUMP STATION

Sec. 1.20.1. GENERAL

This Section includes the specifications for equipment, materials, site work, fences and appurtenances for the installation of wastewater pump stations.

Sec. 1.20.2. WET WELL AND VALVE SLAB

Wet well and valve slab shall be constructed as shown on the STANDARD DETAIL entitled "Lift Station".

Sec. 1.20.3. ACCESS FRAMES AND COVERS

The wet well shall be furnished with aluminum access frames and covers. Equipment furnished shall include 1 ½" nominal diameter aluminum grab rail, stainless steel upper guide holder and level sensor cable holder. Doors shall be of aluminum checkered plate. The access cover and frame shall be sized as shown on the DETAILS.

Sec. 1.20.4. PUMPS AND CONTROLS

Pumps and miscellaneous accessories shall be as specified in Section (1.21.). Controls and miscellaneous accessories shall be as specified in Section 1.22.

Sec. 1.20.5. PIPING, VALVES AND ACCESSORIES

1.20.5.1. PIPING

In fluent piping to the wet well shall meet the requirements of Section 1.14. and 1.19. Flexible boot connection shall be provided at underground wall penetrations. All pipe inside the wet well and the valve vault shall be as shown on the STANDARD DETAIL entitled **"Lift Station"**.

1.20.5.2. VALVES

Valves shall meet the requirements of Section 1.19.8. (wastewater force mains) (valves)

1.20.5.3. CHECK VALVES

Check valves for ductile iron pipelines shall be swing type and shall meet the material requirements of AWWA C500. The valves shall be iron body, bronze mounted, single disc, 150 psi working water pressure, nonshock, and hydrostatically tested at 300 psi. Ends shall be 125 pound ANSI B16.1 flanges.

When there is no flow through the line the disc shall hang lightly against its seat in practically a vertical position. When open, the disc shall swing clear of the waterway. Check valves shall have bronze seat and body rings, extended bronze hinge pins and stainless steel nuts on the bolts of bolted covers.

Valves shall be so constructed that disc and body seat may easily be removed and replaced without removing the valve from the line. Valves shall be fitted with an extended hinge arm with outside lever and weight. If pump shut off head exceeds 77 feet, then an air cushioned assembly shall be installed.

1.20.5.4. PRESSURE GAUGES

Pressure gauges shall be installed on the discharge pipe as indicated on the STANDARD DETAILS. Each pressure gauge shall be direct mounted, stainless steel case, stainless steel sensing element, liquid filled, with a 4-1/2 inch diameter dial and furnished with a clear glass crystal window, shut-off (isolation) cock or valve. All gauges shall be weatherproofed. The face dial shall be white finished aluminum with jet black graduations and figures. The face dial shall indicate the units of pressure measured in psi, with a 0-60 psi range.

Pressure gauges shall not be installed until after the substantial completion date unless otherwise requested by the CITY.

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Sec 1.20.6 – STANDBY POWER GENRATOR SYSTEM

Sec 1.20.6.1 GENRAL

A standby power generator system shall be installed at pump stations as required by Section 1.6.5. for electrical power during the loss of normal power.

The Scope of Work herein described is for a land developer to furnish and install a complete standby power system, including all equipment material and appurtenances, tested and accepted by the City. These terms shall convey the following meanings.

Vender, contractor, and developer shall represent the group of parties collectively providing the equipment and appurtenances, installing the materials into a complete standby power system and turning that system over to the Town of Lake Hamilton. No distinction is intended to limit responsibilities between the individual members of thisgroup.

City and Owner shall mean the Town of Lake Hamilton Utilities Department.

Owner's land shall mean land over which the City owns in fee simple, land over which the City holds an exclusive easement or over which the development plans indicate a developer commitment to convey land in fee simple or an exclusive easement.

Sec 1.20.6.2 SPECIFICATION

These technical specifications were prepared by the Town of Lake Hamilton Utilities Division.

1.20.6.2.1 FINAL ACCEPTANCE

Final acceptance shall take place after installation, start-up, and FDEP certification is receive for the lift station system.

Sec 1.20.6.3 TECHNICAL REQUIREMENTS

1.20.6.3.1 QUALIFICATIONS

The engine-generator set shall be the standard product, as modified by these specifications, of a MANUFACTURER regularly engaged in the production of this type of equipment. The unit to be furnished shall be of proven ability and shall be designed, constructed, and installed in accordance with best practices and methods. The dealer shall have a minimum of ten (10) years' experience in the field of power generation. It is the intent of this specification to secure a generator system that has been prototype tested, factory built, production tested, site tested and of the latest commercial design, together with all accessories necessary for a complete installation as shown on the plans and drawings, and specifications herein. The equipment supplied and installed shall meet the requirements of the NEC, along with all applicable local codes and regulations. All equipment shall be new, of current production of a national firm which manufactures the engine/generator and controls, and assembles the generator system as a matched unit so that there is one-source responsibility for warranty, parts, and service through a local representative with factory-trained servicemen.

The unit shall be shipped to the jobsite by an authorized engine dealer having a parts and service facility within a 50-mile radius of the jobsite. The unit must be of such physical dimensions as to make a good installation in the opinion of the ENGINEER, in the space provided as indicated on the Drawings.

The unit shall be assembled in the U.S. with over 50% of the components such as the engine,generator, auxiliary equipment, etc., manufactured in the U.S. by a MANUFACTURER currently engaged in the production of such equipment.

Sec 1.20.6.4 GENERATOR SET

1.20.6.4.1 GENERAL

The equipment supplied and installed shall meet the requirements of the National Electric Codeand all applicable local codes and regulations. All equipment shall be new, of current productionby a firm which manufactures the generator and controls, transfer switch, and assembles the generator set as a matched unit so that there is one-source responsibility for warranty, parts, and service through a local representative with factory-trained service personnel. Entire unit shallmeet UL 2200 requirements.

1.20.6.4.2 SUBMITTAL

As a minimum for all equipment specified and provided, for each site, submit the following inpdf to Town of Lake Hamilton Wastewater Utilities Department. Submittal shall include specification sheets showing all standard and optional accessories to be supplied, schematic wiring diagrams, dimension drawings, and interconnection diagrams identifying by terminal number each requiredinterconnection between the generator set, the transfer switch, and other remote devices if included elsewhere in these specifications. The complete installation manual shall be deliveredwith the submittal. **No equipment is to be ordered until the submittal is approved**

1.20.6.4.3 PRODUCTS

The standby generator set shall be rated standby power (defined as continuous operation for theduration of any power outage), 500 feet altitude, and temperature range from 72 °F (22.2 °C)minimum to 122°F (50°C) maximum as manufactured by Blue Star Power Systems and GilletteGenerators, or prior approved equal. The standby generator shall be sized to operate all pumps starting sequentially plus all appurtenances. The generator main breakers, power panel and pump station main breaker and transfer switch main breaker shall be equally sized. The standbygenerator shall not be de-rated when variable frequency drive (VFD) or reduced voltage (softstart) motor starters are used. If the belly tank exceeds 36”- 0” in height, then an aluminum catwalk or attached step located on the fuel tank shall be provided to access the controller andbreakers.

Any request for approval of an alternate product or supplier must be received and acknowledged by the Town of Lake Hamilton. This request must include a paragraph by paragraph statement of compliance or deviation to the written specification. Any requests for deviations to the specification must include adequate data to warrant approval. Any request for approval of a different supplier other than that specified above must include a complete

history of past performance and references detailing past success in furnishing a unit of the size specified.

A minimum of three references shall be furnished along with contact person's name and contact number. Requests for approval that are incomplete or that cause the specified to ponder as to what is being offered will be rejected. There are no exceptions to these requirements.

Sec 1.20.6.5 ENGINE AND COMPONENTS

1.20.6.5.1 Starting System

The engine shall be a liquid cooled, diesel fueled, turbocharged after-cooled engine of 4-stroke cycle design.

The engine shall be cooled with a unit mounted radiator, fan, water pump, and closed coolant recovery system providing visual diagnostic means to determine if the system is operating with a normal engine coolant level. The radiator shall be designed for operation in 110-degrees Fahrenheit temperature.

The intake air filter(s) with replaceable paper element(s) shall be mounted on the unit. Full pressure lubrication shall be supplied by a positive displacement lubrication oil pump. The engine shall have a replaceable oil filter(s) with an internal bypass. Engine coolant and oil drain extensions, equipped with pipe plugs, and shall be provided to outside of the engine mounting base for cleaner and more convenient engine servicing. A fan guard shall be installed for personnel safety.

The engine shall have a battery charging direct current (DC) alternator with a transistorized voltage regulator. Remote 2-wire starting shall be by a solenoid shift, electric starter motor.

Engine speed shall be controlled by an isochronous governor to maintain alternator frequency within 0.5% from no load to full load alternator output. Steady state regulation shall be 0.25%.

The engine fuel system shall be designed for operation on No. 2 diesel fuel. A primary fuel filter, water separator, manual fuel priming pump, fuel shutoff solenoid and all fuel lines shall be installed at the factory. The primary diesel fuel filter element shall be replaceable and capable of removing contaminants of 10-microns.

The engine shall have a thermostatically controlled water jacket heater unit(s) to aid in quick starting with wattage as recommended by the manufacturer. The contractor shall provide proper branch circuit from normal utility power source. See Details 35 A and B. Line voltage of the jacket heater shall be the same as the main service voltage. Adding transformers is not acceptable. Sensing elements shall be located on the engine for low oil pressure shutdown, high coolant temperature shutdown, low coolant level shutdown, over-speed shutdown and over-crank shutdown.

These sensors shall be connected to the control panel using a wiring harness with the following features: wire number labeling on each end of the wire run for easy identification, a molded rubber boot to cover the electrical connection on each sensor to prevent corrosion and

all wiring to be run in flexible conduit for protection from the environment and any moving objects.

Sec 1.20.6.6 FUEL SYSTEM - DIESEL

The fuel storage tank, fittings, gauges and piping shall be supplied by the generator set manufacturer in accordance with NFPA and applicable local codes and as specified. Flexible fuel connectors shall be supplied to isolate vibration at the engine.

Sec 1.20.6.7 COOLING SYSTEM

A unit mounted radiator will be furnished complete with a blower fan and glycol coolant. The maximum radiator airflow restriction of 0.5 " WC must be taken in account when sizing the cooling system. The cooling system will be sized to maintain a safe engine temperature at the appropriate ambient conditions. Proper ducting must be used to prevent overheating.

Crankcase fumes disposal shall terminate in front of the radiator to prevent oil from collecting on the radiator core and reducing cooling capacity.

Sec 1.20.6.8 EXHAUST SYSTEM

An Exhaust silencer shall be furnished of industrial standard construction, all welded, for stationary engine application. **The silencer shall attenuate exhaust noise to a critical level**. A seamless, stainless, convoluted flexible exhaust connector shall be provided. The entire exhaust system and silencer shall be supported independently of the generator set to prevent transmission of vibration and allow for thermal expansion. Long radius, low restriction fittings will be used throughout, and pipe size will be sufficiently large to handle the engine exhaust flow at full load without causing back pressure in excess of that allowed by the engine manufacturer.

Sec 1.20.6.9 ENGINE LUBRICATION SYSTEM

The engine shall be furnished with a gear type lube pump that will furnish oil under pressure to moving parts. Full flow lube oil filters shall be provided in addition to a bypass valve that will allow lube oil circulation in the event of a failure of the filtering system.

Sec 1.20.6.10 GOVERNING SYSTEM

ISOCHRONOUS ZERO SPEED DROOP GOVERNING SYSTEM:
The engine generator set shall be provided with a precision electronic governor of the constant speed type. The governor shall be capable of maintaining a steady state bandwidth of not more than ±0.25%, at any constant load, from no load to full load. The governor shall maintain governed speed at 60 Hertz at any load, from no load to full load.

Sec 1.20.6.11 BATTERY

A lead-acid, heavy duty battery shall be furnished of sufficient capacity to provide a minimum of five full cycle starts for ten seconds crank with ten second rest periods between cranks. The lead acid battery will be 12 volt or 24 volt as required by the engine specification. The commercial type lead acid battery will include a manifold vent which eliminates corrosion gases away from the terminals and cables. The cells of the battery will be bonded and the partition inter-cell connectors will create a shorter current path to deliver more power to the terminals.

Sec 1.20.6.12 BATTERY CHARGER

1.20.6.12.1 Battery Charger Design Guidelines

Charger shall be designed for heavy-duty industrial service and capable of full- rated output indefinitely at temperatures between -10º C and +50º C. Charger shall be capable of recharging a fully discharged battery of the maintenance-free lead acid, conventional (wet) lead acid or nickel-cadmium type. Charger shall maintain the battery automatically and minimize the need for battery electrolyte replenishment. Conservatively rated SCRs and diodes in full-wave bridge shall be used. A crank disconnect relay shall not be required to protect the charger from overload. Charger shall be unit mounted and natural convection cooled. The housing shall be constructed of rustproof metal (e.g. aluminum) and treated with a protective coating.

1.20.6.11.2 Battery Charger Output

General Characteristics
Output voltage shall be (12 or 24) volts nominal. Float voltage shall be adjustable from 100% to 120% of nominal. Equalize voltage shall be adjustable up to 15% above float voltage. Output voltage adjustments shall be on separate potentiometers in the charger. Charger shall incorporate automatic current limiting with a rectangular current limit characteristic, and shall be capable of operating into a short circuit or dead battery indefinitely without damage or overheating. Charger shall be equipped with output fuses or circuit breakers on the charging leads to prevent charging errors due to long cable runs.

Float/Equalize Control
Charger shall include an automatic equalize feature that is activated when the battery's state of charge is reduced. Individual adjustment potentiometers shall be provided for float voltage, boost voltage and alarm voltages. User interface shall include digital meter: Automatic meter alternately displays output volts, amps.

Sec 1.20.6.13 ENGINE BLOCK HEATER

Block heater of proper wattage and voltage shall be provided which will be thermostatically controlled to maintain the engine block at a suitable temperature to assure rapid to meet the start-up requirement of NFPA-99 or NFPA-110 Regulations. The heater will be of the

industrial tank type with thermo-syphon circulation.

Sec 1.20.6.14 GENERATOR AND COMPONENTS

1.20.6.14.1 Mainline Circuit Breaker Generator Mounted

Provide a generator UL listed main circuit breaker. This breaker is to be set mounted and wired, molded case thermal-magnetic 80% rated for proper generator set operation. It must be mounted in a NEMA rated enclosure at the manufacturers factory prior to shipment. The line side connections are to be made at the factory. A system utilizing a manual reset field circuit breaker and current transformers is unacceptable.

1.20.6.14.2 Construction-PMG Design

Alternator: 4-pole, 1800 rpm (60 Hz output) revolving field, synchronous generator complying with NEMA MG 1; connected to engine with flexible coupling; voltage output configuration as indicated, with reconnectable 12 leads type for 3 phase alternators.

The power generator will be of the salient pole synchronous type. The generator will be rated at 60 Hertz. The generator will be equipped with armature windings for efficient paralleling. The generator will be equipped with bearing flange-mounted design. The bearing will be a sealed, frictionless, cartridge type. The coupling will be a laminated, steel, semi-flexible, piloting type. The exciter will be direct connected brushless design. Insulation class will be in accordance with the most recent NEMA-MG-1.22.40 requirements for the generator. The generator will be provided with a power terminal cabinet of adequate size for connection of load conductors.

The alternator shall be capable of sustaining at least 300% of rated current for at least 10 seconds under a 3 phase symmetrical short by inherent design or by the addition of an optional current boost system. PMG excitation must be of the true PMG design. The alternator shall be rated at the stated output with a maximum temperature rise of 130 deg.C.. The alternator shall be capable of accepting the loads and instantaneous voltage dip when loads are started as specified. Factory documentation of these requirements shall be made a part of the approval submittals prior to release to production. **3600 rpm alternators will not be accepted.** No exception to these requirements will be allowed.

1.20.6.14.3 Generator Voltage Regulator

The voltage regulator shall be a digital, microprocessor design with solid state voltage build-up. No voltage build-up relay or other relays are acceptable. The unit shall be encapsulated for humidity and abrasion protection. The regulator shall include 1/4% regulation, true volts per hertz operation with adjustable cut in, loss of sensing continuity shutdown, over-excitation shutdown, three-phase RMS sensing, over-voltage protection, and provisions for parallel operation.

1.20.6.14.4 Control Panel

Blue Star model DGC-2020: Open Architecture / Non Proprietary Software
Provide microprocessor-based control system for automatic control, monitoring, and

protection of generator set. Include sensors, wiring, and connections necessary for functions/indications specified.

Generator engine crank control implements a starting sequence. Three separate start signal inputs available: Manual run button. Closing a contact across the automatic transfer switch input on the back of controller Remote start command through the software Password protected Customized start up sequence RS485 Communications Port for Modbus Protocol.

Available with continuous crank (can be set from 5 to 60 seconds) or cycle crank (can be set from 5 to 15 seconds); cycles are adjustable from 1 to 7

Crank cycle delay can be enabled to control pre-heaters or operate a pre-lube system

Pre-crank delay is adjustable from 0 to 30 seconds

7 shutdown conditions: high coolant temperature over speed, low oil pressure, sender failure, over crank, low fuel level, low coolant level 10 Pre-Alarm conditions can be enabled:

Low fuel
Low coolant temperature High coolant
temperature Low oil pressure
Weak battery voltage Battery over-
voltage Low battery voltage Battery
charger failure
kW overload
Maintenance

A complete metering package displays 28 system parameters to help ensure trouble free operation and can be displayed on the front of the Blue Star DGC- 2020 or remotely on a personal computer

Protection levels for both prime mover and generator Battery failure

Other safety features displayed on panel are display panel on and EPS supplying load

1.20.6.14.5 Base Design

The base shall be constructed of steel. The base shall be designed to rigidly support the engine-generator set, ensure permanent alignment of rotating parts, be arranged to provide easy access to allow changing of lube-oil, and ensure that alignment is maintained during shipping and normal operation. The base shall permit skidding in any direction during installation and shall withstand and mitigate the effects of synchronous vibration of the engine and generator. The base shall be provided with suitable holes for anchor bolts. Coolant and oil drains must be plumbed to base with stainless steel lines and isolation valves with bulk head fittings.

1.20.6.14.6 Vibration Isolation

Vibration Mounts to Isolate Unit from Base Rail. Heavy duty vibration isolators shall be provided between the engine-generator and welded steel base. Between the base of the tank and the concrete slab, (2) runs of 1/2” thick commercial grade neoprene meeting ASTM D2000-BC-609 cut into 4” wide strips shall be placed at the anchoring points on the base tank.

1.20.6.14.7 Sub base Tank

A sub-base fuel tank with a minimum capacity for 48 hours of operation at full load shall be provided. This tank will be a UL 142 listed generator subbase tank. The tank shall be constructed to UL-142, sub base generator specifications and of double wall construction. Tank shall be complete with required vents, openings, low level and leak alarm contacts, mechanical level gauge and required emergency vents. Shall have a convenient stub up area for electrical conduit entry.

All diesel fuel tanks must be coated on the exterior with "Liner Xtreeme" (Product Code BLK20), an expoxy/urethane blend painting system, for a minimum total dry mils of 40, but not exceeding 125 dry mils. Any request for approval of an alternate manufacturer's tank must comply with the prior approval procedure previously stated. The capacity of the fuel tanks shall NOT exceed 540 gallons unless approved by the Town of Lake Hamilton.

1.20.6.14.8 Housing

Sound attenuated aluminum weather-protective enclosure with hinged side panels to allow inspection and maintenance. Sound level shall not exceed 71 db at a distance of 23 feet. Wind load rating on the enclosure shall be 150 mph. The enclosure shall be coated with primer and two coats of high-gloss, weather-proof, sag resistant vinylac in the manufacture's standard color through an electrical bonding process. The specified exhaust silencer shall be integrated inside the enclosure. The enclosure is to have large piano style hinged doors to allow access to engine, alternator, and control panels. Each door is to be fitted with stainless steel lockable hardware with identical keys. Padlocks do not meet this specification.

Crankcase fumes disposal shall terminate in front of the radiator to prevent oil from collecting on the radiator core and reducing cooling capacity.

1.20.6.14.9 Startup and Warranty Validation

The start-up of engine generator set and automatic transfer switch (if applicable) will be performed by an authorized service dealer of the Manufacturer. The test will include instruction to personnel of normal maintenance and operation under existing load available. All systems shall be operated for proper starting and stopping and transfer of the emergency power.

1.20.6.14.10 Manufacturer's Product Period of Warranty

The standby electric generating system components, complete engine-generator and instrumentation panel shall be warranted by the manufacturer against defective materials and factory workmanship for a period of **two years or 2,000 hours**.

Such defective parts shall be repaired or replaced at the manufacturer's option, free of charge. The warranty period shall commence when the standby system is invoiced by the factory. Multiple warranties for individual components (engine, alternator, controls, etc.) will not be acceptable. Satisfactory warranty documents must be provided.

Sec 1.20.6.15 AUTOMATIC TRANSFER SWITCH

Furnish and install automatic transfer switches (ATS) with number of poles, amperage, voltage, and withstand current ratings as shown on the plans. Each automatic transfer shall consist of an inherently double throw power transfer switch unit and a

microprocessor controller, interconnected to provide complete automatic operation. All transfer switches and control panels shall be the product of the same manufacturer.

1.20.6.15.1 Acceptable Manufacturers

Automatic transfer switches shall be ASCO Series 300 or Equal.
Any alternate shall be submitted to the consulting engineer in writing at least 10 days prior to bid. Each alternate bid must list any deviations from this specification.

1.20.6.15.2 Codes and Standards

The automatic transfer switches and accessories shall conform to the requirements of:
A. UL 1008 - Standard for Automatic Transfer Switches
B. NFPA 70 - National Electrical Code
C. NFPA 110 - Emergency and Standby Power Systems
D. IEEE Standard 446 - IEEE Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications
E. NEMA Standard ICS10-1993 (formerly ICS2-447) - AC Automatic Transfer Switches
F. NEC Articles 700, 701, 702
G. International Standards Organization ISO 9001

1.20.6.15.3 Mechanically Held Transfer Switch

A. The transfer switch unit shall be electrically operated and mechanically held. The electrical operator shall be a single-solenoid mechanism, momentarily energized. Main operators which include overcurrent disconnect devices will not be accepted. The switch shall be mechanically interlocked to ensure only one of two possible positions, normal or emergency.
B. The switch shall be positively locked and unaffected by momentary outages so that contact pressure is maintained at a constant value and temperature rise at the contacts is minimized for maximum reliability and operating life.
C. All main contacts shall be silver composition. Switches rated 600 amperes and above shall have segmented, blow-on construction for high withstand current capability and be protected by separate arcing contacts.
D. Inspection of all contacts shall be possible from the front of the switch without disassembly of operating linkages and without disconnection of power conductors. A manual operating handle shall be provided for maintenance purposes. The handle shall permit the operator to manually stop the contacts at any point throughout their entire travel to inspect and service the contacts when required.
E. Designs utilizing components of molded-case circuit breakers, contactors, or parts thereof which are not intended for continuous duty, repetitive switching or transfer between two active power sources are not acceptable.
F. Where neutral conductors must be switched, the ATS shall be provided with fully rated neutral transfer contacts.

G. Where neutral conductors are to be solidly connected, a neutral terminal plate with fully-rated AL-CU pressure connectors shall be provided.

1.20.6.15.4 Microprocessor Controller with Membrane Interface Panel

A. The controller shall direct the operation of the transfer switch. The controller's sensing and logic shall be controlled by a built-in microprocessor for maximum reliability, minimum maintenance, and inherent serial communications capability. The controller shall be connected to the transfer switch by an interconnecting wiring harness. The harness shall include a keyed disconnect plug to enable the controller to be disconnected from the transfer switch for routine maintenance.
B. The controller shall be enclosed with a protective cover and be mounted separate from the transfer switch unit for safety and ease of maintenance. Sensing and control logic shall be provided on printed circuit boards. Interfacing relays shall be industrial grade plug-in type with dust covers.
C. The controller shall meet or exceed the requirements for Electromagnetic Compatibility (EMC) as follows:
1. ANSI C37.90A/IEEE 472 Voltage Surge Test
2. NEMA ICS – 109.21 Impulse Withstand Test
3. IEC801-2 Electrostatic discharge (ESD) immunity
4. ENV50140 and IEC 801 – 3 Radiated electromagnetic field immunity
5. IEC 801 – 4 Electrical fast transient (EFT) immunity
6. ENV50142 Surge transient immunity
7. ENV50141: Conducted radio-frequency field immunity
8. EN55011: Group 1, Class A conducted and radiated emissions
9. EN61000 –4 – 11 Voltage dips and interruptions immunity

1.20.6.15.5 Enclosure

A. The ATS shall be furnished in a NEMA 4X Stainless Steel enclosure
B. Controller shall be flush-mounted display with LED indicators for switch position and source availability. It shall also include test and time delay bypass switches.

1.20.6.16 PART 3 OPERATION

1.20.6.16.1 Voltage and Frequency Sensing

A. The voltage of each phase of the normal source shall be monitored, with pickup adjustable to 95% of nominal and dropout adjustable from 70% to 90% of pickup setting.
B. Single-phase voltage and frequency sensing of the emergency source shall be provided.

1.20.6.16.2 Time Delays

A. An adjustable time delay shall be provided to override momentary normal source outages and delay all transfer and engine starting signals.
B. An adjustable time delay shall be provided on transfer to emergency, adjustable from 0 to 5 minutes for controlled timing of transfer of loads to emergency.
C. An adjustable time delay shall be provided on retransfer to normal, adjustable to 30 minutes. Time delay shall be automatically bypassed if emergency source fails and normal source is acceptable.

D. A 5-minute cool down time delay shall be provided on shutdown of engine generator.
E. All adjustable time delays shall be field adjustable without the use of tools.

1.20.6.16.3 Additional Features

A. A set of gold-flashed contacts rated 10 amps, 32 VDC shall be provided for a low voltage engine start signal. The start signal shall prevent dry cranking of the engine by requiring the generator set to reach proper output, and run for the duration of the cool down setting, regardless of whether the normal source restores before the load is transferred.
B. A push-button type test switch shall be provided to simulate a normal source failure.
C. A push-button type switch to bypass the time delay on transfer to emergency, the engine exerciser period on the retransfer to normal time delay whichever delay is active at the time the push-button is activated.
D. Terminals shall be provided for a remote contact which opens to signal the ATS to transfer to emergency and for remote contacts which open to inhibit transfer to emergency and/or retransfer to normal.
E. Auxiliary contacts, rated 10 amps, 250 VAC shall be provided consisting of one contact, closed when the ATS is connected to the normal source and one contact, closed, when the ATS is connected to the emergency source.
F. Indicating lights shall be provided, one to indicate when the ATS is connected to the normal source (green) and one to indicate when the ATS is connected to the emergency source (red). Also provide indicating lights for both normal and emergency source availability.
G. Terminals shall be provided to indicate actual availability of the normal and emergency sources, as determined by the voltage sensing pickup and dropout settings for each source.

1.20.6.16.3 <u>Engine Exerciser</u>

An engine generator exercising timer shall be provided, including a selector switch to select exercise with or without load transfer. It will be a seven day electronic time switch for automatic weekly testing of the engine - generator set. The exerciser shall be fully programmable and backed up by a permanent battery.

A fully programmable engine exerciser with seven independent routines to exercise the engine generator, with or without loads, on a daily, weekly, bi –weekly or monthly basis. Engine exerciser setting can be displayed and changed from the user interface keypad.

Program Control to periodically exercise the emergency engine-generator plant.
The engine-generator should be exercised under load once a week for minimum time period of 60 minutes.

1.20.6.16.4 Inphase Monitor

An Inphase monitor shall be inherently built into the controls.
The monitor shall control transfer so that motor load inrush currents do not exceed normal starting currents, and shall not require external control of power sources. The inphase monitor shall be specifically designed for and be the product of the ATS manufacturer.

1.20.6.16.5 Selective Load Disconnect

A double throw contact shall be provided to operate after a time delay, adjustable to 20 seconds prior to transfer and reset 0 to 20 seconds after transfer. This contact can be used to selectively disconnect specific load(s) when the transfer switch is transferred. Output contacts shall be rated 6 amps at 28 VDC or 120 VAC.

1.20.6.16.6 Withstand and Closing Ratings+

A. The ATS shall be rated to close on and withstand the available rms symmetrical short circuit current at the ATS terminals with the type of overcurrent protection shown on the plans. WCR ATS ratings as be as follows when used with specific circuit breakers:

ATS Size	Withstand & Closing Rating MCCB	W/CLF
30 – 200	22,000A	200,000
225 – 400	42,000A	200,000
600 – 1200	65,000A	200,000
1600 – 2000	85,000A	200,000
2600 – 3000	100,000A	200,000

1.20.6.15.7 Tests and Certification

A. The complete ATS shall be factory tested to ensure proper operation of the individual components and correct overall sequence of operation and to ensure that the operating transfer time, voltage, frequency and time delay settings are in compliance with the specification requirements.
B. Upon request, the manufacturer shall provide a notarized letter certifying compliance with all of the requirements of this specification including compliance with the above codes and standards, and withstand and closing ratings. The certification shall identify, by serial number(s), the equipment involved. No exceptions to the specifications, other than those stipulated at the time of the submittal, shall be included in the certification.

9.20.6.16.8 Startup and Warranty Validation

The start-up of engine generator set and automatic transfer switch (if applicable) will be performed by an authorized service dealer of the manufacturer. The test will include instruction to personnel of normal maintenance and operation under existing load available. All systems shall be operated for proper starting and stopping and transfer of the emergency power.

9.20.6.16.9 Manufacturer's Product Period of Warranty

The standby electric generating system components, complete Automatic Transfer Switch (ATS) shall be warranted by the manufacturer against defective materials and factory workmanship for a period of **two years from the date installed**. Such defective parts shall be repaired or replaced at the manufacturer's option, free of charge. Satisfactory warranty documents must be provided.

1.20.6.17 TESTING

The intent of this specification is to provide equipment of proven reliability and compatibility. In addition to providing factory prototype test date, two separate production tests shall be performed; factory production tests and field tests. The equipment shall be installed by the Vendor/Contractor in accordance with the manufacturer's recommendations and all applicable codes.

Factory prototype tests

To assure that the equipment has been designed and built to the highest reliability and quality standards, the manufacturer shall be responsible for design prototype tests as described herein: Components of the emergency system, such as the engine/generator set, transfer switch, and accessories shall not be subjected to prototype tests since the tests are potentially damaging. Rather, similar design prototypes which will not be sold, shall be used for these tests. Prototype test programs shall include the requirements of NFPA-110 and the following:

Minimum 1 hour load test Full load at unity, 1.0 PF
Recordings of the maximum load carrying capabilities of the engine generator set
Maximum single block load pickup capability
Kilowatts Amperes Voltage
Kilovolt amperes
Resistance of exciter field and stator
Insulation test, generator field, exciter armature, exciter field, generator armature
Dielectric test, generator armature, generator field, exciter armature, exciter field
Lube oil pressure (if applicable) Time
Water temperature (if applicable) Battery charge rate (if applicable) Heaters, jacket water and/or lube oil Safety shutdowns and automatic controls
Accessories (annunciator panel, charger, pumps as supplied) Phase sequence on three phase
Full load and .4PF to verify the motor starting capability of the engine generator set (optional)
Frequency;
Full rated load at rated PF and maximum load, to verify engine power, overload and maximum capability.
kVA, kilowatts, amperes, voltage, frequency and voltage transients at ½ and rated load frequency at: no load, full load rated and maximum output.
Regulator range (adjust), phase sequence, phase voltage balance.
Stator and exciter field resistance.
Insulation test, generator field, exciter armature, exciter field, generator armature or stator.
Dielectric test, generator field, exciter armature, exciter field, generator armature or stator.
All safety shutdown and automatic controls. Standard testing includes portions of MIL-STD 705: MIL-STD-705 Methods:
301.1b: Insulation Resistance Test
302.1a: High Potential Test
401.1a: Winding Resistance Test
410.1a: Open Circuit Saturation Curve Test
503.1b: Start and Stop Test
505.2a: Overspeed Protective Device Test
507.1c: Phase Sequence Test (Rotation)
508.1c: Phase Balance Test (Voltage)

510.1c: Rheostat Range Tes
511.1c: Regulator Range Test
511.2b: Frequency Adjustment Range Test
515.1a: Low Oil Pressure Protective Device Test
515.2a: Overtemperature Protective Device Test
516.1: Controls, Direction of Rotation
640.1c: Maximum Power Test

1.20.6.17.1 Factory Production Tests

Before shipment of the equipment, all components shall be tested under rated load and power factor for performance and proper functioning of control and interface. These tests shall be performed to the name plate power factor rating with a reactive load bank. Certified copies on the test results shall be supplied to the engineer for approval before final acceptance by the owner.

1.20.6.17.2 Field Test After Installation

The complete installation shall be initially checked, started and tested for operational compliance by a factory representative. The time and date of the site tests shall be coordinated with the Owner.

A. Fuel, lubricating oil, and antifreeze shall be checked for conformity to the manufacturer's recommendations under the environmental conditions present and expected. Accessories that normally function while the set is standing by shall be checked prior to cranking the engine. This shall include: engine heaters, battery charger, generator strip heaters, remote annunciator, etc.

B. Initial start-up testing shall include check for exhaust leaks, cooling air flow, movement during starting and stopping, vibration during running, normal and emergency line-to-line voltage and phase rotation while running a known test load. Upon completion of initial start-up and system check out, the supplier of the Emergency Generator set shall perform a field test to demonstrate load carrying capability, stability, voltage, and frequency. It shall be tested under varying loads with guards and exhaust system in place.

C. The equipment shall be tested to show it is free of defects and will start automatically by means of simulated power outage. Prior to this test, all transfer switch timers shall be adjusted for proper systems coordination. It shall be subjected to testing by using portable load banks provided by generator set supplier. Engine temperature, oil pressure and battery charge level along with generator voltage, amperes, and frequency shall be monitored throughout the test. Load bank shall be capable of definite and precise incremental loading and shall not be dependent on generator control instrumentation to read amperage and voltage of each phase.

D. Test instrumentation shall serve as a check of generator set meters. Salt water brine tanks are not acceptable. Under no circumstances shall job site load be utilized for this test. Load bank testing shall be done in the presence of the Owner's Representative after unit is permanently installed in accordance with the drawings and specifications. Load Bank Testing shall be for a minimum of four hours under full load. Tests shall include:

1. Single-step load pickup.
2. Transient and steady-state governing.

3. Safety shutdown device testing
4. Voltage regulation.
5. Rated Power.
6. Maximum Power.

Prior to acceptance, any defects which became evident during this test shall be corrected at no additional expense to the Owner.

E. The CONTRACTOR shall refill the main fuel tank at the completion of the test

1.20.6.17.3 Submittal, Operator's Manual, Certification and Warranty

Submittal shall include specification sheets showing all standard and optional accessories to be supplied; foundation plan; schematic wiring diagrams; dimension drawings; and interconnection diagrams identifying by terminal number of each required interconnection between the generator set, the transfer switch, and the remote annunciator panel and the load. The complete installation manual shall be delivered with the submittal. Equipment shall not be released for manufacture until submittal materials are approved. Each standby electrical power system shall be provided with an operator's manual providing installationand operating instructions. On request, the manufacturer shall provide a letter certifying compliance with all requirements of the transfer switch specification. The certification shall identify equipment by serial number.

1.20.6.17.4 Codes and Regulations

All materials and equipment shall be in accordance with any and all applicable Federal, State, and Local codes, laws, and ordinances in effect at the jobsite. All of the above referenced codes, laws, and ordinances shall take precedence over these specifications in case of any conflict. All such conflicts shall be referred to the OWNER for adjudication. The following industry, association, and government codes and standards shall be followed as applicable to the design, fabrication, assembly, installation, and testing of all materials and equipment furnished under this specification:

AISC-American Institute of Steel Construction
AISI-American Iron and Steel Institute
ANSI-American National Standards Institute
ASME-American Society of Mechanical Engineers
ASTM-American Society of Testing and Materials
AWS-American Welding Society
FM-Factory Mutual
IEEE-Institute of Electrical and Electronics Engineers
NACE-National Association of Corrosion Engineers
NEMA -National Electrical Manufacturers Association
OSHA-Occupational Safety and Health Administration
SBCC-Southern Building Code Congress
SSP-Structural Steel Painting Council
UL-Underwriters Laboratories

1.20.6.18 DELIVERY & ACCEPTANCE OF EQUIPMENT

1.20.6.18.1 Acceptance of Material

The material will be accepted after all work included in the contract is completed to the satisfaction of the OWNER, after the material has been installed, connected, and placed in operation by the Vendor/Contractor, and when performance guarantees have been met.

The VENDOR shall include sufficient training to assure proper operation and maintenance of the equipment, and to certify the WNER'S personnel in safely operating and maintaining the equipment.

1.20.6.18.2 Identification

Each complete field assembly shall be given an IDENTIFICATION number or letter, and each part of each field assembly which is not permanently connected in shop assembly shall be legibly marked. Shop assembly and subassemblies as used herein are defined as minor assembly or parts for ease of shipment. Descriptions and diagrams of all such markings shall be supplied. Each piece or subassembly separately packaged for shipment shall be labeled or tagged with the project name. Material shipped without a complete packing list shall be subject to rejection. All material shall be furnished with a permanently attached stainless steel nameplate. If the equipment is to be insulated the nameplate shall be raised at least one inch above the surface. As a minimum, the following information is to be on the plate:

a) Manufacturer's Name
b) Model and Serial Number
c) Size and/or Type
d) Item Number
e) Design Data
f) Date of Manufacture

A shipping tag must be securely attached to each package shipped. This tag must be durable and must be plainly marked with the project name and equipment item number. Separate packages for a single item must be so marked as to identify the component(s) in each package.

1.20.6.18.3 Spare Parts

The VENDOR'S instruction manual shall include an itemized list of recommended spare parts that should be stocked by OWNER, after warranty expires, to assure proper and expedient maintenance. The VENDOR shall stock spare parts for the material or guarantee delivery of parts within 48 hours.

1.20.6.18.4 Training

The VENDOR shall include sufficient training to assure proper operation and maintenance of the equipment, and to certify the OWNER'S personnel in safely operating and maintaining the equipment.

1.20.6.18.5 Drawings

The VENDOR shall furnish drawings of sufficient detail to document, identify, and define the system(s) and equipment supplied under this Contract.

The drawings shall provide both general and detailed information as follows:

A. System drawings shall show the physical and/or operational relationships of the composite system and major sub-systems. These drawings may include general layout, outline, plan, elevation, and schematic drawings. All drawings shall reference other related system and detail drawings.

B. Detail and section drawings shall show all component parts, and shall include dimensions, manufacturer, and part numbers. These drawings shall reference the related system drawing.

C. Detail drawing showing internal measurements of the fuel tank.

The transmittal of drawings shall include one AutoCAD drawing file stored on CD, and one (1) reproducible print.

1.20.6.18.6 Instruction Manuals

The VENDOR shall furnish operation manuals that provide detailed instructions relative to proper unloading, storage, installation, calibration, and maintenance of equipment supplied and an itemized list of recommended spare parts.
The transmittal of instruction manuals shall include one (1) printed copy and one (1) electronic copy.

1.20.6.18.7 Document Distribution

The mailing address for all correspondence, drawings, and manuals will be as follows:

Town of Lake
Hamilton Utilities
Department1318 By
Goss
Davenport, FL 33837
Tag: Project Manager & Project Name

Sec. 1.20.7 FLOW MONITORING SYSTEM

1.20.7.1. GENERAL

When indicated on the DRAWINGS or as required by Section 1.6.4., a flow monitoring system capable of indicating, recording, and totalizing wastewater flows shall be provided. The system shall include magnetic flowmeter/transmitter, electronic recording receiver, and miscellaneous related accessories as specified herein. It shall be the CONTRACTOR's responsibility to provide and install such equipment resulting in a completely operational flow monitoring system.

1.20.7.2. MAGNETIC FLOWMETER/TRANSMITTERS

The magnetic flowmeter shall be of the low frequency electromagnetic induction type and shall produce a DC pulsed signal directly proportional and linear to the liquid flow rate. The meter shall be designed for operation on 120 VAC+ 10%, 60 Hz + 5% with a power consumption of less than 20 watts for sizes through 12-inches.

The metering tubes shall be constructed of stainless steel. All magnetic flowmeters shall be designed to mount directly in the pipe between ANSI Class 150 flanges and shall consist of a flanged pipe spool piece with laying length of at least 1-1/2 times the meter diameter. Meters shall be mounted according to manufacturer's specifications, but, as a general rule, precautions must be taken to assure that the metering tube is filled at all times during measurement (i.e. do not mount meter at system high point). Meters shall have polyurethane liners with stainless steel electrodes.

The electronics portion of the magnetic flowmeter shall include both a magnet environment. A separate terminal strip for power connection shall be supplied. Driver to power the magnet coils and a signal converter. The signal converter shall be integrally mounted. The converter shall include a separate customer connection section to isolate the electronics compartment and protect the electronics from the electronics shall be of the solid state, feedback type and utilize integrated circuitry.

The input span of the signal converter shall be continuously adjustable between 0-1 and 0-31 fps for both analog and frequency outputs. The converter shall not be affected by quadrature noise nor shall it require zero adjustment or special tools for start-up.

Input and output signals shall be fully isolated. The converter output shall be 4 to 20 mA DC into 0 to 900 ohms. Meter shall be suitable for outdoors installation

and shall be furnished complete with grounding rings and installation hardware including studs, nuts, gaskets, and flange adapter hardware.

The converter shall include an integral zero return to provide a constant zero output signal in response to an external dry contact closure.

Converter shall also include digital type switches for direct adjustment of scaling factor in engineering units along with integral calibration self-test feature to verify proper operation of the electronics.

The meter shall be hydraulically calibrated at a facility located in the United States and the calibration shall be traceable to the National Bureau of Standards. A computer printout of the actual calibration data giving indicated versus actual flows at a minimum of three (3) flow rates shall be provided with the meter. A certification letter shall accompany the computer printout of the calibration data for each meter referencing the meter's serial number. The accuracy of the metering system shall be 1% of rate from 10 to 100% of flow for maximum flow velocities of 3 to 31 feet per second.

Complete zero stability shall be an inherent characteristic of the meter system to eliminate the need to zero adjust the system with a full pipe at zero flow.

The meter housing shall be splash-proof and weather resistant design. The meter shall be capable of accidental submergence in up to 30 feet of water for up to 48 hours without damage to the electronics or interruption of the flow measurement.

1.20.7.3. ELECTRONIC RECORDING RECEIVER

The electronic recording receiver shall be of the solid state, null-balance, servo operated potentiometer type.

The instrument shall contain a differential amplifier, a TORQ-ER driver motor to position the pen, and a Flux Bridge contact less solid state position feedback device for balancing. The instrument shall be capable of receiving one process variable input. Inputs shall be provided with electrical isolation. The instrument shall accept an input signal of 4 to 20 mADC.

Electrical zero and span adjustments shall be provided. Power requirements shall be 120 VAC+ 10%, 60 Hz. A power supply shall be provided for two-wire transmitters. Accuracy shall be + 0.5% of span, with repeatability of + 0.2% of span.

The receiver shall be provided with an indicating 5-inch segmental scale.

The electronic recording receiver shall be housed in a cast aluminum case suitable for panel mounting. The case shall have a gasketed door with glass window. A 12-inch circular chart shall be provided, with 7 day/rev. and chart rotation. An eight (8) digit electronic totalizing counter shall also be provided.

1.20.7.4. WARRANTY AND SERVICE

WARRANTY

Products shall be guaranteed to be free from defects in material and workmanship under normal use and service for a period of one (1) year after start-up.

SERVICE

Service shall be available for insitu repair of the products. Manufacturer's Repair personnel shall be based in Florida to insure a reasonable response time of not more than two (2) working days.

Sec. 1.20.8. CHAIN LINK FENCE

1.20.8.1. GENERAL

The CONTRACTOR shall furnish and erect the chain link fence and gate in accordance with these specifications and in conformity with the lines, grades, notes and typical sections shown on the DRAWINGS and the STANDARD DETAILS.

1.20.8.2. MATERIALS

The fabric, posts, fastenings, fittings and other accessories for chain link fence shall meet the requirement of AASHTO M 181 with the following changes:

1. The weight of coating of wire fabric shall be 1.2 ounces of zinc per square foot (Class B).

2. The galvanizing of steel materials shall be hot-dipped galvanized.

3. The weight of coating on posts and braces shall be 1.8 ounces of zinc per square foot, both inside and outside to meet the requirements of AASHTOM 111.

   The base metal of the fabric shall be a good commercial quality 11.5 Gage Steel Wire. The fabric shall be of uniform quality, and shall be 6 foot high with a 2 inch mesh size.

   All posts and rails shall be in accordance with the following schedule:

   End, corner and pull posts - 2 3/8" O.D., Schedule .055.

   Line posts and gate frames - 2" O.D., Schedule .065.

   Gate Posts - 3" O.D., Schedule .065.

   Post braces and top rail - 1 5/6" O.D., Schedule .055.

   Tension wire shall be 0.177 inch coiled spring wire tensioned along the bottom of the fabric and shall be coated similarly to the wire fabric.

Miscellaneous fittings and hardware shall be zinc coated commercial quality or better steel or zinc coated cast or malleable iron as appropriate for the article. Post caps, designed to provide a drive fit over the top of the tubular post to exclude moisture, shall be provided.

1.20.8.3. INSTALLATION

POST SETTING

All post shall be set three (3) feet deep in concrete footings, 12" diameter for line posts, gate and corner posts.

After the post has been set, aligned and plumbed, the hole shall be filled with 2500 p.s.i. concrete. The concrete shall be thoroughly worked into the hole so as to leave no voids. The exposed surface of the concrete shall be crowned to shed water.

End, corner, pull and gate posts shall be braced to the nearest post with horizontal brace used as a compression member and a galvanized 3/8 inch steel truss rod and truss tightener used as a tension member. Corner posts and corner bracing shall be constructed at all changes of fence alignment of 30 degrees or more. All chain link fence shall be constructed with a top rail and bottom tension wire.

GATES

Swing gates shall generally be two 6-feet wide double hung gates as indicated on the STANDARD DETAILS and hinged to swing through 180 degrees from closed to open and shall be complete with latches, locking device, stops keeper, hinges, fabric and braces. Gates shall be the same height as the fence and the gate fabric shall be the same as the fence fabric.

Gate leaves less than 8 feet wide shall have truss rods or intermediate braces and gate leaves 8 feet or more in width shall have intermediate braces and diagonal truss rods or shall have tubular members as necessary to provide rigid construction, free from sag or twist.

PLACING FABRIC

The fabric shall not be placed until the posts have been permanently positioned and concrete foundations have attained adequate strength. The fabric shall be placed by securing one end and applying sufficient tension to remove all slack before making permanent attachments at intermediate points.

The fabric shall be fastened to all corner, end and pull posts by substantial and approved means. Tension for stretching the fabric shall be applied by mechanical fence stretchers.

Sec 1.20. 9. <u>REQUIRED SUBMITTALS</u>

Submittals shall be provided to the CITY in triplicate (minimum) and include the following:

1. Shop and erection drawings showing all important details of construction, dimensions and anchor bolt locations.

2. Descriptive literature, bulletins, and/or catalogs of the equipment.

3. Data on the characteristics and performance of each pump. Data shall include guaranteed performance curves, based on actual shop tests of similar units, which show that they meet the specified requirements for head, capacity, efficiency, NPSHR, submergence and horsepower. Curves shall be submitted on eight and one-half (8 ½) inch by eleven (11) inch sheets, at as large a scale as is practical. Curves shall be plotted from no flow at shut off head to maximum manufacturer recommended pump capacity. Catalog sheets showing a family of curves will not be acceptable.

4. Complete layouts, wiring diagrams, elementary or control schematics, including coordination with other electrical control devises operating in conjunction with the pump control system. Suitable outline drawings shall be furnished for approval before proceeding with manufacture of any equipment. Standard preprinted sheets or drawings simply marked to indicate applicability will not be acceptable.

5. A drawing showing the layout of the pump control panel shall be furnished. The layout shall indicate all devices mounted on the door and in the panel shall be completely identified.

6. The weight of each pump.

7. Complete motor data shall be submitted including:

   - Nameplate identification
   - No-load current
   - Full load current
   - Full load efficiency
   - Locked rotor current
   - High potential test data
   - Bearing Inspection report

Sec. 1.20.10. ELECTRICAL GROUNDING SYSTEM

1.20.10.1. GENERAL

A grounding system shall be installed as per National Electrical Code, Local Codes and Ordinances. The DRAWINGS shall clearly show the Electrical Grounding System. An underground perimeter cable grounding system shall be installed with connections to at least eh following equipment:

1. Wet Well Cover
2. Valve Vault Cover

3. Control Panel
4. Generator
5. Utility Company Transformer
6. Main Disconnect Switch
7. Fence

1.20.10.2. MATERIAL AND INSTALLATION

The DRAWINGS shall show details of material and installation to construct a completely functional and operational Electrical Grounding System.

Sec. 1.20.11 INSPECTION AND TESTING

A factory representative knowledgeable in pump operation and maintenance shall insect and supervise a test run at the pumping station covered by this MANUAL. A minimum of one (1) working day shall be provided for the inspections. Additional time made necessary by faulty or incomplete WORK or equipment malfunctions shall be provided as necessary to meet the requirements in the MANUAL at no additional cost to the CITY. Upon satisfactory completion of the test run, the factory representative shall issue the required manufacturer's certificate.

The test run shall demonstrate that all items of the MANUAL have been met by the equipment as installed and shall include, but not be limited to, the following tests:

1. That all units have been properly installed.

2. That the units operate without overheating or overloading any parts and without objectionable vibration.

3. That there are no mechanical defects in any of the parts.

4. That the pumps can deliver the specified pressure and quantity at all design points.

5. That the pumps are capable of pumping the specified material.

6. That the pump controls perform satisfactorily.

Sec. 1.20.12. ACCESS ROADS AND QUALITY ASSURANCE

A minimum 10' wide, paved access road shall be provided from the nearest public roadway. Curb, if present, shall have a 15 foot cut for the access road.

Roadway shall include deeded easement or dedicated right-of-way.

* stabilized (if necessary) subgrade: 12" min.

* base course (limerock): 6" min.

* asphaltic concrete surface, type S-1: 1 ½"

SECTION 1.21. SUBMERSIBLE WASTEWATER PUMPS

Sec. 1.21.1. GENERAL

The equipment covered by these specifications is intended to be standard pumping equipment of proven ability as manufactured by a reputable firm having at least five (5) years' experience in the production of such equipment. The equipment furnished shall be designed, constructed, and installed in accordance with the best practices and methods, and shall operate satisfactorily when installed as shown on the DRAWINGS and STANDARD DETAILS.

All part shall be so designed and proportioned as to have liberal strength, and stiffness and to be especially adapted for the work to be done. Ample space shall be provided for inspection, repairs, and adjustment. All necessary foundation bolts, plates, nuts, and washers shall be furnished by the equipment manufacturer, and shall be of Type 304 stainless steel. Brass or stainless steel nameplates giving the name of the manufacturer, voltage, phase, rated horsepower, speed, and any other pertinent data shall be attached to each pump. The nameplate rating of the motors shall not be exceeded.

The pumps shall be capable of handling raw unscreened domestic wastewater and minimum

3" diameter solid sphere. Pump operation shall be controlled automatically by means of float-type liquid level sensors in the wet well. Pumps shall be mounted in the wet well as shown on the DRAWINGS and STANDARD DETAILS. (See approved manufacturer's list in appendix).

Pumps shall be field tested and certified by manufacturer's representative. Certifications and guarantees shall be supplied to the City before acceptance.

Sec. 1.21.2. PUMP CONSTRUCTION DETAILS

1.21.2.1. SHAFT

The pump shaft shall be of Series 300 or 400 stainless steel or carbon steel. When a carbon steel shaft is provided, the manufacturer shall demonstrate that any part of the shaft which will normally come in contact with the wastewater has proven to be corrosion resistant in this application. The shaft and bearings shall be adequately designed to meet the maximum torque required for any startup or operating condition and to minimize vibration and shaft deflection. As a minimum, the pump shaft shall rotate on two (2) permanently lubricated bearings. The upper bearing shall be a single row ball bearing. The lower bearing shall be a two row angular contact ball bearing, if required to minimize vibration and provide maximum bearing life.

1.21.2.2. IMPELLER

The impeller shall be constructed of gray cast iron, ASTM A-48, class 30. All external bolts and nuts shall be of series 300 stainless steel. Each pump shall be provided with a replaceable metallic wear ring system to maintain pump efficiency. As a minimum one stationary wear ring provided in the pump volute or one rotating wear ring provide on the pump impeller shall be required. A two part system is acceptable.

1.21.2.3. MECHANICAL SEAL

Each pump shall be provided with a tandem double mechanical seal running in an oil reservoir, composed of two separate lapped face seals, each consisting of one stationary and one rotating tungsten carbide ring with each pair held in contact by a separate spring, so that the outside pressure assists spring compression in preventing the seal faces from opening. The compression spring shall be protected against exposure to the pumped liquid. Silicone carbide may be used in place of tungsten carbide for the lower seal. The pumped liquid shall be sealed from the oil reservoir by one face seal and the oil reservoir from the

airfilled motor chamber by the other. The seals shall require neither maintenance nor adjustment, and shall be easily replaced. Conventional double mechanical seals with a single spring between the rotating faces, requiring constant differential pressure to effect sealing and subject to opening and penetration by pumping forces, shall not be considered equal to tandem seal specified and required.

.21.2.4. BEARINGS

Motor shaft bearings shall have a minimum life of 40,000 hours, ANSI B-10.

1.21.2.5. GUIDES

A sliding guide bracket shall be an integral part of the pump casing and shall have a machined connecting flange to connect with the cast iron discharge connection, which shall be bolted to the floor of the wet well with stainless steel anchor bolts and so designed as to receive the pump discharge flange without the need of any bolts or nuts. Sealing of the pumps to the discharge connection shall be accomplished by a simple linear downward motion of the pump with the entire weight of the pumping unit guided by no less than two (2) 300 series seamless tubular stainless steel guides which will press it tightly against the discharge connection. No portion of the pump shall bear directly on the floor of the wet well and no rotary motion of the pump shall be required for sealing. Sealing at the discharge connection by means of a diaphragm or similar method of sealing will not be accepted as an equal to a metal to metal contact of the pump discharge and mating discharge connection specified and required. Approved pump manufacturers, if necessary to meet the above specification, shall provide a sliding guide bracket adapter. The design shall be such that the pumps shall be automatically connected to the discharge p1pmg when lowered into place on the discharge connection. The pumps shall be easily removable for inspection or service, requiring no bolts, nuts or fastenings to be removed for this purpose, and no need for personnel to enter the wet well. Each pump shall be fitted with a Type 304 stainless steel, lifting chain of adequate strength. A stainless steel cable, aircraft rating, shall be provided between the cable holder and the lifting chain.

Sec. 1.21.3. MOTORS

1.21.3.1. GENERAL REQUIREMENTS

All motor shall be built in accordance with latest NEMA, IEEE, ANSI and AFBMA Standards where applicable. Pump motors shall be housed in an airfilled, water-tight casing and shall have Class F insulated windings which shall be moisture resistant. Motors shall be NEMA Design 8, rated I 55 degrees C maximum. Pump motors shall have cooling characteristics suitable to permit continuous operation, in a totally, partially or non-submerged condition. The pump shall be capable of running continuously in a non-submerged condition under full load without damage, for extended periods. The motor shall be capable of a minimum of I 0 starts per hour. If required by the CITY, before final acceptance, a field running test demonstrating this ability, with 24 hours of continuous operation under the above conditions, shall be performed for all pumps being supplied. Motors 25 horsepower and below shall be rated 230/460 volts, 3 phase. Motors greater than 25 horsepower shall be 460 volt, 3 phase.

9.21.3.2. HEAT AND MOISTURE SENSORS

Each motor shall incorporate a minimum of one ambient temperature compensated overheat sensing device and one moisture sensing device. These protective devices shall be wired into the pump controls in such a way that if excessive temperature or moisture is detected the pump will shut down. These devices shall be manual reset.

In lieu of moisture and temperature sensors, each pump motor shall have its motor winding insulation resistance monitored automatically by an automatic megger solid state electronics module. Each automatic megger must have an individual disconnect terminal plug, manual shut off switch, three lights

to indicate I 0 Mohm, 5 Mohm, and I Mohm, resistance values, two output circuits for external alarms, and two switches for manual testing. The power source shall be I10 VAC fused at 0.24 AMP. The test voltage shall be 500-700 volts d.c. The automatic megger shall monitor the motor resistance only when the motor is off and shall activate an alarm system when the motor resistance drops to 1 Mohm.

9.21.3.3. CABLES

Cables shall be designed specifically for submersible pump applications and shall be properly sealed. A type CGB water-tight connector with a neoprene gland shall be furnished with each pump to seal the cable entry at the control panel.

Sec. 1.21.4. PUMPS AND CONTROL SYSTEM

Refer to Section 9.22. For control system specifications.

Sec. 1.21.5. SHOP PAINTING

Before exposure to weather and prior to shop painting, all surfaces shall be thoroughly cleaned, dry and free from all mill-scale, rust, grease, dirt and other foreign matter. All pumps and motors shall be shop coated with a corrosion resistant paint proven to withstand an environment of raw wastewater. All nameplates shall be properly protected during painting.

Gears, bearing surfaces, and other similar surfaces obviously not to be painted shall be given a heavy shop coat of grease or other suitable rust-resistant coating. This coating shall be maintained as necessary to prevent corrosion during periods of storage and erection and shall be satisfactory to the CITY up to the time of the time of the final acceptance test.

Sec. 1.21.6. HANDLING

All parts and equipment shall be properly protected so that no damage or deterioration will occur during a prolonged delay from the time of shipment until installation is completed and the units and equipment are ready for operation. Finished surfaces of all exposed pump openings shall be protected by wooden planks, strongly built and securely bolted thereto. Finished iron or steel surfaces not painted shall be properly protected to prevent rust and corrosion.

Sec. 1.21.7. WARRANTY

The pump manufacturer shall warrant the units being supplies to the CITY against defects in workmanship and material for a period of five (5) years or 10,000 hours, whichever comes first. Warranty shall begin at time of start-up.

Sec. 1.21.8. TOOLS AND SPARE PARTS

One (1) set of all special tools required for normal operation and maintenance shall be provided. All such tools shall be furnished in a suitable steel tool chest complete with lock and duplicate keys.

The manufacturer shall furnish the following spare parts for each size pump supplied:

1. 1 – Set impeller wear rings
2. 1 – Impeller
3. 4 – Roto – float normally open

*See Control Panel Specifications Standard Detail 950310 & 950315 for Manufacturer and Part Numbers on the following items.

4. 1 – Surge suppression device 650vac, 3phase/4-wire
5. 1 – Phase Monitor, Base Mont, DPDT, 430-480Vac or 190-270Vac
6. 2 – Motor Starter , Open Type, Nema Size _, 120Vac Coil
7. 2 – Pump Monitor Relay, 11 Pin, 120Vac Coil
8. 1 – Control Transformer, 120Vac/24Vac, 100VA

Spare parts shall be properly packaged and labeled for easy identification without opening the packaging and suitably protected for long-term storage under humid conditions. Spare parts and tools shall be delivered to the CITY at or prior to the time of pump station start-up.

SECTION 1.22 PUMP STATION ELECTRICAL POWER AND CONTROL SYSTEM

Sec. 1.22.1. GENERAL

This section specifies the electrical power and control system requirements for wastewater pump stations. These requirements apply to duplex pump panels. Similar requirements shall apply when more than two pumps are involved except for the quantity of control equipment and panel size shall be increased accordingly. The manufacturer of the control panel shall provide data to indicate that the manufacturer has a minimum of 3 years experience in the building of pump control panels.

A pump station control panel shall be provided for each wastewater pump station. (See approved manufacturers' list in appendix.) The control panel shall respond to liquid level float switches to automatically start and stop pumps as well as sound an alarm upon high wet well levels. The control panel shall operate submersible pumps at the power characteristics stipulated. The control function shall provide for the operation of the lead pump under normal conditions. If the incoming flow exceeds the pumping capacity of the lead pump, the lag pump (s) shall automatically start to handle the increased flows. As the flow decreases, pumps shall be cut off at elevation as shown on the PLANS. Pumps shall alternate positions as lead pump at the end of each cycle. A failure of the alternator shall not disable the pumping system. The alternator shall include a safe, convenient method of manual alternation and also have provisions to prevent automatic alternation without disturbing any wiring. Should the "pump off" regulator fail, the system shall keep the station in operation and provide a visual indication of the regulator failure.

The control panel shall consist of main circuit breakers and generator breaker with mechanical interlock, an emergency power receptacle, a circuit breaker and magnetic starter for each pump motor, and 5 ampere, 120 volt circuit breakers as required. All pump control operations shall be accomplished by a float type liquid level control system with all control components mounted in one common enclosure. Control switches shall provide means to operate each pump manually or automatically. When operated in the automatic mode, the control assembly shall provide means to manually select or automatically alternate the position of the "lead" and "lag" pumps after each pumping cycle.

A float type liquid level control system shall continuously monitor wet well liquid level and control operation of the low-level cutoff for the pumps and shall operate off a 24 volt circuit.

Sec. 1.22.2. PANEL CONSTRUCTION

The duplex pump panel shall be housed in a NEMA 3R, Type 304, 14 Gauge stainless steel enclosure with 30% extra mounting space for additional equipment. Enclosure shall have provisions for padlocking the door and a dead front inner door unit for mounting controls. All exterior hardware and hinges shall be stainless steel there shall be permanently affixed to the interior side of the exterior enclosure door both a nameplate and a 10" X 12" pocket for log sheet storage.

The nameplate shall contain the following information, voltage, phase, rated horsepower, speed, date manufactured and pump and control panel manufacturer's name, address and telephone number, pump data, including impeller data, operating point and head. KW input, and amps at the operating point and at least two other points on the pump curve.

The control panel enclosure shall be Underwriters Laboratories (UL) 50 type 3 R listed.

Sec. 1.22.3. POWER SUPPLY AND MAIN DISCONNECT

Power supply to the control panel shall be 480 volt, 3 phase, 4 wire. Minimum service shall be 480 volt, 3 phase, 4 wire. Minimum service shall be 100 AMP. Single phase power shall not be accepted.

Nonfusible safety service main disconnects shall be installed at all stations. Disconnect should be installed ahead of the meter. LED power available indicators shall be supplied on all legs.

Sec. 1.22.4. CIRCUIT BREAKERS

1.22.4.1. MAIN BREAKERS

The panel shall have an inter-lock system between the normal power main breaker and the emergency breaker to ensure only one breaker is in the "on" position at a time. Both breakers shall be equal in size. (See approved manufacturers' list in appendix.)

1.22.4.2. CIRCUIT BREAKERS

All circuit breakers shall be heavy duty molded case breaker. The handle on the circuit breakers shall be operational through the inner door. (See approved manufacturers' list in appendix.)

Sec. 1.22.5. MOTOR CIRCUIT PROTECTORS

Each pump motor shall be protected by a 3-pole motor circuit protector. (See approved manufacturers' list in appendix.) The Motor Circuit Protector 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 a short circuit and abnormal currents which cause the Motor Circuit Protection to trip. Tripping shall be clearly indicated by the handle automatically assuming a position midway between the normal ON and OFF positions. All latch surfaces shall be ground and polished. All poles shall be so constructed that they open, close, and trip simultaneously. Motor Circuit Protector must be completely enclosed in a high-strength glass polyester molded case. Ampere ratings shall be clearly visible. Contacts shall be of non-welding silver alloy. Arc extinction must be accomplished by means of arc chutes. A manual pushtotrip button shall be provided for manual exercising of the trip mechanism. Each pole of these Motor Circuit Protector's shall provide instantaneous short circuit protection by means of an adjustable magnetic-only element.

Sec. 1.22.6. MOTOR STARTER AND SELECTOR SWITCHES

The panel shall contain the motor starters. The motor starter shall be across the line magnetic starter with individual overload protection on each power leg with reset installed through the inner door unit. (See approved manufacturers' list in appendix.) Local Power Company Regulations shall govern.

Selector switches shall be installed on the face of the inner door unit. Selector switch shall be a heavy duty oil tight "Hand-Off-Auto" three position switch to control the operation mode of each pump motor starter.

Sec. 1.22.7. PUMP ALTERNATOR

An eight pin plug-in solid state alternator (see approved manufacturers' list in appendix) shall be provided to change the pump starting sequence on each pumping cycle. A three position alternator test switch shall be provided to control the alternation operation. Switch positions to include the "Auto" to provide normal automatic sequence, "Off" position to disable alternator, and "test" position with a spring return to allow the alternating of the pump sequence to check alternator operation.

Sec. 1.22.8. LIGHTS AND ALARMS

1.22.8.1. INDICATOR LIGHTS

There shall be installed on the face of the inner door unit, heavy duty oil tight indicator lights.

1.22.8.2. HIGH LEVEL ALARM

A vapor proof red light and horn shall be mounted on top of the panel for high level alarm. Also, there shall be an alarm silence pushbutton on the inner door and a silence relay which will silence the horn and automatically reset when these signals are restored to normal. The pushbutton shall be heavy duty oil tight. The red glove shall be the screw-on type.

1.22.8.3. MOTOR HIGH TEMPERATURE AND LEAK INDICATION

Motor high temperature and leak detection shall be provided. Upon high temperature or leak detection, contacts will close, energizing panel mounted lights on the inner door and sending 120 VAC signal to the RTU to signal pump failure. Manual resets will be provided on the inner door.

Sec. 1.22.9. EMERGENCY POWER RECEPTACLE

This item shall only be required on stations that do not have a permanent standby generator system. The panel shall have external mounted generator receptacle of the required size (See approved manufacturer's list).

Sec. 1.22.10. ADDITIONAL REQUIREMENTS

1.22.10. 1. WIRING

All power wires shall be THW or THWN 75 Degree C insulated stranded copper conductors and shall be approximately sized for the given load application. All control circuit wire shall be type THW; Size 14, stranded type. All wiring within the enclosure shall be neatly routed by the use of slotted type wiring duct with snap on type covers.

Wiring on the rear of the inner door shall be neatly bundled with nylon ties and include sufficient loop across the hinges to prevent wire damage, with each end of conductor marked (I.D.), Color: Red, 24 volt; white, neutral; black, 120 volts.

1.22.10. 2. TERMINAL POINTS

Terminal points of all strips shall be permanently identified. All terminal numbers and identifying nomenclature shall correspond to and be shown on electrical diagrams. All wiring shall be permanently shown on electrical schematic diagrams.

1.22.10. 3. ENGRAVED NAMEPLATES

All circuit breakers, control switches, indicator pilot lights and other control devices shall be identified with permanently affixed legend plates and lamicoid-type engraved nameplates where applicable.

1.22.10. 4. SURGE PROTECTORS

Surge protectors shall be included and wired to protect motors and control equipment from lightning induced line surges. Surge protectors shall have a response time of picoseconds and be capable of dissipating high levels of line side surge energy, without damage to pump station equipment and controls. All surge protectors shall be U.L. approved and installed per respective power company requirements and manufacturer's specifications, primary surge protectors shall be attached to the main disconnects.

1.22.10. 5. ELAPSED TIME METERS

Elapsed time meters shall be 115 volt not-reset type and shall totalize pump running time in hours and tenths of hours to 99999.9 hours.

1.22.10. 6. CONVENIENCE RECEPTACLE

On the face of the inner door unit, there shall be installed a 15 AMP 120 volt, duplex convenience receptacle. It shall be provided with it's own single pole, 15 AMP circuit breaker for protection. Ground fault interrupt type shall be required.

1.22.10. 7. CONTROL TERMINAL BLOCKS

Control terminal blocks shall be of the clamp screw type, rated for 600 volts. Amperage rating shall accommodate the control circuit amperage. The minimum number of terminals provided shall be 30 single stacked or 20 double stacked.

1.22.10. 8. CONTROL POWER TRANSFORMERS

There shall be a control power transformer with a minimum size of 3 KVA to provide 120 VAC power for: coils for starters, 15A duplex receptacle, indicator pilot lights, alarm horn, alarm light, pump alternator, elapsed time meters etc. The secondary side shall have one leg fused and the other grounded. This control power transformer is required only on 480 volt control panels.

The signal required by the float switches and relays shall be 24 VAC. This shall be provided by a 24 VAC control power transformer properly sized with a fused secondary.

1.22.10. 9. CONTROL RELAY

The level control relays shall operate from 24 VAC. They shall be enclosed, plug-in 8 pin type with octal-style screw terminal sockets.

.22.10.10. ELECTRICAL SCHEMATIC

There shall be permanently affixed to the interior side of the exterior enclosure door an electrical schematic diagram and a copy supplied to CITY personnel at start-up. The schematic diagram shall include the rated amperage and voltage for all components.

1.22.10.11. PHASE MONITOR

For all 240 volt stations an eight pin plug-in type phase monitor shall be provided for protection of electrical components due to phase loss. Adequate dummy pin protection shall be provided to prevent accidental interchanging of the eight pin phase monitor with the eight pin alternator. All 480 volt stations shall have surface mount type phase monitors. Both types of phase monitors shall have 2 sets of normally open contacts and 2 sets of normally closed contacts.

1.22.10.12 AREA LIGHT

Provide a LED area lighting fixture with on/off switch, 175 watt minimum. Mount lighting fixture to control panel support post as shown on the STANDARD DETAIL entitled "Lift Station".

1.22.10.13 TELEMETRY

Provide a remote monitoring device "Appendix B"

Sec. 1.22.11. TESTING, SERVICE AND WARRANTY

1.22.11. 1. TESTING

After fabrication in the control panel manufacturer's plant, an operational test shall be performed to check out the entire panel before delivery. Three phase source voltage to which the panel is intended for shall be used for the testing.

1.22.11. 2. SERVICE

The control panel manufacturer shall maintain a service organization in the area that is available for service.

1.22.11. 3. WARRANTY

The manufacturer shall furnish a five (5) year warranty against defects in materials and workmanship covering parts and labor on all items supplied under this section from time of start -up of the lift station.

SECTION 1.23 PIPE MATERIAL FOR WATER MAINS AND SERVICE CONNECTIONS

Sec. 1.23.1. GENERAL

These specifications cover the pipe, fittings, and accessory items used for water distribution systems.

Pipe used in water distribution systems shall be either polyvinyl chloride pipe (PVCP), or ductile iron pipe (DIP). Above ground pipe and buried pipe with less than 30" of cover, or 6" of clearance shall be ductile iron pipe.

The CONTRACTOR shall be responsible for all materials furnished and storage of same, until the date of substantial completion. He shall replace at his expense all materials found to be defective or damaged in handling or storage. The CONTRACTOR shall, if requested by the CITY, furnish certificates, affidavits of compliance, test reports, or samples for analysis; for any of the materials specified herein. All pipe delivered to project site for installation is subject to random testing for compliance with the designated specifications.

Sec. 1.23.2. PIPE INSPECTION AND TESTING

Requirements specified in section 1.14.5. shall apply.

Sec. 1.23.3. PVC PIPE

1.23.3.1. PVC PIPE

All PVC pipe of nominal diameter four (4) through twelve (12) inches shall be manufactured in accordance with AWWA standard C900, latest edition. The PVC pipe shall have a minimum working pressure rating of 150 psi and shall have a dimension ratio (DR) of 18. Pipe shall be the same O.D. as ductile iron pipe.

1.23.3.2. JOINTS

PVC pipe shall be integral bell, push-on type joints. **NO pipe Deflection, must use fittings**

1.23.3.3. FITTINGS

Fittings used with PVC pipe shall conform to section 9.23.4.

Sec. 1.23.4. DUCTILE IRON PIPE AND FITTINGS

1.23.4.1. DUCTILE IRON PIPE

All ductile iron pipe of nominal diameter four (4) through fifty four (54) inches shall conform to ANSI/AWWA A21.51/C151. A minimum of Class 50 pipe shall be supplied for all sizes of pipe unless specifically called out in the DRAWINGS, or required by the CITY.

1.23.4.2. FITTINGS

Anyfittings required shall be mechanical joint ductile iron or grayiron conforming to ANSI/AWWA A21.10/C110, 250 psi minimum pressure rating, or ductile iron compact fittings four (4) through twelve (12) inches in accordance with ANSI/AWWA A21.53/C153.

1.23.4.3. JOINTS

Joints for ductile iron pipe shall be push-on or mechanical joints conforming to ANSI/AWWA A21.11/C111. Where called for in the plans, restrained or flanged joints shall be provided. Above ground joints shall be flanged with galvanized bolts, nuts and washers. Flanged joints shall conform to ANSI Standard B 16.1-125 LB. Restrained joints shall conform to Section 34.2 of these standards.

1.23.4.4. COATINGS AND LININGS

Where ductile iron pipe and fittings are to be below ground or installed in a casing pipe the exterior coating shall be a minimum 1.0 mil thick in accordance with ANSI/AWWA A21.51/C151. Where ductile iron pipe and fittings are to be installed above ground, pipe, fittings and valves shall be thoroughly cleaned and given one field coat (minimum 1.5 mils dry thickness) of rust inhibitor primer. Intermediate and finished field coats of Alkyd shall also be applied by the CONTRACTOR (minimum 1.5 mils dry thickness each coat).

Primer and field coats shall be compatible and shall be applied in accordance with the manufacturers recommendations. (See approved manufacturers' list in appendix.) Final field coat color shall be as directed by CITY.

All ductile iron pipe and fittings shall have an interior protective lining of cement-mortar with a seal coat of asphaltic material in accordance with ANSI/AWWA A21. 4/C104.

1.23.4.5. POLYETHYLENE ENCASEMENT

The pipe shall be polyethylene encased (8 mil) where shown on the DRAWINGS or required by the CITY in accordance with ANSI/AWWA A21.51/C105.

Sec. 1.23.5. SERVICE PIPE, STOPS, FITTINGS, AND SERVICE SADDLES

1.23.5.1. SERVICE PIPE

All service lines shall be 1", 1-1/2" or 2" blue, PC200, DR9, polyethylene tubing conforming to specifications in AWWA C901. Larger service pipe shall be PVCP or DIP as specified in sections 50.3 and 50.4 respectively.

1.23.5.2. STOPS

Corporation stops shall be 1", 1-1/2" or 2" brass, equipped with connections compatible with the polyethylene tubing and threaded in accordance with specifications in AWWA C800. Curb stops shall be lockable and sized to match the meter size and conform to the specifications in AWWA C800 and AWWA C901. Larger services shall have resilient wedge gate valves as specified in section 9.25.2.

1.23.5.3. FITTINGS

Fittings shall be brass, cast and machined in accordance with specifications in AWWA C800 with compatible polyethylene tubing connections.

Direct taps into ductile iron pipe, to accommodate corporation stops up to 1" are allowable if the DIP wall thickness is adequate to allow a minimum of three threads. Refer to AWWA C151, Appendix A, Table A.2.

SECTION 1.24. PIPE INSTALLATION FOR WATER MAINS

Sec. 1.24.1. GENERAL

Pipe shall be installed in accordance with the manufacturer's specifications and instructions for the type of pipe used and applicable AWWA standards, such as C600, unless otherwise stated in these specifications.

Sec. 1.24.2. PIPE HANDLING

All types of pipe shall be handled in such manner as will prevent damage to the pipe or coating. Accidental damage to pipe or coating shall be repaired to the satisfaction of the CITY or be removed from the job. When not being handled, the pipe shall be supported on timber cradles or on properly prepared ground, graded to eliminate all rock points and to provide uniform support along the full length. When being transported, the pipe shall be supported at all times in a manner which will not permit distortion or damage to the lining or coating. Any unit of pipe that, in the opinion of the CITY, is damaged beyond repair by the CONTRACTOR shall be removed from the site of the work and replaced with another unit.

Joint gaskets shall be stored in clean, dark dry location until immediately before use.

Dirt or other foreign material shall be prevented from entering the pipe or pipe joint during handling or laying operations and any pipe or fitting that has been installed with dirt or foreign material in it shall be removed, cleaned and re-laid. At times when pipe laying is not in progress, the open ends of the pipe shall be closed by a water-tight plug.

Sec. 1.24.3. SEPARATION OF WATER MAINS AND SEWERS

1.24.3.1. GENERAL

Water mains that are laid in the vicinity of pipe line designated to carry storm water, raw wastewater or reclaimed water (wastewater effluent) shall meet the horizontal and vertical separations specified in section 1.24.3.3.

1.24.3.2. HORIZONTAL SEPARATION

NORMAL CONDITIONS: Water mains shall be located at least 10 feet horizontally from pipes carrying raw wastewater, and 3 feet horizontally from pipes carrying reclaimed water and storm water, whenever possible; the distance shall be measured from edge of pipe to edge of pipe.

UNUSUAL CONDITIONS: When local conditions prevent the minimum required horizontal separation, a water main may be laid closer to a pipe carrying storm or wastewater provided that the sewer pipe is ductile iron.

1.24.3.3. CROSSING OF WATER MAINS AND SEWER PIPES

Normal Conditions: Water mains shall be above the sewers whenever they cross any sanitary sewer, storm sewer, sewage force main or reuse force main.

A vertical separation of at least 18 inches shall be maintained between the top of the sewer and the bottom of the water main.

Unusual Conditions: Sewers shall have one full length of ductile iron pipe centered at the point of crossing so that the joints will be equidistant and as far as possible from the water main.

Sec. 1.24.4. TRENCH PREPARATION AND PIPE BEDDING

1.24.4.1. TRENCH PREPARATION AND PIPE BEDDING

Applicable provisions of Section 1.10. shall apply. Also refer to STANDARD DETAILS.

1.24.4.2. PIPE PREPARATION AND HANDLING

All pipe and fittings shall be inspected prior to lowering into trench to insure no cracked, broken, or otherwise defective materials are being used. CONTRACTOR shall clean ends of pipe thoroughly and remove foreign matter and dirt from inside of pipe and keep clean during and after laying.

CONTRACTOR shall use proper implements, tools, and facilities for the safe and proper protection of the WORK. CONTRACTOR shall lower pipe into the trench in such a manner as to avoid any physical damage to the pipe and shall remove all damaged pipe from the jobsite. Care shall be taken to not drop or dump pipe into trenches under any circumstances.

1.24.4.3. TRENCH DEWATERING AND DRAINAGE CONTROL

Specifications from Section 1.10. shall apply. CONTRACTOR shall prevent water from entering the trench during excavation an pipe laying operations to the extent required to properly grade the bottom of the trench and allow for proper compaction of the backfill. Pipe shall not be laid in water.

1.24.4.4. SURVEY LINE AND GRADE

Pipe shall be laid to the lines and grades shown on the PLANS. The CONTRACTOR shall provide line and grade stakes at a 100 foot maximum. Spacing and at all line and/or grade change locations. CONTRACTOR shall provide Temporary Bench Marks at maximum 1000 foot intervals. The minimum pipe depth shall be three (3) feet below the elevation of the edge of pavement of the road surface whichever is greater.

1.24.4.5. PIPE LAYING IN TRENCH

CONTRACTOR shall prevent foreign material from entering the pipe while it is being placed in the trench. CONTRACTOR shall remove all foreign material from the pipe or joint ring before the next pipe is placed. Pipe shall be lowered into trench and installed, one piece at a time. During laying operations, CONTRACTOR shall keep debris, tools, clothing, or other materials out of the pipe.

1.24.4.6. LAYING PVC PIPE

All PVC pipe shall be installed in accordance with standards set forth in the UNI-BELL "Handbook of PVC pipe design and construction" unless such standards conflict with this MANUAL in which case this MANUAL shall apply.

1.24.4.7. LAYING DUCTILE IRON PIPE

All ductile iron pipe shall be installed in accordance with AWWA C600 unless such standards conflicts with this MANUAL in which case this MANUAL shall apply. CONTRACTOR shall cut pipe only as necessary to comply with alignment shown on the PLANS. Flame cutting of pipe shall not be allowed.

CONTRACTOR shall provide special tools and devices, such as special jacks, chokers, and similar items required for proper installation. Lubricant for the pipe gaskets shall be furnished by the pipe manufacturer, for potable water piping.

The pipe shall be polyethylene encased (8 mil) where shown on the DRAWINGS in accordance with ANSI/AWWA A21.51/C105.

1.24.4.8. LAYING OF PIPES ON CURVES

Long radius curves, either horizontal or vertical, are prohibited.

1.24.4.9. PIPE RESTRAINT

Requirements specified in Section 1.12. shall apply.

1.24.4.10. BEDDING AND BACKFILL FOR PIPES

Requirements specified in Section 1.12. shall apply.

Sec. 1.24.5. HYDROSTATIC TESTS

1.24.5.1. GENERAL

Before Hydrostatic testing can be done road base MUST be in place. Hydrostatic tests shall consist of pressure test and leakage test. Hydrostatic tests shall be conducted on all newly laid pressure pipes, joints and valves including all service lines to the curb stops. Air testing of pressure pipes will not be permitted under any circumstance. Tests may be made on sections not exceeding 2,000 feet, or between valves, whichever is less. CONTRACTOR shall furnish all necessary equipment and material, make all taps, and furnish all closure pieces in the pipe as required. Equipment to be furnished by the CONTRACTOR shall include graduated containers, pressure gauges, hydraulic force pumps, and suitable hoses and piping. The CITY will monitor and approve a satisfactory test.

The CONTRACTOR may conduct hydrostatic tests after the trench has been partially backfilled with the joints left exposed for inspection for his informational purposes only. The hydrostatic tests for acceptance shall only be conducted after the trenches have been completely backfilled and compacted as specified.

1.24.5.2. TESTING CRITERIA

All pipe sections to be pressure tested shall be subjected to a hydrostatic pressure of 150 psi minimum. The duration of each pressure test shall be for a period of 2 hours for final acceptance the pressure shall not fall below 150 psi during the test period. If during the test, the integrity of the tested line is in question, the CITY may require a 6 hour pressure test. The basic provisions of AWWA C-600 shall be applicable.

1.24.5.3. PROCEDURE FOR PRESSURE TEST

Each section of pipe to be tested, as determined by the CITY, shall be slowly filled with water and the specified test pressure shall be applied by means of a pump connected to the pipe in a satisfactory manner. Before applying the specified test pressure, all air shall be expelled from the pipe. To accomplish this, taps shall be made, and appropriate valves installed to ensure bleeding of all air from the main. If defective pipes, fittings, valves, or hydrant are discovered in consequence of this pressure test, all such items shall be removed and replaced by the CONTRACTOR with sound material and the test shall be repeated until satisfactory results are obtained. Provisions of AWWA C600, where applicable, shall apply.

1.24.5.4. PROCEDURE FOR LEAKAGE TEST

After completion of the pressure test, a leakage test shall be conducted to determine the quantity of water lost by leakage under the specified test pressure. Applicable provisions pf AWWA C600 shall apply.

Allowable leakage in gallons per hour for pipeline shall not be greater than that determined by the formula: $L = \frac{SD(P)^{1/2}}{133,200}$

Note: L = Allowable leakage in gallons per hour.
S = Length of pipe tested, in feet.
D = Nominal diameter of the pipe in inches.
P = Average test pressure during leakage test in pounds per square inch gauge.

Leakage is defined as the quantity of water to be supplied in the newly laid pipe or any valved section under test, which is necessary to maintain the specified leakage test pressure after the pipe has been filled with water and the air expelled. Should any test of pipe laid disclose leakage greater than that allowed, CONTRACTOR shall locate and replace or repair the defective joints, pipe or valve until the leakage from subsequent testing is within the specified allowance.

Sec. 1.24.6 DISINFECTION OF WATER MAINS

1.24.6.1. GENERAL

Before being placed in service, all new water mains shall be chlorinated in accordance with the specifications below and the procedures outline in AWWA C-651 "Standard Procedure for Disinfecting Water Mains".

1.24.6.2. FLUSHING

Sections of pipe to be disinfected shall first be flushed (full diameter) to remove any solids or contaminated material that may have become lodged in the pipe. If no hydrant is installed at the end of the main, then a blow-off valve shall be provided large enough to develop a velocity of at least 2.5 feet per second in the main.

All taps required for chlorination or flushing purpose or for temporary or permanent release of air shall be provided for by the CONTRACTOR as a part of the construction of water mains. After the disinfection, all such taps shall be sealed to the satisfaction of the CITY.

1.24.6.2.1. DISINFECTION CRITERIA

Before being placed into service, all new mains and repaired portions of, or extensions to existing mains shall be chlorinated so that the initial chlorine residual is no less than 50 mg/1 and that a chlorine residual of not less than 25mg/1 remains in the water after standing 24 hours in the pipe.

1.24.6.4. FORM OF APPLIED CHLORINE

Chlorine may be applied as a liquid chlorine (gas-water mixture), or a mixture of water and high-test calcium hypochlorite. CONTRACTOR shall assume responsibility for safe handling of chlorine and shall meet requirements of OSHA and other regulatory agencies for safe handling of chlorine.

1.24.6.5. POINT OF APPLICATION

The preferred point of application of the chlorinating agent is at the beginning of the pipe line extension or any valved section of it, and through a corporation stop inserted in the pipe.

The water injector for delivering the chlorine-bearing water into the pipe should be supplied from a tap made on the pressure side of the gate valve controlling the flow into the pipe line extension. Alternate points of applications may be used when approved or directed by the CITY.

1.24.6.6. OPERATION OF CITY VALVES

Valves shall be manipulated by the CITY personnel so that the strong chlorine solution in the line being treated will not flow back into the line supplying the water.

1.24.6.7. RETENTION PERIOD

Treated water shall be retained in the pipe at least 24 hours. After this period, the chlorine residual at pipe extremities and at other representative points shall be at least 25 mg/1.

1.24.6.8. CHLORINATING VALVES AND HYDRANTS

In the process of chlorinating newly laid pipe, all valves or other appurtenances shall be operated while the pipe line is filled with the chlorinating agent and under normal operating pressure.

1.24.6.9. FINAL FLUSHING AND TESTING

Following chlorination, all treated water shall be thoroughly flushed from the newly laid pipe at its extremity until the replacement water throughout its lengths shows upon test, a free chlorine residual not in excess of that normally carried in the system. Chlorinated water shall not be discharged to surface water.

After flushing, water samples collected on 2 successive days from the treated piping system, as directed by the CITY, shall show acceptable bacteriological results.

All bacteriological testing shall be witnessed by the CITY, after 48 hour notice at the expense of the contractor and proper chain of custody procedures must be followed.

Copies of testing results and all related correspondence with the Florida Department of Environmental Protection (FDEP) shall be copied to the CITY.

1.24.6.10. REPETITION OF FLUSHING AND TESTING

Should the initial treatment result in an unsatisfactory bacterial test, the original chlorination procedure shall be repeated by the CONTRACTOR until satisfactory results are obtained.

Sec. 1.24.7. NOTIFICATION AND CONNECTION TO EXISTING MAINS

Requirements specified in Section 1.13. shall apply.

Sec. 1.24.8. WATER SERVICE PIPING AND CONNECTION

Water service piping and connection shall be installed as indicated in the STANDARD DETAILS. The location of all service lines shall be as shown on the DRAWINGS and shall be either single, dual or multiple service. On curbed streets the exact location for each installed service shall be marked by indenting the letter "W" into the wet concrete curb. **No Saw Cuts** will be allowed to indicate location of service. Where no curb exists, locations shall be adequately marked by a 4" x 4" x 18" concrete marker with "W" indented into the top of the wet concrete pad **No Saw Cuts** will be allowed to indicate service.

Sec. 1.24.9. LOCATION AND IDENTIFICATION

All water mains shall be installed with a continuous, insulated 10 gauge solid copper wire (tracer wire) taped directly on top of the pipe for location purposes. Terminate insulated locator wires, capable of extending 12 inches above top of box, at each valve box pad.

All water mains shall be blue in color or marked with a continuous stripe located within the top 90 degrees of the pipe. Said stripe shall be a minimum 2 inches in width and shall be blue in color. Paint should be touch-dry before backfilling. Provide warning tape 12" to 18" above all water mains.

SECTION 1.25. VALVES, HYDRANTS AND ACCESSORIES FOR WATER MAINS

Sec. 1.25.1. GENERAL

All valves and appurtenances shall be products of firms who are fully experienced and qualified in the manufacture of the particular equipment to be furnished. The equipment shall be designed, constructed and installed in accordance with the best practices and methods and shall comply with these SPECIFICATIONS as applicable.

Sec. 1.25.2. RESILIENT WEDGE GATE VALVES

1.25.2.1. GENERAL

All valves shall be Resilient Wedge Gate Valves

1.25.2.2. VALVE CONSTRUCTION

Resilient Wedge Gate Valves shall be in accordance with AWWA C509.

* Shall have fusion bond epoxy coating.

* Shall have a synthetic rubber encapsulated gate.

* Shall have oil impregnated bronze mechanical components, for permanent lubrication.

* If actuating nut deeper than four (4) feet it must have actuating nut extension..

Above ground service - flanged, OS & Y, handwheel. Buried Service - mechanical joint, NRS, nut w/extension.

Submerged or otherwise inaccessible, above ground service - flanged, NRS, floor stand or suitable operator.

Sec. 1.25.3. (Section has been removed)

Sec. 1.25.4. VALVE INSTALLATION

All valves shall be inspected upon delivery in the field to insure proper working order before installation. They shall be set and jointed to the pipe in the manner as set forth in the AWWA Standards for the type of connection ends furnished. All valves and appurtenances shall be installed true to alignment and rigidly supported. Any damage to the above items shall be repaired to the satisfaction of the CITY before they are installed.

Flanged joints shall be made with hot dipped galvanized bolts, nuts and washers. Mechanical joints shall be made with mild corrosion resistant alloy steel bolts and nuts. All exposed bolts shall be painted the same color as the pipe.

Sec. 1.25.5. VALVE BOXES

All buried valves shall have cast-iron three piece valve boxes. Valve boxes shall be provided with suitable heavy bonnets and shall extend to such elevation at or slightly above the finished grade surface as shown on the STANDARD DETAILS. The barrel shall be two-piece, sliding type, having 5 1/4 inch shaft. The upper section shall have a flange at the bottom having sufficient bearing area to prevent settling and shall be complete with cast iron covers. Barrel extensions for deep valves shall be ductile iron or cast iron pipe. Covers shall have “WATER” cast into the top for all water mains. The actuating nuts for deeper valves shall be extended to come up to within 6" of finished grade as shown on the STANDARD DETAILS.

Care shall be taken while constructing valve boxes to ensure that valve stems are vertical and the cast iron box has been placed over the stem with base bearing on compacted fill and top flush with final grade. Boxes shall have sufficient bracing to maintain alignment during backfilling. CONTRACTOR shall remove any sand or undesirable fill from valve box prior to final inspection.

1.25.5.1. VALVE IDENTIFICATION

A 3" diameter cast bronze disc engraved with identification data as shown on the STANDARD DETAILS shall be provided for each buried valve.

Bronze disc shall be cast into the concrete valve box pad as shown on the STANDARD DETAILS.

Sec. 1.25.6. AIR RELEASE VALVES

The air release valves for use in water mains shall be installed where shown on the DRAWINGS and as shown on the STANDARD DETAILS. The valves shall have a cast iron body and cover, and a stainless steel float. Valves shall be provided with a vacuum check to prevent air from reentering the line.

Sec. 1.25.7. FIRE HYDRANTS

1.25.7.1. MATERIAL

Fire hydrants shall have 5-1/4 inch valve opening and shall comply with AWWA Standard C502 for fire hydrants for water works service, unless in conflict with MANUAL in which case this manual shall apply. Each hydrant shall have 6 inch mechanical joint ends with harnessing lugs ("dog-ears") and shall open by turning to the left (counter-clockwise). Fire hydrant shall be of ample length for 3-½ foot depth of bury. It shall be provided with two 2-½ inch hose nozzles and one 4-1/2 inch pumper nozzle, all having National Standard hose threads. Nozzles shall have caps attached by chains. Operating nuts shall be AWWA Standard (pentagonal, measuring 1-1/2 inch point to flat). Fire hydrants shall be equipped with "O-Ring" packing. Fire hydrant shall be provided with weep hole. Fire hydrant shall be equipped with break - away flanges. Shear bolts shall not be acceptable. (See approved manufacturers' list in appendix.)

1.25.7.2. PAINTING

All iron parts of the hydrant both inside and outside shall be painted, in accordance with AWWA C-501. All inside surfaces and the outside surfaces below the ground line shall be coated with asphalt varnish. They shall be covered with two coats, the first having dried thoroughly before the second is applied.

The outside of the hydrant above the furnished ground line shall be thoroughly cleaned and thereafter painted with one coat of paint of a durable composition, and one additional coat of compatible paint, the color of which is to be determined by the Fire Department under whose jurisdiction the fire hydrant becomes the responsibility.

All hydrants are to be painted by AWWA color scheme for relative capacity. The capacity is to be determined by flow measurements of the individual hydrants taken at a period of ordinary demand. When initial pressure are over 40psig at the hydrant under test, the rating is to be on 20psig residual pressure, observed at the nearest hydrant connected to the same main and when no water is being drawn. When initial pressures are less than 40 psig, residual pressures shall be at least half of the initial.

1.25.7.3. CONSTRUCTION DETAILS

Hydrants shall be plumb and shall be set so that the lowest hose connection is, at least, eighteen (18) inches above the surrounding finished grade. All hydrants shall be inspected in the field upon delivery to the job to insure proper operation before installation. The resetting of existing hydrants and moving and reconnecting of existing hydrants shall be handled in a manner similar to a new installation. Hydrant shall be constructed in accordance with the STANDARD DETAILS.

1.25.7.4. LOCATION

Fire hydrants shall be located in the general location as shown on the DRAWINGS. Final field location of all hydrants shall be as approved by the CITY. All hydrants shall be located no less than five (5) and no more than ten (10) feet from the edge of pavement of the adjacent roadway and no less than five (5) feet from any physical feature which may obstruct access or view of any hydrant unless otherwise approved by the CITY.

1.25.7.5. TESTING

Fire hydrants shall be flow tested and witness by the CITY and flow test reports must be turnover at the end of the testing to the CITY.

APPENDIX “A”

PROJECT ACCEPTANCE CERTIFICATE

Appendix 'A'

PROJECT ACCEPTANCE CERTIFICATE

PROJECT NAME: _____

PROJECT LOCATION: _____

PROJECT OWNER: _____

ENGINEER OF RECORD: _____

ADDRESS: _____

PHONE: (_____) _____ FAX: (_____) _____

UTILITIES CONTRACTOR: _____

ADDRESS: _____

PHONE: (_____) _____ FAX: (_____) _____

FL UNDERGROUND LICENSE NUMBER:

PROJECT TYPE: Residential: Single-family_____ Multi-family _____

Commercial: _____

IMPACT FEES:

Sewer Reservation: Calculated by:_____ Gallonage_____ Date Paid_____

Sewer Impact: Calculated by:_____ Gallonage_____ Date Paid _____

Water Impact: Calculated by:_____ Gallonage_____ Date Paid_____

Line Extensions: Water_____ Sewer_____ Force Main _____

Hydraulic Shares: $_____/Gallon Water Calculated by: _____

$_____/Gallon Sewer Calculated by: _____

$_____/Gallon Force Main Calculated by: _____

$_____/Gallon Reuse Calculated by: _____

Projects Due Hydraulic Shares:

_____ $/Gal_____Amount _____

_____ $/Gal_____Amount_____

_____ $/Gal_____Amount _____

Trunkline Agreement: No_____Yes_____ DEP Agreement Number: _____

List of Trunklines UPDATED: N/A_____Yes_____By:_____

COMMENTS FOR IMPACT FEE SECTION:

_____

_____

_____

_____

DEP Water Permit Number:_____Date Rec._____Exp. Date_____

DEP Sewer Permit Number: CS49-_____Date Rec._____Exp. Date_____

Wastewater Treatment Facility_____Plant ID#_____

CONSTRUCTION PLAN REVIEW:

Master Plan Concurrency review: By:_____Date: _____

Hydraulic Review: Water: N/A____By:_____Date: _____

Sewer: N/A____By:_____Date:_____

Back-flow Preventor(s) Reviewed for size, type and approved make: N/A _____

By:_____Date:_____

Industrial Waste Requirements Review: By:_____N/A_____

Type Required: Grease Trap_____ # required_____Size required_____

Gas/Oil_____# required_____Size required_____

Sand Int._____# required_____Size required_____

Other, specify requirements

Original Submittal Received:_____Approved_____Date comments sent_____By:_____

2nd Submittal Received:_____Approved_____Date comments sent_____By:_____

Reviewing Engineer:_____Reviewing Inspector:_____

APPROVED:_____ As Noted:_____By:_____Date:_____

*Gravity Sewer Uni-Bell Low Air Pressure Testing: N/A _____

Witnessed by:_____Date:_____

*Gravity Sewer System Lamping Inspection: N/A _____

*Gravity Sewer System Televising: N/A_____

Witnessed by:_____Date:_____

*Gravity Sewer Manhole Inspection: N/A_____

Witnessed by:_____Date:_____

*Industrial Waste Inspection: N/A _____

Type: Grease Trap_____Oil/Gas_____Sand Intercepter_____Other _____

Size_____Inspected By:_____ Date:_____

*Lift Station Inspection and Start-up: N/A_____

Site: Inspected By:_____Date: _____

Pump and Controls Start-up: Witnessed By:_____Date:_____

*Force Main Hydrostatic Pressure Test: N/A_____

Witnessed By:_____ Date:_____

*Water Distribution System Hydrostatic Pressure Test: N/A_____

Witnessed By:_____ Date:_____

*Water Distribution System Disinfection: N/A _____

Witnessed By:_____ Date:_____

*Water Distribution system Bacteriological Sampling: N/A _____

Performed By:_____Date:_____

*Back-flow Preventors Inspected and Tested: N/A _____

# of Back-flow(s) on job:_____Performed by:_____ Date:_____

*Walk-thru Final Inspection:

Conducted By:_____ Date:_____

Conducted By:_____Date:_____

Water Distribution Systems: N/A_____OK_____ See Punch List_____

Sanitary Sewer Collection Systems: N/A_____OK_____ See Punch List_____

Sanitary Force Main System: N/A_____OK_____ See Punch List_____

Lift Station: N/A_____OK_____ See Punch List_____

Industrial Waste: N/A_____OK_____ See Punch List_____

Back-flow Preventors: N/A_____OK_____ See Punch List_____

Punch List: Yes_____No_____

Comments:_____

_____

_____

*Project Job File:

` Sub-Files All Present: Finance:_____Engineering:_____Construction: _____

Permitting:_____Contract/Agreement:_____Acceptance: _____

Sub-Files Reviewed for Proper Document Insertion:

By:_____Date:_____

*Acceptance Check-List:

Project Billings:

_____ Date Paid: _____

_____ Date Paid:_____

_____ Date Paid: _____

_____ Date Paid:_____

Hydrant Meter Issued: Yes_____ No _____

Hydrant Meter Returned: Yes_____ No_____

Letter to DEP Stating connection to Existing Trunkline System By:

Date:_____ N/A _____

Density Test Reports: Sewer:_____Water:_____Force Main: _____

Lift Station:

Certification of Cost: Yes_____ No_____

Maintenance Bond: Yes_____N/A_____

Easements Recorded: N/A___By Plat:_____Blanket Easement:_____Legal Description:_____

Agreement for Service: N/A_____ Water:_____ Sewer: _____

Record Documents:

Water Distribution Systems: Record Drawings:_____CAD Disc:_____N/A_____

Sanitary Sewer Collection System: Record Drawings:_____CAD Disc:_____N/A_____

Sanitary Sewer Force Main Systems: Record Drawings:_____CAD Disc:_____N/A_____

*Acceptance Certificate Attachments:

Inspection and Test Results: Water Hydrostatic Pressure Test:_____N/A _____

Force Main Hyerostatic Pressure Test:_____N/A _____

Sanitary Manhole Inspection:_____N/A _____

Sanitary Low-Air Pressure Test:_____N/A _____

Sanitary Line Video Inspection:_____N/A _____

Back-flow(s) Inspection and Test:_____N/A_____

Industrial Waste Inspection:_____N/A _____

DEP Clearance for Use: Water:_____N/A _____

Sewer:_____N/A _____

** PROJECT ACCEPTED BY THE TOWN OF LAKE HAMILTON **

Project Name: _____

Water Clearance Only:***_____Date:_____
Signature of the Director (or Designee)

*** All Applicable Acceptance Certificate Attachments for Water System Must be Present.

Complete Project Acceptance_____ Date:_____
Signature of the Director (or Designee)

ALL PERTINENT BLOCKS WILL BE INITIALED AND/OR DATED

"CHECK MARKS SHALL NOT BE USED"

APPENDIX "B"

LIST OF MATERIALS

AND

APPROVED MANUTFACTURES

Last updated: October 22, 2018

WASTEWATER MAIN MATERIALS

ITEM	MANUFACTURERS	PART NO. OR DISCRIPTION
AIR RELEASE / VACUUM RELIEF VALVES AND FORCE MAIN	1. Apco 2. Val-matic	443 with attachments minimum VM-801-ABW
CASING SPACERS (POLY)	1. BWM 2. CASCADE 3. PSI	BWM-SS-8 (4" to 20") BWM-SS-12 (24" to 36") CCS-12" Width Min. C12G-2
CHECK VALVES (4" & LARGER)	1. Kennedy 2. M & H 3. Mueller 4. Clow 5. American Flow Control	D.I. body, rubber seat, weighted lever, fusion bond, epoxy coated
EPANSION JOINTS	1. Mercer 2. Metraflex	
FITTING M.J.	1. Union 2. U.S. Pipe 3. NAPPCO 4. American Ductile Iron Pipe 5. Tyler	
FREEZE PROTECTION VALVE	1. Conbraco	1. 40-000-FPV1
STANDARD MANHOLE FRAME AND COVER	1. U.S. Foundry	1. USF #663 RING & AB/MG COVER
LOCKABLE MANHOLE FRAME AND COVER	1. U.S. Foundry	1. USF #663 RING & AB/M COVERS BWT
MANHOLE JOINTING MATERIAL	1. K.T. Snyder Co. Inc. 2. Conseal	
MANHOLE SURFACE COATING PAINTING: AERIAL PIPING AND FITTINGS		Water Based Epoxy
A. FIELD PROMER		Alkyd Metal Primer
B. FINISH (EXTERIOR)		Alkyd Gloss Enamel

ITEM	MANUFACTURERS	PART NO. OR DISCRIPTION
PIPE (DI)		Pressure Class 150 Minimum Interior coating "Protecto" 401' or equal.
PIPE FORCEMAIN		1. C900, DR minimum 2. HDPE Driscipipe 4000 series, DR II
PIPE (PVC) GRAVITY		SDR 35 minimum
PLUG VALVE	1. Clow/Kennedy	1. 6413-FF Fusion Bond Epoxy Coated Stainless Stem
RESTRAINED JOINTS	1. Romac Industries, 2. EBAA Iron 3. Uniflange	Grip Ring
TAPPING SLEEVES, STAINLESS STEEL		Fusion Bond Epoxy Coated
TAPPING SLEEVES, MJ	1. Mueller 2. Smith Blair 3. Ford 4. JCM	
TAPPING VALVES, RESILIENT WEDGE	1. AFC 2. Clow 3. Kennedy	Fusion Bond Epoxy Coated
VALVE BOXES	1. Union 2. Star 3. Sigma 4. Proflo	
VALAVE MAKERS	Flint	Green - Thermoplastic (90 Mils)
VAULT FRAME AND COVER FOR AIR RELEASE / VACUUM RELEF VALVES	1. U.S. Foundry	1. USF #663-AB-M
WIRE CONNECTORS	1. Pro-Trace	TW Connector – Part# 739010250

II. WASTEWATER PUMP STATION METERIALS

ITEM	MANUFACTURERS	PART NO. OR DISCRIPTION
GENERATOR CIRCUIT BREAKER	1. Square D 2. Westinghouse	
GENERATOR SYSTEMS **(DIESEL)**	1. Blue Star Power Systems 2. Gillette Generators	
LED AREA LIGHT FXITRE	1. Dialight	1. HZD5C2G
LIGHT FXITRE **-** Mounting Bracket	1. Safe Site	1. Pipe Mount Clamp Kit HZXW8
MOTOE AUTOMATIC MEGGER	1. Automeg	
PRESSURE GAUGES	1. Ashcroft 2. H.O. Trerice Co.	
SUBMERSIBLE PUMPS	1. Hydro Matic	Barney's Pumps
WETWELL ACCESS	1. U.S. Foundry	
FRAMES AND COVERS	1. Bilco Co.	
CONTROL PANELS	1. Sta-Con, Inc. 2. Quality Control, Inc.	
ALARM HORN (AH)	1. Edwards 2. Wheelock	1. 870-N5 2. 31T-115-R
ALARM LIGHT (AL)	1. American Electric 2. Red Dot	1. F32552 2. 866 B
CONTROL CIRCUIT BREAKER	1. Square D	1. QOU120
CONTROL CIRCUIT TRANSFORMER	1. Square D	1. EO-18
DUPLEX RECEPTACLE GFI (DR)	1. Square D 2. Hubbel	1. GFSR-115-IC 2. GF-5262I

ITEM	MANUFACTURERS	PART NO. OR DISCRIPTION
ELAPSE TIME METER (ETM)	1. Engler 2. Hecon	1. AC-200-10NG7 2. TO621134
EMERGENCY	1. Square D	
ENCLOSURE	1. Hoffman 2. Tanco	
FUSE (F)	1. Bussmann 2. Gould-Shawmut	
FLASHER (FL)	1. Sta-Con, Inc. 2. SSAC	1. 008-24-13SP 2. FS-126
FLOAT REGULATOR (FR)	1. Roto-Float	1. GSI8ONO
GENERATOR RECEPTACLE (GR)		
1. 230V, 100A, 3P, 4W	1. Russell-Stroll	1. JRSB1044FR
2. 230/460V, 200A, 3P, 4W	2. Russell-Stroll	2. JRSBZ044FR
INSIDE DROP BOWL	1. Reiner / Duran Inc.	
MAIN SILENCE BUTTON (HSS)	1. Westinghouse 2. Square D	1. PB1AAH 2. 9001-SKR-1U
MAIN CIRCUIT BREAKER (MCB)	1. Square D	
MAIN CIRCUIT TRANSFORMER (MCT)	1. Square D	1. 500 SV43F
MOISTURE AND TEMPERATURE FAILURE LIGHT (MT)	1. Dialco 2. Littlefuse	1. 803-1710 2. 930407X
MOTOR CIRCUIT BRAKER (MB)	1. Square D	
MOTOR STARTER (MS)	1. Westinghouse 2. Square D	1. A-200 2. D-8536
OVERLOAD HEATER (OL)	1. Westinghouse 2. Square D	
PHASE MONITOR	1. Diversified	1. SLA-230-ASA (230 Volt) 2. SLA-440-ASA (460 Volt)

ITEM	MANUFACTURERS	PART NO. OR DISCRIPTION
PILOT LIGHT (PL)	1. Dialco 2. Littlefuse	1. 803-1710 2. 93047X
PUMP AUTOMATIC ALTERNATOR (PAA)	1. Diversified	1. ARA-120-ACA
RELAY (R)	1. Potter Burmfield	1. KRPA-11AN 2. 22 Series
RESISTOR 5 watt, 2500 ohm	1. Rockwood	
RUN INDICATOR	1. Dialco 2. Littlefuse	1. 803-1710 2. 930407X
SURGE PROTECTOR (LA)	1. Volt-Guard	1. VGX
TERMINAL STRIP (TS)	1. Marathon 2. Square D 3. Phoenix	1. Series 200 2. 9070-GR6 3. UKK B3
TELEMETRY	1. Omni site	1. XR-50 Alarm Monitor

III. WATER AND REUSE MAIN MATERIALS

ITEM	MANUFACTURERS	PART NO. OR DISCRIPTION
AIR RELEASE VALVES	1. Apco 2. Val-matic	S-200A **(2" NPT)** Series 38 **(Model #38.2)**
AUTOMATIC FLAUSH DEVICE	1. Hydro-Guard	HG-1
WATER SAMPLING STATION	1. GIL Industries	EH101-30
CASING SPACERS (POLY)	1. BWM 2. CASCADE 3. PSI	BWM-SS-8 (4" to 20") BWM-SS-12 (24" to 36") CCS-12" Width Min. C12G-2
CORPORATION STOPS	1. Ford	FB1100-4-NL (1") FB1100-6-NL (1-1/2")
CURB STOP	1. Ford	1. **Single Service:** B43-342W-NL **Double Service / Branch:** UVBS43-42W-NL **Water Sampling Station:** B41-343W-NL
EXPANSION JOINTS	1. Mercer 2. Metraflex	

ITEM	MANUFACTURERS	PART NO. OR DISCRIPTION
FIRE HYDRANTS	1. AMERICAN FLOW CONTROL	• 5-1/4 AMERICAN-DARLING B-84-B-5 TRAFFIC MODEL FIRE HYDRANT
FITTINGS D.I.	1. Tiger Union 2. Sigma	
GATE VALVES,	1. AFC 2. Clow 3. Kennedy	Fusion Bond Epoxy Coated
RESILIENT WEDGE	1. American Flow Control 2. M & H 3. Kennedy 4. Mueller 5. AVK	 Series 25
HYDRANT PAINT **(Body Only)**	Dupli-Color	RED
HYDRANT PAINT **(Bonnet Only)**	Dupli-Color Krylon Dupli-Color Dupli-Color	DE1601- Ford Blue 1817 - John Deere Green DE1653 - Red DE1620 – Chevrolet Orange
LOCKSEAL STUD (EXTRA LONG)	Highfield	Part# 93210143
LOCKSEAL STUD (WITH SEAL)	Highfield	Part# 93280156
Residential and Commercial Water Meter 5/8” (3/4) – 2”	Neptune	MACH 10 Ultrasonic

ITEM	MANUFACTURERS	PART NO. OR DISCRIPTION
METER BOX **(DUAL)**	Hubbell	A131730506425X 17 x 30 x 18 Assembly
METER BOX **SINGLE RESIDENTIAL**	Hubbell	A131118520425X
METER BOX **RECLAIME SINGLE** RESIDENTIAL (**PURPULE)**	Hubbell	A131118521425X
PIPE (DI)		Pressure Class 150
PIPE (PVC)		C900, DR18 Minimum HDPE Driscopipe
POLYETHYLENE TUBING	1. Endot Pure Blue 2. Charter Plastics	
RESTRAINED JOINTS	1. Romac Gripring 2. EBBA Iron Inc. 3. Uniflange / Ford	
SERVICE SADDLES	1. Smith Blair 2. Romac Gripring 3. Ford	Double Strap / Stainless Steel
STRAIGHT DUAL CARTRIDGE CHECK VALVE	1. Ford	HHC31-323-NL
TAPPING SLEEVES, STAINLESS STEEL	1. Mueller 2. Smith Blair 4. M & H 5. Ford 6. JCM	Fusion Bond Epoxy Coated
TAPPING VALVES, RESILIENT WEDGE	1. AFC 2. Clow 3. Kennedy	Fusion Bond Epoxy Coated
TRACER WIRE	1. Copperhead	10 Gauge UF Solid
SHAFT CATHODIC TEST BOX	1. Bingham & Taylor	P200 NFG Test

ITEM	MANUFACTURERS	PART NO. OR DISCRIPTION
VALVE BOXES	1. Tyler Union 2. Star 3. Sigma 4. Proflo	
VALAVE MAKERS	1. Flint	Blue - Thermoplastic (90 Mils) Red - Thermoplastic (90 Mils)
VAULT FRAME AND COVER	1. U.S. Foundry	1. USF #663-AB-M
WIRE CONNECTORS	1. Pro-Trace	TW Connector – Part# 739010250

END OF APPENDIX "B"

APPENDIX A

TOWN OF LAKE HAMILTON

ENGINEERING DESIGN STANDARDS MANUAL

APPENDIX A

This Appendix is provided to establish minimum standards to be used by engineers and contractors in constructing development projects throughout the Town of Lake Hamilton.

Section A101 Purpose and Intent

This Section establishes the minimum engineering design standards applicable to all developments exclusive of private parking lots and drive aisles. The standards are intended to promote the public health, safety and welfare by insuring the improvements are designed to adequately provide for transportation and drainage features of the development.

Section A102 Authority

In the event of a conflict between the requirements/standards listed in this Appendix, or in the interest of the public safety, health and welfare, or a conflict with the best management practices or requirements/standards recommend or adopted by the appropriate State Agencies and/or Professional Organizations/Associations, the more restrictive or stringent requirement/standard shall apply, as determined by the Administrative Official, Public Services Director or City Engineer/Consultant.

Section A103 Drainage Design Requirements

A. ***Storm Sewer Design***

1. Manning's equation will be used for storm sewer design with coefficient of roughness (n) of 0.012 for concrete pipes and 0.012 for smooth lined corrugated metal pipes. Coefficient of roughness (n) for all other pipes shall be as shown in Table A1.

Table A-1 Values of Coefficient of Roughness (n) for Standard Corrugated Steel (Manning's Formula)

Corrugations	Annular 2-2/3" x 2"	Helical 1-1/2" x 1/4"	Helical 2-2/3" x 2"				
	All Diameters	Diameter 8" 10"	Pipe Diameter				
			15"	18"	24"	36"	48"
Unpaved	.024	.013 .016	.013	.014	.017	.019	.020
25% Paved	.021				.015	.017	.020
Fully Paved	.012				.012	.012	.012

Corrugations	Annular 3" x 1"	Helical 3" x 1"					
		Pipe Diameter					
	All Diameters	36"	48"	54"	60"	66"	72"
Unpaved	.027	.020	.020	.021	. .021	.021	.021
25% Paved	.023	.018	.018	.019	.019	.019	.019
Fully Paved	.012	.012	.012	.012	.012	.012	.012

2. When pipe is sized using full flow conditions, the hydraulic gradient shall be at least one foot below the gutter profile. Sufficient head should be allowed at inlet entrances to force the flow to the velocity required at full flow conditions. When the design is based on partial depth flows, the depth of flow shall not be over 2/3 pipe diameter at velocities exceeding 15 f.p.s. Pipes will have a physical slope sufficient for a minimum flow velocity of two and one-half feet per second.

3. Inlets not in sump position shall be spaced to receive 80 percent of the runoff (See Table A2) in curb and gutter or urban sections. Inlets shall be carefully placed near intersection returns to avoid flooding adjacent properties and intersections.

4. Capacity of inlets in sump position shall not exceed 12 cubic feet per second (cfs). FDOT Standard Index Inlet Types "P" and "J," with inlet throats Type 1, 2, 5 and 6 shall be used on curbed sections. Grates shall be parallel to centerline profile grade.

5. FDOT Standard Index ditch bottom inlets "C," "D," "E" and "H" shall be used in ditches or low areas where water would be collected. Where debris is a problem and there is no safety hazard, slots will be used.

6. The Rational Method of analysis shall be used in the design of storm sewer systems and small culverts.

   Q = CIA
   Q = runoff in cubic feet per second (CFS)
   I = rainfall intensity in inches per hour
   A = drainage areas, in acres
   C = coefficient of runoff (See Tables A3 and A4)
   "I" will be determined by using the intensity-duration-frequency zones and curves shown in Figure A1 and Figure A2.

7. Time of Concentration will be determined by using Figures A3 and A4. The minimum Time of Concentration used in computations will be ten minutes.

Table A2 Maximum Capacity (Q cfs) for 80% Efficiency Total

Cross Slopes	Longitudinal Slopes							
in/ft	0.20%	0.50%	1.0%	2.0%	3.0%	4.0%	5.0%	6.0%
Type 1 Inlet								
1/4	6.5	5.0	4.0	3.2	2.5	2.3	2.0	1.5
3/8	*7.3/85	6.8	5.5	4.7	4.2	3.5	3.0	2.3
2	*5.5/95	7.7	6.6	4.9	4.5	4.0	3.5	2.8
5/8	*3.9/100	8.5	7.9	6.5	5.3	4.5	4.0	3.5
3/4	*2.7/100	6.7/95	8.6	7.7	8.7	5.9	4.9	4.0
Type 3 Inlet								
1/4	3.0	2.3	1.8	1.6	1.3	1.1	0.9	0.8
3/8	4.3	3.8	3.2	2.7	2.4	2.1	1.8	1.5
2	5.1	4.1	3.3	2.6	1.8	1.6	1.4	1.2
5/8	*7.0/75	5.0	3.9	3.2	2.7	2.3	1.9	1.6
3/4	*6.0/85	5.8	4.5	3.7	3.0	2.7	2.4	2.0
Type 5 Inlet								
1/4	4.8	4.3	3.7	3.2	2.8	2.7	2.6	2.5
3/8	6.4	5.7	5.2	4.6	4.2	3.8	3.6	3.3
2	7.7	7.2	6.7	6.1	5.7	5.3	4.9	4.6
5/8	*5.6/95	*8.0/80	7.5	6.9	6.2	5.5	5.2	5.0
3/4	*4.9/100	*7.0/90	*7.6/85	8.2	7.5	7.0	6.5	6.2
Type Y Inlet								
3/4	9.3/82.5	----	8.0/75	6.0	8.0/72.5	8.5/75	----	----

* = Road Flooded @ cfs/% efficiency - = No data

Table A-3 Runoff Coefficients ("C" Factor)

RUNOFF COEFFICIENTS FOR A DESIGN STORM RETURN PERIOD OF 10 YEARS OR LESS					
Slope	**Land Use**	**Sandy Soils**		**Clay Soils**	
		Minimum	**Maximum**	**Minimum**	**Maximum**
Flat (0 - 2%)	Woodlands	0.10	0.15	0.15	0.20
	Pasture, grass, and farmland [a]	0.15	0.20	0.20	0.25
	Rooftops and pavement	0.95	0.95	0.95	0.95
	Pervious pavements [b]	0.75	0.95	0.90	0.95
	SFR: 2-acre lots and larger	0.30	0.35	0.35	0.45
	Smaller lots	0.35	0.45	0.40	0.50
	Duplexes	0.35	0.45	0.40	0.50
	MFR:Apartments, townhouses and condominium	0.45	0.60	0.50	0.70
	Commercial and Industrial	0.50	0.95	0.50	0.95
Rolling (2 - 7%)	Woodlands	0.15	0.20	0.20	0.25
	Pasture, grass, and farmland [a]	0.20	0.25	0.25	0.30
	Rooftops and pavement	0.95	0.95	0.95	0.95
	Pervious pavements [b]	0.80	0.95	0.90	0.95
	SFR: 2-acre lots and larger	0.35	0.50	0.40	0.55
	Smaller lots	0.40	0.55	0.45	0.60
	Duplexes	0.40	0.55	0.45	0.60
	MFR:Apartments, townhouses and condominium	0.50	0.70	0.60	0.80
	Commercial and Industrial	0.50	0.95	0.60	0.95
Steep (7% +)	Woodlands	0.20	0..25	0.25	0.30
	Pasture, grass, and farmland [a]	0.25	0.35	0.30	0.40
	Rooftops and pavement	0.95	0.95	0.95	0.95
	Pervious pavements [b]	0.85	0.95	0.90	0.95
	SFR: 2-acre lots and larger	0.40	0.55	0.50	0.65
	Smaller lots	0.45	0.60	0.55	0.70
	Duplexes	0.45	0.60	0.55	0.70
	MFR:Apartments, townhouses and condominium	0.60	0.75	0.65	0.85
	Commercial and Industrial	0.60	0.95	0.65	0.95

[a] Coefficients assume good ground cover and conservation treatment.
[b] Depends on depth and degree of permeability of underlying strata.

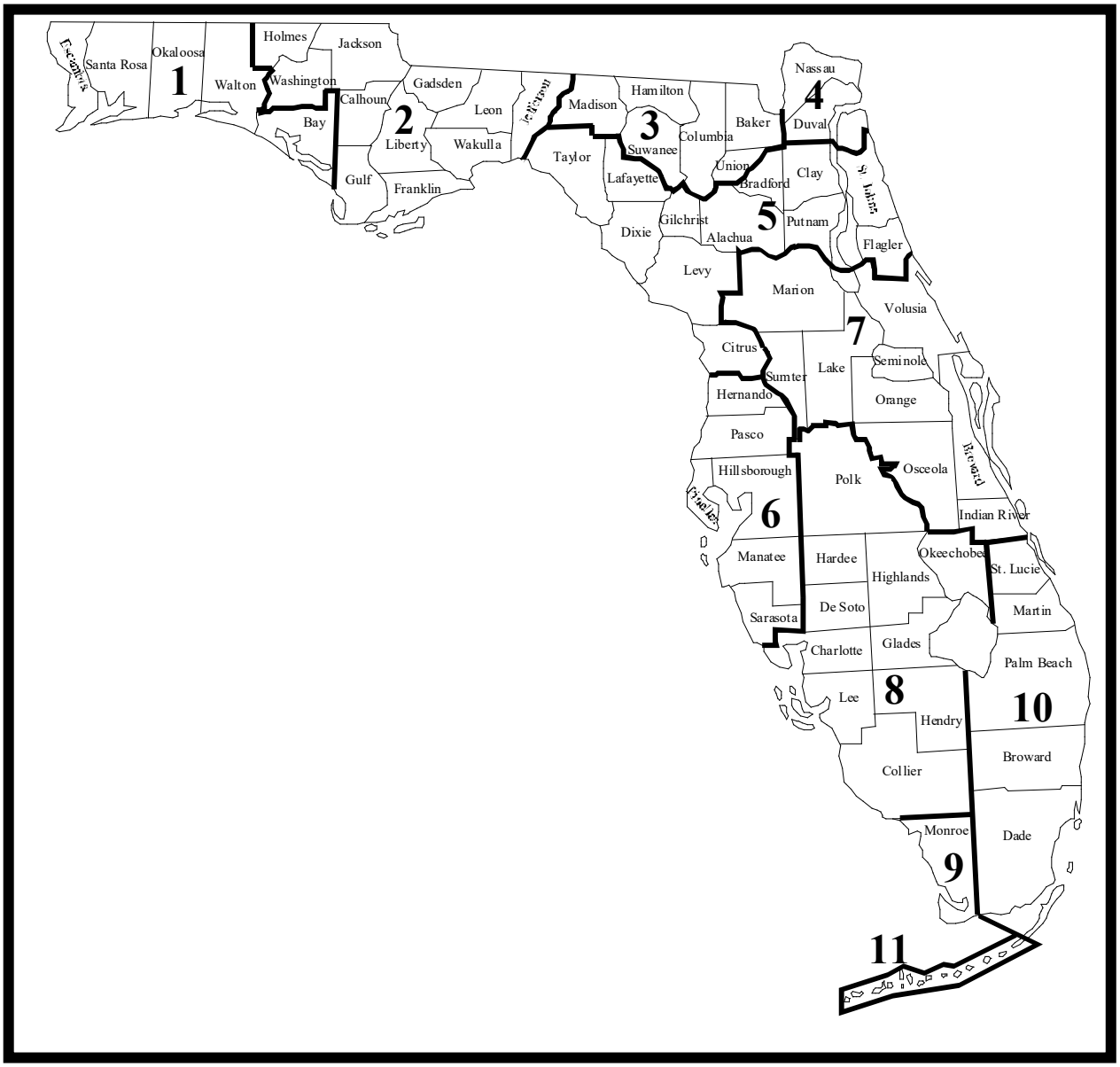
Note: SFR = Single Family Residential MFR = Multi-Family Residential

Table A-4 Design Storm Frequency Factors

DESIGN STORM FREQUENCY FACTORS FOR PERVIOUS AREA RUNOFF COEFFICIENTS	
Return Period (years)	Design Storm Frequency Factor, X_T
2 to 10	1.00
25	1.10
50	1.20
100	1.25

Reference: Wright-McLaughlin Engineers (1969).

Figure A-1 Zones for Precipitation Intensity Duration Frequency



Zones for Precipitation Intensity Duration Frequency (IDF) Curves
Source: Volume 2 _ Procedures, Florida Department of Transportation Drainage Manual

Figure A-2 Rainfall Intensity Duration Curves

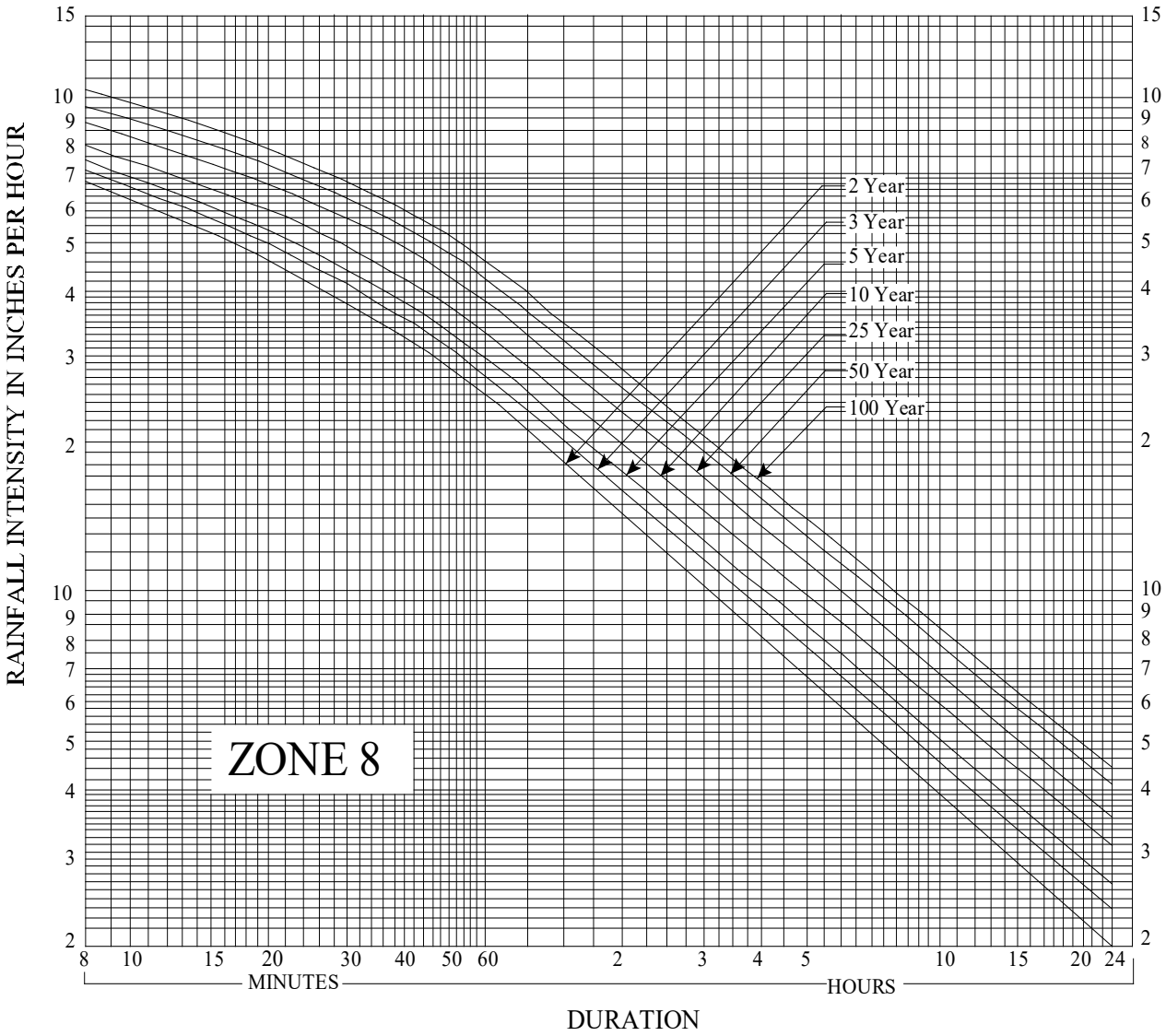
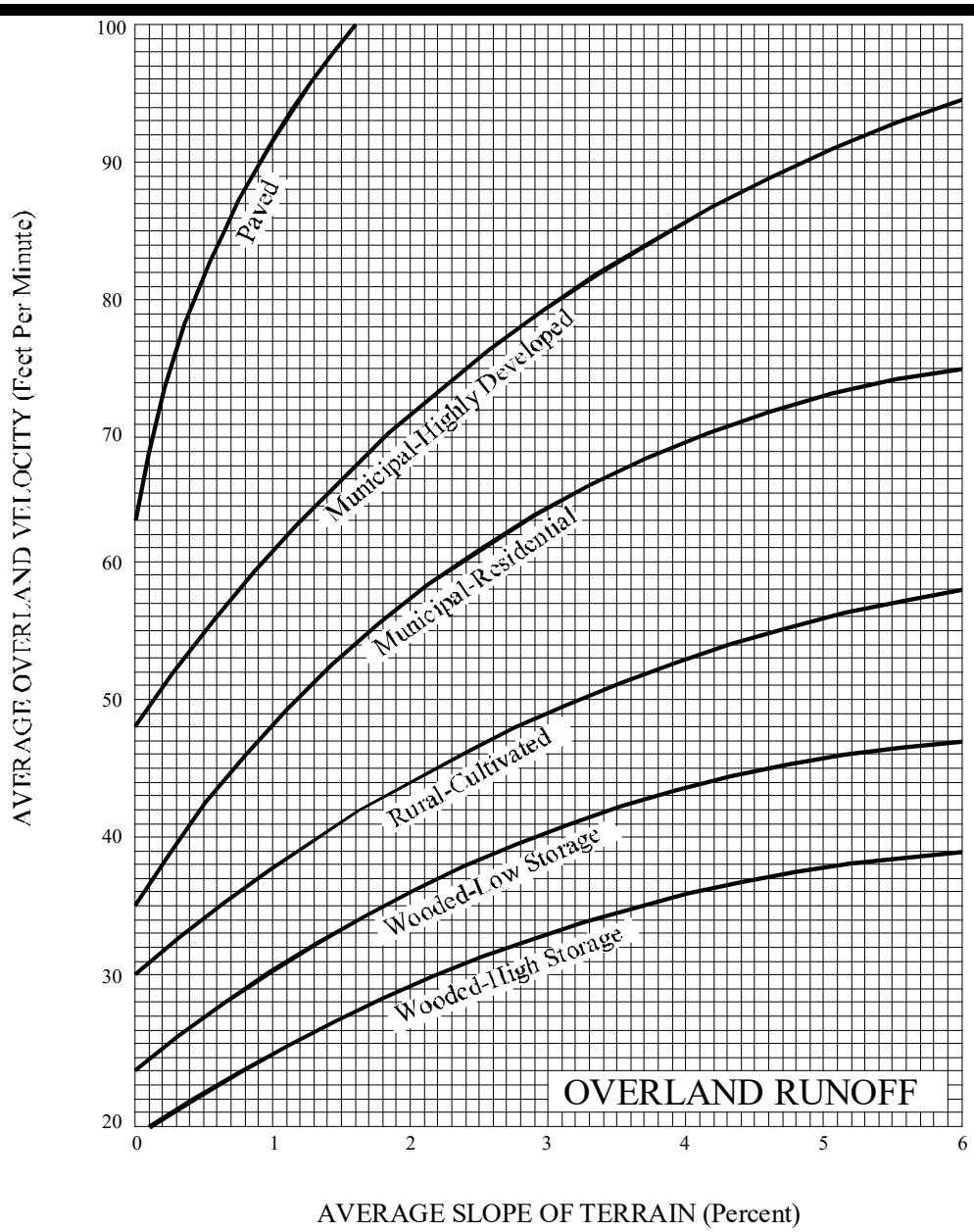
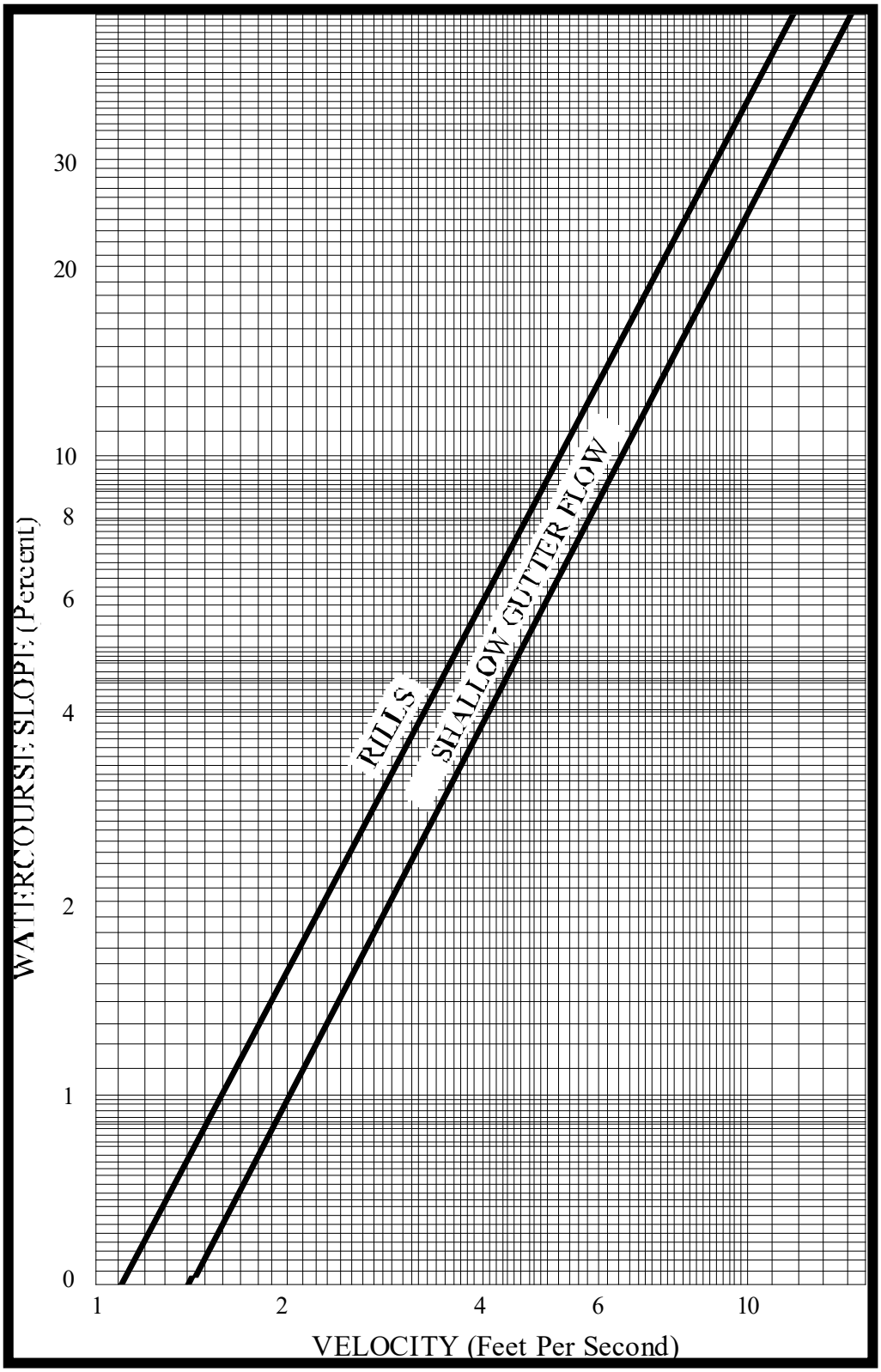


Figure A-3 Overland Flow Velocities for Various Land Use Types



Overland Flow Velocities for Various Land Use Types
Source: Volume 2 - Procedures, Florida Department of Transportation Drainage Manual

Figure A-4 Average Velocities for Estimating Travel Time for Small Channel Flow



B. ***Ditches***

1. The maximum ditch velocity allowed, without erosion protection, shall be governed by the following table:

Table A-5 Maximum Ditch Velocity

Type of Soil	Maximum Allowable Velocity (Feet Per Second)
Fine Sand	1.5
Silt Loam	2.0
Fine Gravel	2.5
Clay	3.0

2. Ditch protection shall be determined by the following table:

Table A-6 Ditch Protection

DITCH PROTECTION		
Grade	**Flow**	**Protection**
Less Than 2%	Less Than Allowable Velocities Shown Above	Grass and Mulch
Less Than 2%	More Than Allowable	*Sod
Up to 3%	Less Than 15 cfs	*Sod
Exceeds 3%	Exceeds 15 cfs	Paved

* Where watering, either natural or artificial, is available

15+5′ = 20′

3. Outfall ditches and ditches not adjacent to a road shall be situated within a drainage easement of sufficient width to allow a 15 feet wide maintenance berm on one side and a five feet stability berm on the opposite side. The bottom width of an outfall ditch should be two feet wider than any culvert it serves. Side slopes of outfall ditches shall be 2:1 or flatter, unless ditches are paved. Drainage easements located on platted lots will be noted on the plat to be maintained by the property owner or other specified entity. Drainage easements will not serve as utility easements unless specifically approved by the City Engineer.

4. Highway section ditches shall be a minimum of two feet below shoulder point elevation. Roadway centerline grades shall be higher than surrounding natural ground where wet conditions are encountered to prevent damage to base material. Ditch bottom width shall not be less than four feet.

5. Roadside "V" or swale ditches may require storm sewer protection. Roadside "V" or swale ditches will be permitted only where soil conditions and grades are favorable.

C. ***Culverts, Bridges and Pipes***

Pipe culverts under roads shall be reinforced concrete or pipe material approved by the City Engineer. The minimum diameter shall be 18 inches. When hydraulic conditions indicate the need for a head wall, a FDOT standard head wall will be required. Mitered pipe end sections shall be used in all locations where head walls create traffic hazards and may be substituted for standard end walls in other locations. Bridges and box culverts shall be designed to the FDOT Design Index.

D. ***Side Drains***

Side drains may be bituminous coated corrugated metal pipe, reinforced concrete pipe, aluminum pipe, or any other pipe material approved for the same use by FDOT. The minimum pipe size for local residential roads shall be 15 inches in diameter. For all other roads, the minimum pipe size shall be 18 inches in diameter.

E. ***Seasonal High Water Table***

1. Soil borings will be taken and analyzed to a depth of six feet below natural ground or profile grade, whichever is the lower. Sufficient borings will be taken to determine the soil conditions and seasonal high water elevation evident throughout the proposed development. The depth to the high water table as shown in the Soil Survey of Polk City, Florida published by the Soil Conservation Service shall be taken into consideration in determining the seasonal high water elevation.

2. Where the seasonal high ground water table or high water elevation of any detention/retention area adjacent to or in close proximity to the road is less than one and one-half feet below the proposed base, soil cement or cemented coquina base will be required in sections without highway ditch protection. In some areas, underdrains may be required in conjunction with the soil cement or cemented coquina base to protect the roadway from premature deterioration.

3. Underdrains will be placed on the uphill side of the road (or on both sides, where needed) with the crown of the underdrain pipe four feet below natural ground or one-half feet below the base, whichever is the lower. The underdrain systems shall be designed by the engineer using the guideline specified below. Cleanouts, where required, shall be designed in accordance with Figure A5. Alternate underdrain designs shall be reviewed by the City Engineer.

F. ***Underdrains***

1. The materials used shall conform to the following requirements:

a. Filter fabric for use in underdrains shall conform to the following minimum properties:

Fabric Property	Test Method	Unit	Typical Value
Grab Tensile Strength	ASTM D-1682	lb.	120
Grab Tensile Elongation	ASTM D-1682	%	55
Trapezoildal Tear Strength	ASTM D-1117	lb.	50
Mullen Burst Strength	ASTM D-3786	psi	210
Puncture Strength	ASTM D-3787	lb.	70
Water Flow Rate	CFMC-GET-2	gal/min/sf	285

b. The filter fabric pipe wrap shall be an approved strong, tough, porous nylon, polyester, polypropylene, or other approved fabric which completely covers and is secured to the perforated plastic tubing pipe underdrain in such a way as to prevent infiltration of trench backfill material. The filter envelope shall weigh a minimum of four ounces (4 oz.) per square yard and shall retain soil particles larger than 212 microns (No. 70 sieve), when tested in accordance with ASTM D-1682, the grab strength (wet) of the filter wrap shall not be less than 100 lbs. and the grab elongation shall not be less than 60 percent. Storage and handling of filter envelope shall be in accordance with the manufacturer's recommendations. Torn or punctured filter wrap shall not be used.

c. An example of a filter aggregate (fine aggregate) would be sand. Sand used for backfilling trenches under, around and over underdrain pipe shall consist of hard, durable, clean quartz sand and shall be reasonably well graded from coarse to fine and when tested by means of laboratory sieves, it shall meet the following requirements in percent of total weight.

Total Retained on:

Sieve	Percent	Sieve	Percent
No. 4	0 to 5	No. 30	30 to 75
No. 8	0 to 15	No. 50	65 to 95
No. 16	3 to 35	No. 50	93 to 100

d. Examples of a filter aggregate (other) would be:

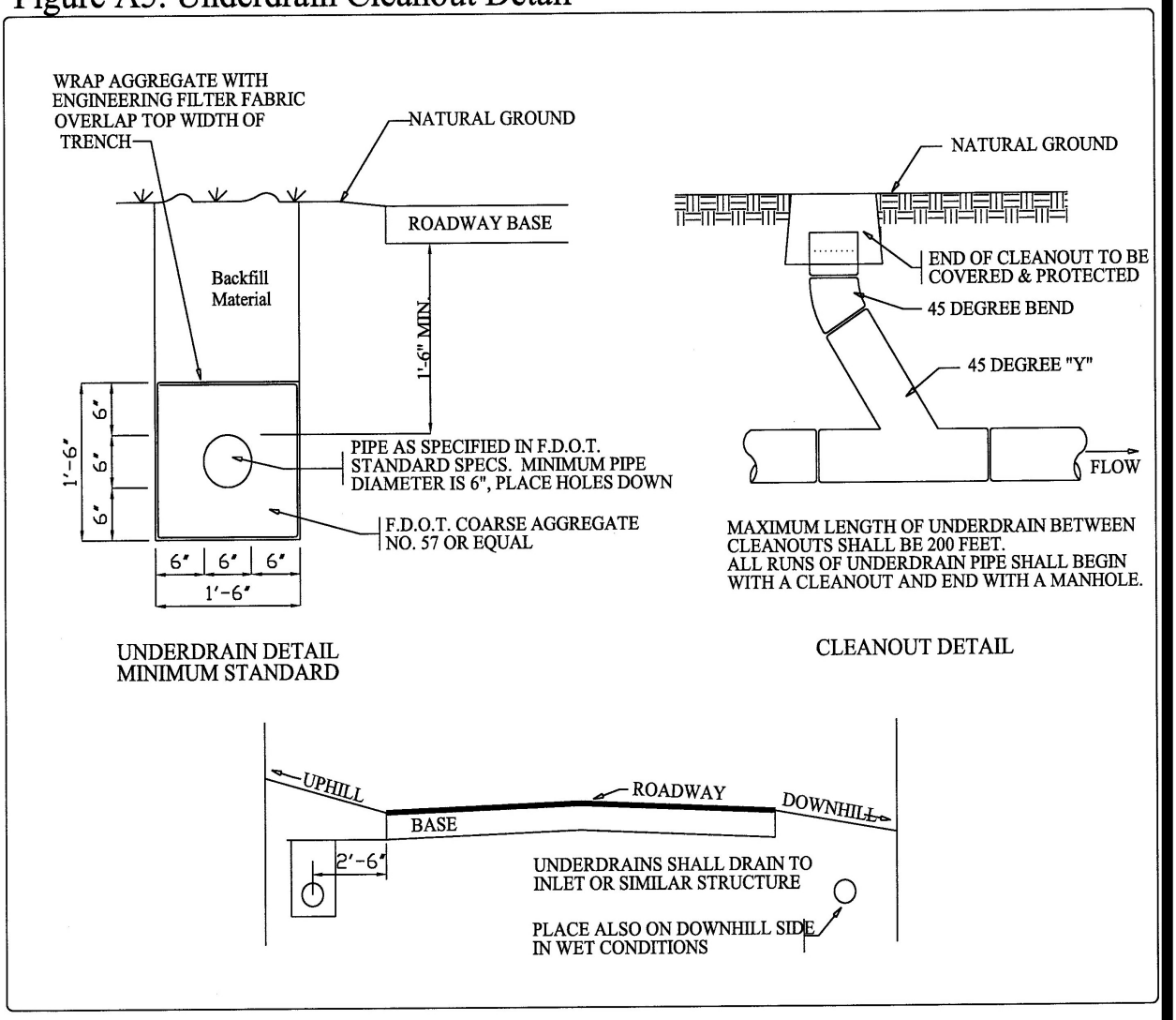
i. When stone is used for filter aggregate it shall be composed clean, durable rock that is noncementous when exposed to water for extended periods and shall be so certified by a geotechnical engineer.

ii. Slag shall be clean, tough and durable. It may be either air-cooled, blast-furnace slag or phosphate slag. It shall be reasonably uniform in density and quality and shall be so certified by a geotechnical engineer.

iii. The gradations of stone and slag filter aggregates shall be designed and certified by a geotechnical engineer and approved by the City Engineer.

e. Corrugated polyethylene tubing for use as underdrain shall conform to the requirements of AASHTO M-252. Polyethylene Tubing shall be delivered in lengths of 20 feet (minimum) and shall be fitted, prior to installation, with a filter fabric wrap (filter sock).

Figure A5. Underdrain Cleanout Detail



Section A104 Road Design Requirements

A. ***Stabilized Subgrade***

1. All road subgrade, where applicable, shall be stabilized to the required depth and required Florida bearing value, six inches outside the edge of base on each side of the road, and shoulders shall be stabilized six inches deep to Florida bearing value of 75. Where existing soils to be used in the road subgrade have the required bearing value, no additional stabilizing material need be added. Mixing shall be done to insure uniformity whether or not additional material is added.

2. The stabilizing material, if required, shall be high bearing value soil, clay-sand, limerock, shell or other material conforming to FDOT Standard Specifications.

B. ***Base Course***

The materials permitted as base course for flexible pavement are indicated in Table A-7 and shall meet the requirements of FDOT Standard Specifications for Road and Bridge Construction, 2000 Edition.

C. ***Surface Course***

Any asphaltic concrete Type-S or Friction Course (FC) approved by the City (Marshall Mixes) or FDOT approved Superpave Mixes will be permitted. All asphalt mix designs submitted to the City for approval must be prepared by a certified materials testing laboratory, or by a Construction Training Qualification Program (CTQP) certified Asphalt Mix Designer. In either case all asphalt mix designs submitted to the City for approval shall be signed and sealed by a Professional Engineer (with the exception of Superpave Mixes). Only one type surface course will be permitted in each development or phase of a development. The allowable layer thickness for Type-S and friction courses asphalt mixes shall be as follows:

Type S-III = 1 inch
Type S-I = 1 ½ inches
FC– 3 = 1 inch

Recycled asphalt pavement (RAP) may be allowed for all layers, including the surface course except the friction course where only virgin material is permitted. The maximum percentage of RAP allowed for structural layers is 30 percent by weight of total aggregate. For each RAP stockpile, a stockpile number and composition data sheet, which includes the average gradation, asphalt content, and viscosity shall be provided.

D. ***Flexible Pavement Road Design***

1. For collector and arterial roads, the method of determining road stabilized sub-grade, base and pavement thickness for standard typical sections are shown in Figures A6-A8. Typical road sections shall be designed using the structural number criterion, as set forth in Table A7. The minimum structure number shall be 3.0 as

determined by layer coefficients. The typical road sections shall be used unless permitted otherwise by the City Engineer. The layer thickness for stabilized sub-grade shall be between 8 and 12 inches.

2. For local roads, the minimum structural number shall be 2.29 as determined by the layer coefficients shown in Table A7. The layer thickness for stabilized sub-grade shall be between 8 -12 inches.

3. The total layer coefficient allowed for the subgrade designed for local residential traffic shall not exceed the value assigned for eight inch thickness. The base material specified in Table A7, shall be used. The proposed typical section shall be shown on the plans and the structural number computation included under the typical section.

4. Proposed local roads which are to accommodate commercial or industrial traffic shall be designed to a minimum structural number of 3.00 as determined by the layer of coefficients shown in Table A7.

5. Table A7 is a suggested starting place for determining pavement layer type and material use based on previous general experience. Pavement sections differing from these guidelines are feasible when justified by local experience, construction procedure or appropriate supporting data. For cost comparison purposes, it may be desirable to use the thicknesses of ABC Types I, II, and III in increments of one inch.

E. ***Rigid Pavement Design***

Portland cement concrete pavement designed in accordance with the requirements of the American Concrete Paving Association Guide Specifications and Design Standards, contained in the "Municipal Concrete Paving Manual," or an equivalent specification may be approved by the City Engineer for construction.

F. ***Access and Intersection Improvement***

Access and intersection improvements to residential or non-residential developments shall be evaluated and improvements required as to be determined by the Administrative Official, City Engineer or the City's Engineering Consultant and the following governmental agencies and their staff, if the impacted roadway or roadways are within those agencies jurisdiction, include the Polk County Engineer, Polk County TPO Staff and Florida DOT District One Staff. A Traffic Impact Study shall be required in accordance with an approved methodology determined by the Administrative Official, City Engineer or the City's Engineering Consultant and governmental agency that has jurisdiction of the impacted roadway or roadways. Other factors that shall be considered for access and or intersection improvements, include but are not limited to, existing traffic volume, traffic speed, vertical and horizontal alignments for sight clearance, bona fide future roadway improvements (e.g. C.I.P.), and other safety considerations.

Table A-7 Flexible Pavement Road Design Guidelines

FDOT Spec. Section No.	Layer Coeff.	Layer	Remarks
160-3	0.10	Stabilized Subbase Type B	As shown in the plans
160-2	08	Type B, C Stabilization	FBV 75 or LBR 40 8" Min.
204-	0.15	Crushed Concrete	LBR 125
230	0.18	Limerock Base	(LBR =70)
250	0.12	Shell Base	(LBR =70)
250	0.18	Coquina Shell	(LBR = 100)
270	0.22	Soil Cement Base	(MR = 300 psi)
See Section A207 (1)	0.21	ABC Type 1	
See Section A207 (1)	0.25	ABC Type 2	
See Section A207 (1)	0.30	ABC Type 3	
See Section A207 (1)	0.44	Type S I Type S III	See Section A104
See Section A207 (1)	0.44	Superpave 9.5 Superpave 12.5 Superpave 19.0	
337	0.20	FDOT Friction Course(FC)	(FC-3)

(1) Section A207 is contained within this Appendix

Section A201 Site Construction Standards

This Section establishes the minimum requirements for acceptable construction practices to be used on development projects throughout the City. The standards of the following sections are intended to promote the health, safety and welfare by providing a level of workmanship which is safe and durable.

Section A202 Clearing and Grubbing

Clearing and grubbing shall consist of the removal and disposal of all timber, brush, stumps, roots, grass, weeds, sawdust, rubbish, and all other deleterious material resting on or protruding through the surface of the areas to be cleared.

A. ***Road Construction and Embankment***

In all areas of road construction and embankment, roots, and other deleterious materials shall be removed to a depth of not less than one foot below the subgrade.

B. ***Stumps***

Stumps shall be completely removed and plowed.

Section A203 Excavation

This Section applies to excavation and embankment required for roads, ditches, channel changes and other works. Unless otherwise provided, this Section shall include all excavation, shaping, filling, sloping and finishing necessary for the construction, preparation, and the completion of all embankments, subgrades, shoulders, ditches, slopes, gutters, intersections, approaches, private entrances and other works, all in accordance with the required alignment, grade, and cross sections shown on the plans.

A. ***Requirements***

1. While the excavation is being done and until the work is finally accepted, the contractor shall take the necessary steps to protect the work to prevent loss of material from the construction area due to the action of wind or water. During construction, the area shall be maintained in such condition that it will not constitute a hazard and will be well drained at all times.

   a. Where muck, rock, clay, phosphate slimes or other material is encountered within the limits of the construction area, the engineer of record shall direct that the material be excavated completely and backfilled with suitable materials. Other unsuitable plastic materials, identified as A-2-6, A-2-7, A-5, A-6, A-7 (AASHTO Designation), will be removed.

   b. The placing of embankments shall conform to the following:

      i. Embankments shall be constructed true to lines, grades and cross sections shown on the plans, within a 0.1 foot tolerance, unless otherwise specified on the approved plans.

      ii. Embankments shall be constructed of suitable materials placed in successive level layers not more than 12 inches in thickness, loose measure, for the full width and length of the embankment to the bottom of the stabilized subgrade and 98 percent of AASHTO T-180 Method "D" for the stabilized subgrade and base, and compacted to a minimum density of 100 percent of the maximum density value as determined by AASHTO T-99 Method "C."

   c. Shoulders, ditches and slopes shall conform to the following:

i. When the work includes surfacing or paving, the earthwork, including the slopes and all drainage structures shall be substantially completed before the construction of the base course and pavement is started.

ii. Where a stabilized shoulder is required, the earth shoulders, slopes, and side ditches shall be completed and shaped to a surface which is within 0.1 foot above or below the true surface shown on the plans, except that, adjacent to pavement, curb, or sidewalk, the shoulders shall be shaped to match the edge of the pavement, curb or sidewalk. The shoulder lines shall not vary more than 0.3 foot horizontally from the true lines shown on the plans.

2. Subgrade shall be defined as that portion of the roadbed immediately below the base course or pavement including below the curb and gutter, the limits of which will ordinarily include those portions of the roadbed shown in the plans. The limits of the subgrade shall be considered to extend outward to six inches beyond the base. On roads where curbs are constructed, the subgrade shall extend to six inches beyond the back of curb as follows:

a. The subgrade of limerock/clay shall:

i. Stabilize to 75 psi Florida Bearing Value

ii. Compact to 98 percent of AASHTO T-180 Method "D"

b. The subgrade of soil cement shall compact to 95 percent of AASHTO T-134.

c. The subgrade of curbs shall:

i. Stabilize to 75 psi Florida Bearing Value or LBR 40

ii. Compact to 98 percent of AASHTO T-180 Method "D" to include both sides of road.

d. The stabilization material shall be high bearing value soil, sand-clay, limerock, shell, or other material approved by the engineer of record and shall meet the physical requirements of FDOT Standard Specifications Section 914-2.

e. The surface of the subgrade shall conform to the lines and grades as defined on the construction plans to a tolerance of 0.05 feet.

f. Tests for the subgrade bearing capacity, thickness and compaction shall be spaced at a maximum of 300 feet apart. Locations for the tests shall be chosen by the engineer of record at locations where weakness is suspected and shall be staggered to the left, right, and on the centerline of the road.

Testing results shall be submitted by the testing engineer of record to the City Engineer. When, in the judgment of the City Engineer conditions warrant additional testing to assure compliance with specifications, the engineer of record will be advised and arrangements will be made by the engineer of record for the additional testing. All tests shall be the responsibility of the engineer of record. A minimum of three tests per road is required. Testing for stabilized shoulders shall include both sides of the road.

g. After the subgrade has been completed as specified above, the contractor shall maintain it free from ruts, depressions and any damage resulting from the hauling or handling of materials, equipment, and tools. It shall be the contractor's responsibility to maintain the required density until the subsequent base or pavement is in place. Such responsibility shall include any repairs, or replacement, of curb, gutter, or sidewalk, which might become necessary in order to recompact the subgrade/subbase in the event of underwash or other damage occurring to the previously compacted subgrade/subbase. Ditches and drains shall be constructed and maintained along the completed subgrade section.

Section A204 Soil Cement Standards

Soil Cement shall consist of soil and Portland Cement uniformly mixed, moistened, compacted, finished and cured in accordance with these specifications, and shall conform to the lines, grades, thicknesses and typical cross-section shown on the plans.

A. ***Testing***

1. Processing of the base shall not be started until the soil-cement design mix, which has been prepared by a registered engineer for the particular soil, has been submitted to and approved by the engineer of record. A modified PCA Short Cut Procedure for sandy soil test method may be used. However, a minimum seven day laboratory compressive strength of 300 psi shall be required. Locations for the tests shall be chosen by the engineer of record at locations where weakness is suspected and shall be staggered to the left, right, and on the centerline of the road. Testing results shall be submitted by the engineer of record to the City Engineer. When, in the judgment of the City Engineer conditions warrant additional testing to assure compliance with specifications, the engineer of record will be advised and arrangements will be made by the engineer of record for the additional testing. Sampling of soil cement pills shall be spaced at a maximum of 300 feet apart. All tests shall be the responsibility of the engineer of record. A minimum of two sets of pills will be required per road.

2. Construction of the soil cement base shall not proceed without 24 hour notice to the City. The following is the minimum information/test data required to be obtained during construction:

   a. Area and date of construction

   b. Average cement spread

c. Uniformity of mix

d. Moisture content at time of compaction

e. Percent compaction (95 percent of T-134)

f. Compacted thickness

g. Seven day compressive strength tests be required

3. In addition to the above data, the engineer of record, the City Engineer and the contractor shall perform a detailed engineering inspection of the hardened soil-cement base prior to approval for paving to assure that the soil-cement base has set-up satisfactorily and that no soft areas or surface scabs exist which may need repair. All deficiencies shall be corrected and approved by the City prior to paving.

4. The engineer of record shall prepare and submit to the City a signed report documenting the mix design and all field tests and observations.

B. ***Materials***

1. Portland Cement shall be Type I or Type I-P and shall comply with the Standard Specifications for Portland Cement ASTM C-145. Cement which is partially set, lumpy or caked shall not be used. One cubic foot of Portland Cement shall be considered to weigh 94 lbs.

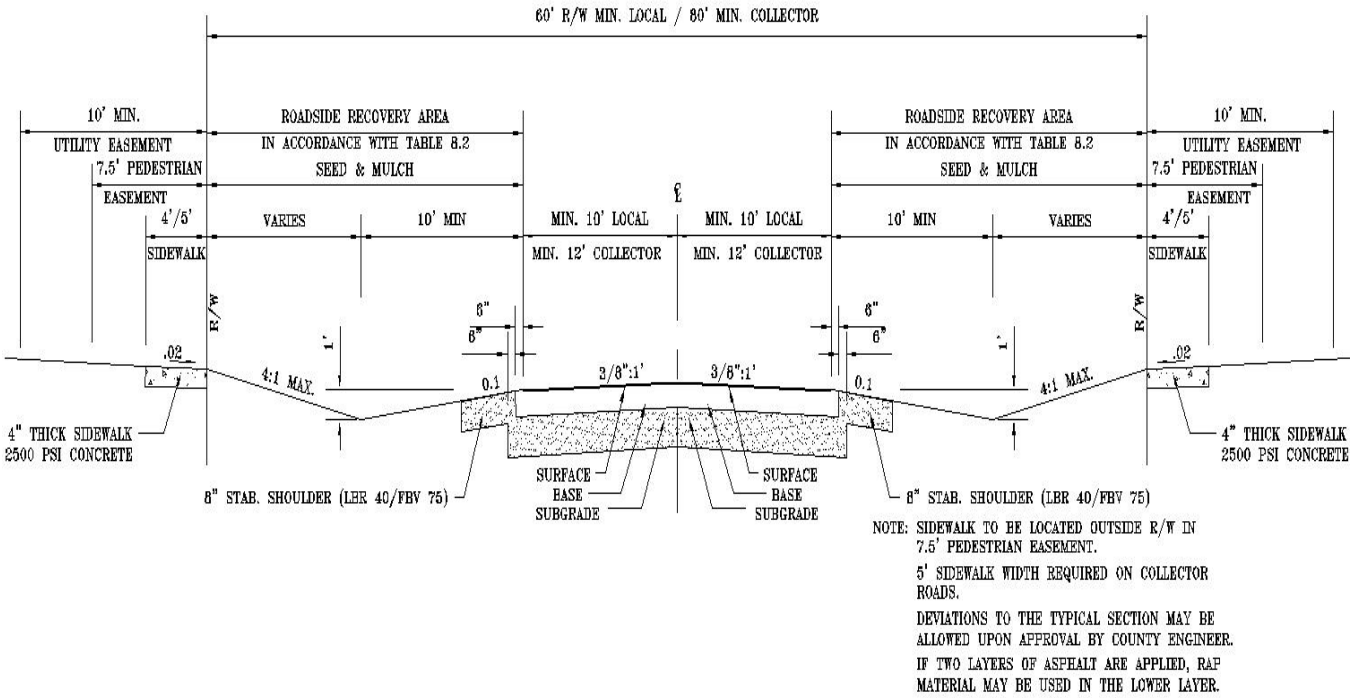
2. Water shall be clean and free from substance deleterious to the hardening of the soil cement.

3. Only soils which have proven themselves to produce a high quality soil cement base shall be acceptable. New sources of soil cement material shall be approved by the City Engineer prior to use.

C. ***Equipment***

Soil cement may be constructed with any machine, combination of machines or equipment that will produce the results meeting the requirements for soil pulverization, cement application, mixing, uniform depth control, water application, incorporation of materials, compaction, finishing and curing, as required by these specifications.

Figure A6
SWALE SECTION



NOTE: SIDEWALK TO BE LOCATED OUTSIDE R/W IN 7.5' PEDESTRIAN EASEMENT.

5' SIDEWALK WIDTH REQUIRED ON COLLECTOR ROADS.

DEVIATIONS TO THE TYPICAL SECTION MAY BE ALLOWED UPON APPROVAL BY COUNTY ENGINEER.

IF TWO LAYERS OF ASPHALT ARE APPLIED, RAP MATERIAL MAY BE USED IN THE LOWER LAYER.

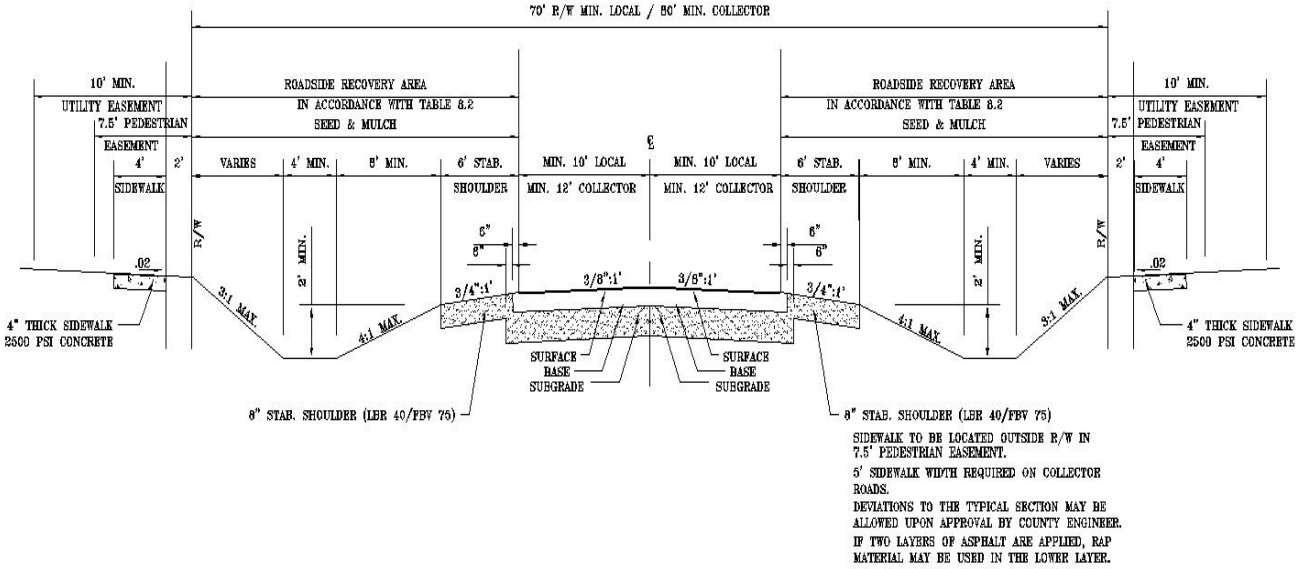
LOCAL ROAD PAVEMENT OPTIONS

SURFACE	1.5" ASPHALTIC CONC.	1.5" ASPHALTIC CONC.	1.5" ASPHALTIC CONC.
BASE	6" LIMEROCK BASE (LBR 100)	6" COQUINA SHELL BASE (LBR 100)	7" CRUSHED CONCRETE (LBR 120)
SUBGRADE	6" TYPE B STABILIZATION (LBR 40/FBV 75)	6" TYPE B STABILIZATION (LBR 40/FBV 75)	6" TYPE B STABILIZATION (LBR 40/FBV 75)

COLLECTOR ROAD PAVEMENT OPTIONS

SURFACE	2" ASPHALTIC CONC.	2" ASPHALTIC CONC.	2" ASPHALTIC CONC.
BASE	8" LIMEROCK BASE (LBR 100)	8" COQUINA SHELL BASE (LBR 100)	8" CRUSHED CONCRETE (LBR 120)
SUBGRADE	12" TYPE B STABILIZATION (LBR 40/FBV 75)	12" TYPE B STABILIZATION (LBR 40/FBV 75)	12" TYPE B STABILIZATION (LBR 40/FBV 75)

Figure A7
DITCH SECTION



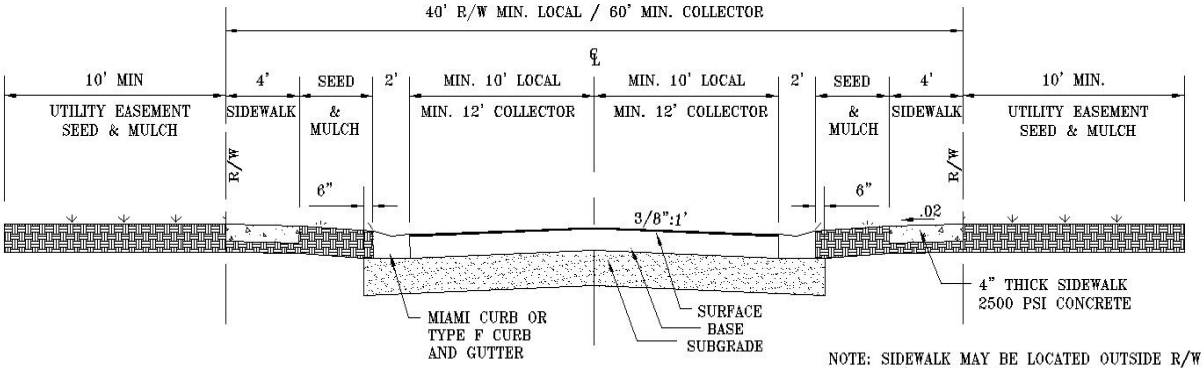
LOCAL ROAD PAVEMENT OPTIONS

SURFACE	1.5" ASPHALTIC CONC.	1.5" ASPHALTIC CONC.	1.5" ASPHALTIC CONC.
BASE	6" LIMEROCK BASE (LBR 100)	6" COQUINA SHELL BASE (LBR 100)	7" CRUSHED CONCRETE (LBR 120)
SUBGRADE	8" TYPE B STABILIZATION (LBR 40/FBV 75)	8" TYPE B STABILIZATION (LBR 40/FBV 75)	8" TYPE B STABILIZATION (LBR 40/FBV 75)

COLLECTOR ROAD PAVEMENT OPTIONS

SURFACE	2" ASPHALTIC CONC.	2" ASPHALTIC CONC.	2" ASPHALTIC CONC.
BASE	6" LIMEROCK BASE (LBR 100)	8" COQUINA SHELL BASE (LBR 100)	8" CRUSHED CONCRETE (LBR 120)
SUBGRADE	12" TYPE B STABILIZATION (LBR 40/FBV 75)	12" TYPE B STABILIZATION (LBR 40/FBV 75)	12" TYPE B STABILIZATION (LBR 40/FBV 75)

Figure A8
CURB SECTION



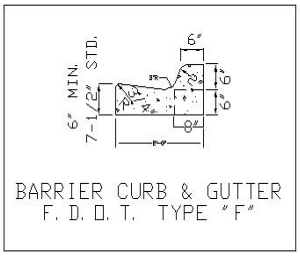
NOTE: SIDEWALK MAY BE LOCATED OUTSIDE R/W IN 7.5' PEDESTRIAN EASEMENT.

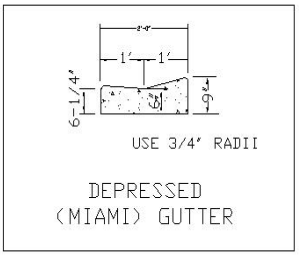
5' SIDEWALK WIDTH REQUIRED ON COLLECTOR ROADS.

6' SIDEWALK WIDTH REQUIRED ADJACENT TO TYPE F CURB.

DEVIATIONS TO THE TYPICAL SECTION MAY BE ALLOWED UPON APPROVAL BY COUNTY ENGINEER.

IF TWO LAYERS OF ASPHALT ARE APPLIED, RAP MATERIAL MAY BE USED IN THE LOWER LAYER.





CURB & GUTTER SECTION

LOCAL ROAD PAVEMENT OPTIONS

SURFACE	1.5" ASPHALTIC CONC.	1.5" ASPHALTIC CONC.	1.5" ASPHALTIC CONC.
BASE	6" LIMEROCK BASE (LBR 100)	6" COQUINA SHELL BASE (LBR 100)	7" CRUSHED CONCRETE (LBR 120)
SUBGRADE	8" TYPE B STABILIZATION (LBR 40/FBV 75)	8" TYPE B STABILIZATION (LBR 40/FBV 75)	8" TYPE B STABILIZATION (LBR 40/FBV 75)

COLLECTOR ROAD PAVEMENT OPTIONS

SURFACE	2" ASPHALTIC CONC.	2" ASPHALTIC CONC.	2" ASPHALTIC CONC.
BASE	8" LIMEROCK BASE (LBR 100)	8" COQUINA SHELL BASE (LBR 100)	8" CRUSHED CONCRETE (LBR 120)
SUBGRADE	12" TYPE B STABILIZATION (LBR 40/FBV 75)	12" TYPE B STABILIZATION (LBR 40/FBV 75)	12" TYPE B STABILIZATION (LBR 40/FBV 75)

D. ***Construction Methods***

1. The contractor is responsible for completing the project in accordance with plans and specifications and with experienced competent supervision.

2. Before construction operations are begun, the area to be mixed shall be graded, shaped, and sufficiently moistened, as required, to construct the soil cement base in conformance with the grades, lines, thicknesses and typical cross section shown on the plans. Additional soil needed, if any, shall be placed as directed. Unsuitable soil or material shall be removed and replaced with acceptable soil.

3. The soil shall be so pulverized that, at the completion of moist-mixing, 100 percent by dry weight passes a one inch sieve, and a minimum of 80 percent passes a No. four sieve, exclusive of gravel or stone retained on these sieves.

4. The application of cement shall conform to the following:

   a. The specified quantity of Portland Cement required for full depth treatment shall be applied uniformly on the soil. When bulk cement is used, equipment suitable for handling, measuring and spreading the cement shall be used. The percentage of moisture in the soil, at the time of cement application, shall not exceed the quantity that will permit a uniform and intimate mixture of soil and cement during mixing operations and shall not exceed the specified optimum moisture content by more than two percent for the soil cement mixture. No equipment, except that used to spread and mix the soil cement, will be allowed to pass over the freshly spread cement until it is mixed with the soil.

   b. The operations from application of cement to finishing, inclusive shall be continuous and surface finishing shall be completed as soon as possible. Spread cement that has been displaced shall be replaced before mixing is started. No cement shall be applied when the soil or subgrade is frozen. The air temperature shall be at least 40EF in the shade and rising.

5. After the cement has been applied, it shall be thoroughly mixed with the soil. Mixing shall continue until the cement has been thoroughly blended with the soil in order to prevent the formation of cement balls when water is applied. Any soil and cement mixture that has not been compacted and finished shall not remain undisturbed for more than 30 minutes.

6. The application of water and moist mixing shall conform to the following:

   a. Immediately after or during the mixing of soil and cement, and before beginning the compaction, the moisture content of the soil cement mixture shall be determined by the laboratory and, if required, water shall be applied uniformly in quantities required to obtain proper moisture content. After the final application of water, mixing shall be continued until the water is distributed uniformly through the full depth of the mixture.

   b. When water application and mixing has been completed, the percentage of moisture in the mixture and in unpulverized soil lumps, based on oven-dry weights, shall not be more than two percentage points above the specified optimum moisture content, and shall be less than that quantity which will cause the soil cement mixture to become unstable during compaction and finishing.

7. Prior to beginning of compaction, the mixture shall be in a loose condition for its full depth. The loose mixture shall then be uniformly compacted until the entire depth of the mixture is compacted to at least 95 percent of the maximum density prescribed in AASHTO T-134 as determined in the field on representative samples of soil cement mixture obtained from the road at the time compaction begins. During the compaction operations, shaping may be required to obtain the required grade and cross-section.

8. Finishing shall consist of the following:

   a. After the mixture has been initially compacted, the surface of the soil cement shall be shaped to the required lines, grades and cross-section. During the shaping operations, the surface shall be lightly scarified to loosen any imprints left by the compacting or shaping equipment, when deemed necessary. The resulting surface shall then be compacted to the specified density with a pneumatic tire roller. Rolling shall be supplemented by broom-dragging, if required.

   b. The moisture content of the surface material must be maintained at not less than its specified optimum moisture content during finishing operations. Surface compaction and finishing shall be done in such a manner as to produce a smooth, dense surface, free of surface compaction planes, cracks, ridges or loose material. Surface-finishing methods may be varied, provided a smooth, dense surface, free of surface compaction planes, is produced. The moisture and density requirements shall be determined by the methods prescribed in AASHTO T-134.

9. After compaction and finishing have been completed, and not later than the beginning of the next calendar day after the construction of any section of the base, the surface shall be tested with a template cut to the required crown or with a straight-edge of 15 feet laid parallel to the centerline, and all irregularities greater than 1/4 inch shall be immediately corrected with a blade adjusted to the lightest cut, which will ensure a surface that does not contain depressions greater than 1/4 inch under the template or the straight-edge. The material removed shall be wasted. Additional wetting, during and after this final shaping operation will be required to keep the base continuously moist.

10. Prime/curing shall consist of the following:

    a. After the soil cement has been finished as specified herein, it shall be protected against drying for seven days by the application of bituminous coating. The curing material shall be applied as soon as possible after the completion of finishing operations. The finished soil cement shall be kept continuously wet until the curing material is placed. The curing material shall be maintained by the contractor during the seven day protection period.

    b. Prime and curing materials shall conform to Section A204.

11. Prior to the beginning of each day's construction, a straight transverse construction joint shall be formed by cutting back into the completed work to form a true vertical face.

12. Thickness requirements shall conform to the following:

    a. During various stages of construction, test holes or trenches shall be dug in the mixture to determine the thickness. After the base is completed test holes shall be dug or drilled at intervals of not more than 300 feet, or at closer intervals, if necessary, and the thickness of the base shall be determined from measurements made in these test holes.

    b. Where the base is deficient in thickness by more than 2 inch, the area of deficient base shall be removed and replaced by base of the required thickness, at the contractor's expense, except that, at the engineer's option, such deficient thickness base may be left in place provided the deficiency is not more than one inch. This deficiency may be made up in asphaltic concrete if the grade control can be met.

E. ***Opening to Traffic***

The contractor will not be permitted to drive heavy equipment over the completed sections, but light weight pneumatic-tired equipment may be permitted after the surface has hardened sufficiently to prevent the equipment from marking the surface and provided the protection and curing specified are not impaired. Completed sections may be opened to light traffic after 24 hours protection provided the surface has hardened sufficiently to prevent marking by traffic.

F. ***Maintenance***

1. The contractor shall maintain the base to a true and satisfactory surface until the wearing surface is constructed. Should any repairs or patching be necessary, they shall extend to the full depth of the base and shall be made in a manner that will assure restoration of a uniform base course conforming to the requirements of these specifications. In no case shall repairs be made by adding a thin layer of soil cement or concrete to the completed work. The contractor may, at his option, make full depth repairs to small or minor areas, such as at manholes, inlets, or the like, with Class I concrete.

2. The patching of deficient areas less than 100 square feet and less than one inch in depth, the area shall be corrected using Type S-III Asphalt. For patching of deficient areas less than 100 square feet and greater than one inch in depth, the area shall be removed to full depth and replaced, using Asphalt Base Course Type III, Type S Asphalt, or soil cement.

G. ***Inspection***

After a minimum of seven days have elapsed, and prior to applying the asphalt wearing surface, an inspection of the base shall be performed by the City Engineer, engineer of record and contractor. All deficiencies shall be corrected and approved by the City Engineer prior to commencing paving operations.

H. ***Batch Plant Soil Cement Construction Specifications***

1. The supplier shall submit a mix design prepared by a registered engineer to the City Engineer, for approval, prior to use of the material for road construction. Also, the supplier shall continuously monitor at the plant the batching and mixing of the material and submit to the City Engineer, as requested, reports, prepared by the engineer of the gradation, cement content, and moisture content. The engineer shall monitor the installation and conduct applicable tests and inspections.

2. The base material will be hauled to the project site from the batch plant and immediately placed on top of the prepared subgrade. The material shall be graded to conform to the lines and grades of the finished pavement section as shown on the project drawings and shall be placed in a sufficient thickness to assure the minimum required compacted thickness.

3. The material shall be placed in a single uniformly thick layer and compacted to a density not less than 95 percent (AASHTO T-134). Not more than four hours shall elapse from the time of batching to final compaction and the material shall not remain undisturbed for more than two hours. The surface of the base materials may require the addition of water during the final rolling and shaping operation to prevent excessive surface moisture losses prior to sealing the base.

Section A205 Limerock Base

This Section applies to the construction of a base course composed of limerock. It shall be constructed on a prepared subgrade in accordance with these specifications and in conformity with the lines, grades, notes, and typical cross sections shown on the plans.

A. ***Materials***

The material used shall conform with the requirements as specified in the FDOT Standard Specifications.

B. ***Equipment***

This work may be performed with any machine, combination of machines, or equipment that will produce the specified results.

C. ***Transporting Limerock***

The limerock shall be transported to the point where it is to be used, over rock previously placed and dumped on the end of the preceding spread.

D. ***Spreading Limerock***

The limerock shall be spread uniformly. All segregated areas of fine or coarse rock shall be removed and replaced with well-grading rock. When the specified compacted thickness of the base is greater than six inches, the base shall be constructed in two courses. The thickness of the first course shall be approximately one-half the total thickness of the finished base, or enough additional to bear the weight of the construction equipment without disturbing the subgrade.

E. ***Compacting and Finishing Base***

1. For double-course base, the first course shall be bladed, if necessary, to secure a uniform surface, and shall be compacted to the specified density immediately prior to spreading the second course. No other finishing of this course is required.

2. After spreading is completed, the entire surface shall be scarified and shaped so as to produce the exact grade and cross section after compaction. For double-course bases, this scarifying shall extend to a depth sufficient to penetrate slightly the surface of the first course.

3. Proper moisture condition shall be maintained uniformly throughout the material during the compaction operation. The material shall be compacted to a minimum density of 98 percent of the maximum density obtainable under AASHTO T-180 Method "D". Where the base is being constructed in one course and the specified thickness is more than six inches, the density specified above shall be obtained in both the bottom half and top half of the base. During final compacting operations, if blading of any areas is necessary to obtain the true grade and cross section, the compacting operations for such areas shall be completed prior to making the density determinations on the finished base.

4. The surface shall be "hard-planed" with a grader immediately prior to the application of the prime coat to remove the thin-glazed or cemented surface, leaving a granular or porous condition that will allow free penetration of the prime material. The materials planed from the base shall be removed from the base area.

5. If, at any time, subgrade material should become mixed with the base course material, the contractor shall excavate and remove the mixture, reshape and compact the subgrade, and replace the materials removed with clean base material, which shall be shaped and compacted as specified above.

F. ***Prime/Curing***

When the limerock has been finished as specified herein, it shall be protected by the application of a bituminous coating. The bituminous material shall be applied as soon as possible after the completion of finishing operations. The Prime/Curing material shall be in accordance with Section A204.

G. ***Testing Surface***

The finished surface of the base course shall be checked with a template cut to the required cross section and with a straight edge of 15 feet laid parallel to the centerline of the road or other approved testing devices. All irregularities greater than 1/4 inch shall be corrected by scarifying and removing or adding rock, as may be required, after which the affected areas shall be re-compacted and retested, as specified herein. In testing the surface, measurements will not be taken in small holes caused by individual pieces of rock having been pulled out by the grader.

H. ***Tests***

At least one of each of the following tests shall be made on every project by the engineer of record, or his representative:

1. Modified Proctor Maximum Density Determination Tests

2. Intervals of 300 feet, minimum of three density determinations per road.

3. Intervals of 300 feet, with a minimum of two per road. Locations for the tests shall be chosen by the engineer of record at locations where weakness is suspected and shall be staggered to the left, right, and on the centerline of the road. Testing results shall be submitted by the testing engineer to the City Engineer. When, in the judgment of the City Engineer conditions warrant additional testing to assure compliance with specifications, the engineer of record will be advised and arrangements will be made by the engineer of record for the additional testing.

I. ***Deficiencies***

1. If deficiency in the density occurs, the base shall be reworked to 100 feet on either side of the deficiency and re-compacted until the density tests conform to these specifications.

2. Any deficiencies greater than one-half inch shall be completely reworked to conform to the original line and grade and specifications as shown on the original plans.

Section A206 Prime and Tack Coats for Base Courses

This Section applies to the application of bituminous material, on a previously prepared base, in accordance with these specifications and in conformity with the lines, grades, dimensions, and notes shown on the plans.

A. ***Materials***

The materials used shall be as follows:

1. A prime coat consisting of cutback asphalt, Grade RC-SS-1, SS-1H, special MS-Emulsion, diluted at the ratio of 6 parts emulsified asphalt to 4 parts water.

2. A tack coat consisting of cutback asphalt, Grade RC-70, asphalt cement, viscosity grades AC-20 or AC-30, emulsified asphalt, Grade RS-2, SS-1, SS-1H special MS-Emulsion, diluted at the ratio of 6 parts emulsified asphalt to 4 parts water.

3. For the prime and tack coat, any one of the specified bituminous materials may be used at the option of the contractor, unless a specific type and grade is called for on the plans, which has been approved by the City Engineer.

4. This work may be performed with any machine, combination of machines, or equipment that will produce the specified results.

5. Before any bituminous material is applied, all loose material, dust, and foreign material which might prevent proper bond with existing surface shall be removed for the full width of the application. Particular care shall be taken to clean the outer edges of the strip to be treated in order to ensure that the prime or tack coat will adhere. Where the prime or tack coat is applied adjacent to curb and gutter or valley gutter, such concrete surfaced are to be protected and kept free of bituminous material.

6. No bituminous material shall be applied when the temperature of the air is less than 40EF. in the shade, or when the weather conditions or the condition of the existing surface is unsuitable.

7. Application of the prime coat shall be as follows:

   a. The surface to be primed shall be clean and free of standing water.

   b. For limerock bases, the glazed finish shall have been removed leaving a granular or porous condition that will allow free penetration of bituminous material. The temperature of the prime material shall be between 100EF. and 150EF. The actual temperature will be that which will ensure uniform distribution. The material shall be applied by means of a pressure distributor. The amount of bituminous material applied shall be not less than 0.10 gallon per square yard for limerock base and not less than 0.20 gallon per square

yard for sand clay, soil cement, or shell base, not greater than 0.25 gallon per square yard.

c. The prime coat shall be applied only when the base meets the specified density requirements and the moisture content in the top half of the base does not exceed 90 percent of the optimum moisture of the base material. At the time of priming, the base shall be firm, unyielding, and in such condition that no undue distortion will occur.

d. A light uniform application of clean sand shall be applied prior to opening the primed base to traffic, in which case the sand shall be rolled with a traffic roller. If warranted by traffic conditions, the application shall be made only on one-half of the width of the base at one time, care being taken to secure the correct amount of bituminous material at the joint.

e. The base shall be sufficiently moist in order to obtain maximum penetration of the asphalt.

8. Where a bituminous surface is to be laid and a tack coat is required, it shall be applied as follows:

a. On newly constructed base courses, the application of the tack coat shall follow the application of the prime coat, immediately prior to placing the wearing surface, when the tack coat is required.

b. In general, a tack coat will not be required on primed bases, except in areas which have become excessively dirty and cannot be cleaned in areas where the prime has cured and lost bonding effect, or where the prime coat has worn away.

c. The tack coat shall be applied with a pressure distributor. The bituminous material shall be heated to a suitable consistency as designed. The bituminous material shall be applied at the rate between 0.02 gallon and 0.08 gallon per square yard.

d. The tack coat shall be applied sufficiently in advance of the laying of the wearing surface to permit drying but shall not be applied so far in advance or over such an area as to lose its adhesiveness as a result of being covered with dust or other foreign material and shall be kept free from traffic until the wearing surface is laid.

Section A207 Asphaltic Concrete Surface Course

This Section applies to the application of asphaltic concrete surface course composed of a mixture of aggregates and, if necessary, mineral filler and asphalt cement to produce the desired stability hereinafter described, properly laid upon a prepared base in accordance with these specifications and in conformity with the lines, grades, thickness and typical cross section shown on the plans. This work shall include the conditioning of the existing surface or base as described in section A206.

A. ***Asphaltic Concrete Mixes*** ***(Rev. 10/07/09 - Ord. 09-061)***

Marshall Mixes

1. The plant and methods of operation for preparing all plant mixed hot bituminous mixtures for surface courses and bases shall comply with the FDOT Standard Specifications for Section 320 of the Road and Bridge Construction, 2000 Edition, or as provided in Section A207-A below.

2. All asphaltic concrete mixes shall meet FDOT Standard Specifications for Marshall Design properties and standard design thickness and be approved by the City Engineer. The minimum design thickness for Type S-III and FC-3 shall be 1 inch and 1 ½ inches for Type S-I .

Hot Mix Asphalt **(Superpave (SP)**

1. General: Construct a Hot Mix Asphalt (HMA) pavement based on the type of work specified in the Plans and the Asphalt Work Categories as defined below. Meet the applicable requirements for plants, equipment, and construction requirements as defined below. Use a HMA mix that meets the requirements of this specification.

2. Asphalt Work Mix Categories: Construction of Hot Mix Asphalt Pavement will fall into one of the following work categories:

   a. Asphalt Work Category 1: Includes the construction of bike paths and other non vehicular traveled surfaces.

   b. Asphalt Work Category 2: Includes the construction of new HMA turn lanes, paved shoulders, parking lots, and other non-mainline pavement locations. Also, includes the construction of new mainline HMA pavement lanes, milling and resurfacing.

Table A-8 Allowable Hot Mix Types			
Roadway Type	**Work Category**	**Mix Types (1)**	**Traffic Level (1)**
Misc. asphalt such as bike paths, walkways, etc.	1	Type SP-9.5, SP-12.5	A
Includes parking lots, local roads, county roads, city streets, collector roads or access streets, medium trafficked city streets and majority of county roadways.	2	Type SP-9.5, SP-12.5	B or C
Includes two-lane, multilane divided and partially or completely control access roadways. Included are medium to highly trafficked city streets, and some state routes.	2	Type SP-9.5, SP-12.5, SP-19.0	C
(1) Traffic Level B may be substituted for Traffic Level A or Traffic Level C may be substituted for Traffic Level B.			

3. Mix Types: Use the appropriate HMA mix as shown in Table A8

4. Gradation Classification: HMA mixes are classified as either coarse or fine, depending on the overall gradation of the mixture. Coarse and fine mixes are defined in this Section. Use only fine mixes.

   The equivalent AASHTO nominal maximum aggregate size Superpave mixes are as follows:

   Type SP-9.5 = 9.5 mm
   Type SP-12.5 = 12.5 mm
   Type SP-19.0 = 9.0 mm

5. Thickness: The total pavement thickness of the HMA pavement will be based on a specified spread rate or plan thickness as shown in the Plans. Before paving, propose a spread rate or thickness for each individual layer meeting the requirements of this specification, which when combined with other layers (as applicable) will equal the plan spread rate or thickness. When the total pavement thickness is specified as plan thickness, the plan thickness and individual layer thickness will be converted to spread rate using the following equation:

   Spread rate (lbs/yd^2) $= t \times G_{mm} \times 43.3$
   where: t = Thickness (in.) (Plan thickness or individual layer thickness)
   G_{mm} = Maximum specific gravity from the mix design

   For target purposes only, spread rate calculations shall be rounded to the nearest whole number.

   a. Layer Thicknesses: Unless otherwise called for in the Plans, the allowable layer thicknesses for HMA mixtures are as follows:

Type SP-9.5 = 1 inch
Type SP-12.5 = 1 1/2 inches
Type SP-19.0 = 2 inches

b. Additional Requirements: The following requirements also apply to HMA mixtures:

i. When construction includes the paving of adjacent shoulders (≤5 feet wide), the layer thickness for the upper pavement layer and shoulder shall be the same and paved in a single pass, unless otherwise called for in the Plans.

ii. For overbuild layers, use the minimum and maximum layer thicknesses as specified above unless called for differently in the Plans. On variable thickness overbuild layers, the minimum allowable thickness may be reduced by 1/2 inch, and the maximum allowable thickness may be increased by 1/2 inch, unless called for differently in the Plans.

6. Weight of Mixture: Equip the asphalt plant with or provide HMA from a plant with an electronic weigh system that: has an automatic printout, is certified every six months by an approved certified scale technician. Weigh all plant produced hot mix asphalt on the electronic weigh system, regardless of the method of measurement for payment. Print the delivery ticket with an original and at least one copy. Delivery ticket must have mix design number and mix type printed on it. Furnish the original to the Engineer at the plant and one copy to the City Engineer at the paving site.

B. ***Materials***

1. Superpave Asphalt Binder: Use an asphalt binder from the FDOT's Qualified Products List (QPL) meeting FDOT Section 916.

2. Aggregate: Aggregate supplier shall certify that the aggregate meets FDOT requirements Section 901, Coarse Aggregate, and 902, Fine Aggregate.

3. Reclaimed Asphalt Pavement (RAP) Material:

a. General Requirements: RAP may be used as a component of the asphalt mixture if approved by the City Engineer. Usage of RAP is subject to the following requirements:

i. Limit the amount of RAP material used in the mix to a maximum of 30 percent by weight of total aggregate. Up to 40 percent RAP may be used when additional testing is performed or approved by the City Engineer.

ii. Provide stockpiled RAP material that is reasonably consistent in characteristics and contains no aggregate particles which are soft or

conglomerates of fines. RAP stockpiles must be FDOT certified or approved by the City.

iii. Provide RAP material having a minimum average asphalt content of 4.0 percent by weight of total mix. The City Engineer may sample the stockpile to verify that this requirement is met.

iv. Use a grizzly or grid over the RAP cold bin, in-line roller crusher, screen, or other suitable means to prevent oversized RAP material from showing up in the completed recycle mixture. If oversized RAP material appears in the completed recycle mix, take the appropriate corrective action immediately. If the appropriate corrective actions are not immediately taken, plant operations must stop.

b. Material Characterization: Assume responsibility for establishing the asphalt binder content, gradation, viscosity and bulk specific gravity (Gsb) of the RAP material based on a representative sampling of the material.

c. Asphalt Binder for Mixes with RAP: Select the appropriate asphalt binder grade based on Table 2. Maintain the viscosity of the recycled mixture within the range of 5,000 to 15,000 poises.

Table A-9: Asphalt Binder Grade for Mixes Containing RAP

Percent RAP	Asphalt Binder Grade
<20	PG 67-22
20 – 29	PG 64-22
≥ 30	Recycling Agent

C. Composition of Mixture (Rev. 10/07/09 - Ord. 09-061)

1. General: The asphalt mixture shall be composed using a combination of aggregates, mineral filler, if required, and asphalt binder material. The aggregate fractions shall be sized, graded, and combined to meet the grading and physical properties of the mix design.

2. Mix Design:

a. General: The asphalt mixture shall be designed in accordance with AASHTO R35-04, except as noted herein. A current FDOT approved mix design shall be used. A copy of the current mix design must be provided to the City Engineer.

b. Mixture Gradation Requirements: Combine the aggregates in proportions that will produce an asphalt mixture meeting all of the requirements defined in this specification and conform to the gradation requirements at design as defined in AASHTO M323-04, Table 3. Aggregates from various sources may be combined.

i. Mixture Gradation Classification: Plot the combined mixture gradation on an FHWA 0.45 Power Gradation Chart. Include the Control Points from AASHTO M323-04, Table-3, as well as the Primary Control Sieve (PCS) Control Point from AASHTO M323-04, Table 4. Fine mixes are defined as having a gradation that passes above or through the primary control sieve control point. Use only fine mixes.

c. Gyratory Compaction: Compact the design mixture in accordance with AASHTO T312-04. Use the number of gyrations as defined in AASHTO R35-04, Table 1.

d. Design Criteria: Meet the requirements for nominal maximum aggregate size as defined in AASHTO M323-04, as well as for relative density, VMA, VFA, and dust-to-binder ratio as specified in AASHTO M323-04, Table 6.

e. Moisture Susceptibility: In lieu of moisture susceptibility testing, add a liquid anti-stripping agent from the Department's Qualified Products List. Add 0.5% liquid anti-stripping agent by weight of binder.

f. Additional Information: In addition to the requirements listed above, provide the following information on each mix design:

i. The design traffic level and the design number of gyrations (Ndesign).

ii. The source and description of the materials to be used.

iii. The FDOT source number and the FDOT product code of the aggregate components furnished from an FDOT approved source (if required).

iv. The gradation and proportions of the raw materials as intended to be combined in the paving mixture. The gradation of the component materials shall be representative of the material at the time of use. Compensate for any change in aggregate gradation caused by handling and processing as necessary.

v. A single percentage of the combined mineral aggregate passing each specified sieve. Degradation of the aggregate due to processing (particularly material passing the No. 200 sieve) should be accounted for and identified.

vi. The bulk specific gravity (Gsb) value for each individual aggregate and RAP component.

vii. A single percentage of asphalt binder by weight of total mix intended to be incorporated in the completed mixture, shown to the nearest 0.1 percent.

viii. A target temperature at which the mixture is to be discharged from the plant and a target roadway temperature. Do not exceed a target temperature of 330°F for modified asphalts and 315°F for unmodified asphalts.

ix. Provide the physical properties achieved at four different asphalt binder contents. One shall be at the optimum asphalt content, and must conform to all specified physical requirements.

x. The name of the Mix Designer.

xi. The ignition oven calibration factor.

D. ***Contractor Quality Control*** ***(Rev. 10/07/09 - Ord. 09-061)***

Assume full responsibility for controlling all operations and processes such that the requirements of these Specifications are met at all times. Perform any tests necessary at the plant and roadway for quality control purposes.

E. ***Mechanical Spreading & Screening Equipment*** ***(Rev. 10/07/09 - Ord. 09-061)***

1. Bituminous pavers shall be self-contained, self-propelled and equipped with a receiving and disbursing hopper. The hopper shall be equipped with a conveyer distribution system to place the mixture uniformly in front of the screed.

2. The paver shall also be equipped with a heated mechanical screed or strike-off assembly. The screed or strike-off shall be capable of adjustment to regulate the depth of material spread and produce a finished surface of the required evenness and texture, without tearing, shoving, or gouging the mixture.

3. Power boxes will not be acceptable.

F. ***Equipment***

1. For all asphalt courses, with the exception of open-graded friction mixes, placed with mechanical spreading and finishing equipment in pavement widths of 20 feet or greater, the paving machine shall be equipped with automatic longitudinal screed controls of either the skid type or the traveling stringline type. The length of the skid or traveling stringline shall be at least 25 feet. On the final layer of Base, Overbuild and Structural Courses, and for Friction Courses, the joint matcher shall be used in lieu of the skid or traveling stringline on all passes after the initial pass.

2. When the paving machine is equipped with pneumatic tires, the Engineer may require that the tires be ballasted.

3. Paving machines used on main roads shall be a screed width greater than eight feet. On widening strips, cross-overs, or ramps, paving machines having a screed width of eight feet or less may be used.

4. Steel-wheeled rollers shall be of the tandem type. For the seal rolling, these rollers shall weigh between five and 12 tons and for the final rolling; they shall weigh between eight and 12 tons.

5. Traffic rollers shall be of the self-propelled, pneumatic-tired type, equipped with at least seven smooth-treated, low-pressure tires, with the tire pressure maintained between 50 and 55 pounds. They shall weigh between six and ten tons. The use of wobble-wheeled rollers will not be permitted.

6. Adhesion of the mixture to the wheels of all rollers will not be permitted. The use of fuel oil or other petroleum distillates to prevent adhesion will not be permitted. No method shall be used which results in water being sprinkled directly onto the mixture.

7. Trucks used to transport the mix shall be of tight construction, which will prevent the loss of material and the excessive loss of heat. Each truck shall have a tarpaulin or other waterproof cover, mounted in such a manner that the entire load can be covered. When in place, the waterproof cover shall overlap all sides and be capable of being tied down. The trucks shall also be equipped with chains on the tail gates to limit the size of the opening while unloading into the paver.

8. The contractor will be required to furnish a suitable saw or drill for obtaining the required density cores.

9. The necessary hand tools such as rakes and shovels, and a suitable means for keeping them clean, shall be provided.

G. ***Marshall Mixes Construction Methods***

1. No pavement shall commence until:

   a. The Contractor has submitted a pavement mix design signed and sealed by a Professional Engineer licensed in the state of Florida;

   b. The City Engineer has approved the mix design and provided written or electronic authorization to pave; and

   c. A pre-paving meeting has been held with City Engineer.

2. The mixture shall be spread on the surface designated only when the surface previously prepared is intact, firm, properly cured and dried; and only when the air temperature in the shade and away from artificial heat is above 40EF and rising. The mixture shall not be spread when the wind is blowing to such an extent that proper

and adequate compaction cannot be maintained or when sand or dust are being deposited on the surface being paved to the extent that the bond between layers will be diminished.

3. Transportation of asphalt mixtures from the plant to the site shall cease immediately at the first indication of rain on the project roadway. Asphalt mixtures shall not be placed while rain is falling or when there is water on the surface to be covered. As an exception, the Contractor may place mixture caught in transit, at the Contractor's risk, if the only option is to waste this mixture. In such case, the surface shall be tacked as required prior to the rain and the surface shall be broomed in front of the spreading operation. The City Engineer, or his/her representative, will evaluate such placed mixture separately, and if the mixture is unsatisfactory in any way, the contractor shall remove and replace it with satisfactory mixture.

4. The mixture shall be delivered on the road in ample time to permit the spreading, rolling and surface testing during daylight hours. The temperature of the mixture at the time of spreading shall be within 25° (above or below) of the design mix temperature. Any load or portion of a load of asphalt mix with a mix temperature exceeding 335 °F either at the plant or on the road shall be rejected.

5. Material shall be delivered to the job site with sufficient frequency that the paving operation can continue without interruption.

6. Depressions which may develop after the initial rolling shall be remedied by removing the mixture laid, and adding new material to bring such depressions to a true surface. Such portions of the completed course that are defective in surface planeness, compaction or composition, or that do not comply with the requirements of these specifications, shall be removed and replaced with suitable mixture properly laid in accordance with these specifications.

7. Vertical construction joints shall be constructed prior to the commencement of the ongoing paving operation. All cold joints will be prepared according to the FDOT Standard Specifications, latest edition. The vertical surface of all existing asphaltic concrete mixes at cold joints shall be mopped with an approved liquid bitumen material so as to provide a water-tight joint at the interface of the two mixes.

8. Night work shall only be permitted as directed by the City Engineer.

H. ***Marshall Mix Acceptance Tests***

1. The contractor shall notify the City Engineer, in writing, and shall submit for approval of the asphalt mix design, at least five (5) business days prior to the start of paving. The asphalt mix design shall be prepared by a certified material testing laboratory or a certified Construction Training Qualification Program (CTQP) Asphalt Mix Designer. The asphalt mix design must be signed and sealed by a Professional Engineer for Marshall mixes. Superpave mix designs shall be FDOT approved. Any asphalt mix design formulas used must have been verified by a certified material testing laboratory within the past 24 months.

2. During construction of the asphaltic concrete structural or surface course, the following tests must be completed and reports submitted within three working days to the City Engineer before acceptance can be given:

   a. The asphalt mixture shall be sampled and tested at the plant to determine Marshall stability and flow. In addition, the test shall include an extraction to determine the liquid asphalt content and gradation. Testing shall be performed at a frequency of one test per 500 tons or a minimum of one per day. Liquid asphalt content, and Marshall stability and flow shall conform to intent of job mix formula, as approved by the City Engineer.

   b. Tests for in-place density and layer thickness, for each course, shall be conducted at a frequency of one test per 300 linear feet of roadway (minimum 3 tests per road). The minimum acceptable density for each course of asphaltic concrete material shall be 93 percent of the laboratory density of the approved asphalt mix design.

   c. If the City Engineer believes that the number of cores taken is insufficient to properly indicate the thickness of the pavement, he or she may request additional cores. All additional costs shall be borne by the contractor.

      i. When the deficiency in thickness is in excess of the minimum thickness required on approved plans, less the allowable construction tolerance, the contractor shall correct the deficiency either by replacing the full thickness for a length extending at least 50 feet from each end of the deficient area, or when permitted by the City Engineer by overlaying the entire width of the road. Normally an overlay will not be permitted in a concrete curb section.

      ii. All tests and job mix formulas, aggregate verification and temperature control verification shall be made by an independent testing engineer as approved by the City Engineer and all reports shall be signed and sealed by a registered professional engineer for the State of Florida.

      iii. When there is a deficiency in test results for stability/flow, gradation or roadway core density, the City Engineer may require up to a five year extended warranty for acceptance.

   d. The following items may be required by the City Engineer:

      i. Plant inspection and calibration check;

      ii. Test of asphalt cement; and,

      iii. Full-time construction monitoring.

e. The City Engineer, upon written request of the engineer of record, may modify the testing requirements on projects of 500 feet or less.

I. ***Superpave Mixes Construction Methods***

1. Weather Limitations: Do not transport asphalt mix from the plant to the roadway unless all weather conditions are suitable for the laying operations.

2. Limitations of Laying Operations:

   a. General: Spread the mixture only when the surface upon which it is to be placed has been previously prepared, is intact, firm, and properly cured, and is dry.

   b. Surface Temperature: Spread the mixture only when the pavement surface temperature in the shade and away from artificial heat is at least 40ºF for layers greater than 1 inch (100 lb/yd2) in thickness and at least 45ºF for layers 1 inch (100 lb/yd2) or less in thickness (this includes leveling courses). The minimum temperature requirement for leveling courses with a spread rate of 50 lb/yd2 or less is 50ºF.

   c. A pre-paving meeting has been held with the City.

3. Mix Temperature: Heat and combine the ingredients of the mix in such a manner as to produce a mixture with a temperature at the plant and at the roadway, within a range of ±30ºF from the established plant mixing temperature as shown on the mix design. Reject all loads outside of this range.

4. Transportation of the Mixture: Transport the mix in trucks of tight construction which prevents the loss of material and excessive loss of heat. Vehicles will be cleaned of all foreign material. After cleaning, thinly coat the inside surface of the truck bodies with soapy water or an asphalt release agent as needed to prevent the mixture from adhering to the beds. Do not allow excess liquid to pond in the truck body. Do not use diesel fuel or any other hazardous or environmentally detrimental material as a coating for the inside surface of the truck body. Provide each truck with a tarpaulin or waterproof cover mounted in such a manner that it can cover the entire load when required. Cover each load during transportation, but fully tarp and strap down loads produced in cool weather or when there is a high probability of rain.

5. Preparation of Surfaces Prior to Paving:

   The following steps shall be followed prior to paving:

   a. Cleaning: Clean the surface of all loose and deleterious material by the use of power brooms or blowers, supplemented by hand brooming where necessary.

b. Patching and Leveling Courses: Where the HMA is to be placed on an existing pavement which is irregular, wherever the plans indicate, or if directed by the Engineer, bring the existing surface to proper grade and cross-section by the application of patching or leveling courses.

c. Application over Surface Treatment: Where an asphalt mix is to be placed over a surface treatment, sweep and dispose of all loose material from the paving area.

d. Tack Coat: Apply a tack coat on existing pavement structures with a pressure distributor that is to be overlaid with an asphalt mix and between successive layers of all asphalt mixes, unless directed otherwise by the Engineer. In areas inaccessible by a pressure distributor, use of a wand or hand tacking is permissible. Use a tack coat product meeting FDOT specifications. Use an emulsified tack coat spread rate of 0.02 to 0.08 gal/sy or as specified by the Engineer.

6. Paving:

a. Alignment of Edges: With the exception of pavements placed adjacent to curb and gutter or other true edges, place all pavements by the stringline method to obtain an accurate, uniform alignment of the pavement edge. Control the unsupported pavement edge to ensure that it will not deviate more than ± 1.5 inches from the stringline.

b. Rain and Surface Conditions: Immediately cease transportation of asphalt mixtures from the plant when rain begins at the roadway. Do not place asphalt mixtures while rain is falling, or when there is water on the surface to be covered. Once the rain has stopped and water has been removed from the tacked surface to the satisfaction of the Engineer (no puddles or ponded water) and the temperature of the mixture caught in transit still meets the requirements as specified in Section A207, the Contractor may then place the mixture caught in transit.

c. Checking Depth of Layer: Check the depth of each layer at frequent intervals, and make adjustments when the thickness exceeds the allowable tolerance. When making an adjustment, allow the paving machine to travel a minimum distance of 32 feet to stabilize before the second check is made to determine the effects of the adjustment.

d. Hand Spreading: In limited areas where the use of an asphalt paver is impossible or impracticable, spread and finish the mixture by hand and compact thoroughly.

e. Spreading and Finishing: Provide mechanical spreading and screeding equipment of an approved type that is self-propelled and can be steered. Equip it with a receiving and distribution hopper and a mechanical screed.

Use a mechanical screed capable of adjustment to regulate the depth of material spread and to produce the desired cross-section. Upon arrival, dump the mixture in the approved paver, and immediately spread and strike-off the mixture to the full width required, and to such loose depth for each course that, when the work is completed, the required weight of mixture per square yard, or the specified thickness, is secured. Carry a uniform amount of mixture ahead of the screed at all times.

f. Thickness of Layers: Construct each course of Type SP mixtures in layers of the thickness as outlined Section A207.

7. Leveling Courses:

a. Patching Depressions: Before spreading any leveling course, fill all depressions in the existing surface more than 1 inch deep by spot patching with leveling course mixture, and compact thoroughly.

b. Spreading Leveling Courses: Place all courses of leveling with an asphalt paver or by the use of two motor graders, one being equipped with a spreader box. Other types of leveling devices may be used upon approval by the Engineer.

c. Rate of Application: When using Type SP-9.5 (fine graded) for leveling, do not allow the average spread of a layer to be less than 50 lb/yd2 or more than 75 lb/yd2. The quantity of mix for leveling shown in the plans represents the average for the entire project; however, the Contractor may vary the rate of application throughout the project as directed by the Engineer. When leveling in connection with base widening, the Engineer may require placing all the leveling mix prior to the widening operation.

8. Compaction: For each paving or leveling train in operation, furnish a separate set of rollers, with their operators. When density testing for acceptance is required (Asphalt Work Category 2) select equipment, sequence, and coverage of rolling to meet the specified density requirement. Regardless of the rolling procedure used, complete the final rolling before the surface temperature of the pavement drops to the extent that effective compaction may not be achieved or the rollers begin to damage the pavement. When density testing for acceptance is not required (Asphalt Work Category 1), use a rolling pattern approved by the Engineer. Use hand tamps or other satisfactory means to compact areas which are inaccessible to a roller, such as areas adjacent to curbs, headers, gutters, bridges, manholes, structures, etc.

9. Joints.

a. Transverse Joints: Construct smooth transverse joints, which are within 3/16 inch of a true longitudinal profile when measured with a 15 foot manual straightedge.

b. Longitudinal Joints: For all layers of pavement except the leveling course, place each layer so that longitudinal construction joints are offset 6 to 12 inches laterally between successive layers. Do not construct longitudinal joints in the wheelpaths. The Engineer may waive this requirement where offsetting is not feasible due to the sequence of construction.

10. Surface Requirements: Construct a smooth pavement with good surface texture and the proper cross-slope.

a. Texture of the Finished Surface of Paving Layers: Produce a finished surface of uniform texture and compaction with no pulled, torn, raveled, crushed or loosened portions and free of segregation, bleeding, flushing, sand streaks, sand spots, or ripples. Correct any area of the surface that does not meet the foregoing requirements in accordance with this Section.

b Cross Slope: Construct a pavement surface with cross slopes in compliance with the requirements of the Plans. Contractor is not responsible for bird baths if design cross slope is less than 2%.

c. Pavement Smoothness: Construct a smooth pavement meeting the requirements of this Specification. Furnish a 15 foot manual and a 15 foot rolling straightedge meeting the requirements of FM 5-509. Make them available at the job site at all times during paving operations for Asphalt Work Category 2 and make them available upon request of the Engineer for Asphalt Work Category 1.

i. Asphalt Work Category 2:

(a). Acceptance Testing: Straightedge the final Type SP structural layer and friction course layer with a rolling straightedge. Test all pavement lanes where the width is constant using a rolling straightedge and document all deficiencies on a form approved by the Engineer. Notify the Engineer of the location and time of all straightedge testing a minimum of 48 hours before beginning testing.

(b). Rolling Straightedge Exceptions: Testing with the rolling straightedge will not be required in the following areas: shoulders, intersections, tapers, crossovers, parking lots and similar areas. In addition, testing with the rolling straightedge will not be performed on the following areas when they are less than 250 feet in length: turn lanes, acceleration/deceleration lanes and side streets. However, correct any individual surface irregularity in these areas that deviates from the plan grade in excess of 3/8 inch as determined by a 15 foot manual straightedge, and that the Engineer deems to be objectionable, in accordance with Section A207. The Engineer may waive or modify straightedging requirements if no milling, leveling, overbuild or underlying structural layer was placed on the project and the underlying layer was determined to be exceptionally irregular.

(c). Final Type SP Structural Layer: Straightedge the final Type SP structural layer with a rolling straightedge behind the final roller of the paving train. Correct all deficiencies in excess of 3/16 inch in accordance with Section A207, and retest the corrected areas.

(d). Friction Course Layer: At the completion of all paving operations, straightedge the friction course. Correct all deficiencies in excess of 3/16 inch in accordance with this Section. Retest all corrected areas.

ii. Asphalt Work Category 1: If required by the Engineer, straightedge the final structural layer with a rolling straightedge, either behind the final roller of the paving train or as a separate operation. Correct all deficiencies in excess of 5/16 inch in accordance with Section A207. Retest all corrected areas. If the Engineer determines that the deficiencies on a bicycle path or other areas due to field geometrical conditions, the Engineer will waive corrections with no deduction to the pay item quantity.

d. Correcting Unacceptable Pavement:

i. General: Correct all areas of unacceptable pavement .

ii. Structural Layers: Correct deficiencies in the Type SP structural layer by one of the following methods:

(a). Remove and replace the full depth of the layer, extending a minimum of 50 feet on either side of the defective area for the full width of the paving lane, or as determined by the City Engineer, or his or her designee.

(b). Mill the pavement surface to a depth and width that is adequate to remove the deficiency. (This option only applies if the structural layer is not the final surface layer.)

iii. Fiction Course: Correct deficiencies in the friction course layer by removing and replacing the full depth of the layer, extending a minimum of 50 feet on either side of the defective area for the full width of the paving lane. Corrections may be waived if approved by the City Engineer.

J. ***Superpave Mix Acceptance Tests***

1. General: The asphalt mixture will be accepted based on the Asphalt Work Category as defined below:

a. Asphalt Work Category 1 – Certification by the Contractor as defined in Section A207.

b. Asphalt Work Category 2 – Quality control for acceptance testing by the Contractor and verification testing at the discretion of the City Engineer as defined in Section A207.

2. Certification by the Contractor: On Asphalt Work Category 1 construction, the City Engineer will accept the mix on the basis of visual inspection. Submit a Notarized Certification of Specification Compliance letter on company letterhead to the City Engineer stating that all material produced and placed on the project was in substantial compliance with the Specifications. The City Engineer may run independent tests to determine the acceptability of the material.

3. Quality Control Testing by the Contractor and Acceptance Testing by the City Engineer: On Asphalt Work Category 2, perform quality control testing as described in Section A207. In addition, the City Engineer will accept the mixture at the plant with respect to air voids, gradation (P-8 and P-200) and asphalt binder content (Pb). The mixture will be accepted on the roadway with respect to density. The City Engineer may sample and test the material as described in Section A207 with the contractor retaining a split of the sample. The City Engineer may randomly obtain at least one set of samples per day. Assure that the asphalt content, gradation and density test results meet the criteria in Table 3. Material failing to meet these acceptance criteria will be addressed as directed by the City Engineer.

   a. Quality Control Sampling and Testing Requirements: Perform quality control testing at a frequency of minimum of 1 per mix type per day up to 500 tons, a second test required for production over 500 tons per day. If multiple jobs producing from same mix – test once and attach to results each project. Obtain the samples in accordance with FDOT Method FM 1-T 168 and retain an additional split sample for the City Engineer. Test the mixture at the plant for air voids, gradation (P-8 and P-200) and asphalt binder content (Pb). Test the mixture on the roadway for density using six-inch diameter roadway cores, with no cores located closer than 1 foot to joint or unsupported edge. Trim and test roadway cores for Gmb and patch core holes within 72 hours. Obtain cores at a minimum frequency of 3 cores per 500 tons or less, unless otherwise directed by the City Engineer. If tonnage exceeds 500 tons, take additional cores at the frequency of 1 per 150 tons. Determine the asphalt content of the mixture in accordance with FM 5-563. Determine the gradation of the recovered aggregate in accordance with FM 1-T 030. Determine the roadway density in accordance with FM 1-T 166. The minimum roadway density will be based on the percent of the maximum specific gravity (Gmm) from the accepted quality control test results representing that day's production. Roadway density testing will not be required in certain situations as described in Section A207. Assure that the air voids, asphalt content, gradation and density test results meet the criteria in Table A10. Forward copies of the test results to the City Engineer.

Table A10 Quality Control and Acceptance Values

Characteristic	Tolerance
Air Voids	2 to 6%
Asphalt Binder Content (percent)	Target ± 0.55
Passing No. 8 Sieve (percent)	Target ± 6.00
Passing No. 200 Sieve (percent)	Target ± 2.00
Roadway Density (average of three cores)	Target 92% Gmm: +3%, -2%
Roadway Density (minimum of any single core)	89.0 % Gmm
Note: Test results outside of Table A10 may be accepted at the discretion of the City Engineer	

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b. Acceptance Testing Exceptions: Density testing for acceptance will not be performed on widening strips or shoulders with a width of 5 feet or less, variable thickness overbuild courses, leveling courses, first lift of asphalt base course placed on subgrade, irregular shaped hand worked areas, miscellaneous asphalt pavement, or any course with a specified thickness less than 1 inch or a specified spread rate less than 100 lbs/sy. In addition, density testing for acceptance will not be performed on the following areas when they are less than 250 feet in length: crossovers, turning lanes, acceleration lanes, deceleration lanes, or ramps. Compact these courses in accordance with a standard rolling procedure approved by the City Engineer. In the event that the rolling procedure deviates from the approved procedure, placement of the mix will be stopped.

K. ***Finished Surface Requirements***

For the purpose of testing the finished surface, the contractor provides a rolling straight edge of 15 feet and standard template cut to the true cross section of the road. These shall be available at all times during construction so that the City may check the finish surface. The contractor shall provide and designate some employee whose duty it is to use the straight edge and template in checking all rolled surface under the direction of the City. Vertical measurement from a string line between curbs or edge of pavement to determined crown may be accepted as an alternate. The finished surface shall be such that it will not vary more than 3/16 inch from the rolling straight edge of 15 feet applied parallel to the centerline of the pavement and shall be of uniform texture and compaction. The surface shall have no pulled, torn or loosened portions and shall be free from segregation, sand streaks, sand spots, or ripples. Irregularities of the surface exceeding the above requirements shall be corrected by the contractor who has the option of selecting one of the following methods:

1. If correction is made by removing and replacing the pavement, the removal must be for the full depth of the course and extend at least 50 feet on either side of the defective area, for the full width of the paving lane.

2. If correction is made by overlaying, the overlay shall cover the length of the defective area and taper uniformly to a feather-edge thickness at a minimum distance of 50 feet on either side of the defective area. The overlay shall extend full width of the road. Care shall be taken to maintain the specified cross slope. The mix used for the overlay may be adjusted as necessary for this purpose by the City Engineer. Overlaying will not be permitted when the finished pavement surface is a friction course or abuts concrete curbs.

3. For courses which will not be the final pavement surface, correction of minor straightedge efficiencies by methods other than specified above may be approved by the City Engineer.

Section A208 Portland Cement Concrete Pavement

Rigid pavement consists of constructing a specified Portland Cement Concrete Paving on a prepared subgrade. The utilities and other items in and beneath the road must be properly coordinated with the construction of rigid pavement to avoid all conflicts. The work to be done shall include the furnishing of all supervision, labor, materials, equipment and incidentals necessary for the proposed rigid pavement construction in accordance with the approved drawings and specifications.

A. ***Subgrade Preparation for Rigid Pavement***

1. General requirements for subgrade preparation for rigid pavement are as follows.

   a. The bottom of the excavation for the pavement or top of the earth fill will be known as the pavement subgrade and shall conform to the lines, grade, and cross-sections shown on the plans.

   b. Prior to placing the concrete, the subgrade shall be tested for conformity with the cross-section shown on the plans.

   c. If necessary, material shall be removed or added as required to bring all portions of the subgrade to the correct elevation. Concrete shall not be placed on any portion of the subgrade which has not been tested for correct elevation. The subgrade shall be cleared of all loose material. At any time that trucks, construction equipment or slipforming machines cause rutting or displacement of the subgrade materials, the subgrade shall be reshaped and compacted. The subgrade shall be in a moist condition at the time the concrete is placed.

2. The top six (6) inches shall be composed of well drained granular soils that are predominantly sandy, mixed with no more silt or clay than required to obtain a Florida Bearing value of 35 plus or minus 5 and be compacted to 95 percent of maximum density in accordance with AASHTO T-180.

3. Testing of the subgrade shall conform to the following:

   a. Tests for subgrade stabilization shall be located no more than 400 feet apart and shall be staggered to the left, right, and on the centerline of the road. Test reports for subgrade stabilization shall be submitted to the City Engineer by the engineer of record for review and approval prior to paving.

   b. When in the judgment of the City Engineer conditions warrant additional testing, the engineer of record will be advised that additional tests will be required and the extent of such additional tests.

B. ***Materials, Proportioning and Construction for Rigid Pavements***

The materials and proportioning shall be in accordance with ACI Standard 318, latest edition. All construction procedures shall be in accordance with FDOT Standard Specifications.

1. All concrete shall have a minimum compressive strength of 3,000 (pci) psi at 28 days. Conformance to strength requirements shall be determined by American Concrete Institute Standard 318, Sections 4.8.2.3 and 4.8.3.

2. Slump shall consist of the following:

   a. The mixture shall contain no more water than is necessary to produce concrete which is workable and plastic. The minimum slump necessary to place the concrete satisfactorily shall be used. Slumps should be maintained so as not to exceed four and one-half inches for nonvibrated placement and not to exceed 5 inches for vibrated placement.

   b. The design mix shall be submitted to the City Engineer for approval prior to paving.

C. ***Equipment***

1. The pavement shall be placed to lines and grades established by the engineer. The edges of pavement shall be vertical to the subgrade and forms will be sufficient to support mechanical equipment.

2. All plants must be certified by the FDOT.

3. The plant shall be in accordance with the FDOT Standard Specifications. The trucks used to transport the concrete shall be so constructed to prohibit segregation of the mix. All plants must be certified by the FDOT.

4. All equipment used in the placement of concrete pavements shall conform to Section 350-3 of the FDOT Standard Specifications.

D. ***Mixing and Placing for Rigid Pavement***

1. Concrete pavement shall be constructed on the prepared subgrade in accordance with these Regulations and in conformity with the lines, grades, thickness, and typical cross-sections shown on the construction plans.

2. Concrete may be transported any distance providing it is discharged on the grade with the slump within the required slump range and meets concrete time limit requirements. If additional water is required to maintain the specified slump of concrete transported in truck mixers, it may be added with the permission of the City

Engineer. In this case, a minimum of 25 additional revolutions of the mixer drum at designed mixing speed shall be required before discharging of the concrete.

3. The length of time that the concrete can be held in the truck shall conform to the following:

   a. Air temperature 45EF to 80EF - 90 minutes maximum

   b. Air temperature over 80EF with a retarder added to the mix - 90 minutes maximum

   c. Air temperature over 80EF without a retarder added to the mix - 60 minutes maximum

   d. The maximum temperature of the concrete at the time of placing shall be 95EF.

4. The concrete shall be deposited on the grade in such a manner as to require as little rehandling as possible. It shall be deposited in successive batches in a continuous operation. The concrete shall be consolidated by suitable means so as to preclude the formation of voids or honeycomb pockets.

5. Concrete shall only be placed when the temperature is at least 40EF in the shade and rising. Any concrete damaged by frost or freezing action shall be removed and replaced.

6. Finishing requirements are as follows:

   a. The concrete shall be struck-off, consolidated, and finished with mechanical equipment in such a manner that after final finishing, it shall conform to the pavement cross-section shown on the construction plans. Hand finishing will be permitted in narrow width, areas, or irregular dimensions, and in the event of breakdown of the mechanical equipment only to finish the concrete already deposited on the grade.

   b. The final surface of the pavement shall have uniform, skid-resistant texture. The method of texturing shall be approved by the City Engineer and may require changes in the final finishing procedure as required to produce the desired final surface texture. A burlap drag or transverse broom finish is recommended for local and collector roads. Arterial and rural roads may require an overlapping stiff bristled broom or steel comb finish at the City Engineer's option.

c. The contractor shall always have materials available to protect the surface of the plastic concrete against rain. Areas of the pavement surface that exhibit a smooth sandy appearance after the rain ceases shall be textured to these areas before applying the membrane curing material. Areas that have suffered some surface erosion and have coarse aggregate exposed shall be reworked by hand methods or with the finishing machine when the form paving method is used. Fresh concrete containing the same materials and properties as the pavement concrete shall be added to maintain an adequate supply in front of the screeds or machine to assure replacement of the concrete eroded from the surface. The surface shall then be textured and cured as specified.

d. If pavement edges have been severely eroded and the concrete has not set, the edges shall be repaired by setting side forms and replacing eroded concrete. After the side forms are set, fresh concrete shall be placed and finished prior to texturing and curing. After the pavement has hardened, remedial work shall not be permitted until after the curing period has terminated.

7. Curing for rigid pavements shall be as follows:

a. After finishing operations have been completed and immediately after the free water has left the surface, the surface of the slab and, for slipformed pavements, the sides of the slab shall be coated and sealed with a uniform layer of membrane curing compound applied at the rate of not less than one gallon per 200 square feet of surface. When the forms are removed, curing compound shall be applied to the sides of the slab. Areas in which the curing membrane is damaged within a period of three days shall be re-sprayed with curing compound.

b. Curing compound may be omitted when, in conjunction with protection of pavement from inclement weather, a polyethylene film or other acceptable material is applied over the pavement and maintained intact for three days.

c. Rigid concrete pavement with excessive, uncontrolled cracks will not be accepted. Shrinkage cracks must be avoided. Uncontrolled cracks 1/8 inch or larger in width shall be repaired. One of the following repair methods shall be used:

i. Removal and replacement;

ii. Widen with power router and fill with an approved joint sealant; or

iii. Epoxy grout injection.

d. The City Engineer shall determine which cracks are to be repaired and the method to be used.

8. Joints in rigid pavements shall be as follows:

   a. Transverse and longitudinal joints shall be constructed to a maximum spacing of 15 feet. Transverse joints shall extend the entire width of the pavement and through the curbs. Joints must be sawed after the concrete has hardened and conform to the standard detail within the Standard Indexes.

   b. Sawing of joints shall begin four to six hours after placing or as soon as the concrete has hardened sufficiently to permit sawing without excessive raveling and before uncontrolled cracking occurs. If necessary, the sawing operations shall be carried on both day and night, regardless of weather conditions.

   c. Longitudinal joints may be construction joints at the City Engineer's option. Transverse construction joints shall be installed whenever the placing of concrete is suspended a sufficient length of time for the concrete to begin to harden.

   d. Joints shall be sealed, if required, before the pavement is exposed to traffic, including construction traffic. Prior to sealing, all foreign material shall be removed from the joints and the joints shall be thoroughly dry.

9. Final acceptance for rigid pavements shall be as follows:

   a. Before the pavement will be considered for acceptance all items shall be complete in accordance with the construction plans and these Regulations. Equipment, surplus materials, and construction debris shall be removed from the project.

   b. The pavement shall be closed to traffic after the concrete is placed until it reaches a compressive strength of 2500 psi under ordinary field conditions. This does not include the sawing and sealing equipment or other light miscellaneous equipment.

   c. Concrete pavement shall have a 28 day compressive strength of 3000 psi. Portland Cement Concrete control for slump testing and concrete cylinder samples and testing is required and shall be in accordance with AASHTO and ASTM Specifications. Test reports shall be submitted to the City Engineer by the engineer of record for review.

Section A209 Culverts and Storm Sewers

This Section applies to furnishing and installing culverts and storm sewers with appurtenances in conformance with the specifications hereinafter described and of the sizes and dimensions shown on the plans. Only concrete pipe shall be permitted under road pavement.

A. ***Pipe***

1. Concrete pipe shall meet the following requirements**:**

   a. Concrete pipe shall be of first quality, conforming to ASTM C-76 for round pipe and ASTM C-507 for elliptical pipe. The size and class shall be as shown on the plans. Joints for all round pipe shall be sealed by the use of round rubber gaskets and shall conform to the applicable provisions of ASTM C-361.

   b. Joints for elliptical pipe may be a tongue and groove type and sealed with a preformed gasket material (Ram-Nek or equal). The preformed gasket shall be applied to form a continuous gasket around the leading edges of both the primed tongue and groove in a manner that when the pipes are joined, the entire annular space will be filled with gasket material and there will be evidence of squeeze out of gasket material for the entire internal and external circumference of the joint.

   c. Elliptical concrete pipe joints shall be wrapped with filter fabric conforming to Section A103-A11. Filter fabric material shall extend a minimum of three (3) feet on both sides of the joint and shall overlap a minimum of two (2) feet at the top of the joint.

2. Corrugated metal pipe shall meet the following requirements:

   a. Bituminous coated metal pipe shall conform to the current AASHTO Standard Specification M-190. Corrugated aluminum alloy pipe shall conform to the current AASHTO Standard Specification M-196. All corrugated metal pipe installed shall have a continuous helical lock seam or a continuous welded helical seam. Riveted seam, spot welded seams, or non-helical corrugated metal pipe shall not be installed under this specification. Aluminum culverts can be specified if the soil Ph is between five and one-half and eight and one-half and soil resistivity is 1500 ohm-cm or greater certified by a licensed geotechnical engineer. If soils fall outside of these ranges, prior approval of storm drainage materials shall be obtained from the City Engineer.

   b. The ends of all corrugated metal pipe shall be recorrugated and the pipe supplied with a metal banding system. The metal band system shall have a minimum width of one foot and a rubber gasket or approved equal, which shall fit snugly in the space between the recorrugated end and metal band.

   c. The jointing system shall prevent soil infiltrating into the pipe. All joints under and within six (6) feet of the edge of a pavement shall be wrapped with filter fabrics. The material shall extend a minimum of three (3) feet on both sides of the joint and shall have an overlap of two (2) feet on the top of the joint.

d. Banding of the filter fabric may be required at the discretion of the City Engineer.

e. Corrugated steel pipe and corrugated aluminum pipe shall conform to the minimum gages of metal set forth in the attached schedule. All accessories and hardware shall conform to Section 430 of the FDOT Standard Specifications.

f. Alternative storm sewer materials may be utilized, such as aluminized steel per Section 943 of the FDOT Standard Specifications, Polyvinyl Chloride (PVC) in accordance with ASTM F-949 and Section 948-1.7 of the FDOT Standard Specifications or other FDOT approved materials.

3. All pipe shall be carefully laid, true to the lines and grades as shown on the plans. All pipe shall be laid "in the dry" unless specifically authorized otherwise by the City Engineer.

a. Concrete pipe shall meet the following requirements:

i. The joint shall be thoroughly lubricated and assembled according to the manufacturer's recommendations so that the maximum width of the joint opening shall not exceed the standards as set forth in FDOT 430-7.2.

ii. If, while making the joint, the gasket comes loose and can be seen through the exterior joint recess when joint is pulled up within one inch of closure, the dry pipe shall be removed and the joint remade.

b. Trenching shall conform to the latest OSHA requirements.

c. The metal band shall be drawn together in conformance with the manufacturer’s specification. The rubber gasket shall be uniformly compressed around the circumference of the pipe. Re-corrugated ends and bands damaged shall be rejected and removed from the construction site.

d. Pipe inlet/manhole joints shall conform to the following:

i. The joints of pipe and inlet/manhole shall be carefully cleaned and completely filled with non-shrink mortar applied and cured in accordance with the manufacturer's recommendations. An asphaltic mastic material shall be applied 12 inches in width from the joint around the exterior of the pipe and on the exterior wall of the inlet/manhole. A continuous 24 inch width of filter fabric shall be wrapped around each joint and shall have an overlap of two feet on the top of the pipe-inlet/manhole joint.

ii. The filter fabric shall be thoroughly bonded to the asphaltic mastic material. Filter fabric shall conform to Section A211.

iii. All pipe shall be carefully laid, true to the lines and grades as shown on the plans. All pipe shall be laid "in the dry" unless specifically authorized otherwise by the City Engineer.

e. Backfilling shall conform to the following:

i. Backfilling shall progress as rapidly as the construction and testing of the work will permit. All backfill material shall be suitable and free of deleterious material. The initial backfill shall be carefully deposited on both sides of the pipe at the same time and uniformly compacted around the barrel of the pipe until enough has been placed to provide a cover of one foot above the crown of the pipe. In no case shall backfill material be placed in the trench in a manner that will cause shock to or unequal pressure on the pipe. The backfill shall be placed and compacted to 100 percent of maximum density as determined by AASHTO T-99 to the bottom of the stabilized subgrade and 98 percent of T-180 for the stabilized subgrade and base under and within six feet of the traveled way and under other existing hard surfaced or previously compacted areas. In all areas except for those stated, compaction must equal a firmness approximately equal to that of the soil adjacent, or as directed by the City Engineer.

ii. Flowable fill is an acceptable method.

iii. Under no condition is construction debris or concrete, to be included with the backfill.

f. Where the nature of the foundation materials is of poor supporting value, the foundation material shall be replaced with sand or other material, or as

approved by the City Engineer. The foundation material shall be consolidated by mechanical methods to specified densities.

g. Tests shall be performed in accordance with the following:

i. Compaction tests shall be in accordance with Section 125-8 of the FDOT Standard Specifications for Road and Bridge Construction, latest edition. The City Engineer may determine that more compaction tests are required to certify the installation depending on field conditions. The locations of compaction tests within the trench shall be in conformance with the following schedule:

(a) One test at 6" intervals from the bottom of the pipe to an elevation one foot above the crown of the pipe (contractor may use 12" lifts if densities can be obtained in 12" lifts);

(b) One test for each one foot of backfill placed one foot above the crown of the pipe to subgrade elevation; and,

(c) Cross drain culverts shall have a minimum of two density tests per lift.

ii. All pipe runs shall be video recorded by a remote camera in the presence of a City representative. The video shall be provided to the City Engineer in DVD format with a narrative for each pipe run.

4. A pipe certification shall be submitted to the City Engineer for all pipe furnished or as approved by the City Engineer. The certification shall be signed and sealed by a registered professional engineer for the State of Florida. The certification shall state that the pipe installed and materials supplied comply with all applicable specifications contained herein. The substitution of corrugated metal pipe for concrete pipe or concrete pipe for corrugated metal pipe requires the written authorization of the City Engineer.

Section A210 Inlets and Manholes

This Section applies to the construction inlets and manholes. These structures shall be constructed of either clay brick, Portland Cement concrete and reinforcing steel with the necessary metal frames and gratings and shall be constructed in conformity with the detailed plans and in accordance with these specifications.

A. ***Materials***

1. Concrete shall have a minimum compressive strength of 3000 psi at 28 days. The mortar for masonry shall be of Portland Cement and sand mixed in the proportions of one part cement to three parts of sand.

2. At the option of the contractor, high early strength cement may be used.

B. ***Forms***

Forms shall be built true to line and grade, braced in a substantial and unyielding manner and so designed and constructed that they may be removed without injury to the concrete.

C. ***Placing and Curing Concrete***

The concrete shall be placed in the form to the depth shown on the plans and thoroughly tamped and spaded. After the concrete has hardened sufficiently, it shall be covered with suitable material and kept moist for a period of three days or longer, if necessary, and shall be protected in a satisfactory manner from the elements until thoroughly cured.

D. ***Masonry Construction***

All clay brick used shall conform to the current ASTM Designation C-55 Grade P-11. All masonry construction of inlets and manholes will be of cylindrical shape.

E. ***Pre-Cast Inlets and Manholes***

Pre-Cast manholes, inlets and junction boxes shall be in accordance with FDOT Standard Specifications.

F. ***Placing Pipes***

The inlet and outlet pipes shall be flush with the inside face of the wall. The joints of pipe and inlet/manhole shall be carefully cleaned and completely filled with nonshrink mortar applied and cured in accordance with the manufacturer's recommendations. An asphaltic mastic material shall be applied 12 inches in width from the joint around the exterior of the pipe and on the exterior wall of the inlet/manhole. A continuous 24 inch width of filter fabric shall be wrapped around each pipe-inlet/manhole joint and shall have an overlap of two feet on the top of the pipe-inlet/manhole joint. The filter fabric shall be thoroughly bonded to the asphaltic mastic material. Filter fabric shall conform to Section A211.

G. ***Flow Channels***

A flow channel shall be formed in the invert of all inlets, manholes and junction boxes and shall extend to the spring line of the pipe.

Section A211 Underdrains

This Section applies to the construction of underdrains.

A. ***Pipe Diameter***

Underdrain pipe shall have a minimum diameter of six inches, unless otherwise approved by the City Engineer.

B. ***Excavation Trench***

1. The trench shall be excavated carefully, to such depth as is required to permit the pipe to be laid to the grade desired, and to the dimensions shown in the plans.

2. The underdrain trench shall be constructed in a dry condition. This shall be accomplished by the use of a well point system or other positive dewatering method.

C. ***Placing the Filter Fabric***

After the trench has been excavated, the filter fabric shall be rolled out over the trench and walked into the trench. Care shall be taken to prevent the excavated material from entering the trench after the fabric has been installed.

D. ***Laying the Pipe***

1. After the filter fabric has been placed in the trench, approximately three inches of filter aggregate shall be placed in the trench.

2. The pipe shall be bedded firmly in the filter aggregate to the correct line and grade. The upper end of the run of pipe shall terminate at a drainage structure or underdrain clean-out to prevent any filter aggregate from entering the pipe.

3. All lateral connections to underdrains shall be made at approved drainage structures. Cleanouts or approved drainage structures shall be located along all underdrain systems. The maximum spacing of cleanouts or structures shall be 350 feet.

E. ***Placing and Compacting Filter Aggregate***

After the pipe has been laid to grade, the pipe shall be firmly held in place by mechanical means while the filter aggregate is placed to a maximum height of five (5) inches plus one

inch (compacted) above the top of the pipe. After the first lift is placed and compacted to the satisfaction of the City Engineer, the remainder of the filter aggregate shall be placed. The excavation of the trench, the placement of the filter fabric, the installation of the pipe and the placement and compaction of the first lift of filter aggregate shall be accomplished in a single continuous operation. Special care shall be taken to avoid displacement or damage to the pipe or filter fabric.

F. ***Backfill Above Filter Aggregate***

After the filter aggregate has been placed 12 inches above the pipe the filter fabric shall be lapped the full width of the trench from both sides. The portion of the trench above the filter aggregate shall be filled with fine filter aggregate which shall be placed and tamped in layers not thicker than 12 inches to the existing grade.

G. ***Certification***

Upon completion of the project, the engineer of record shall provide to the City Engineer, a certification that all materials installed and construction on the underdrain system complies with the approved design or approved design with defined exception.

H. ***Acceptance of Underdrains***

The City Engineer may require a video inspection of underdrain systems and correction of any deficiencies before approval.

Section A212 Sidewalks and Concrete Curb

This Section applies to the construction of curb, curb and gutter, valley gutter, or sidewalks of Portland Cement Concrete. Such work shall be constructed in accordance with these specifications and in conformity with the lines, grades, dimensions, and notes shown on the plans. Should the contractor so elect, he may use a curb machine.

A. ***Materials***

Unless otherwise shown on the plans, concrete shall be Class I.

B. ***Forms***

1. Forms for this work shall be made of either wood or metal. They shall be straight, free from warp or bends, and of sufficient strength, when staked, to resist the pressure of the concrete without springing.

2. Forms shall have a depth equal to the plan dimensions for the depth of the concrete being deposited against them.

C. ***Construction Methods***

1. Excavation shall be made to the required depth and the subgrade or base upon which the curb, curb and gutter, valley gutter, and sidewalks are to be set shall be compacted as specified.

2. The concrete shall be placed in the forms to the depth specified and tamped and spaded until mortar entirely covers its surface. The top of the curb or gutter shall be floated smooth and the edges rounded to the radius shown on the plans.

D. ***Joints***

1. Where metal templates are used for joint construction, the curb and curb and gutter shall be constructed in uniform sections ten feet in length, except where shorter sections are necessary for closures, but no section shall be less than four feet.

2. At the option of the contractor, the sections may be formed by the use of dummy joints (either formed or sawed) or by the use of sheet metal templates. If sheet metal templates are used, they shall be of the dimensions and shall be set to the lines shown on the plans. The templates shall be held firmly during the placing of the concrete and shall be left in place until the concrete has set sufficiently to hold its shape, but shall be removed while the forms are still in place.

3. Dummy joints shall be spaced at intervals of ten feet for curb and intervals of five feet for sidewalks. They shall be ¼ the depth of the concrete. Expansion joints shall be placed in sidewalks at a maximum of 30 feet at driveways, sidewalk intersection, all inlets, all radius points, all points where operations cease for any considerable time (such as the end of the day's run).

E. ***Finishing***

1. The gutter or flow-line section or curb shall be tested with a straight of ten feet edge laid parallel to the centerline of the road and while the concrete is still plastic. Irregularities in excess of ¼ inch shall be immediately removed.

2. Repair of minor defects shall meet the following requirements:

   a. The forms shall be removed within 24 hours after the concrete has been placed, and minor defects then filled with mortar composed of one part Portland Cement and two parts fine aggregate.

   b. Plastering will not be permitted on the face of the curb, and any rejected curb, curb and gutter, or valley gutter shall be removed and replaced.

3. The top of the curb and the face from the top to eight (8) inches below, shall be given a surface finish while the concrete is still green. In general, only a brush finish will be required.

F. ***Curing***

All curbs shall be covered with suitable material and kept moist for a period of three days, or longer if necessary, and shall be protected in a satisfactory manner from damage by the elements or other causes until acceptance of the work. If curing compound is used, moistening is not required.

G. ***Backfilling and Compaction***

1. After the concrete has set sufficiently, but not later than three days after pouring, the spaces in front and back of the curb shall be refilled to the required elevation with suitable material, which shall be placed and thoroughly compacted in layers not thicker than six inches.

2. Where bases are to be constructed adjacent to the curb, the concrete shall be properly backfilled and shall set for a period of not less than three days before any base material is placed against it.

H. ***Requirements for Machine-Laying***

As a specified requirement for machine-laid curb and gutter, contraction joints shall be sawed unless an alternate method of constructing them is approved in advance. Joints shall be provided at intervals of ten feet, except where shorter intervals are required for closure, but no joints shall be sawed or constructed at intervals of less than four feet.

Section A213 Seeding and Mulching

This Section applies to the seeding and mulching of road shoulders, ditches, embankments, and other areas left barren by construction to establish a dense stand of grass.

A. ***Materials***

The grass seed shall be common Bermuda and Bahia. In addition, brown top millet will be included during summer months and annual rye in the winter months. The mulch shall consist of thoroughly shredded straw or hay. All seed shall meet the requirements of the State Department of Agriculture. The chemical composition of the fertilizer shall be 12-8-8 or other chemical composition specified in the plans.

B. ***Construction Methods***

1. Construction methods shall be in accordance with the FDOT Standard Specifications, except as noted herein.

2. Seed will be applied at not less than the following rate:

Permanent type:	100 lbs. per acre
Quick growing type:	30 lbs. per acre

3. Fertilizer shall be applied at the rate of 500 lbs. per acre.

4. A hydro-mulch process meeting the application rates provided above may be used.

C. ***Sodding***

Sodding shall be in accordance with the FDOT Standard Specifications. Sod destroyed by construction will be replaced with existing type of grass.

Section A214 Traffic Control

All projects and work on existing roads shall have a traffic control plan. Traffic control or maintenance of traffic plan shall be submitted for City review, prior to the pre-construction meeting. All work shall be executed under the established plan and department-approved procedures, and conform to the Manual of Uniform Traffic Control Devices adopted by FDOT.

A. ***Pavement Markings***

This Section applies to the installation of pavement markings as shown on the plans in accordance with these specifications.

B. ***Materials***

All paint, reflective pavement markers, and glass spheres shall conform to FDOT Standard Specifications.

C. ***Installation***

Painted traffic markings, reflective pavement markers, and thermoplastic traffic markings shall be installed in conformance with FDOT Standard Specifications. Thermoplastic traffic markings shall not be applied to asphalt pavements within 30 days of the placement of the asphalt pavement.

Section A215 Restoration of Existing Right-of-Way

Restoration of existing right-of-way disturbed by the installation of utilities or adjacent construction projects shall be in conformance with the special conditions of the permit and this Section.

A. ***Traffic Control***

Traffic control shall be in conformance with the Manual on Uniform Traffic Control Devices and the FDOT Road and Traffic Design Standards.

B. ***Excavation***

Excavation shall be in accordance with Section A203.

C. ***Utility Foundations***

Where the nature of the foundation materials is of poor supporting value, the foundation material shall be replaced with sand or other material, or as approved by the City Engineer. The foundation material shall be consolidated by mechanical methods to specified densities.

D. ***Backfill and Compaction to Sub-Grade or Existing Ground***

Backfilling shall progress as rapidly as the construction and testing of the work will permit. All backfill material shall be suitable and free of deleterious material. The initial backfill shall be carefully deposited on both sides of the utility at the same time and uniformly compacted around the utility until enough has been placed to provide a cover of one foot above the utility, at which time a density test shall be conducted. Material shall then be placed and compacted in one foot lifts above the utility. In no case shall backfill material be placed in the trench in a manner that will cause shock to, or unequal pressure on, the utility. Under no conditions is construction debris or concrete to be included with the backfill.

E. ***Compaction***

1. Compaction density testing shall begin as stated above, and shall be tested for each one foot increment, above that point. The last test shall be taken at existing ground level, or top of the subgrade/subbase, whichever applies.

2. Testing shall conform to the following:

    a. Under and within six feet of the traveled way and under other existing hard surfaced or previously compacted areas. Compaction must equal 100 percent of maximum density as determined by AASHTO T-99 to the bottom of the stabilized subgrade and 98 percent of maximum density as determined by AASHTO T-180 for the stabilized subgrade and base.

b. In all areas except for the above, compaction must be equal to a firmness approximately equal to that of the soil adjacent.

3. Density tests for determination of the specific backfill, base or compaction shall be under the direction of an engineer licensed in the State of Florida at the expense of the permittee, and reports submitted to the City Engineer.

4. Flowable fill is an acceptable backfill.

F. ***Base and Pavement Restoration***

1. Pavement or road surfaces cut or damaged shall be replaced with the same type material that existed at the time of removal, or as approved by the City Engineer, to like or better condition than existing prior to the construction.

2. Where existing pavement is to be removed, the surface shall be mechanical saw cut prior to trench excavation, leaving a uniform and straight edge, with minimum disturbance to the remaining adjacent surfacing.

3. The base, during open cut restoration, shall be brought up to the grade of the existing pavement, and shall consist of a minimum thickness of eight inches of 3000 psi high early strength concrete.

4. The minimum width of the concrete shall be 12 inches each side of the open cut in addition to the width of the open cut as shown on the Standard Road Open Cut Detail.

5. In advance of pouring the concrete base, during final restoration, the existing asphalt surface shall be mechanically sawed straight and clean.

6. Immediately following the specified backfilling, compaction, testing and base construction, the final surface restoration shall be commenced in accordance with the applicable detail, and as approved on the permit. Asphalt material shall be replaced with the same type of material that existed at the time of removal and shall be a minimum of one inch thick, or as approved by the City Engineer.

G. ***Unpaved Road Restoration***

The top 12 inches of the excavation shall be stabilized with a mixture of clay and sand to a condition equal to or better than existing surface. Compaction density of this layer shall equal 98 percent of maximum density as determined by AASHTO Specification T-180.

H. ***Seeding and Mulching***

Seeding and mulching shall be in accordance with Section A213 of these specifications.

Section A216 Utility Appurtenances in Roadways

A. ***Location***

A pressurized pipe such as sanitary force main, gas pipe, storm water force main, reclaimed water main, and potable water main, except for a pipe that is four inches in diameter or less, shall be constructed outside of roadway pavement a minimum setback distance of six (6) feet from the outside edge of the travel lane or four (4) feet from outside face of curb in a roadway with a curb and gutter, to closest outside face of the utility pipeline. Utility access panels shall be placed outside of roadway pavement at a minimum distance of six feet from the outside edge of roadway travel lanes or accessory lane, and driveways.

If placement of a pressure pipe does not meet the setback requirement and is not installed under roadway travel lanes (or curb and gutter if applicable), the pipeline excavation, and backfill in six inches lifts shall be in accordance with subsections 125-4 and 125-8 of the latest edition of Florida Department of Transportation Standard Specifications for Road and Bridge Construction, Section 125 Excavation for Structures and Pipe.

A pressure pipe that is proposed under a roadway pavement (or curb and gutter if applicable) shall be evaluated and approved/denied by the utility purveyor on a case-by-case basis, with the approval of the City Engineer. The pressure pipeline backfill and compaction tests shall be at six inches lift. The pipeline excavation and backfill under a proposed roadway shall also be in accordance with subsections 125-4 and 125-8 of the latest edition of Florida Department of Transportation Standard Specifications for Road and Bridge Construction. In all cases, any pressure and gravity pipe approved for construction under a roadway shall be constructed at least 36 inches below the bottom of the road base. A pressure pipeline proposed under and across an existing roadway pavement shall be installed by directional bore or jack and bore in accordance with applicable latest edition of FDOT Section 555 or Section 556.

B. ***Backfill for Structures and Tests***

Backfill placed under and around a structure such as a utility manhole or a drainage inlet located within the right of way of an existing or proposed road shall be compacted and tests performed under and on at least two opposite sides of the structure, and on at least one side for every curb inlet. One compaction test shall be taken directly under the structure and all side tests shall be taken at a minimum vertical frequency of every 12 inches. Compaction test report certified by a licensed geotechnical engineer must be submitted to the City Engineer within two weeks of the test performed and prior to placement of roadway paving structural courses if pipe work and backfill are performed within the right of way of an existing or proposed road.

Compaction tests shall also be performed for backfill for each facility or utility structure including manholes and drainage inlets, within a proposed roadway or improvement to existing roadway such as acceleration and deceleration lanes.

Backfill placed under and within six feet of the edge of a road travel or accessory lane and under other existing paved surface or previously compacted areas shall be placed and compacted to 100 percent of maximum density as determined by AASHTO T-99 to the bottom of the stabilized subgrade and 98 percent of AASHTO T-180 for the stabilized subgrade and base. Compaction of backfill in other locations shall be in accordance with Section A203, Appendix A.

C. ***Finished Grade Requirement***

Appurtenances for storm sewer, sanitary sewer, water and other utility system, such as manhole covers, valve box covers, etc., which are located within an existing or proposed pavement such as a roadway or sidewalk shall be at grade with the final pavement surface. Acceptable tolerance shall be 3/8 inch. A deficiency found shall be corrected either by adjusting the appurtenance or the placement of asphalt in an asphalt roadway for a length extending from the appurtenance at a slope of 50:1; or in a manner recommended by engineer of record and approved by the City Engineer.

Section A301 Commercial, Industrial and Multi-Family

This section is provided to establish minimum standards to be used designing and constructing non-residential horizontal infrastructure, specifically regarding transportation and drainage features of the development.

Section A302 Purpose and Intent

This Section establishes the minimum engineering design standards applicable to all Commercial, Industrial and Multi-Family developments. The standards are intended to promote the public health, safety and welfare by ensuring the improvements are designed to adequately provide for transportation and drainage features of the development.

Section A303 Drainage Design Requirements

The storm sewer design shall follow the requirements of Section A102 of this Appendix. However, the Engineer of Record may use other design storms and materials for those facilities on site as deemed appropriate for the level of risk acceptable to the developer and approved by the City Engineer.

Section A304 Road and Parking Area Design Requirements

The road design for local and collector roads within non-residential developments that serve as access to parking areas and driveway aisles shall be in accordance with Section A103 of this Appendix. Those service roads, parking areas and driveway aisles that will not be dedicated to the City, and are required to be paved in accordance with Section 709, shall be designed according to the following criteria:

A. ***Stabilized Subgrade***

All road subgrade, where applicable, shall be stabilized to the required depth and required bearing value as shown on the approved plans. The Engineer of Record shall determine the depth required to meet the structural number of the pavement design.

B. ***Base Course***

The base course shall be compacted to the depth and bearing value shown on the approved plans. The Engineer of Record shall determine the depth required to meet the structural number of the pavement design.

C. ***Surface Course***

1. Any asphaltic concrete surface course meeting the requirements of Section A207 of this Appendix, or as approved by the City Engineer, will be permitted. Minimum thickness for all asphaltic surface courses shall be one inch with construction tolerance of 0.25 inch. The maximum content of recycled asphalt pavement (RAP) in the mix shall be 40% by weight.

2. Other alternative pavements may be utilized as a surface course conforming to the manufacturer specifications as approved by the City Engineer.

D. ***Flexible Pavement Road Design***

Typical Pavement Sections shall be determined by the structural number criterion. The minimum structure number shall be 1.58 as determined by layer coefficients shown in Table A7.

E. ***Rigid Pavement Design***

Portland cement concrete pavement, designed in accordance with the requirements of the American Concrete Paving Association Guide Specifications and Design Standards, contained in the "Municipal Concrete Paving Manual," or an equivalent specification may be approved by the City Engineer for construction.

Section A401 Site Construction Standards for Non-Residential Development

This Section establishes the minimum requirements for acceptable construction practices to be used on non-residential development projects throughout the City. The standards of the following sections are intended to promote the health, safety and welfare by providing a level of workmanship which is safe and durable.

Section A402 Clearing and Grubbing

Clearing and grubbing shall consist of the removal and disposal of all timber, brush, stumps, roots, grass, weeds, sawdust, rubbish, and all other deleterious material resting on or protruding through the surface and one foot below of the areas to be cleared. Areas outside of the pavement and building areas may be left in a natural state or partially cleared when appropriate.

Section A403 Excavation

This Section applies to excavation and embankment required for roads, ditches, channel changes and other works. Unless otherwise provided, this Section shall include all excavation, shaping, filling, sloping and finishing necessary for the construction, preparation, and the completion of all embankments, subgrades, shoulders, ditches, slopes, and other works, all in accordance with the required alignment, grade, and cross sections shown on the plans.

A. ***Requirements***

1. While the excavation is being done and until the work is finally accepted, the contractor shall take the necessary steps to protect the work to prevent loss of material from the construction area due to the action of wind or water. During construction, the area shall be maintained in such condition that it will not constitute a hazard and will be well drained at all times.

    a. Where muck, rock, clay, phosphate slimes or other material is encountered within the limits of the construction area, those areas shall be removed.

    b. The placing of embankments shall conform to the following:

    Embankments shall be constructed true to lines, grades and cross sections shown on the plans, within a 0.1 foot tolerance, unless otherwise specified on the approved plans.

c. Shoulders, ditches and slopes shall conform to the following:

When the work includes surfacing or paving, the earthwork, including the slopes and all drainage structures shall be substantially completed before the construction of the base course and pavement is started.

Section A404 Culverts and Storm Sewers

Culverts and storm sewers shall meet the requirements of the drainage design and shall consist of materials specified on the approved plans by the Engineer of Record.

Section A405 Inlets and Manholes

Inlets and manholes shall meet the requirements of the drainage design and shall consist of materials specified on the plans by the Engineer of Record.

Section A406 Inspection, Testing and Certification Requirement

A. ***Pre-Construction Meeting***

Once the Construction Plans have been approved, the Land Development Division shall be notified in writing at least five days in advance of the start of construction to schedule a Pre-Construction meeting. The Pre-Construction meeting shall include the assigned City Inspectors, the Contractor, the Engineer of Record (or his/her representative), and any utility providers to discuss construction issues and project schedules.

B. ***Inspection and Testing***

The Inspector shall inspect and monitor the construction to ensure compliance with the approved plans and National Pollution Discharge Elimination System (NPDES) requirements. The Inspector shall be notified at least 24 hours before clearing and grubbing, installation of silt fence, and any testing of materials. In the event the Inspector cannot be on site due to scheduling conflicts, a field copy of the test shall be provided to the Inspector by email, facsimile, or mail. After the project has been completed the Inspector shall be notified and a Pre-Final inspection shall be scheduled. The Inspector shall provide a punch list of items that need to be addressed or are outstanding including the following items.

C. ***Certification***

1. A Professional Engineer shall provide the City Engineer with two sets of As-Built/Record Drawings prepared by a Surveyor and Mapper licensed in the state of Florida depicting the constructed pavement and stormwater system improvements. The drawings shall show the drainage system with inverts, tops, and all elevations relevant to the design of the stormwater system. It shall also include pond bottom and top elevations and all control elevations of any outfall structures. Spot elevations of the pavement shall be provided to determine flow directions. These drawings shall be signed and sealed by the Professional Surveyor and Mapper and the Professional Engineer shall submit the appropriate form provided by the Land Development Division. (Digital format CAD, GIS??)

2. A Professional Engineer shall provide a signed and sealed report certifying to the pavement section and the thicknesses of the layers included therein. In addition to this report, the Professional Engineer shall provide copies of material testing and a written record of any approved changes in material or composition of the pavement section differing from the approved plans.

3. Upon completion of the project and receipt of the preceding items, the Inspector will release the project and any Certificate of Occupancy hold that the Land Development Division may have.

APPENDIX B

TOWN OF LAKE HAMILTON

UTILITY SPECIFICATIONS & TECHNICAL STANDARDS MANUAL

APPENDIX B

This Appendix is provided to establish minimum standards to be used by engineers and contractors in constructing utilities to all development projects throughout the Town of Lake Hamilton.

SECTION B101 PURPOSE AND INTENT

This Section establishes the minimum engineering design standards applicable to all public and private utility systems within all developments. The standards are intended to promote the public health, safety and welfare by insuring the improvements are designed to adequately provide for the public and private water and wastewater utilities for all development.

SECTION B102 AUTHORITY

In the event of a conflict between the requirements/standards listed in this Appendix, or in the interest of the public safety, health and welfare, or a conflict with the best management practices or requirements/standards recommend or adopted by the appropriate State Agencies and/or Professional Organizations/Associations, the more restrictive or stringent requirement/standard shall apply, as determined by the Administrative Official, Public Services Director City Engineer/Consultant.

SECTION B103 EXTENSIONS TO PROPERTIES OUTSIDE THE CITY

A. GENERAL

The following provides a means by which the Town of Lake Hamilton's utility systems may be connected to or extended. In general, developers are responsible for all cost and installation of utility systems within and adjacent to the proposed development, except for portions of individually metered service installations.

B. PROCEDURES FOR REQUESTING UTILITY SERVICE TO PROPERTIES LYING OUTSIDE THE CORPORATE LIMITS OF THE TOWN OF LAKE HAMILTON.

1) The extension of Town of Lake Hamilton utility services to properties lying outside and non-contiguous to the corporate limits of the Town of Lake Hamilton shall be considered by the City Commission. The extension of utility service to properties lying outside, but contiguous to the corporate city limits shall be considered by the Administrative Official. The extension of utility service to properties lying within and outside the corporate City limits, but contiguous to existing utility lines, may be considered by the Administrative Official. The below procedure shall be utilized in all applications for utility service.

2) The applicant/property owner of the site to be served by the city public utility system must formally request that the City provide available utility

services to the site. In order to initiate the request, the applicant/property owner shall contact the Administrative Official and Public Services Director and provide the following information in order for the proper evaluation of the request:

a) A project location map address and complete legal description of the subject property.

b) Proof of ownership, e.g., a copy of deed to property site.

c) A comprehensive, itemized breakdown of the proposed land use intended for the subject site,

d) An estimate of the daily water and wastewater demands of the subject property. Consumption and generation rates shall be in accordance with City standards unless the developer can provide evidence that other consumption/generation rates would be more appropriate.

3) For noncontiguous properties, the required information shall be provided to the Administrative Official or their designee at least 30 days prior to the City Commission meeting at which the request for utility service is to be considered.

4) The petitioner must execute a "Petition for Utility Service" that shall be reviewed by the Administrative Official and then forwarded to the City Commission for their consideration. The execution of the petition obligates the developer to construct the utility system in compliance with certain conditions:

a) All utilities construction within the subject property shall be in conformance with all applicable Land Development Regulations, Administration and Procedures Manual, City codes, specifications, other regulatory requirements and shall be approved by the Public Services Director and City Engineer/Consultant.

b) All costs associated with extension of the Town of Lake Hamilton utility services to the subject property are to be made at no expense to the City, except as provided below for over-sizing.

C. RESPONSIBILITY FOR INSTALLATION

1) Where an extension will benefit other property owners and/or developments, the City may consider the following options for line extension:

a) The developer may prepay the entire cost of the extension. The developer will be reimbursed those extension cost from other users connecting to the line within a five (5) year period and/or from the developer's own impact fees. Such reimbursement shall

be up to 100% of the certified cost of the extension on a prorated basis of five (5) years,

b) The City and the developer may enter into a utility extension agreement requiring the developer to reimburse the City for the cost incurred by the City. Any portion of the facilities to be installed or materials supplied by the City must be labeled as such on the plans,

c) These extension fees are in addition to usual impact fees and connection fees, and;

d) Said five (5) year period commences at the time of final acceptance of the extension.

2) Where an extension will not benefit other property owners and/or developments, the developer shall be totally responsible for all installation costs within the development and/or adjacent to his property, except as noted below.

3) Extensions will be of the City's minimum size or greater if needed by the developer.

4) Where it is deemed by the City to be more feasible to serve a development with a new water or wastewater facility rather than by extending existing City utilities, the developer shall be responsible for the cost of constructing the required and requirements of the Public Services Director and City Engineer/Consultant. Where desired, the City may require additional facilities. Water and/or wastewater treatment plants may be designed by the developer's Engineer in accordance with City standard details and specifications sizing of the facility and reimburse the developer in accordance with the following procedures.

D. OVERSIZING OF UTILITIES EXTENSIONS

1) The City may, at its discretion, require the over sizing of utility lines, lift stations, and/or other utility facilities to benefit the overall utility system.

2) Where the City elects to oversize any utility line, lift station, or other utility facility, the City shall reimburse the developer for the documented cost differential directly attributable to over sizing or additional facilities of benefit only to the City. The determination of that portion of the extension cost paid by the City shall be made from a minimum of three (3) bids, submitted for evaluation by the City.

SECTION B104 LIFT STATION STANDARDS

A. MAINTENANCE RESPONSIBILITY

To better manage the expansion of the City's wastewater service area, the City has established a standard relevant to the maintenance responsibility for wastewater lift stations. This standard is intended to encourage developers to plan the expansion of wastewater systems in an orderly fashion and to limit the number of lift stations that are to be maintained by the City.

B. REQUIREMENTS

In order for the City to consider accepting the maintenance responsibility for a wastewater lift station, the following minimum requirements must be met:

1) The lift station site must be accessible by a paved access point.

2) The lift station site and force main easements, as required, must be dedicated to the City.

3) All lift stations shall included an emergency generator, which the size and make shall be approved by the Public Services Director and/or City Engineer/Consultant.

4) The lift station pumps, motors and emergency generators shall be of a make, size, and specification approved by the City.

5) The development must generate a minimum average wastewater flow of 35,000 gallons per day.

6) Where the sizing of the lift station pumps, motors and emergency generators is dependent upon the lift station serving future phases of development, either on or off-site, then the developer must sufficiently document this future flow and provide a reasonable time frame for this additional capacity to be required of the station.

7) The design and construction of the lift station and the wastewater force main shall be approved by the Administrative Official, Public Services Director and City Engineer/Consultant.

C. PRIVATE RESPONSIBILITY

If the above conditions cannot be met, then the maintenance responsibility for the operation of the lift station shall remain private (Applicant, Developer, and Property Owner, Home/Property Owners Association or similar entity).

D. PUMPING RATE RESTRICTIONS

The pumping rate of any lift station, whether privately or publicly maintained, shall be restricted, as nearly as possible, to the theoretical peak flow of the gravity collection

system which drains to the lift station, as determined by the Public Services Director and City Engineer/Consultant.

E. MANIFOLD PUMP STATIONS

All Manifold force mains, where multiple lift stations pump into a common force main, shall not be allowed unless approved by the Public Services Director and City Engineer/Consultant. The Public Services Director and/or City Engineer/Consultant may request hydraulic analyses from the developer documenting the effect of the manifold pump stations.

SECTION B105 SUBMITTAL REQUIREMENTS FOR UTILITY SYSTEM ADDITIONS

A. PRELIMINARY SUBMITTALS

Preliminary or conceptual plans are to be submitted to the Administrative Official, Public Services Director and City Engineer/Consultant for review. A minimum of three (3) sets of plans and specifications, including electronic files (Auto-CAD files and PDF Format), shall be submitted. If service from the City Utilities Systems is determined to be feasible, the following procedures shall be utilized.

B. ENGINEER'S RESPONSIBILITIES

1) The engineer shall submit a minimum of three (3) copies of plans/drawings and specifications, including electronic files (Auto-CAD files and PDF Format), drawn to scale, showing the proposed system design to the City. The Administrative Official, Public Works Director, City Engineer/Consultant and City staff shall, upon payment of required review fee, review the drawings and specifications and request additional information if necessary.

2) The Administrative Official, Public Services Director and/or City Engineer/Consultant shall return to the developer's engineer one set of plans and specifications with City comments regarding the design within 20 working days of receipt by the City. The developer's engineer will make any modifications requested by the City or will respond in writing to the City's comments.

3) Three (3) sets of final plans and specifications, including electronic files (Auto-CAD files and PDF format) showing all utility improvements shall be submitted to the Administrative Official, Public Services Director and City Engineer/Consultant, along with copies of all water and sewer permit applications from all the reviewing government agencies. The City will issue wastewater collection system permits for a maximum of two (2) years.

4) The developer's engineer shall obtain all required from the Florida Department of Environmental Protection (FDEP) and the Polk County Health Department

(PCHD), together with all required City, County or State right-of-way use permits, railroad permits, or other required permits. Where the proposed utility extension crosses or utilizes an easement owned by another utility, the developer's engineer shall be responsible for obtaining permission from the utility owning the easement.

5) If requested by the Administrative Official, Public Services Director and City Engineer/Consultant, the developer's engineer shall conduct a pre-construction conference. This conference shall include the developer's engineer, the project construction inspector, the construction contractor, representatives of affected, utilities, and at least one staff member from the appropriate City staff. The scope of the work shall be discussed fully to ensure that all work is conducted in accordance with City standards and requirements.

6) At intervals deemed appropriate by the City, a representative of Public Works Department and the City Engineer shall inspect the construction to ensure that City construction standards are being met.

7) Prior to final acceptance by the City, a final inspection shall be conducted. A written request for inspection and acceptance shall be submitted at least 15 business days prior. This inspection shall include, but not be limited to, a review of the inspectors' (City, County, and State) comments, an inspection of above ground facilities, and an inspection of site restoration and clean-up. In addition, certified reports on pressure and leak tests and line disinfection tests shall be submitted by the developer's engineer. If a lift station is constructed, a start up and clean construction will be required with forms prior to acceptance.

8) The developer's engineer shall submit three (3) sets of reproducible plans stamped "record drawing", signed and sealed by the engineer of record, including electronic files (Auto-CAD files and PDF Format). The record drawings shall be in conformance with City requirements for record drawings.

9) In addition, the engineer's Certification shall be submitted to the City utilizing the current application/permits/forms of the reviewing government agencies and a “Request for Letter of Release to Place Water Supply System into Service”. This request and forms shall be submitted and forwarded to the required reviewing government agencies for their release.

C. DEVELOPER'S RESPONSIBILITIES

1) All connections to the existing utility system shall be made by the City and shall be paid in advance by the developer. In the event there is an existing stub from previous construction, no charge will be made. The City will provide all wet taps through two (2) inches in size. Sizes larger than two (2) inches will be made by the contractor at the developer's expense to City standards, and under the City's inspection and control. No charges will be assessed by the City for contractor installed connections.

2) Formal application for utilities service shall be made by the owner/developer. No sewer and/or water system permit applications shall be signed by the City until the application is received and approved.

3) Utility easements for system maintenance/operation shall be dedicated to the City by the Owner or Owners. Deeds for all easements shall be submitted prior to final acceptance by the City with all documentations and forms.

D. CONTRACTOR'S RESPONSIBILITIES

1) The contractor must exhibit a good working knowledge and experience in the installation of underground utility systems. Contractor shall be licensed by State of Florida as either an underground contractor or a general contractor.

2) The contractor shall conduct pressure, infiltration, and leakage tests as required by the engineer of record and conforming to approved standards. The contractor shall have all gravity sewer lines tested in accordance with City standards. Contractor shall provide at least 48 hours notification to the Administrative Official, Public Services Director, or City Engineer/Consultant before any test.

3) The contractor shall conduct disinfection operations on water lines as required by the engineer and shall submit bacteriological samples to the Polk County Health Department for analysis and approval. Three (3) copies, including electronic files in PDF format, of the test results shall be submitted to the Public Services Director and City Engineer/Consultant.

4) The name of the contractor to perform the construction, the construction project manager, and the telephone number at which he can be reached must be submitted to the City prior to commencing construction.

5) The contractor shall submit proof of insurance meeting the requirements of the City for any work done on portions of the project where the City is signer or cosigner to a use permit. This includes PCHD, FDEP, FDOT and Railroad permit applications. Additional, the City shall be listed on the Contractor's insurance policy.

SECTION B106 RECORD DRAWINGS

A. RECORD DRAWINGS

1) Record drawings shall be a complete, accurate visual representation of the exact location of any and all facilities installed for use by the Public Works Department. The record drawings shall include, but not be limited to:

a) An accurate scale.

b) All dimensions necessary to easily locate a facility. Measurements shall be from a permanent, above-ground facility to the City's facilities or to a point directly above an underground facility. All valves, services, manholes, air release valves, etc, shall be indicated by accurate dimensions. All valves, fittings and structures shall be located on state plane coordinate system.

c) For underground facilities, depth from final grade or other fixed point of reference shall be shown. The location where depth from final grade is required will be determined by the Administrative Official, Public Services Director, or City Engineer/Consultant.

d) Location dimensions on pipe runs shall be indicated as necessary to accurately define the permanent location at terminations, at service wyes, and at any deflection, vertically or horizontally.

B. COMPUTER DOCUMENTATION

The Developer's Engineer, in addition to the construction/engineering plan documents, shall provide a complete set of record documents, in computerized form to the City. This documentation shall be in AutoCAD files and PDF format. In addition, the engineer shall provide a document listing the layers and color/line types utilized in preparation of the drawings. These computer files shall contain all the information shown on the record drawings.

SECTION B107 DETAILED SPECIFICATIONS-WATER SYSTEMS

A. GENERAL

The Contractor shall furnish all labor, equipment, and materials and shall perform all operations in connection with installation of a complete water distribution system ready for use in accordance with the specifications and the City's requirements either specific or implied. This includes any and all restoration required to duplicate original site conditions prior to the commencement of construction. All excavation, trenching, and backfill for the installation of underground piping systems shall be conducted as specified hereunder.

B. SUBMITTALS

Three (3) copies of as-built drawings, including electronic files, shall be submitted to the Public Services Director and City Engineer/Consultant for review on any materials which are requested as a substitute for previously approved materials. The City retains the right to refuse any proposed substitution not on the approved materials list.

C. MINIMUM LINE SIZE

All new transmission mains shall be a minimum of eight (8) inches in diameter.

D. LOOPING OF DISTRIBUTION SYSTEM

It is the City's standard that all new water lines shall be looped to minimize dead-end conditions and the need of flushing of the system. Wherever possible, lines shall be looped to provide at least two points of connection to the existing system. Where this is not feasible, as determined by the City staff, then easements and/or rights-of-way shall be provided to facilitate looping as future construction allows.

E. PRODUCTS

1) All materials shall be new, of highest quality and manufacturing, and shall conform to the appropriate PCHD, FDEP and American Water Works Association (AWWA) best management practices and latest standards.

2) All fittings and materials may be inspected by the City after delivery and prior to being installed.

F. DUCTILE IRON PIPE

1) Shall comply with the requirements of the PCHD, FDEP, American National Standards Institute (ANSI) and AWWA best management practices and standards.

2) All underground pipes shall be a minimum of Pressure Class 350 with push-on or mechanical joints, unless otherwise indicated, where cover exceeds 4½ feet, the pipe manufacturer shall determine the additional wall thickness required, if any. All aboveground pipes to be Pressure Class 250 with flanged joints.

3) Pipe manufacturing shall be in accordance with PCHD, FDEP, ANSI and AWWA best management practices and standards.

4) Pipe shall be lined/bituminous coated cement in accordance with PCHD, FDEP, ANSI and AWWA best management practices and standards.

G. POLYVINYL CHLORIDE (PVC) PIPE

1) Four (4) inches diameter to 12 inches diameter shall the appropriate Pressure Class pipe meeting the requirements of PCHD, FDEP and AWWA.

2) PVC pipe larger than 12 inches shall meet the requirements of the PCHD, FDEP and AWWA, with a cast iron pipe outside diameter. Pipe shall have a pressure rating of 165 psi, and shall have a DR of 25.

3) Each length shall be clearly labeled so as to allow identification and specification conformance. Pipe shall bear the National Sanitation Foundation Seal for potable water pipe.

4) All PVC pipe shall be blue in color or bear an acceptable indelible blue marking in three (3) locations for the length of the pipe.

5) Connection for PVC water pipe two (2) inches and larger shall be rubber compression ring type. The Bell shall consist of an integral wall section with a solid cross-section elastomeric ring which meets the requirements of American Society for Testing and Materials International (ASTM) best management practices and standards.

6) PVC water pipe two (2) inches diameter and smaller shall conform to the ASTM best management practices and standards.

7) Trace wire shall be 14-gauge UF wire with joint seal.

H. POLYETHYLENE WATER SERVICE TUBING

Polyethylene water service tubing shall be used for service piping only. Pipe shall be rated for 200 psi working pressure.

I. FITTINGS

1) All fittings shall be rated for not less than 150 psi working pressure.

2) Grade for ductile iron fittings shall conform with all applicable PCHD, FDEP, ANSI and AWWA best management practices and standards, and shall be cement lined inside and bituminous coated outside. Mechanical joint ductile iron fittings complying with PCHD, FDEP, AWWA standards are acceptable.

3) Malleable iron fittings shall be galvanized conforming to the applicable provision of all Federal Specifications, as determined by the Public Services Director and/or the City Engineer/Consultant, and may be used in sized two (2) inches and under only.

4) Polyvinyl chloride (PVC) fittings shall be minimum Schedule 40 and may be used in sizes two (2) inches and under only

J. GATE VALVES

1) Gate valves four (4) inches and over shall be of the resilient wedge type and shall be in accordance with PCHD, FDEP, ANSI and AWWA latest standards and editions with O-ring type stem seal and two (2) inch square operating nut for buried services. Valves shall be mechanical joint unless otherwise noted and open left (counter clockwise).

2) Gate valves two (2) inches and under shall conform to all Federal Specifications, as determined by the Public Services Director and/or the City Engineer/Consultant, solid wedge disc, rising stem, secured joints and of bronze construction. Valves shall have malleable iron hand wheels.

3) All valves shall be made of the highest quality and manufacturing, minimum, 150 psi cold water rated and shall be cast with manufacturer's name and pressure rating.

K. VALVE BOXES

1) Boxes shall be cast iron of standard design with adjustable drop section to fit disc or cover over valve. Interior diameter shall be not less than five (5) inches, with cast iron cover marked "WATER".

2) Upon approval from the City, valve boxes may be PCHD, FDEP and AWWA approved PVC with six (6) inch diameter. Pipe color shall match valve service.

L. FIRE HYDRANTS

Shall be in compliance with the PCHD, FDEP, NFPA, ANSI and AWWA best management practices and latest standards; and the following requirements:

1) Dry barrel compression type.

2) O-ring seal at operating nut stem and means for lubrication.

3) Traffic model with frangible sections at ground line.

4) Open left (counter clockwise).

5) Two 2½ inch hose nozzles and one 4½ inch pump nozzle with National Standard threads.

6) Main valve openings shall be not less than 5¼ inches.

7) Paint shall be one coat primer and two (2) coats finish.

8) Pipe outlet shall be six (6) inch mechanical joint.

9) Operating nut shall be pentagonal measuring 1½ inch point to flat.

10) All hydrant leads shall be valved.

11) All hydrants shall be installed plumb and in true alignment with the connection pipe to the water main. A minimum of 18 inch clearance shall be provided between hose nozzles and finish grade.

M. STEEL PIPE SLEEVES AND CARRIER PIPE

All construction projects requiring steel sleeves shall conform to the minimum DOT requirements for roadway crossing. Railroad crossings shall conform to railroad requirements. The following casing sizes shall be used for the corresponding carrier pipes:

CARRIER PIPE (Normal O.D.)	STEEL CASING (Required Dia.)
4"	10"
6"	12"
8"	16"
10"	18"
12"	24"
16"	30"
20"	36"

N. AIR-VACUUM VALVES

All air-vacuum valves shall be constructed with cast iron body and coyer, stainless steel float and Buna rubber seat. All interior parts shall be stainless steel or bronze. Valves sizes shall be approved by the Public Services Director and City Engineer/Consultant as required.

As an alternative to the cast iron body and stainless steel float, the air/vacuum valve may be constructed of high strength light-weight fiberglass reinforced nylon. A rolling resilient seal shall provide a smooth, positive opening, closing, and leak free sealing over the fluctuation of pressure differentials. Working pressure shall be 200 psi. The connection to the system shall be a direct two (2) inch threaded connection on top of the pipe using a saddle with an isolation valve.

O. TAPPING SADDLES & TAPPING VALVE RESILIENT SEAT

1) All connections to the existing City system through two (2) inches in size shall be made by the City at the developer's expense. Sizes two (2) inches and above shall be made by the Contractor, utilizing only materials approved and inspection by the City.

2) Meter boxes ¾ inch through two (2) inches shall be supplied by the City. Type and size of meter boxes shall be determined by the City or its representative. Meter boxes three (3) inches and larger shall be installed by the contractor and shall conform to approved City standards. All shop drawings shall be reviewed and approved by the Public Services Director and City Engineer/Consultant.

3) Variation of product requirements by brand name or specification number may be made by the Public Services Director, or City Engineer/Consultant. When it can be determined that a substitute

which is equal to or better than the product required or that the substitute product will better meet the public need, the Public Services Director, or City Engineer/Consultant have the authority to determine that the intent of these regulations are being met.

P. INSTALLATION

1) PREPARATION

Remove scale and dirt on inside and outside, before assembly.

2) PIPE AND FITTINGS

a) Trenches shall be maintained in a dry condition at all times unless otherwise approved by the Public Services Director, or City Engineer/Consultant.

b) Maintain 10 feet minimum horizontal or 12 inches minimum vertical separation of water main from sewer piping in accordance with State requirements.

c) Install pipe to indicated elevation to within tolerance of 5/8 inches. Minimum cover shall be 36 inches unless otherwise stipulated or authorized by the City.

d) Install ductile iron piping and fittings to comply with requirements of the PCHD, FDEP, ANSI and AWWA latest standards and editions. Install PVC piping to comply with Uni-Bell's Handbook of PVC Pipe.

e) Route pipe in straight line, except as noted. Deflections shall not exceed 80% of manufacturer's recommendations.

f) Install pipe to allow for expansion and contraction without stressing pipe or joints.

g) Install access fittings to permit disinfection of water system.

h) All fittings and valves shall be restrained with retainer glands in accordance with the City's standard details. All stubs shall be restrained with a minimum of 60 lineal feet of pipe beyond the valve. Where this is not possible, utilize City approved retaining glands.

i) A blue coated #14 gauge UF solid tracer wire and joint seal shall be installed along all pipe and service. Trace wire shall be taped to the pipe and stubbed up at all hydrants and valves.

j) Pipe shall be laid in a level trench. Hand trim excavation for accurate placement of pipe to elevations indicated. The width of trenches for

installation of all lines shall be in accordance with the pipe manufacturer's recommendations, Occupational Safety & Health Administration (OSHA) safety requirements, and all applicable codes. Trench widths shall not be less than necessary for safe and proper construction. Where required, excavation support systems shall be provided.

k) Contractor shall place bedding material at trench bottom, level fill materials in one continuous layer not exceeding 8 inches compacted depth, compacted to 95% of maximum density by modified Proctor method.

l) Contractor shall backfill around sides and to top of pipe with fill, tamped in place and compacted to 95% of maximum density by modified Proctor method. Maintain optimum moisture content of bedding material to attain required compaction density.

m) Installation and restoration operation under roads, shoulders or other level areas shall be performed in compliance with any City, County or State requirement which may apply.

n) Every effort shall be made to cover pipe ends during installation and a watertight plug or other approved seal must be used when installation is not in progress.

o) Length of open trench on existing roads may be limited by the inspector to minimize public inconvenience or danger to life or property.

3) VALVES AND HYDRANTS

a) Set valves on solid bearing.

b) Center and plumb valve box over valve. Set box cover flush with finished grade. Pour concrete pad around valve box in accordance with standard details. Sod 10 feet in all directions.

c) Set hydrants plumb and locate pumper nozzle perpendicular to roadway.

d) Hydrants shall be set at the bury line with a minimum of 18 inch clearance from the hose connection to finish grade.

e) The control valve shall be attached directly to the water main by a gland, swivel tee, or a tapping saddle as approved by the City. Restraining rods shall be at least ¾ inch stock and shall be galvanized or stainless steel.

f) Hydrants shall be painted in accordance with City requirements.

4) SERVICE LINES

a) Water installation shall include service stubs at alternate lot lines or other locations as required by the Public Services Director, and City Engineer/Consultant.

b) In all cases, a gate valve shall immediately adjoin the main connection and a second gate valve, equivalent in size to the service crossing, shall be provided at termination adjacent to the property line or other specified point. This valve should be approximately 12 inches deep, buried and staked. No valve box required in either case unless the valve is located in a paved area.

5) CONNECTIONS TO EXISTING LINES

a) All connections to existing City water mains up to two (2) inches in size shall be performed by the City at the developer's expense. All connections over two (2) inches shall be made under the direction of the City at the developer's expense.

b) Where connections are required to be made between new mains and existing water mains, the connection shall be made in a thorough and workmanlike manner using proper materials, fittings, and labor practices to suit the actual materials and conditions.

c) Where connection is made to an existing fitting, the contractor shall schedule his work so that the excavation and location of this existing fitting can be completed prior to starting trench work on the line.

d) Cut-ins to existing lines shall be done by the Contractor under the direction of the city unless otherwise approved.

e) Whenever it is required to interrupt existing water supplies to residences or business, the contractor shall notify all concerned parties or agencies at least 24 hours in advance of such cut-off. Contractor must first obtain approval from the Administrative Official and Public Works Director.

6) TERMINATIONS

No distribution line shall be terminated without a hydrant or a blow-off. Blow-offs shall be one-half the size of the distribution main and shall be constructed with galvanized or ductile iron pipe and fittings and enclosed in a meter box in accordance with the City's Standard.

7) TESTING

a) A 24-hour notice must be provided to the City prior to testing. After installation is completed, the system shall be filled with water and flushed at the highest obtainable velocity and at the furthest points. Velocity must be at

least 2½ feet per second. All air must be expelled. A pressure at least equal to the City's existing system should be maintained for a period of one hour. Flushing of the system and control of the connecting valve shall be under the direct control of the City's inspector. All connections and pipe for fire service shall be flushed prior to entering the structure. No flushing shall take place through backflow preventers. Should the system appear tight, the leakage test may begin.

b) The contractor will pump his lines to a pressure equal to or greater than 150 psi. Should pressure fall below 150 psi during the test period, it shall be voided and restarted. Test period shall be one hour. Allowable leakage shall be computed on the basis of the AWWA best management practices and latest standards, or the applicable formula for installed pipe lengths other than 18 feet.

c) The following table approximates the above for a 1,000 foot segment at 150 psi and may be used in lieu thereof:

8) ALLOWABLE LEAKAGE PER 1,000 FEET OF PIPELINE

Pipe Size (inches)	Allowable Leakage (Gallons)
2"	0.19
4"	0.37
6"	0.55
8"	0.74
10"	0.92
12"	1.10

9) DISINFECTION

a) Before any portion of the newly installed system can be placed in service, all mains and appurtenances shall be thoroughly disinfected and tested.

b) Procedures to be used conform to the AWWA best management practices and latest standards. Pertinent requirements are as follows:

i. Chlorine solution shall be added to ensure an appropriate residual in all portions of the system. Inspectors may designate points where residual is measured.

ii. Retention time shall be not less than 24 hours.

iii. The appropriate chlorine residual must remain at the end of the 24 hour period based on method used.

c) Chlorine may be used in the following forms:

i. Liquid chlorine as gas/water mixture through an approved solution feeding device.

ii. Sodium Hypochlorite in a package liquid form with 5% to 15% available chlorine.

iii. Calcium Hypochlorite in a dry form (powder or tablets) with 80% available solution such as HTH or Perchloron.

d) After the disinfection process has been completed, all lines shall be thoroughly flushed to a condition equal to the normal base residual.

e) A minimum of two (2) bacteriological samples shall be drawn from the newly installed system at remote points. Samples shall be taken on two acceptable techniques using a suitable sterile container.

f) Proof of satisfactory results will be required from the PCHD and FDEP before service will be provided by the City.

10) WARRANTY

All portions of the installed water system and site restoration shall be fully guaranteed against material defects of improper workmanship for a period of one year from acceptance by the City. During this time, repairs will be made by the developer at no cost to the City. Any repairs made on the newly installed system by the City during this period will be charged to the developer.

SECTION B108 CROSS CONNECTION

A. GENERAL

To establish a cross connection, backflow and back-siphonage control program to protect the public potable water distribution system from contamination or pollution.

B. PURPOSE

1) To protect the public water system against actual or potential cross connections backflow and back-siphonage age by isolating within the premises of private property, contamination or pollution that has occurred or may occur because of some undiscovered or unauthorized cross connection on the premises or private property.

2) To protect the water supply system within the premise of private property against actual or potential cross connections, backflow and back-siphonage by requiring such air gaps, vacuum breakers, backflow-presenters, special devices as required by this program, or other applicable regulations.

3) To eliminate cross connections, backflow and back-siphon age from any other source of water or process water used for any purpose whatsoever which may jeopardize the safety of the water supply or which may endanger the health and welfare of the general public.

4) To establish a cross connection, backflow and back-siphon age control program.

C. RESPONSIBILTY

The Administrative Official, or their designee, shall be responsible for the protection of the public portable water distribution system from contamination or pollution due to the backflow or back-siphonage of contaminants or pollutants through the water service connection. If, in the judgment of said Administrative Official, or their designee, an approved backflow prevention device is required, at the city's water service connection to any customer's premises, for the safety of the water system, the Administrative Official, or his designated agent, shall give notice in writing to said customer to install such an approved backflow prevention device at each service connection to his premises. The customer shall immediately install such approved device, or devices at his own expense, and failure, refusal, or inability on the part of the customer to install said device, or devices immediately shall appropriate to the degree of hazard constitute a ground for discontinuing water service to the premises until such device, or devices have been properly installed.

D. DEFINITIONS

1) Administrative Officials: The Administrative Official, or their designee in charge of the public water system of the Town of Lake Hamilton.

2) Approved: Accepted by the Administrative Official or their designee, as meeting an applicable specification stated or cited in this program, or as suitable for the proposed use.

3) Auxiliary Water Supply: Any water supply used or available to the premises other than the purveyor's approved public potable water supply. These auxiliary waters may include water from another purveyor's public potable water supply or any natural source(s) such as well, spring, river, stream, etc., or "used waters" or "industrial fluids". These waters may be polluted or contaminated or they may be objectionable and constitute an unacceptable water source over which the water purveyor does not have sanitary control.

4) Backflow: The flow of water or other liquids, mixtures or substances into the distribution pipes of a potable water supply system from any source other than its intended source caused by the sudden reduction of pressure in the potable water supply system.

5) Backflow Preventer: A device or means designed to prevent backflow or back-siphonage.

6) Air-Gap: The unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet supplying water to a tank, plumbing fixture, or other device and the flood level rim of said vessel. An approved air-gap shall be a least double the diameter of the supply pipe, measured vertically, above the top of the rim of the vessel, and, in no case less than one inch. When an air-gap is used at the service connection to prevent the contamination or pollution of the public of the public potable water system, an emergency by-pass shall be installed around the air-gap system and an approved reduced pressure principle device shall be installed in the by-pass system.

7) Reduced Pressure Principle Device: An assembly of two independently operating approved check valves with an automatically operating differential relief valve between the two check valves, plus properly located test cocks from the testing of the check and relief valves. The entire assemble shall meet the design and performance specifications and approval of a recognized and city-approved testing agency for backflow prevention assemblies. The device shall operate to maintain the pressure in the zone between the two check valves at a level less than the pressure on the public water supply side of the device at cessation of normal flow the pressure between the two check valves shall be less than the pressure on the public water supply side of the device. In case of leakage of either of the check valves the differential relief valve shall operate to maintain the reduced pressure in the zone between the check valves by discharging to the atmosphere. When the inlet pressure is two pounds per square inch, or less, the relief valve shall open to the atmosphere. To be approved, these devices must be readily accessible for in-line maintenance and testing and be installed in a location where no part of the device will be submerged.

8) Double Check Valve Assembly: An assembly of two independently operating approved check valve with tightly closing shut-off valves on each side of the check valves, plus properly located test cocks for the testing of each check valve. The entire assembly shall meet the design and performance specifications and approval of a recognized and city approved testing agency for backflow-prevention devices. To be approved, these devices must be readily accessible for in-line maintenance and testing.

9) Contamination: Means an impairment of the quality of the potable water by sewage, industrial fluids or waste liquids, compounds or other materials to a degree which may create a hazard to the public heath through poisoning or through the spread of disease.

10) Cross - Connection: Any physical connection or arrangement of piping on fixtures between two otherwise separate piping systems one of which contains potable water and the other no-potable water or industrial fluids of questionable safety, through which, or because of which, backflow or back-siphonage may occur into the potable water system. A water service connection between a public potable water distribution system and a customer’s water distribution system which is cross-connected to a contaminated supply or auxiliary water system, constitutes one type of cross-connection. Other types of cross-connection include connectors such as swing connections, removable sections, four-way valves, spools, dummy sections of pipe, swivel or change over devices, siding multiple tube, solid connections, etc.

11) Cross - Connections Controlled: A connection between a potable water system and a non-potable water system with an approved backflow prevention device properly installed that will continuously afford the protection commensurate with the degree of hazard.

12) Cross - Connections Control By Containment: The installation of an approved backflow prevention device at the water service connection to any customer's premises where it is physically and economically infeasible to find and permanently eliminate or control all actual or potential cross-connection within the customer's water system: or, it shall mean the installation of an approved backflow prevention device on the service line leading to and supplying a portion of a customer's water system where these are actual or potential cross-connections which cannot be effectively eliminated or controlled at the point of cross-connection.

13) Hazard, Degree Of: The term is derived from an evaluation of the potential risk to public health and the adverse affect of the hazard upon the potable water system.

    a) Hazard - Health: Any condition, device or practice in the water supply system and its operation which could create, or in the judgment of the superintendent, or his designee may create a danger to the health and well-being of the water consumer. An example of a health hazard is a structural defect, including cross-connections, in a water supply system.

    b) Hazard - Plumbing: A plumbing type cross-connection in a consumer's potable water system or to the potability of the public or the consumer's potable water system but which would constitute a nuisance or be aesthetically objectionable or could cause damage to the system or its appurtenances, but would not be dangerous to health.

    c) Hazard - Pollutional: An actual or potential threat to the physical properties of the water system or to the potability of the public or the consumer's potable water system but which would constitute a nuisance or be aesthetically objectionable, but would not be dangerous to health.

    d) Hazard - System: An actual or potential threat of severe damage to the physical properties of the public potable water system or the customer's potable waste system of a pollution or contamination which would have a protracted effect on the quality of the potable water in the system.

14) Industrial Fluids System: Any system containing a fluid or solution which may be chemically, biologically or otherwise contaminated or polluted in a form or concentration such as would constitute a health, system, pollutional or plumbing hazard if introduced into and approved water supply. This may include, but not be limited to: polluted or contaminated waters: all types of process waters and used waters originating from the public potable water system which may have deteriorated in sanitary quality, chemical in fluid from plating acids and alkalies, circulated cooling waters connected to an open cooling tower and or cooling towers that are

chemically or biologically treated or stabilized with toxic substances, contaminated natural waters such as from wells, springs, streams, rivers, bays, seas, harbors, irrigation canals or systems, etc., oils, gases, glycerin, paraffins, caustic and acid solutions and other liquids and gaseous fluids used in industrial or other purposes or for fire-fighting purposes.

15) Pollution: Means the presence of any foreign substances (organic, inorganic or biological) in water which tends to degrade it's quality so as to constitute a hazard or impair the usefulness or quality of the water to a degree which does not create an actual hazard to the public health but which does adversely and unreasonably effect such waters for domestic use.

16) Water-Potable: Any water which, according to recognized standards is safe for human consumption.

17) Water-Non-Potable: Water which is not safe for human consumption or which is of questionable potability.

18) Water-Purveyor: The term water purveyor shall mean the owner or operator of the public potable water system supplying an approved water supply to the public as used herein, the terms water purveyor and Town of Lake Hamilton may be used synonymously.

19) Water-Service Connections: The terminal end of a service connection from the public potable water system: I.e., where the water purveyor loses jurisdiction and sanitary control over the water at its point of delivery to the customer's water system. If a meter is installed at the end of the service connection, the service connection shall mean the downstream end of the meter. There should be no unprotected takeoffs from the service line ahead of any meter or backflow prevention device located at the point of delivery to the customer's water system. Service connection shall also include water service connection from a fire hydrant and all other temporary or emergency water service connections from the public potable water system.

20) Water-Used: Any water supplied by a water purveyor from a public potable water system to a consumer's water system after it has passed through the point of delivery and is no longer under the sanitary control of the water purveyor.

E. REQUIREMENT:

1) Water System: The water system shall be considered as made up of two parts: The Utility System and the Consumer System.

2) Utility System: The Utility System shall consist of the source facilities and the distribution system, and shall include all those facilities of the water system under the complete control of the utility, up to the point where the customer's system begins.

3) Source: The source shall include all components of the facilities utilized in the production, treatment, storage, and delivery of the water to the distribution system.

4) Distribution System: The distribution system shall include the network of conduits used for the delivery of water for the source to the customer's system.

5) Custom's System: Shall include those parts of the facilities beyond the termination of the utility distribution system which are utilized in conveying utility delivered domestic water to points of use.

F. POLICY:

1) No water service connection to any premises shall be installed or maintained by the water purveyor unless the water supply is protected as required by State Laws and Regulations and this program service of water purveyor if is backflow prevention device required by this program is not installed, tested and maintained, or if it is found that a backflow prevention device had been removed, by-passed, or if an unprotected cross connection exists on the premises. Service will not be restored until such conditions or defects are corrected.

2) The customer's system should be open for inspection at all reasonable times to authorized representatives of the Town of Lake Hamilton to determine whether cross connection or other structural or sanitary hazards, including violations of the regulations exist. Water service may be discontinued after reasonable notice to the customer if a violation of this program exists on the premises, and such other precautionary measures may be taken as are deemed necessary to eliminate any danger to the potable water. Water service shall not be restored until the danger had been eliminated in compliance with the provisions of this program.

3) An approved backflow-prevention device shall also be installed on each service line to a customer's water system at or near the property line or immediately inside the building being served, but, in all cases, before the first branch line leading off the service line where ever the following conditions exist:

    a) In the use of premises having an auxiliary water supply which is not or may not be safe bacteriological or chemical quality and which is not acceptable as an additional source by the superintendent, or his designee, the public water system shall be protected against backflow from the premises by installing a backflow prevention devise in the service line appropriate to the degree of hazard.

    b) In the case of premises on which any industrial fluids or any other object able substance is handles in such a fashion as to create an actual or potential hazard to the public water system, the public system shall be protected against backflow from the premises by installing a backflow prevention device in the service line appropriate to the degree of hazard. This shall include the handling of process waters and waters originating from the utility system which have been subject to deterioration in quality.

c) In case of premises having 1) internal cross connection that cannot be permanently corrected and controlled, or 2) intricate plumbing and piping arrangements or where entry to all portions of the premises is not readily accessible for inspection purposes, making it impracticable or impossible to ascertain whether or not dangerous cross connection exist, the public water system shall be protected against backflow from the premises by installing a backflow prevention device in the service line.

4) The type of protective device required shall depend upon the degree of hazard which exists as follows:

a) In the case of any premises where there is an auxiliary water supply and it is not subject to any of the following rules the public water system shall be protected by an approved air-gap separation or an approved reduced pressure principle backflow prevention device.

b) In the case of any premises where there is water or substance that would be object able but not hazardous to health, it introduced into the public water system, the public water system shall be protected by an approved double check valve assembly.

c) In the case of any premises where there is any material dangerous to health which is handled in such a fashion as to create an actual or potential hazard to the public water system, the public water system shall be protected by an approved air-gap separation or an approved reduced pressure principle backflow prevention device. Example of premises where these conditions will exist include but are not limited to sewage treatment plants, sewage pumping stations, chemical manufacturing plants hospitals, mortuaries and planting plants.

d) In the case of any premises where there is uncontrolled cross-connection, either actual or potential the public water system shall be protected by an approved air-gap separation or an approved reduced pressure principle backflow prevention device at the service connection.

e) In the case of any premises where, because of security requirements or other prohibitions or restrictions it is impossible or impractical to make a complete implant cross-connection service, the public water system shall be protected against backflow or back-siphonage from the premises by the installation of a backflow prevention device in the service line. In this case, maximum protection will be required, that is, an approved air-gap separation or an approved reduced pressure principle backflow prevention device shall be installed in such service to the premises.

5) Any backflow prevention device required herein shall be of a model and size approved by the Administrative Official, or his designee, the term “approved backflow prevention device” shall mean a device that had been manufactured in full

conformance with the standards established by the American Water Works Association entitled:

AWWA C506-59 Standards for Reduced Pressure Principal and Double Check Valve Backflow Prevention Service

6) As well as the standards set forth by the Foundation for Cross-Connection Control and Hydraulic Research of the University of Southern California established by:

Specification of Backflow Devices #69-2 dated March 1969 or the most current issue

7) The Town of Lake Hamilton at any premises where backflow prevention devices are installed may have certified inspections and operational tests made at least once per year. In those instances where the superintendent of utilities, or his designee, deems the hazard to be great enough, he may require certified inspections at more frequent intervals. Upon completion of such tests and inspections, if it is necessary to rebuild parts or replacement or complete device change out, it shall be at the expense of the customer. Records of all such tests, repairs and overhaul shall be kept at City Hall.

G. Backflow prevention devices as specified by the Town of Lake Hamilton shall be required on the following types of facilities:

a) Beverage bottling plants
b) Carwashes
c) Chemical plants
d) High-rise Buildings
e) Canneries, packing houses and reduction plants
f) Dairies
g) Film and other laboratories
h) Commercial laundries and dye works (excluding coin laundries)
i) Wastewater facilities
j) Metal manufacturing, cleaning, processing and fabricating plants
k) Oil and gas production, storage and transmission facilities
l) Planting Plants
m) Radioactive materials, research, production and utilization plants
n) Restricted, classified and other facilities closed to inspection
o) School and colleges with laboratories
p) Send and gravel plants
q) Hospitals, medical buildings, doctor’s offices, veterinaries offices, sanitariums, morgues, mortuaries, autopsy facilities, nursing and convalescent homes and clinics
r) Fire fighting systems
s) Pest control facilities
t) All irrigation systems

H. Backflow prevention devices may be required by the Administrative Official or their designee for facilities not listed above, if deemed necessary to protect the water system from possible contamination.

I. Procedure for determining appropriate device at service connection.

1) Table B-1 shall serve as the guide for the type of protection required at the service connection.

Table B-1

	Acceptable Types of Backflow Preventers						
Types of Hazard on Premises	***AG***	***RPBP***	**DCVA**	**AVB**	**PVB**	***BPIAV***	Comments*
1. Sewage Treatment Plant	X	X					No direct connection from potable water to sewage
2. Sewage Pumping Station	X	X					No direct connection from potable water to sewage
3. Food Processing	X	X	X*				*If no health hazard exists
4. Laboratories	X	X	X*				*If no health hazard exists
5. Fixtures with hose threads on inlets	X	X	X	X			In addition to an air gap separation, all fixtures that have a threaded hose type connection shall at a minimum, be equipped with a AVB in accordance with 248 CMR 2.14
6. Hospitals, Mortuaries, Clinics	X	X					
7. Plating Facilities	X	X					
8. Irrigation Systems	X	X			X**		Each case should be evaluated individually. *An AVB can be used if no backpressure is possible and no health hazard exists. **Pressure Vacuum Breakers can be installed if. back pressure is not possible
9. Systems or Equipment Using Radioactive Material	X	X					
10. Submerged Inlets	X	X			X		*If no health hazard exists and no back pressure is possible
11. Dockside Facilities	X	X					
12. Valved outlets or fixtures with hose attachments	X	X		X*			Each case should be evaluated individually *If no health hazard exists and no back pressure is possible
13. Commercial Laundries and Dry Cleaners	X	X					
14. Commercial Dishwashing Machines	X	X					*If no health hazard exists
15. High and Low Pressure Boilers	X	X*					*If chemicals are added
16. Low Pressure Heating Boilers						X	Residential and small commercial, having no chemicals added

Table B-1 cont'd

	Acceptable Types of Backflow Preventers						
17. Photo Processing Equipment	X	X					
18. Reservoirs – Cooling Tower Re-circulating Systems	X	X					
19. Fire Protection Systems: For cross connection control, fire protection systems may be classified on the basis of water source and arrangement of supplies as follows:		Leak alarm					
19. Fire Protection Systems (continued) a. Class 1: Direct connection from public water system mains only; no pumps, tanks, or reservoirs; no physical connection from other water supplies; no antifreeze or other additives of any kind; all sprinkler drains discharge to atmosphere, dry wells, or other safe outlets. These systems may or may not have fire department connections. Refer to 310 CMR 22.22(9) (d) 1.	X	Leak alarm X	X				A backflow prevention assembly does not have to be installed on existing fire protection systems installed prior to March 21, 1997, provided that the fire protection system is registered with the public water system, equipped with a UL listed alarm check valve that is properly maintained in accordance with NFPA 25 and has not undergone substantial modification defined within 310 CMR 22.22(9) (d) 3. Alarm check maintenance records must be available for inspection by the Department, its designee or the public water system
b. Class 2: Same as Class 1 except that booster pumps may be installed in the connections from the street mains. These systems may or may not have fire department connections. Refer to 310 CMR 22.22(9) (a).	X	Leak alarm X	X				A backflow prevention assembly does not have to be installed on existing fire protection system installed prior to March 21, 1997, provided that the fire protection system is registered with the public water system and equipped with a UL listed alarm check valve that is properly maintained in accordance with NFPA 25. Alarm check maintenance records must be available for inspection by the Department, its designee or the public water system
c. Class 3: Direct connection from public water system mains, plus one or more of the following: elevated storage tanks; fire pumps taking suction from aboveground covered reservoirs, or tanks; and pressure tanks.	X	Leak alarm X*	X*				*RPBP or DCVA contingent on evaluation of auxiliary supply and on-site system in accordance with 310 CMR 22.22(9) (d) 1.
d. Class 4: Directly supplied from public water system mains, similar to Class 1 and Class 2 with an auxiliary water supply dedicated to fire department use and available to the premises, such as a non-potable water source located within 1700 feet of the fire department connection, (FDC).	X	Leak alarm X*					*RPBP on evaluation of auxiliary supply and on-site system in accordance with 310 CMR 22.22(9) (d) 1.
e. Class 5: Directly supplied from public water system mains, and interconnected with auxiliary supplies, such as pumps taking suction from reservoirs exposed to contamination, or rivers and ponds; driven wells; mills or other industrial water systems; or where antifreeze or other additives are used.	X*	Leak alarm X*					*RPBP or air gap contingent on evaluation of auxiliary supply and on-site system. Refer to 310 CMR 22.22(9) (d) 1.
f. Class 6: Combined industrial and fire protection systems supplied from the public water mains only, with or without gravity storage or pump suction tanks.	X	Leak alarm X*			X	X	*RPBP contingent on evaluation of on-site water system Refer to 310 CMR22.22 (9) (d) 1.

Table B-1 cont'd

g. Residential fire protection systems for one and two family detached dwellings and manufactured homes only. Fire protection systems in three family dwellings meeting NFPA 13D requirements as provided in 780 CMR, Chapter 9, are included in this section.	X	X	X				Non testable devices and flow through systems should be used whenever possible. Systems are typically designed and installed in accordance with NFPA 13D: "Installation of Sprinkler systems in One and Two Family Dwellings and manufactured homes." These systems are authorized to use food grade antifreeze with no additional requirements when potable piping (PB, CPVC, and copper tube) is employed. If non-grade antifreeze is utilized, the system may be classified as a class 5. If a fire department connection is used, the requirements for a class 1 or 2 apply.
h. Residential fire protection systems for other than those described in Table 22-1-19.g.	X	Leak alarm X	X				Fire protection system in this category shall comply with the requirements set forth in class 1 through 4 as appropriate.
20. Solar Energy Systems	X	X				X*	Residential and small commercial having no chemicals or only USP Glycenne added to water
21. Single Jacketed Heat Exchangers	X	X					Each case should evaluated individually

a) Exhibit A of this program is a notice to install the proper back flow prevention device.

b) Exhibit B of this program is a second notice to install the proper backflow prevention device.

c) Per rule 62-555.360 dual check assemblies or residential dual check valves may be installed instead of RPBP at service connections to residential premises that are served by reclaimed water and have no other hazards requiring a backflow preventer.

d) UL listed alarm check valves may be accepted in lieu of a backflow preventer at service connections to existing fire protection systems presenting only low hazard with no chemical additives.

e) A backflow assembly may be installed just at service connections to premises having auxiliary water system instead of at all service connections and auxiliary water supply connections.

f) Reduced pressure principal assemblies (RPBP), double check valves assemblies (DCVA) must conform to AWWA standards C510 and C511

g) New customers must conform to applicable standard referenced in the Florida building code.

h) Backflow preventers shall be installed consistent with FDEP rules including AWWA manual M-14 recommendations.

i) Backflow preventers must be installed at customer's point of service.

j) Reduced pressure principal assemblies (RPBP), Pressure Vacuum Breakers (PVB), Atmospheric Vacuum Breakers (AVB) shall not be installed in below ground pits. Double check valve assemblies and residential dual check valves may be installed in below ground pits if test cocks are plugged and adequate drainage is provided to maintain a normally dry location.

k) The water treatment facilities shall be inspected and devices tested annually by a certified backflow technician.

2) Procedure for the testing and maintenance of backflow prevention assemblies.

a) Reduced Pressure Principle Assemblies (RPBP), Pressure Vacuum Breakers (PVB), Atmospheric Vacuum Breakers (AVB), Double Check Valve Assemblies (DCVA), and certain Residential Dual Check Valve's (RDC) must be field-tested after installation or repair and tested at least annually,

b) Reduced Pressure Principle Assemblies (RPBP), Pressure Vacuum Breakers (PVB), Atmospheric Vacuum Breakers (AVB), Double Check Valve Assemblies (DCVA) and certain Residential Dual Check Valve's (RDC) must be repaired or replaced if they fail field-testing,

c) Authorized testing personnel must complete the following minimum criteria:

i. Successfully complete a minimum of a 32-hour course
ii. Pass the Backflow Certification written and hands-on exams
iii. Periodically re-certify at least every 2 years.

d) Customer owned Reduced Pressure Principle Assemblies (RPBP) and double check valve assemblies (DCVA) must be tested in accordance with standards referenced in Florida Building code.

e) Residential Dual Check Valve's (RDC) at service connections must be overhauled or replaced at least every 5 years.

f) Field testing equipment must be calibrated annually.

g) Exhibit C of this program is a copy of the test and maintenance report.

3) Policy for assessing new and existing service connections to determine a need for BFP's.

a) When new building construction permits are issued by the local permitting agency, plans must be reviewed from a cross-connection control perspective and address cross-connection protection

b) When application for service is made by the customer, use of the appropriate backflow prevention device or assembly should be confirmed by the reviewer in accordance with the degree of hazard at the service connection.

c) The BFP should be inspected to ensure that it has been properly installed. Fire protection systems must also be inspected to protect against these potential sources of cross-connections.

d) For multi-use developments where the ultimate hazard is unknown the designer of the plumbing systems must address the use of a Reduced Pressure Principle backflow preventer.

e) Care should be taken in sizing to ensure that it does not reduce fire protection ratings or reduce domestic water main pressures below the minimum needed. Typically the size of the BFP should match the size of the water main.

f) High Hazard assemblies must be tested yearly.

g) Non-testable Dual Check Valve Assemblies (DCVA) must be replaced every five years.

h) Improperly functioning backflow preventers shall be promptly repaired in accordance with the DEP requirements and the water utility shall take appropriate actions in accordance with their local ordinance or other legal instrument.

i) Low hazard establishments must be re-inspected every five years to ensure the classification has not changed.

j) All backflow prevention assemblies required by the CCCP should be inspected (and where applicable tested) within 10 days of initial installation and tested in accordance with the Town of Lake Hamilton's written requirements thereafter by a certified tester.

k) Elimination or disconnection upon discovery of inadequately controlled or protected cross-connections. These shall include requirements for the appropriate level of backflow protection and for disconnection of service until the problem is corrected.

l) Exhibit D of this program is the survey for new commercial industrial and institutional use.

m) Exhibit E of this program is for inspecting existing connections.

n) Exhibit F of this program is findings of a violation of the cross connection control program.

4) Procedure for establishing cross-connection control records.

a) The person assigned primary responsibility for administering the CCC Program will be the water distribution and wastewater collection superintendent.

b) Keep all completed service connection assessment questionnaires or reports or keep paper or computer summaries of this information.

c) A List of all customers with backflow prevention assemblies.

d) List pertinent information about each BFP's, i.e., size, make, model, location, etc.

e) Keep all actual BFP test reports, i.e., completed service connection assessment, annual retest date, and test reports or keep paper or computer summaries of this information.

f) Records retention shall be as follows:

g) Service Connection Assessment records and BFP test records must be kept for 10 years.

h) Records must be maintained by the Town of Lake Hamilton and made available to DEP during the *sanitary surveys* of the water utility.

i) Actual Service Connection Assessment Questionnaire should be kept indefinitely and should contain signed statement concerning the customer's water use.

5) Procedure for enhanced public education.

a) Public education will be provided at a minimum during the following occurrences.

b) Procedures for Systems that use Reclaimed Water Systems and permit Dual Check Valves at service connections at residential premises must adhere to all the following (Rule 62-555.360(4)(f) and (5)(b).

c) Educational brochures will be distributed to customers every 2 to 5 years, and should be provided on-site at displays and through media coverage such as public service announcements and newspaper articles.

d) The Town of Lake Hamilton will distribute educational brochures to customers when:

i. When Dual Check Valve is originally installed or when application is made for new service to premises with Dual Check Valve

ii. When application is made for change in customer of record at premises with Dual Check Valve

j) Exhibit G of this program is a notice of backflow prevention replacement

k) Exhibit H of this program is a notice of backflow inspection requirement.

l) Exhibit I of this program is a second notice of back flow inspection requirement.

m) Exhibit J of this program is an updated list of commercial and industrial consumers with the appropriate backflow preventer for each customer.

6) Procedure for residential, commercial and industrial uses of reclaimed water. This section is to comply with section 62-610 F.A.C.

a) No cross-connections to potable water systems shall be allowed

For all systems, there shall be readily identifiable "non-potable" or "do not drink" notices, marking, or coding on application/distribution facilities and appurtenances.

b) Protection of Reclaimed Water Supply

i. For all systems, advisory signs shall be posted around the portions of the industrial site in which reclaimed water is used and at the main entrances to the industrial site to notify employees at the industrial site and the public of the nature of the reclaimed water use. Access control beyond what is normally provided by the industry is not required. The return of reclaimed water to the reclaimed water distribution system after the reclaimed water has been delivered to an industrial facility is prohibited. The permittee shall conduct an evaluation of the potential for cross-connections and backflow to the reclaimed water distribution system. This analysis shall include an evaluation of the types of substances present at the industrial site which could potentially backflow into the reclaimed water system and the risk associated with possible backflow. The applicant shall evaluate the need for backflow prevention devices on the reclaimed water connection to the industrial facility. This analysis shall be included in the engineering report. A backflow prevention device shall be provided on the reclaimed water service connection to the industrial site; unless the evaluation in the engineering report provides reasonable assurances that there is minimal risk of cross-connection or backflow with contamination of the reclaimed water supply.

ii. The public shall be notified of the use of reclaimed water. This shall be accomplished by the posting of advisory signs designating the nature of the reuse project area where reuse is practiced, notes on scorecards,

or by other methods. Examples of some of the notification methods which may be used by permittees include posting of advisory signs at entrances to residential neighborhoods where reclaimed water is used for landscape irrigation and posting of advisory signs at the entrance to a golf course and at the first and tenth tees. Use of purple as a prominent color on advisory signs and written notices related to a reuse project is recommended, but shall not be required. Advisory signs shall include the following text in English and Spanish: "Do not drink" together with the equivalent standard international symbol. Advisory signs shall be posted adjacent to lakes or ponds used to store reclaimed water that are not located at the domestic wastewater treatment facilities. Advisory signs shall be posted at decorative water features that use reclaimed water. Advisory signs at storage ponds or decorative water features shall include the following text in English and Spanish: "Do not drink" and "Do not swim" together with the equivalent standard international symbols.

iii. The permittee shall ensure that users of reclaimed water are informed about the origin, nature, and characteristics of reclaimed water; the manner in which reclaimed water can be safely used; and limitations on the use of reclaimed water. Notification is required at the time of initial connection to the reclaimed water distribution system and annually after the reuse system is placed into operation. The details of the public notification program shall be included in the engineering report and with each permit application. A description of ongoing public notification activities shall be included in the annual reuse report required by subsection 62-610.870(3), F.A.C. The public notification program shall include details on written public notification activities, activities related to the news media, use of advisory signs, and other public notification activities, except as specifically allowed in this paragraph, above ground hose bibbs (spigots or other hand operated connections) shall not be present. Hose bibbs shall be located in locked vaults, service boxes, or compartments which shall be clearly labeled as being of non-potable quality (bearing the words in English and Spanish: "Do not drink" together with the equivalent standard international symbol). Hose bibbs which can only be operated by a special tool may be placed in non-lockable vaults, service boxes, or compartments clearly labeled as non-potable water (bearing the words in English and Spanish: "Do not drink" together with the equivalent standard international symbol). Vaults, service boxes, and compartments meeting the requirements of this rule may be located above or below grade. For restricted access sites, the Department shall approve the use of hose bibbs that are not in vaults, service boxes, or compartments, if the applicant provides an affirmative demonstration in the engineering report that alternate means of securing the hose bibb will preclude unauthorized use of the hose bibb. If the Department approves alternate measures for securing hose bibbs for restricted access sites, the alternate control measures and the hose bibb shall be

color coded and clearly labeled as being of non-potable quality (bearing the words in English and Spanish: “Do not drink” together with the equivalent standard international symbol).

iv. Reclaimed water shall not be used to fill swimming pools, hot tubs, or wading pools.

v. Reclaimed water may be used to irrigate landscaped areas with a tank truck only if the following requirements are met: All applicable requirements in Part III of Chapter 62-610, F.A.C., are met;

vi. The truck used to transport and distribute reclaimed water is not used to transport potable water that is used for drinking water; and The truck used to transport and distribute reclaimed water is not used to transport waters or other fluids that do not meet, at a minimum, the requirements of Part III of Chapter 62-610, F.A.C., unless the tank has been evacuated and properly cleaned prior to the addition of the reclaimed water.

c) Cross-connection control

i. No cross-connections to potable water systems shall be allowed. The permittee shall submit documentation of Department acceptance for a cross-connection control and inspection program, pursuant to Rule 62-555.360, F.A.C., for all public water supply systems located within the area to be served by reclaimed water. Reclaimed water shall not enter a dwelling unit or a building containing a dwelling unit except as allowed by Rules 62-610.476 and 62-610.479, F.A.C.

ii. Maximum obtainable separation of reclaimed water lines and domestic water lines shall be practiced. A minimum horizontal separation of three feet (outside to outside) shall be maintained between reclaimed water lines and either potable water mains or sewage collection lines. The Department shall approve smaller horizontal separation distances if one of the following conditions is met: The top of the reclaimed water line is installed at least 18 inches below the bottom of the potable water line. The reclaimed water line is encased in concrete.

iii. The applicant provides an affirmative demonstration in the engineering report that another alternative will result in an equivalent level of protection. The provisions of Chapter 62-604, F.A.C., are applicable to in-ground crossings. No vertical or horizontal separation distances are required for above-ground crossings. Separation distance requirements in paragraphs 62-610.469(7) (c) and (d), F.A.C., apply to transmission and distribution systems located in rights-of-ways. Similar separation distances are recommended, but are not required on properties where reclaimed water is being used. All reclaimed water valves and outlets shall be appropriately tagged or labeled (bearing the words in English

and Spanish: “Do not drink” together with the equivalent standard international symbol) to warn the public and employees that the water is not intended for drinking. All piping, pipelines, valves, and outlets shall be color coded, or otherwise marked, to differentiate reclaimed water from domestic or other water. Effective January 1, 1996, underground piping which is not manufactured of metal or concrete shall be color coded for reclaimed water distribution systems using Pantone Purple 522C using light stable colorants. Underground metal and concrete pipe shall be color coded or marked using purple as a predominant color. If tape is used to mark the pipe, the tape shall be permanently affixed to the top and each side of the pipe (three locations parallel to the axis of the pipe). For pipes less than 24 inches in diameter, a single tape may be used along the top of the pipe. Visible, above-ground portions of the reclaimed water distribution system shall be clearly color coded or marked. New systems and expansions of existing systems for which permit applications are submitted to the Department on or after January 1, 1996, shall comply with this color coding standard. It is recommended, but shall not be required, that distribution and application facilities located on private properties, including residential properties, be color coded using Pantone Purple 522C.

iv. The return of reclaimed water to the reclaimed water distribution system after the reclaimed water has been delivered to a user is prohibited. The permittee is responsible for conducting inspections within the reclaimed water service area to verify proper connections, monitor proper use of reclaimed water, and minimize the potential for cross-connections. Inspections are required when customers first connect to the reclaimed water distribution system. Periodic inspections are required as specified in the cross-connection control and inspection program.

v. Rule 62-610.472, F.A.C., applies to projects for which complete permit applications involving the use of supplemental water supplies were received by the Department on or after August 8, 1999.

vi. Rule 62-610.472, F.A.C., shall also apply to any existing reuse system which proposes to add a new supplemental water supply or to expand the facilities, structures, or pumps used for an existing supplemental water supply; however, these rule requirements shall only apply to the expanded or modified portion of the project. Incorporation of a supplemental water supply into the reuse system shall require a permit modification. Other water supplies may be used by the permittee to supplement the supply of reclaimed water. Surface waters, ground waters, treated storm water, and drinking water may be used to supplement the reclaimed water supply.

vii. Surface water and storm water supplies

a. Surface water supplies may be used to supplement the reclaimed water supply, if all of the following conditions are met: Disinfection is provided and the fecal coliform and TSS limits established for high-level disinfection in subsection 62-600.440(5), F.A.C., are met for the treated surface water or storm water supply before mixing with the reclaimed water. Operating protocols and reject storage facilities are not required for the supplemental water supply. The applicant shall provide an affirmative demonstration that the quality of the resulting mixture of reclaimed water and treated surface water or storm water will be acceptable for the permitted uses of the reclaimed water within the reclaimed water distribution system. The following factors shall be evaluated in assessing the acceptability of the mixture of reclaimed water and supplemental water: The mixture shall not harm vegetation or crops grown in the reuse system. The mixture shall enable compliance with ground water standards at the edge of the zone of discharge. Public health shall be protected. A one-way flow device shall be provided on each surface water or storm water supply line to prevent backflow of reclaimed water into the surface water or into the storm water treatment facilities. This does not have to be an approved device as listed in Rule 62-555.360, F.A.C. A check valve, flap valve, or other device may be used. Continuous monitoring for disinfectant residual shall be performed on the disinfected surface water or storm water supply at a point before mixing with the reclaimed water. Fecal coliforms and TSS shall be monitored at this point in accordance with the schedule established in Chapter 62-601, F.A.C., for high-level disinfection facilities, based on the permitted capacity of the largest domestic wastewater treatment facility providing reclaimed water to the reuse system.

b. The supplemental water supply pipes and appurtenances shall be color coded and marked to differentiate them from the reclaimed water and potable water facilities. Subparagraphs 62-610.472(3)(a)1. Through 5., F.A.C., shall apply to situations involving the introduction of storm water or surface water directly into a reclaimed water distribution system. Cases involving storage of reclaimed water in lakes and ponds which are part of a storm water management system are described in, and regulated by, Rules 62-610.464 and 62-610.830, F.A.C., and are not subject to Rule 62-610.472, F.A.C., shall not apply to system storage and reclaimed water distribution facilities that are on the property of and are operated by the user of reclaimed water (such as a golf course or farm). Storm water may be introduced into the sanitary sewerage system to augment the supply of reclaimed water, if all of the following conditions are

met: The resulting mixture of storm water and domestic wastewater receives the full level of treatment and disinfection required by Part III of Chapter 62-610, F.A.C. The applicant provides an affirmative demonstration that the sewerage system and treatment facilities have sufficient capacities to accommodate the added volumes of storm water. Introduction of storm water into the sewerage system shall be limited to dry-weather, low-flow conditions in the sanitary sewerage system.

viii. Monitoring for Giardia and Cryptosporidium

a. For treatment plants having capacities of 1.0 mgd or larger, the permittee shall sample the reclaimed water for Cryptosporidium and Giardia as follows: Sampling shall be conducted at one time during each two-year period. Intervals between sampling shall not be greater than two years.

b. Samples shall be taken at a point after treatment of the supplemental water supply (before blending with reclaimed water). For treatment plants having capacities less than 1.0 mgd, the permittee shall sample the reclaimed water for Cryptosporidium and Giardia as follows:

c. Sampling shall be conducted at one time during each five-year period. Intervals between sampling shall not be greater than five years. Samples shall be taken at a point after treatment of the supplemental water supply (before blending with reclaimed water).

ix. Ground water supplies

a. Ground water supplies may be used to supplement the reclaimed water supply, if all of the following conditions are met: The applicant shall provide an affirmative demonstration that the quality of the resulting mixture of reclaimed water and ground water will be acceptable for the permitted uses of the reclaimed water within the reclaimed water distribution system. This shall include an evaluation of the factors contained in subparagraph 62-610.472(3) (a) 2., F.A.C. This shall include an analysis of the ground water source for all of the parameters included in the ground water quality standards listed in Chapter 62-520, F.A.C. An approved backflow prevention device, as described in Rule 62-555.360, F.A.C., shall be provided on the pipe from each well connected into the reclaimed water system. Monitoring of the ground water supply shall be conducted quarterly for fecal coliforms, unless additional monitoring is required by paragraph 62-610.472(4) (b), F.A.C. At the end of the first year of operation, monitoring of the ground water

supply shall be reduced if the applicant provides an affirmative demonstration that the ground water supply meets the high-level disinfection criteria for fecal coliforms and that public health will be protected. The supplemental water supply pipes and appurtenances shall be color coded and marked to differentiate them from the reclaimed water and potable water facilities.

b. If the initial analysis of the ground water supply reveals that the ground water supply does not meet ground water quality standards in Chapter 62-520, F.A.C., the parameters for which the ground water standards are not met shall be added to the quarterly monitoring of the ground water supply. For purposes of subsection 62-610.472(4), F.A.C., water withdrawn at a springhead shall be considered as "ground water."

x. Drinking water supplies

a. Drinking water from a public water supply system may be used to supplement the reclaimed water supply, if all of the following conditions are met: An air gap separation, as described in Rule 62-555.360, F.A.C., shall be provided on each connection from the public water supply system into the reclaimed water system. The reuse permit shall not include requirements for monitoring of the drinking water supply. The supplemental water supply pipes and appurtenances shall be color coded and marked to differentiate them from the reclaimed water facilities.

b. The number of connections from the public water supply system into the reclaimed water system shall be minimized. A consumptive use permit for the use of surface water or ground water to supplement the reclaimed water supply may be required by the appropriate water management district. A consumptive use permit from the water management district shall not be required at the time of application for a permit from the Department. The permittee shall be responsible for securing any needed consumptive use permits from the water management district before using ground water or surface water to supplement the reclaimed water supply. Facilities used to connect supplemental water supplies into the reclaimed water distribution system shall be located and documented in the record drawings for the reuse system.

xi. Toilet flushing

Reclaimed water may be used for toilet flushing in commercial or industrial facilities or buildings. Reclaimed water may be used for

toilet flushing in motels, hotels, apartment buildings, and condominiums where the individual guests or residents do not have access to the plumbing system for repairs or modifications. Reclaimed water pipes shall be color coded. Reclaimed water shall not be used for toilet flushing in any residential property or dwelling unit where the residents have access to the plumbing system for repairs or modifications. If reclaimed water will be used only for toilet flushing, the Department shall approve alternative levels of reliability, operation controls, and operator attendance if the applicant provides an affirmative demonstration in the engineering report that alternative controls will provide controls on reclaimed water production equivalent to the full requirements of Part III of Chapter 62-610, F.A.C., and the engineering report presents reasonable assurances that public health will be protected. The engineering report shall document cross-connection control measures and controls on facility operation sufficient to ensure reliable production of reclaimed water of suitable quality.

xii. Fire protection

Reclaimed water may be used to provide water for fire protection. Reclaimed water may be supplied to fire hydrants. Hydrants supplied with reclaimed water shall be color coded and shall have no connection to the potable water supply. Reclaimed water may be used to provide water for fire protection in sprinkler systems located in commercial or industrial facilities or buildings. Reclaimed water may be used to provide water for fire protection in sprinkler systems located in motels, hotels, apartment buildings, and condominiums where the individual guests or residents do not have access to the plumbing system for repairs or modifications. Such sprinkler systems shall be color coded and shall be supplied only by reclaimed water. Fire protection systems using reclaimed water shall be designed and operated in accordance with local fire protection codes, regulations, or ordinances. If reclaimed water will be used only for fire protection, the Department shall approve alternative levels of reliability, operation controls, and operator attendance if the applicant provides an affirmative demonstration in the engineering report that alternative controls will provide controls on reclaimed water production equivalent to the full requirements of Part III of Chapter 62-610, F.A.C., and the engineering report presents reasonable assurances that public health will be protected. The engineering report shall document cross-connection control measures and controls on facility operation sufficient to ensure reliable production of reclaimed water of suitable quality.

Exhibit A **Notification to Customer**
To install a backflow prevention device

In accordance with Florida Administrative Code 62-555.360 and the Town of Lake Hamilton, you are hereby informed that you must install a backflow prevention assembly on your water service. The backflow device(s) are the responsibility of the customer to be installed, tested and repaired. The Town of Lake Hamilton has the primary responsibility of protecting the public water supply from backflow, backsiphonage, and backpressure of dangerous substances which would endanger the public health or physically damage the public water system.

If you have any questions or concerns, please feel free to contact me at (863) 419-3300.

Yours very truly,

(Authorized Agent for the Town of Lake Hamilton)

Exhibit B Second Notice to Customer
To install a backflow prevention device

Dear Customer:

Our records indicate that your Backflow Prevention Assembly has not been installed as required. The Town of Lake Hamilton sent a notice to have a backflow prevention device(s) installed. As of this date we have not received notice that this has been completed. To prevent possible contamination of the water system of the Town of Lake Hamilton, FAC 62-555.360 and the Town of Lake Hamilton requires that your backflow prevention assembly be installed and tested yearly. It is your responsibility to have this device installed failure to comply within 30 days may result in discontinuance of water service.

If you have any questions or concerns or if we can be of any assistance please feel free to contact us at (863) 419-3300.

We appreciate your cooperation in this extremely important matter.

Sincerely,

(Authorized Agent for the Town of Lake Hamilton)

Exhibit C **Backflow Prevention Device Test and Maintenance Report**

To: _____
_____
_____

The cross-connection control assembly detailed hereon has been tested and maintained as required by the Town of Lake Hamilton and is certified to comply with these regulations.

Make of assembly _____ Size_____

Model Number _____ Located at_____

Serial Number _____ _____

Type	Reduced Pressure Assemblies			Pressure Vacuum Breaker	
Date _____	Double Check Assemblies		Relief Valve	Air Inlet	Check Valve
	1st Check	2nd Check			
Initial Test	DC – Closed Tight __ RP ___ psid Leaked ___	Closed Tight __ Leaked __	Opened ___ psid	Opened ___ psid Did not Open ___	____ psid Leaked ___
Repairs and Matls. Used					
Test After Repairs	DC – Closed Tight __ RP ____ psid	Closed Tight __	Opened ___ psid	Opened ___ psid	___ psid

The above is certified to be true. Date: _____

Firm Name _____

Address _____

Certified Tester _____Cert. Tester No. _____

Exhibit D **Cross-Connection Survey Form**
Commercial, Industrial and Institutional

Name of Company, Corporation, or Business:

_____

Address: _____

Name of Contact:

_____

Type of Use: Industrial _____ Commercial _____ Governmental _____

Other _____ SIC _____

Location of Service:

_____

Size of Service: _____inch Metered? Yes ☐ No ☐

Require non-interrupted water service? Yes ☐ No ☐
Does Boiler Feed utilize chemical additives? Yes ☐ No ☐
Is Backflow protection incorporated? Yes ☐ No ☐
Are air conditioning cooling towers utilized? Yes ☐ No ☐
Is Backflow protection incorporated? Yes ☐ No ☐
Is a Water Saver utilized on condensing lines or cooling towers? Yes ☐ No ☐ N/A ☐
Is the make-up supply line backflow protected? Yes ☐ No ☐
Is process water in use; Is it potable supply water or "Raw" water? Yes ☐ No ☐
(if "Yes" check appropriate) Potable ☐ Raw ☐ Protected ☐ Unprotected ☐
Is fire protection water separate from the potable supply? Yes ☐ No ☐
Are Containment Assemblies in place? Yes ☐ No ☐

Summary- (for official use only)

Degree of Hazard: High ☐ Low ☐
Type of Assembly recommended for containment: RPZ ☐ DCV ☐ None ☐
Fixture Outlet protection required? Yes ☐ No ☐

If so, where? _____

Date: _____ Inspector: _____

Exhibit E Notification to Customer
Intent to Perform Inspection of Existing Connections

In accordance with Florida Administrative Code 62-555.360 the Town of Lake Hamilton must ensure that there are no interconnections that can possibly back feed into the water system.

A program of cross-connection inspection and control has been initiated to provide for reasonable protection of the public drinking water from possible contamination caused by backflow, backpressure or backsiphonage conditions on your premises that might cause contamination to the public drinking water.

To assist you with identifying actual or potential cross-connections on your premises, a cross-connection inspector will contact you in the near future to arrange for a time when an inspection can be made of your water system connection. Following the inspection, you will receive a written report of any significant findings.

Yours very truly,

(Authorized Agent for the Town of Lake Hamilton)

Appendix F Notification to Customer of Inspection and Findings of Violation of Cross-Connection Program

Dear _____ (Customer)

On the above referenced date, personnel from the Town of Lake Hamilton _____ made an inspection of the water facilities on your premises for the purpose of detecting any existing or potential cross-connections to the public water supply.

The inspection revealed that some revisions, as indicated on the attached sheet, must be made to protect the Town of Lake Hamilton water system. However, it should be pointed out that our inspection is not an absolute guarantee that all cross-connection hazards have been located.

Provisions of the Town of Lake Hamilton's Cross-Connection Control Program and FAC 62-555.360 prohibit the existence of cross-connections within the public water supply. Since the Town of Lake Hamilton is committed to ensuring the safety of the public's water, in the future, periodic inspections will be made to determine if your on-site water facilities are in compliance with these laws.

If you have any question, please give me a call between 8:00 A.M. and 5:00 P.M. at (863) 419-3300.

Yours very truly,

(Authorized Agent for the Town of Lake Hamilton)

Exhibit G Notice to Customer Requirements for Backflow Prevention Replacement

Dear Customer:

Our records indicate that your Backflow Prevention Device or Assembly is due for replacement on (date) _____.

To prevent possible contamination of the water System of the Town of Lake Hamilton, FDEP requires that your particular backflow prevention device or assembly be replaced every five years. It is your responsibility to have this device or assembly replaced.

Certified backflow prevention testing companies are available to replace the device or assembly and provide this office with a copy of the completed installation.

Please have your certified tester perform the replacement of your device or assembly; please provide a certified copy of the results to this office.

We appreciate your cooperation and look forward to receiving the confirmation that your backflow prevention device or assembly has been replaced.

Sincerely,

(Authorized Agent for the Town of Lake Hamilton)

Exhibit H **Notice to Customer**
Requirements for Backflow Prevention Inspection

Dear Customer:

Our records indicate that your Backflow Prevention Assembly is due for testing and inspection on (date) _____.

To prevent possible contamination of the water system of the Town of Lake Hamilton, FAC 62-555.360 and the Town of Lake Hamilton requires that your backflow prevention assembly be inspected and tested yearly. It is your responsibility to have this device tested and or repaired by a certified backflow technician.

If you have any questions or concerns or if we can be of any assistance please feel free to contact us at (863) 419-3300.

We appreciate your cooperation and look forward to receiving the results of your testing and inspection soon.

Sincerely,

(Authorized Agent for the Town of Lake Hamilton)

Exhibit I **Second Notice to Customer**
Requirements for Backflow Prevention Inspection

Dear Customer:

Our records indicate that your Backflow Prevention Assembly has not been tested as required. The Town of Lake Hamilton sent a notice to have your backflow prevention device(s) tested and or repaired. As of this date we have not received your test results. It is your responsibility to have this device tested failure to comply within 30 days may result in discontinuance of water service.

To prevent possible contamination of the water system of the Town of Lake Hamilton, FAC 62-555.360 and the Town of Lake Hamilton requires that your backflow prevention assembly be inspected and tested yearly.

If you have any questions or concerns or if we can be of any assistance please feel free to contact us at (863) 419-3300.

We appreciate your cooperation and look forward to receiving the results of your testing and inspection soon.

Sincerely,

(Authorized Agent for the Town of Lake Hamilton)

SECTION B109 DETAILED SPECIFICATIONS - WASTEWATER SYSTEMS

A. GENERAL

Contractor shall furnish all labor, equipment, and materials and shall perform all operations in connection with installation of a complete waste water collection and pumping system ready for use in accordance with the specifications and the City's requirements, either specific or implied. This includes any and all restoration required to duplicate original site conditions prior to the commencement of construction.

B. SUBMITTALS

Three (3) Two copies of plans/drawings, including electronic files (Auto-CAD files and PDF format) shall be submitted to the Public Services Director and City Engineer/Consultant for review on any materials which are requested as a substitute for previously approved materials. The City retains the right to refuse any proposed substitution.

C. MINIMUM LINE SIZE

All new gravity sanitary sewer lines shall be a minimum of eight (8) inches in diameter, all new force mains shall be a minimum of six (6) inches in diameter.

D. PRODUCTS

All materials shall be new, of the highest quality and manufacturing, and shall conform to the appropriate PCHD, FDEP, ASTM and AWWA best management practices and latest standards. All fittings and materials shall be inspected by the Public Works Department and City Engineer/Consultant after delivery and prior to being installed.

E. POLYVlNYL CHLORIDE (PVC) GRAVITY SEWER PIPE

1) Provide ring-tight gravity sewer pipe and fittings to meet or exceed the requirements of PCHD, FDEP and ASTM best management practices and latest standards. Specified length per section of pipe is 12½ feet. Pipe shall be dyed green or have green identification markings at 90-degree intervals around the pipe circumference.

2) PVC gravity sewer pipe and fittings 18 inches and larger shall meet or exceed the requirements of the PCHD, FDEP and ASTM best management practices and latest standards. Pipe shall be dyed green or have identification markings at 90-degree intervals around the pipe circumference.

F. DUCTILE IRON GRAVITY SEWER PIPE

Unless stated otherwise by the City, ductile iron pipe shall not be used for gravity sewer.

G. SANITARY SEWER MANHOLES

1) Sewer manholes shall be constructed in accordance with the City's standards. Excavation shall be made in accordance with applicable sections of these specifications.

2) Concrete manholes shall be constructed of 4,000 pound, Type II Acid Resistant Concrete Pre-cast manholes shall be in accordance with PCHD, FDEP and ASTM best management practices and latest standards.

3) Pre-cast concrete manholes shall have a minimum wall thickness of five (5) inches. Cast-in-place manholes shall have a minimum wall thickness of eight (8) inches. Top slabs shall have a minimum thickness of eight (8) inches.

4) Manholes shall have inverts accurately and smoothly formed. Use of brick or concrete block to form the invert is not acceptable.

5) When the manhole is complete, the frame and cover of dimensions shown shall be set in place in mortar to the line and grade which matches finish grade.

6) Interior and exterior of all manholes shall receive three (3) coats of coal tar epoxy with a minimum thickness of four (4) mils each.

7) Backfill shall be made in accordance with applicable section of these specifications.

8) All connections of pipes to manholes shall be made utilizing resilient pipe connectors.

9) Drop pipe to manholes shall be installed by the Contractor when the difference in elevation of the incoming sewer invert and the manhole invert exceeds two (2) feet, or where directed by the Public Services Director and City Engineer/Consultant. The difference in elevation shall be measured from the invert of the incoming pipe to the invert at the center of the manhole.

10) All castings for manhole covers and other purposes shall conform to specifications of the PCHD, FDEP and ASTM best management practices and latest standards. The castings shall be true pattern in form and dimensions, free from pouring faults, sponginess, cracks, blow-holes, and other defects in position affecting their strength and value for the service intended.

11) Manhole frames and covers shall have the words "TOWN OF LAKE HAMILTON" and "SANITARY SEWER" cast thereon. Circular covers must fit the frames in any position. Contact surfaces of both frames and covers shall be machined and any tendency to rattle, as determined by test before or after installation, will be sufficient cause for rejection of the frames and cover.

12) All manholes will be located in the center of roads or outside of the tire travel path. At no case, manholes or sewer line will cross sidewalks or curbs.

H. DUCTILE IRON FORCE MAIN

1) Ductile iron force main shall comply with the PCHD, FDEP, ANSI and AWWA best management practices and latest standards.

2) All ductile iron force mains 4 inch diameter and greater shall be a minimum of pressure Class 350 with mechanical joint or push-on joints. Where indicated, flanged pipe shall be pressure class 250 at a minimum.

3) Pipe manufacturing shall be in accordance with the PCHD, FDEP, ANSI and AWWA latest standards.

4) Ductile iron force main shall be bituminous coated in accordance with PCHD, FDEP, ANSI and AWWA best management practices and latest standards. Pipe interior shall have a thermobonded epoxy coating

5) Above ground and exposed pipe to be painted green with high build epoxy paint system.

I. POLYVlNYL CHLORIDE (PVC) FORCE MAIN

1) All PVC force mains four (4) inch diameter and greater shall be pressure Class 150 pipe meeting PCHD, FDEP and ASTM best management practices and latest standards.

2) Each length should be clearly labeled so as to allow identification and specification conformance. Force Main Pipe shall be colored green or shall have green identification markings at 120 degree intervals around the pipe circumference.

J. FITTINGS

1) All fittings shall be rated for not less than 150 psi working pressure.

2) Grade for ductile iron fittings shall conform to the PCHD, FDEP, ANSI and AWWA best management practices and latest standards, and shall be epoxy lined inside and bituminous coated outside. Mechanical joint ductile iron fittings complying with the PCHD, FDEP and AWWA latest standards are acceptable.

3) Malleable iron fittings shall be galvanized conforming to the applicable provision of Federal Specifications, as determined by the Public Services

Director and City Engineer/Consultant, and may be used in size two (2) inches and under only.

4) Polyvinyl chloride (PVC) fittings shall be minimum Schedule 40 and may be used in size two (2) inches and under only.

K. PLUG VALVES

Plug valves shall be of the eccentric plug type, non-lubricated, with port area equal to a minimum of 80% of full pipe area. Minimum pressure rating shall be 150 psi. Valve bodies to be cast iron shall approved by the PCHD, FDEP, ASTM. Plugs shall be cast iron with neoprene facing and shall be of the single piece design. Plug shall be of same configuration for all valves and shall require no stiffening member opposite the plug for balance or support. Valve body seats shall have a welded in overlay not less than 90°, four (4) nickel. Packing shall be adjustable and shall be replaceable without removing the valve from service, depressurizing the line, or removing the valve operator. Bushings in both upper and lower journals shall be stainless steel. Valve shall be drip tight in both directions to the full pressure rating. All exposed nuts, bolts, springs and washers to be stainless steel. All plug valves to be approved by the Public Works Director/Consultant. Coat valve exterior with two (2) coats, 12 mils each coat, in accordance with manufacturer's directions.

L. SEWAGE COMBINATION AIR VALVES

Valves shall be approved by the Public Services Director and City Engineer/Consultant. The Combination Air Valves shall be fitted with inlet isolation valves. Isolation valves shall be bronze gate valves. Valves shall have phenolic red oxide primer and shall be coated with two (2) coats or equal, chlorinated rubber base coating to a minimum dry film thickness of 2.0 mils.

M. VALVE OPERATORS

1) Provide suitable hand wheels for gate, globe, angle, and drain valves and inside hose bibbs mounted above-ground. Provide wrench operator having adjustable, open stop memory positions for exposed plug valves smaller than 4 inches.

2) Provide two (2) inch operating nut for all buried valves.

3) Provide gear operators for plug valves four (4) inches and larger. Gear operators for plug valves four (4) inches through 20 shall be of the worm and gear type. Operator shall include spur gears, input stops, stainless steel bolting, and shall be outfitted for buried service, if applicable.

4) Gear operators shall be enclosed, suitable for running in oil, with shaft seals to prevent entry of dirt and/or water. The actuator shaft and sector gear shall be supported on permanently lubricated bronze bushings. Actuators without bronze bushings will not be allowed.

5) Gear operators shall be of the totally enclosed design and shall be proportioned to permit operation of the valve under full rated pressure in either direction with a maximum force of 80 pounds on the hand wheel or crank. Provide stop limiting devices in the operator at the open and closed positions. Operators shall be of the self locking type to prevent creeping. Design components between input and stop limiting devices to withstand without damage a pull of 200 pounds for hand wheel and crank operators and an input torque of 300 foot-pounds for operating.

6) Worm gear shall be one-piece design of gear bronze material, accurately machine cut. Sector gear shall be hardened alloy steel. Reduction gearing shall run in proper lubricant. Operators shall be PCHD, FDEP and AWWA approved.

7) Gear operators for above-ground service shall be hand wheels with a minimum diameter of 12 inches. Operator shall contain a dial indicating position of the valve plug. Chain operators shall be provided as required.

8) Gear Operators for underground service shall have two (2) inch operating nut. Provide watertight shaft seals and actuator cover gaskets. Provide operators designed for buried service.

9) All operators to open by turning counter clockwise.

N. VALVE BOXES

Boxes shall be cast iron of standard design with adjustable drop section to fit disc or cover over valve. Interior diameter shall be not less than five (5) inches, with cast iron cover marked "SEWER”.

O. STEEL PIPE SLEEVES AND CARRIER PIPE

1) All construction projects requiring steel sleeves shall conform to the minimum DOT requirements for roadway crossings. Railroad crossings shall conform to railroad requirements. The following casing sizes shall be used for the corresponding carrier pipes:

CARRIER PIPE		STEEL CASING
(Normal O.D.)		(Required Dia.)
4"		10"
6"		12"
8"		16"

10"		18"
12"		24"
16"		30"
20"		36"

2) Marker wire shall be in accordance with City standards and shall be installed on all PVC pipe

3) Variation of product requirements by brand name or specification number may be made by the Administrative Official, Public Works Director, City Engineer/Consultant, when it can be determined that the substitute is equal to or better than the product required or that the substitute product will better meet the public need and that the intent of these regulations are being met.

P. INSTALLATION

1) PREPARATION

a) Remove scale and dirt on inside and outside before assembly.

2) GENERAL

a) Trenches shall be maintained in a dry condition at all times unless otherwise approved by the City Engineer/Consultant.

b) Maintain six (6) foot minimum horizontal or 12 inch minimum vertical separation of water main from sewer piping in accordance with State requirements.

c) The trench shall be dug so that the pipe can be laid to the alignment and depth require, and it shall be excavated only so far in advance of pipe laying as permitted by the City Engineer/Consultant. The trench shall be so braced and drained that the workmen may work therein safely and efficiently.

d) All excavations deeper than three (3) feet shall be dewatered as required to maintain the water level at a minimum of two (2) feet below the excavation throughout excavation, bedding, and backfilling. Discharges of dewatering pumps shall be conveyed to natural drainage channels, drain, or sewers. Contractor shall treat discharge as required to prevent violations of state water quality standards.

e) The width of the trench shall be ample to permit the pipe to be laid and jointed properly, and the backfill to be placed and compacted as

specified. Trenches shall be of such extra width, when required, as will permit the convenient placing of timber supports, sheeting and bracing, and handling of specials.

f) Pipe trench shall be prepared in accordance with pipe manufacturer's recommendations.

3) SHEETING AND BRACING

a) During construction, the side slopes of all the excavations shall be maintained at an inclination no steeper than two horizontal to one vertical. Vehicles shall be at least five (5) feet away from the top of Slope. If site conditions do not permit such side slopes, excavation shall be performed using sheeting, shoring, and bracing.

b) Open-cut trenches shall be sheeted and braced as required by any governing Federal and State Laws and municipal ordinances, and as may be necessary to protect life, property, or the work. Comply with requirements of Florida Trench Safety Act and OSHA regulations, specifically, 29CFR.S.1926.650 Part P. When close sheeting is required, it shall be so driven as to prevent adjacent soil from entering the trench either below or through such sheeting. Where sheeting and bracing are used, the trench width shall be increased accordingly.

c) Sheeting and bracing which have been ordered left in place must be removed for a distance of three (3) feet below the established street grade or the existing surface of the street, whichever is lower. Trench bracing, except that which must be left in place, may be removed when the backfilling has reached the respective levels of such bracing. Sheeting, except that which has been left in place, may be removed after the backfilling has been completed or has been brought up to such an elevation to permit its safe removal.

d) Sheeting and bracing may be removed before flooding the trench, but only in such manner as will insure that adequate protection of the completed structures and adjacent underground or surface structures, and prevent the disturbance of adjacent ground.

4) HANDLING MATERIAL

All pipe and accessories shall be loaded and unloaded by lifting with hoists or skidding in a manner that will avoid shock or damage. Under no circumstances will such materials be dropped. Pipe handled on skid ways shall not be skidded or rolled against pipe already on the ground.

Q. INSTALLATION - GRAVITY SANITARY SEWERS

1) Trenching shall be in accordance with manufacturer's recommendations.

2) Gravity sewers shall be laid to exact line and grade by the use of a grade line supported on batter boards spaced at not more than 25 foot centers or by laser beam. Sewers will be inspected with a light at each manhole when the line is completed and backfill has been placed to a depth of one-foot over the pipe. Backfill may be completed only after approval of each section is given for alignment and grade. Laser beam control is encouraged. Faulty sections of sewer lines rejected by the City shall be removed and re-laid by the Contractor at his own expense.

R. INSTALLATION - FORCE MAIN

1) All pipes shall be laid to a minimum cover of 36 inches from established grade if not otherwise indicated. Any variation there from shall be approved by the Public Services Director, or City Engineer/Consultant.

2) The pipe fittings shall be inspected for defects and while suspended above grade.

3) Every precaution shall be taken to prevent foreign material from entering the pipe while it is being placed in the line. If the pipe laying crew cannot put the pipe into the trench and in place without getting earth into it, the Engineer may require that before lowering the pipe into the trench, a heavy, tightly woven canvas bag of suitable size shall be placed over each end and left there until connection is to be made to the preceding joint. During laying operations, no debris, tools, clothing, or other materials shall be placed into the pipe.

4) After placing a length of pipe into the trench, the end shall be centered in the coupling and the pipe forced home and brought to correct line and grade. The pipe shall be secured in place with approved backfill material tamped under it except at the joints. Pipe and fittings which do not allow a sufficient and uniform space for joint shall be removed and replaced with pipe fittings of proper dimensions to insure such uniform space. Precautions shall be taken to prevent dirt from entering the joint space.

5) At times when pipe laying is not in progress, the open ends of pipe shall be closed by a watertight plug or other means approved by the Engineer. Joints of pipe in the trench which cannot be poured shall be caulked with packing to make them as watertight as possible. This provision shall apply during the noon hour as well as overnight. If water is in the trench, the seal shall remain in place until the trench is pumped completely dry.

6) The cutting of pipe for inserting fittings or closure shall be done in a neat and workmanlike manner without damage to the pipe so as to leave a smooth end at right angles to the axis of the pipe.

7) Install trace wire with all force main installations in accordance with City requirements.

8) All plugs, caps, tees, and bends deflecting 22½ degrees or more on main 4 inches in diameter or larger shall be provided with restraining glands and thrust blocks in accordance with City standards.

S. TESTING - GRAVITY SANITARY SEWERS

1) Each gravity sanitary sewer, upon completion, or at such time as the Engineer may direct, is to be cleaned, tested, and inspected. All repairs or alterations shown necessary by these tests shall be made; all broken or cracked pipe removed; all excessive infiltration stopped; all deposits in pipe and manholes removed and the sewer left clear, true to line and grade, and ready for use. Each section of pipe form manhole to manhole is to show a full circle of light form either end. Each manhole shall be to the specified form and size, to the proper depth, and watertight. The frame and cover shall be permanently set to exact positions and grade. Any defects found in the system shall be repaired to the satisfaction of the City. Gravity sewers will also be tested or gauged to determine the amount of infiltration, and sewers in which the leakage or infiltration exceeds the following maximum limit will not be acceptable. 50 gallons per 24 hours per mile of sewer pipe per inch of nominal diameter where the invert of the sewer is constructed above the usual ground water elevation.

2) Before final acceptance, gravity sewer lines shall be televised by a contractor with qualifications suitable to the City. Each line will be recorded using electronic/digital video. Each run will be clearly labeled showing the manholes and with a counter indicating the lineal number of feet run from the reference point. The video shall be in color and shall include inspection of all newly installed laterals. The original video shall be provided to the City.

3) Any deviation from grade greater than ½ inch for slopes of 0.4%, and less, and greater than 1 inch for grades greater than 0.4%, shall be cause for rejection of the installation.

T. TESTING - FORCE MAINS

1) Before pressure testing force main, place a minimum cover of six (6) inches above the top of pipe but leave all joints exposed. The backfill should be free of stones and hard earth. Pressure tests of the pipe in the presence of the City Inspector and carefully examine joints for leaks. After pressure testing, joints should be covered with same select backfill as used for pipe.

2) Each valved section of force main shall be slowly filled with water and the specified test pressure, based on the elevation of the lowest point of the line or section under test, and corrected to the elevation of the test gauge, shall be

applied by means of a gasoline driven test pump connected to the pipe in a manner satisfactory to the City. The Contractor shall make arrangements for metering the amount of water used during the test.

3) All joints shall be left uncovered during the test. If they become covered they shall be re-dug. If the ditch is wet, each joint shall be pumped dry for inspection of loose bolts and leaks. Sufficient manpower shall be employed to insure the inspection of each joint during the two-hour test period.

4) Before applying the specified test pressure, all air shall be expelled from the pipe. Taps at points of highest elevation shall be made before the test is made and plugs inserted after the line has been flooded.

5) All exposed pipes, fittings, and joints will be carefully examined during the open trench test. Any cracked or defective pipes or fittings discovered in consequence of this pressure test shall be removed and replaced with sound material and the test shall be repeated until satisfactory to the Engineer.

6) The leakage test shall be conducted at a minimum pressure of 150 psi.

7) Leakage is defined as the quantity of water to be supplied into the newly laid pipe, or in any valved section thereof, necessary to maintain the specified leakage test pressure after the pipe has been filled with water and the air expelled.

8) No pipe installation will be accepted until the leakage is less than the number of gallons per hour as determined by the formula: L = ND (sq. rt. P) 3,700 in which L equals the allowable leakage in gallons per hour; N is the number of joints in the length of the pipe line tested; D is the nominal diameter of the pipe in inches; and P is the average test pressure during the leakage test, in pounds per square inch gauge. (The allowable leakage, according to the formula is equivalent to 10½ U.S. gallons per 24 hours, per mile of pipe, per inch nominal diameter, for pipe in 20-foot lengths evaluated on a pressure basis of 150 psi.)

9) Where any section of main is provided with concrete reaction backing, the hydrostatic pressure test shall not be made until at least seven days have elapsed after the concrete reaction backing was installed. If high early strength cement is used in the concrete reaction backing; the hydrostatic pressure test shall not be made until at least two days have elapsed.

SECTION B110 DETAILED SPECIFICATIONS - WASTEWATER PUMPING STATIONS

A. GENERAL

Contractor shall furnish all labor, equipment, and materials and shall perform all operations in connection with installation of a complete waste water pumping station ready for use in accordance with the specifications and the City's requirements, either specific or implied. This includes any and all restoration required to duplicate original site conditions prior to the commencement of construction.

B. SUBMITTALS

1) Three copies of shop drawings, including electronic files, for all components, including wet well and valve box, shall be submitted to the Public Services Director, and City Engineer/Consultant for review. The City retains the right to refuse any proposed substitution.

2) Provide manufacturer's instructions, three copies (including electronic files), for all manufactured components.

3) Provide manufacturer's certification that all valves meet specification requirements.

C. PRODUCTS

1) All materials shall be new, of first quality, manufactured in the United States, and shall conform to the appropriate standard, latest revision.

2) All fittings and materials shall be inspected by the Public Works Department and City Engineer/Consultant after delivery and prior to being installed.

D. CONCRETE

All concrete used for lift station construction shall have a minimum compressive strength (28 Days) of 4,000 psi and shall be Type II. Maximum slump by vibration shall be 4 inches.

E. SEALING COMPOUND AND GROUT

Plastic sealing compound shall comply with Federal Specification SS-S-00210. Mortar shall comply with ASTM C387, Type S.

F. WET WELL

1) Concrete pipe, if used for the lift station wet well, shall conform to ASTM Designation C76-59T, Class III, Wall "B" Reinforced Concrete. 7.3.5.2. Pre-cast wet wells shall be in accordance with ASTM C478.

2) Interior and exterior of all wet wells shall receive three (3) coats of coal tar epoxy with a minimum thickness of three (3) mils each.

3) Backfill shall be made in accordance with applicable sections of these specifications.

4) All connections of pipes to or through the wet well shall be made utilizing Thunderline Link-Seal.

5) Minimum wet well diameter shall be six (6) feet.

G. ACCESS FRAME AND ACCESSORIES

1) Furnish and install aluminum hatch Covers and access frame, size as shown on the standard details, over lift stations. All hatches shall be rated for a live load of 150 psf. Assemblies shall be complete with hinged and hasp-equipped cover(s), upper guide holder and level sensor cable holder. Frame shall be anchored securely above the pumps. Each door shall have safety locking handle in operating position. Doors shall be of checkered plate.

2) Lower guide rail holders shall be integral with discharge connection; guide bars shall be two (2) inch Schedule 40 stainless steel pipe as indicated on drawings.

3) Furnish and install one (1) aluminum hatch cover and access frame, size as shown on plans, over each valve box. It shall be complete with hinged and hasp-equipped cover. Each cover shall have safety locking handle in open position. Doors shall be of checkered plate.

H. PIPING

1) Piping inside wet well and valve box shall be flanged ductile iron pipe (DIP), minimum working pressure of 250 psi.

2) Fittings inside wet well and valve box shall be flanged ductile iron, short-body.

I. CHECK VALVES

Valves shall be rubber flapper type check valve with full cast iron body and cover.

J. PUMPS

1) Each pump shall be of the sealed submersible type. The pumps shall be capable of handling raw, unscreened sewage and shall utilize impellers as shown in the pump schedule. The pump casing shall be fitted with bronze wear rings. Each pump shall have mechanical seals with an oil chamber between seals. Rotating seal faces shall be carbon and stationary seal faces

are to be ceramic. Each pump shall be equipped with seal failure probes and heat sensors.

2) All metal parts of the seal, including the spring, shall be 303 stainless steel. All pump fasteners shall be 303 stainless steel.

3) The discharge of each pump shall be fitted with a diaphragm type hydraulically operated sealing flange. When pump is in operation, pressure shall force diaphragm against discharge elbow flange providing a leak-proof seal. When pump is idle, pressure shall be removed from diaphragm so that pump can be removed from sump with no mechanical contact of sealing flanges. The complete weight of the pump is to rest on the bottom support plate, no weight is to be supported on the guide rails or discharge elbow. The sealing diaphragm is to be removable and mounted on the pump discharge flange. Diaphragm material is to be approved rubber.

4) A separate steel mounting plate shall be furnished for each pump. These plates shall include adjustable guide rail supports and discharge elbow with flange to align with pump hydraulic sealing flange. Discharge elbow shall have 125 pound standard flanges. Plates and fittings shall be coated with tar base epoxy paint. All fasteners, hardware, etc., are to be stainless steel.

5) Pumps shall be from a manufacture approved by the Public Services Director, or City Engineer/Consultant. Substitutions are not allowed.

K. CONTROL PANEL

1) The sewage pump control panels shall be self contained complete duplex pump control unit containing the features described herein.

2) There shall be permanently affixed to the inside of the exterior enclosure door a nameplate indicating the voltage, phase, horsepower, order reference number, date manufactured and the control panel manufacture's name, address and telephone.

3) All power wire shall be stranded and sized as required for load and application according the National Electrical Code (NEC). All control and signal wire shall be a minimum of #14 AWG, 90 degree insulated and color coded. Colors shall be red for all AC control, blue for all DC control, yellow for external source control, white for AC neutral, and green for equipment ground wiring.

4) All wiring on the rear of the inner door shall be neatly bundled using tie wraps or other means. All internal wiring on the back plate shall be neatly routed in wire duct with removable covers. All wiring shall be continuous point to point (no splices) and be totally accessible with permanent number marking on each end to match the control schematic drawings.

5) The panel shall be manufactured using quality workmanship and components. Upon completion of the panel it shall be completely factory tested. All control and alarm operations shall be performed with external signals simulated to insure proper operation. The three (3) phase line voltage source for which the panel is intended shall be used for testing.

L. ENCLOSURE CONSTRUCTION AND MATERIALS

1) The pump controls shall be housed in a National Electrical Manufacturers Association (NEMA) 3R stainless steel enclosure. The material used shall be 14 gauge, type 304 stainless steel with a 2B brushed finish. Construction shall be machine formed to provide rounded edges and solid seam welded. The completed enclosure shall have all welded seams ground smooth to a radius and buffed. The enclosure shall be mounted as shown and sized to house all the required components and all adequate space for testing and maintenance as necessary. The enclosure shall have back plate mounting studs, padlocking provisions, door latches and continuous hinge, all of stainless steel. The door gasket shall be continuous rubber composition with a molded in spring steel retainer for attachment to the enclosure without the use of adhesives and provide a positive weatherproof door seal.

2) The panel shall have a hinged inner door of aluminum with a latch to protect all live internal wiring from operator personnel. The inner door shall be able to be opened to a minimum of 150 degrees to allow safe access to the components. Cutouts for breaker handles shall be provided to allow the operation of all circuit breakers through the inner door. All control switches, indicator pilot lights, elapsed time meters and motor starter overload reset push buttons shall be mounted on the inner door. The inner door shall be designed so that the mounting will not in any way penetrate the exterior of the control panel enclosure and deteriorate the NEMA rating. It shall also be designed to allow and provide full access to the sides, top and bottom of the control panel for power and control conduit entrance. All conduit entrances shall be made in a NEC approved manner. The conduits to the wet well shall have approved seal off fittings installed and properly sealed to protect the control panel from adverse damage from the wet well. All components shall be securely mounted to the back plate with plated machine screws through machine thread tapped holes in the backplate. The screws shall be of adequate size for the device being secured. Permanent marking to identify each component as shown on the drawing shall be provided on the backplate.

M. POWER DISTRIBUTION

1) The panel power distribution shall include all components as indicated below and be completely wired with stranded conductors having a minimum of 90 degree insulation rating and an ampacity rating a minimum of 125% of the motor ampere rating, All power wiring shall be neatly routed and totally

accessible. All conductor terminations shall be as recommended by the device manufacturer and be secure to provide adequate electrical conductivity.

2) The panel shall have a normal and emergency main circuit breaker to allow manual positive switching from the utility normal power source to a remote connected auxiliary standby power source when the normal power has failed. They shall also provide a positive disconnect for the normal and ampacity as per the NEC for main breakers. The two breakers must be 3 pole and of the same frame and size rating. The voltage rating shall match that of the incoming service. They shall be mounted side by side with an interlock to insure only one can be in the "ON" position at a time and with the breaker handles and mechanical interlock totally accessible through the inner door. The line side of the normal breaker shall have adequately sized lugs attached to provide connection of the incoming normal power source conductors. The line side of the emergency breaker shall be wired to an exterior mounted standby generator power receptacle. The load side of any breaker is to be commonly connected and wired to the line side of each pump individual branch circuit breaker. The normal and emergency breakers must have a permanently attached positive mechanical interlock made of stainless steel. The interlock must be easily switched between the two breakers only when both breakers are in the off position. The interlock must provide that only one breaker shall be in the "ON" position at a time. When one is in the "ON" position the other must be positively blocked in the "OFF" position and the handle shall not be free to be inadvertently turned on. When either breaker is in the "ON" position it must be trip free to allow it to be totally operational should a fault or over-current cause the trip unit to open the breaker. The external power receptacle, for the connection of a standby generator, shall match the system type. The receptacle shall be of reverse service design, 600 volt rated with an ampacity rating sufficient to carry the total load of the panel. It shall be securely mounted externally to the side of the enclosure to be fully accessible. The receptacle shall be totally weatherproof with a cover over the plug access opening that is permanently attached. Receptacle shall be NEC approved.

3) The pump motor breakers shall be thermal magnetic trip devices and provide for individual motor disconnect and overload/short circuit protection as required by the NEC. The breakers shall be three (3) pole and have a trip rating as indicated on the drawings that shall not exceed the NEC rating for motor branch circuit protection. The voltage rating shall match that of the panel incoming service. The breaker handles shall be totally accessible through the inner door. All circuit breakers shall be Square D, Westinghouse, or Allen Bradley.

4) For all pumps less than 20 HP, the motor starters shall be NEMA rated three (3) pole devices with three (3) pole overload relay protection. They shall provide the electrical start/stop control and running overload protection for

each pump and have 120 volt operating coils. The thermal overload unit heater coils shall be ampacity rated per the specific nameplate ampere rating of the pump motor and checked upon final inspection prior to system start up.

N. POWER PANEL ACCESSORIES

1) The panel power accessories shall include all components as indicated below and be completely wired with stranded conductors. All wiring shall be neatly routed and sized as required with a minimum of number 12 AWG.

2) The 120 volt common control circuit and the 24 volt float circuitry shall be protected by an auxiliary one (1) pole circuit breaker. The breaker handle shall project through the inner door.

3) The control panel shall have lightning arrestor protection included mounted on the outside of the panel to protect the motors and control equipment from lightning induced line surges. It shall be 600 volt rated and be a three phase unit with connection to ground. The arrestor shall be mounted near the incoming power source and be properly wired to all three phases and ground. Lightning arrestor shall be approved by the Public Services Director, or City Engineer/Consultant.

4) The control panel shall have surge capacitor protection included within the panel to protect the unit from damaging transient voltage surges. The surge arrestor shall be mounted near the incoming power source and be properly wired to all three phases and ground. The surge arrestor shall be approved by the Public Services Director, or City Engineer/Consultant.

5) A three (3) phase monitor relay shall be installed to protect the motors. It shall be a three phase voltage sensing device that is adjustable for the system nominal voltage. It shall protect the control panel from loss of a single phase, even with a three phase motor running on line, low voltage on all three phases simultaneously and phase sequence reversal. An output contact shall be wired in the pump motor starter control circuit. Should the voltage fall below any of the parameters the phase monitor shall shut off the pumps. The phase monitor shall automatically reset when nominal voltage is restored to allow the pumps to restart.

6) A receptacle shall be mounted on the inner door to provide a maximum of three (3) amperes at 120 volt. The receptacle shall be a 15 ampere rated three (3) wire ground fault interrupter duplex type. Provide circuit breaker for receptacle.

7) The panel shall have an ammeter and ammeter selector switches mounted on the inner door. The ammeter range shall be a 3½ inch, 2 percent meter to indicate the full load ampacity of the pump between 2/3 and ¾ scale. Matching current transformers shall be included on each phase of the motor to provide

the signal to the ammeters. One selector switch shall select the pump to which the ammeter is connected. The second selector switch shall be four (4) position to read each phase and off.

O. DUPLEX PUMP CONTROLS

1) The control circuit shall provide for the automatic and manual control and alteration of the pumps to maintain a pumped down condition of the wet well. The control system shall sense the wet well level through remote wet well level sensing regulator float switches. The source voltage for the float switches shall be 24 volt AC and the controls shall include all interposing relays. Four regulator float switches shall include all pumps off level, lead pump on level, lag pump on level, and high alarm level to control the pumps operation and provide alarms. The set point elevation of each of the regulator floats shall be as indicated on the drawings. Terminal blocks shall be provided for each separate regulator float switch connection and other remote control device. The float switch cables shall be of sufficient length to be continuous from the panel terminals. All control relays shall be multi- contact plug in type with track mounted bases. The pump alternator relay shall be plug in type with a test switch and an alternator sequence selector switch. The control system shall include alarm indication for high wet well level. The system shall have a lag pump delay timer to prevent simultaneous starting of both pumps. Each pump shall have alarm indication and/or shut clown for motor thermal alarm protection, motor overload alarm, pump failed alarm and seal failure alarm. The controls shall include, but not be limited to, the following functions and features.

2) A three (3) position selector switch mounted on the inner door shall provide the Hand-Off or Automatic operating mode selection for each pump. The switched shall be oil tight with 10 ampere rated contacts as required. A position indicating legend plate and an identifying engraved nameplate shall be provided with each switch. In hand position the pumps shall run continuously without regard to the level sensing. In automatic position the pumps shall respond to the regulator float switches in the wet well and start/stop on demand and in off position the pumps shall be locked out and not operate.

3) A run pilot light shall be mounted on the inner door for each pump to turn on when the starters are energized to indicate pump run. The pilot lights shall be 120 volt oil tight type with a red lens.

4) An elapsed time meter shall be mounted on the inner door for each pump to record the accumulated running time of the pump motor. It shall run when the pump is operated in Hand or Auto mode. It shall be 120 volt non-resettable and record time in hours (6 digits) and 10th.

5) An alternator relay shall be included to automatically provide alternation of the lead pump upon completion of each pumping cycle. It shall be 120 volt solid state plug in type with DPDT Form C (double pole double throw) 10 ampere contacts and two LED position indicators to show the alternator position. It also shall allow the lag pump to operate as a backup on demand.

6) An alternator test switch shall be provided to allow testing of the alternator. It shall be toggle type switch bracket mounted on the backplate and have two positions, "Alt" for normal automatic alternator operation and 'test" for a test operation. Switch shall have only momentary contact in the "Test" position. The test cycle operation when repeated shall assure alternator operation.

7) A three (3) position oil tight selector switch mounted on the inner door shall be provided for manual alternator operation selection of a fixed sequence operation or automatic alternation of pumps when operating under the automatic control logic. Selections to include a fixed pump one (1) lead/pump two (2) lag, automatic alternation, and a fixed pump two (2) lead/pump one (1) lag operation.

8) A lag pump delay timer shall be provided to delay the start of the lag pump after an interruption in utility power to the control panel and the demand for both pumps to run exists. During normal automatic operation the timer shall allow the lag pump to start immediately when called for. The timer should be adjustable and set for 10 to 15 seconds.

9) The control circuit shall include a 120 volt to 24 volt transformer with a secondary fuse to provide a low voltage source for the regulator floats that sense the wet well level for pump operation. Terminal blocks shall be provided to connect each regulator float switch to the control circuitry, each relay must operate in response to a specific regulator float in respect to the wet well level with the relay energizing when the normally open float closes. Control relays, with 24 volt operating coils, shall interface between the floats and the pump starters and alarm functions.

10) Liquid level indicator lights shall be provided. Lights shall indicate the position of each float in the wet well. Pilot lights shall be oil-tight type. Low level float and lead pump float lenses shall be green. Lag pump float indicator lens shall be yellow (amber). High alarm float indicator lens shall be red. Provide momentary contact to test toggle switch for each light.

P. ALARM SYSTEMS

Each of the following alarm functions shall be included in the panel to continually monitor the specific condition for which it is intended and provide the indication and response described. The indicator pilot lights for all alarms shall be oil tight 120

volts with nameplates to identify each function. These alarm functions are to protect the pumps and indicate abnormal conditions of the system.

1) ALARM LIGHT

The exterior panel mounted alarm light shall be a weatherproof shatterproof red light fixture with a 40 watt bulb to indicate an alarm condition exists. The general alarm light shall be turned on by any alarm function. An indicator pilot light on the inner door shall show which of the alarm conditions has caused the exterior general light to be turned on. The light shall turn off when the alarm condition is corrected and the alarm circuit is manually reset, if required.

2) AUDIBLE ALARM HORN

The exterior panel mounted audible alarm horn shall be a weatherproof device to provide an audible signal to indicate an alarm condition exists. The alarm horn shall be a minimum of 80 decibels and be turned on by any alarm function that will turn on the exterior alarm light. The audible alarm shall be silenced by depressing the Alarm Silence pushbutton, located on the inner door. The silence circuit shall automatically reset when the alarm condition is cleared.

3) HIGH LEVEL ALARM

The high alarm level regulator float switch shall close on a high wet well level condition. A High Level Alarm relay and an oil tight red pilot light shall be provided to indicate the alarm condition. The general alarm shall turn on to indicate the alarm condition. The general alarm and high level pilot tight shall automatically turn off when the high level condition has cleared.

4) PUMP MOISTURE ALARMS

a) Each pump shall be provided with a seal failure alarm relay and an oil tight amber pilot light to indicate the condition. The relay shall be a liquid sensing induction type relay and have a secondary circuit wired to terminals, for each pump, to be connected to the moisture sensing probe in each pump seal chamber. If probe senses moisture the seal failed relay shall turn on the Sear Failed alarm pilot light to indicate same.

b) The pump shall be taken out of service by the seal failed alarm and the general alarm shall indicate same. Immediate action must be taken for maintenance or replacement of the failed seal to place the pump back in service and reset the alarm.

5) MOTOR TEMPERATURE ALARMS - AUTO RESET

Each pump is to be provided with a thermal alarm relay and an oil tight red pilot light to indicate the condition. Terminal blocks shall be provided for connecting the normally closed thermal sensing contact located in each motor windings for motor thermal protection. An abnormal rise in motor winding temperature shall cause the thermal alarm relay to shutdown the pump motor and turn on the High Temperature red alarm pilot light and the general alarm to indicate same. The thermal alarm shall automatically reset and restore pump operation upon the thermal contact resetting when the thermal condition of the windings is back to normal due to the pump shutdown. The thermal alarm shall also reset after a power failure or if control power is interrupted for any reason.

6) TELEMETRY ALARM CONTACTS

A telemetry alarm contact shall be provided for a remote interface signal to future telemetry equipment. Each contact shall be a dry contact, open during normal conditions and wired to terminal blocks. The respective contacts shall close upon alarm and return to normal when the condition is corrected and the alarm reset. The alarm conditions monitored shall include high level alarm and pump one (1) or two (2) failed. Provide 12"x12" space in lower right side of cabinet for future telemetry system.

Q. DRAWINGS AND MARKINGS

1) PANEL MARKING

a) All component parts in the control panel shall be permanently marked and identified as they are indicated on the control drawings. Markings shall be on the backplate adjacent to the component.

b) All control panel conductors shall be permanently number marked with wire markers at each end as close as practical to the termination of the conductor.

2) NAMEPLATES

The panel shall include engraved nameplates on the inner door for all components to indicate the device function. The nameplates shall be permanently affixed with plated machine screws or a bonding adhesive suitable for the application. The material shall be white with a black core and have a minimum of 3/16 inch letters.

3) FINAL DRAWINGS

a) Upon completion of the panel a complete set of As-Built drawings and Bill of Materials shall be supplied to the City. The drawings shall include a power and control schematic and a terminal block diagram showing each remote connection to the panel. An

adhesive copy of the schematic drawings and terminal diagram must be permanently affixed to the inside of the control panel door.

b) All Float switches shall be "Roto-float".

4) SPARE PARTS

One complete set of mechanical seals shall be supplied for each pump bearing furnished. The spare parts for each control panel shall also include one spare alternator, one complete spare relay with base and spring retaining clip and one spare phase monitor relay with base.

R. INSTALLATION

1) PLACEMENT OF CONCRETE

a) Forms for bottom slabs may be omitted when the soil and workmanship permit accurate excavation to size, and the omission is approved by the City.

b) Removal of forms shall be done in a manner which will assure complete safety of the structure. In no case shall the supporting forms be removed until the members have acquired sufficient strength to support their weight and loads thereon safely.

c) All water and foreign matter shall be removed from forms and excavations. Unless otherwise directed, wood forms must be thoroughly wetted just prior to placing concrete.

d) Concrete shall be deposited as nearly as practicable in its final position to avoid segregation due to rehandling of flowing, conduits, sleeves, hangers and other work required to be built into concrete shall be inspected and approved by the City. No concrete that has been partially hardened becomes contaminated by foreign materials, or has been retempered, shall be used. Placement of concrete shall generally be carried on as a continuous operation until construction joints are necessary. Except for slabs on earth surfaces, concrete shall be placed with the aid of mechanical vibrating equipment. The frequency of vibration shall be sufficient to cause flow or settlement of the concrete into place. The vibration shall be of sufficient duration to accomplish thorough compaction. Vibration shall be supplemented by forking or spading by hand adjacent to the forms on exposed faces in order to secure smooth, dense, even surfaces. The concrete shall be compacted and worked in an approved manner into all corners and angles of the forms and around reinforcement and embedded fixtures.

Light hammer tapping will be allowed at lift lines to prevent air bubbles.

e) Curing: Finished concrete shall be kept damp continuously for one week after it has been poured, or some acceptable curing compound shall be used as directed by the manufacturer. All concrete shall be used as directed by the manufacturer. All concrete shall be adequately protected from injurious action by the sun, heavy rains, flowing water and mechanical injury.

2) TOP SLAB

a) Size of top slab shall be as shown on the City's standard details. It is very important that the Access Cover is properly installed in the top slab, with the proper orientation (hinge side as shown on drawing).

b) Check top slab horizontally with level. Consult manufacturer's individual access over drawing before installation of access cover.

c) Provide padlocks for access covers keyed to City's master key system.

3) AUTOMATIC DISCHARGE CONNECTION

The automatic discharge connection shall be attached to the bottom slab level and at the exact location required relative to the access cover.

4) INTERNAL PIPING AND MANIFOLD

Use proper gaskets, tighten bolts gradually and evenly. On all lift stations deeper than 15 feet, install discharge pipe brackets to relieve discharge connection from overload and intermediate guide bar brackets to prevent guide bars from bending when pumps are pulled.

5) INSTALLATION OF PUMPS

Contractor shall install pumps with City representative present. Lower pump units shall be place along guide bars. Check visually contact between volute flange and discharge connection. If necessary, recheck and re-align discharge connection(s) and guide bars with pumps in place

6) GROUTING

After proper alignment of all components is established, grout access cover, discharge connection(s) and pipe thrulets. Build up and shape slopes at pump button in accordance with drawing. Use top quality grout only.

S. DETAILED SPECIFICATIONS - WASTEWATER PUMPING.

Variation of product requirements by brand name or specification number may be made by the Administrative Official when it can be determined by the Administrative Official that the substitute is equal to or better than the product required or that the substitute product will better meet the public need and that the intent of these regulations are being met.

SECTION B111 - FIRE FLOW REQUIREMENTS

All water distribution systems shall be designed to provide adequate fire flow to all new construction. Fire flow requirements shall be calculated in accordance with one of the three (3) methods contained in "Distribution System Requirements for Fire Protection," AWWA M31, latest edition, except that fire flow for one and two-family dwellings shall be calculated in accordance with Table 1-4 of the same manual.

SECTION B112 – APPROVED PRODUCTS

A list of products and materials to be used in construction of water and wastewater systems to be owned, operated, and maintained within the City Limits shall be approved by the City (Public Services Director and City Engineer/Consultant), PCHD and FDEP, which meet the latest standards of the ANSI and AWWA, at the time of the Construction/Engineering Plan Approval or the date of any approved construction/engineering plan extension.

RESOLUTION R-2021-14

A RESOLUTION ADOPTING CRUMP ROAD ESTATES, A REPLAT OF TWO ACRES OF PARCEL OF THE PLAT OF MAGNOLIA SHORES; PROVIDING FOR SEVERABILITY; AND PROVIDING FOR AN EFFECTIVE DATE.

Whereas, Chapter 177, Florida Statutes, establishes the minimum requirements and creates such additional powers in local government bodies to regulate and control the platting of lands; and

Whereas, the Town of Lake Hamilton has received a boundary survey of the lands proposed for the Crump Road Estates Re-Plat prepared by a professional land surveyor and reviewed by a professional land surveyor engaged by the Town for strict conformity to chapter 177, Florida Statues; and

Whereas, the Town has received a title opinion for the property prepared by an attorney licensed in the State of Florida; and

Whereas, a map of the Crump Road Estates Re-Plat has been prepared with all required signatures and dedications executed by the owners of record and mortgages having a record interest in the land subdivided and presented to the Town Council for approval to record the Plat.

NOW, THEREFORE, BE IT RESOLVED BY THE TOWN COUNCIL OF THE TOWN OF LAKE HAMILTON, FLORIDA:

Section 1. Crump Road Estates, being a Re-Plat of the North Two Acres of Parcel "F" of the Plat of "Magnolia Shores" as described, displayed, and detailed in Exhibit "A", which is attached hereto and made a part of this Resolution, is hereby approved.

Section 2. The mayor is hereby authorized to execute Crump Road Estates, being a Re-Plat of the North Two Acres of Parcel "F" of the Plat of "Magnolia Shores" for the Town of Lake Hamilton and return same to the developer for recording by the Clerk of the Circuit Court of Polk County.

Section 3. All existing Resolutions of the Town of Lake Hamilton in conflict with this Resolution are repealed to the extent necessary to give this resolution full force and effect.

Section 4. If any provision or portion of this Resolution is declared by a court of competent jurisdiction to be void, unconstitutional, or unenforceable, then all remaining portions, provisions, and regulations of this resolution shall remain in full force and effect.

Section 5. This Resolution shall take effect immediately upon its passage and approval at a regular meeting of the Town Council.

INTRODUCED AND PASSED at the regular meeting of the Town Council of Lake Hamilton, Florida, held this _____ day of November 2021.

TOWN OF LAKE HAMILTON, FLORIDA

_____
MICHAEL KEHOE, MAYOR

ATTEST:

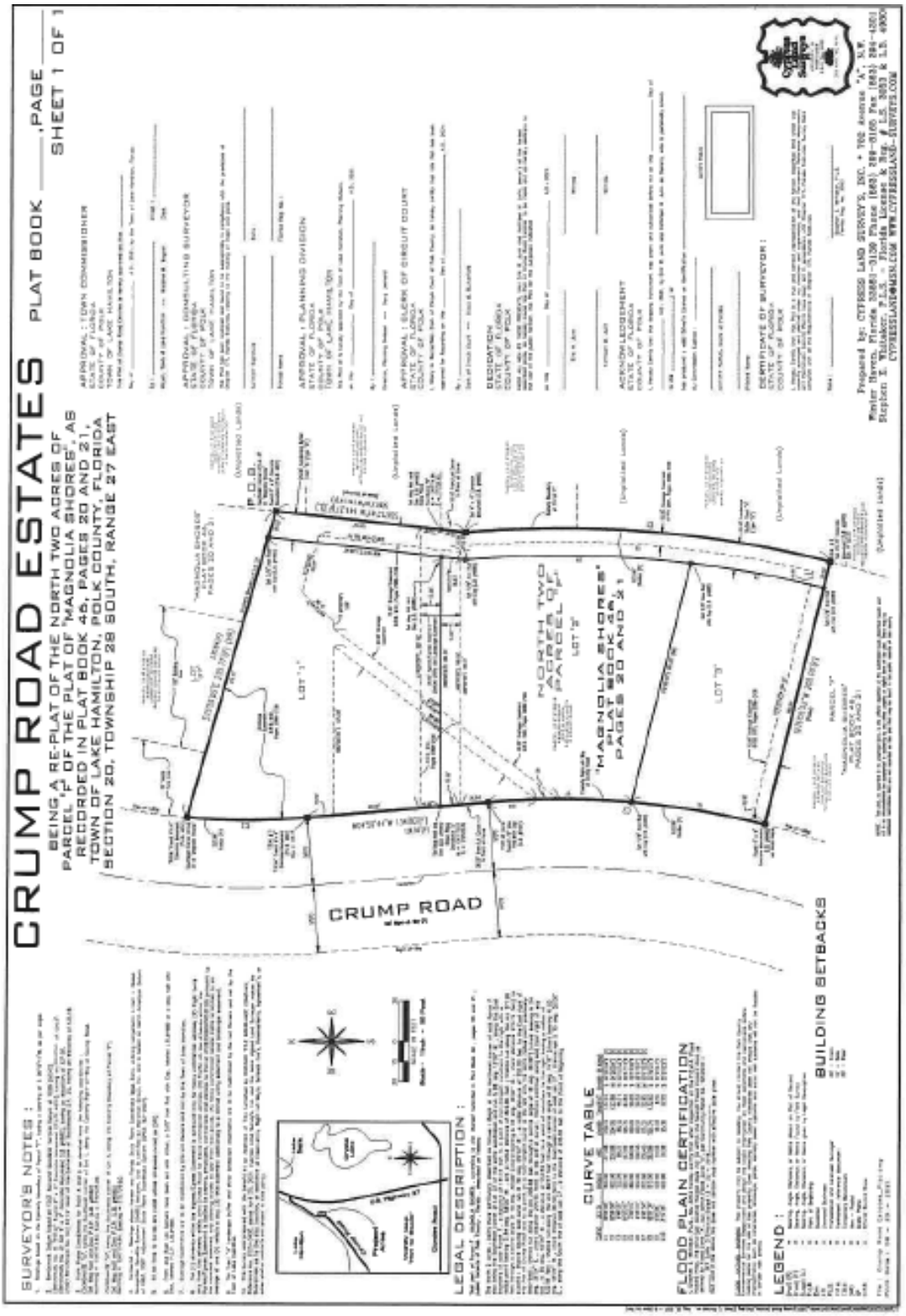
_____
BRITTNEY SANDOVALSOTO, TOWN CLERK

Approved as to form:

_____
HEATHER R MAXWELL, ESQ., TOWN ATTORNEY

Record of Vote	**Yes**	**No**
Roberson	____	____
Tomlinson	____	____
O'Neill	____	____
Wagner	____	____
Kehoe	____	____

EXHIBIT A


CRUMP ROAD ESTATES
PLAT BOOK ____, PAGE ____
SHEET 1 OF 1
BEING A RE-PLAT OF THE NORTH TWO ACRES OF PARCEL "F" OF THE PLAT OF "MAGNOLIA SHORES", AS RECORDED IN PLAT BOOK 46, PAGES 20 AND 21, TOWN OF LAKE HAMILTON, POLK COUNTY, FLORIDA
SECTION 20, TOWNSHIP 28 SOUTH, RANGE 27 EAST
CRUMP ROAD
LOT "1"
LOT "2"
LOT "3"
NORTH TWO ACRES OF PARCEL "F"
"MAGNOLIA SHORES" PLAT BOOK 46 PAGES 20 AND 21
P.O.B.
SURVEYOR'S NOTES :
LEGAL DESCRIPTION :
CURVE TABLE
FLOOD PLAIN CERTIFICATION
LEGEND :
BUILDING SETBACKS
APPROVAL : TOWN COMMISSIONER
APPROVAL : CONSULTING SURVEYOR
APPROVAL : PLANNING DIVISION
APPROVAL : CLERK OF CIRCUIT COURT
DEDICATION
ACKNOWLEDGEMENT
CERTIFICATE OF SURVEYOR :

RESOLUTION R-2021-15

A RESOLUTION OF THE TOWN COUNCIL OF THE TOWN OF LAKE HAMILTON, FLORIDA ADOPTING A BUDGET AMENDMENT FOR THE TOWN OF LAKE HAMILTON FOR FISCAL YEAR 2020-2021; REFLECTING AN AMENDMENT TO REVENUE GENERATED TOGETHER WITH THE SOURCES OF THE REVENUE; DELINEATING AN AMENDMENT TO THE EXPENDITURES BY DEPARTMENT OF ACTIVITY; PROVIDING FOR CONFLICTS, SEVERABILITY, AND EFFECTIVE DATE.

WHEREAS, after a duly noticed meeting of the Town Council of the Town of Lake Hamilton, Florida, the 2020-2021 budget amendment was presented to the people of the Town of Lake Hamilton on November 2, 2021; and

WHEREAS, public comments and input were considered by the Town Council in approving the attached budget amendment.

NOW, THEREFORE, BE IT RESOLVED by the Town of lake Hamilton, Florida as follows:

1. The attached General Fund and Enterprise Fund budget amendments in "Exhibit A" for the Town of Lake Hamilton is hereby adopted and incorporated by reference.
2. The sums of money delineated therein, or as much as may be authorized by law, or as may be needed or deemed necessary to defray the expenses and liabilities of the Town are herein confirmed, ratified, and appropriated for the corporate purposes and objects of said Town herein specified.
3. This Resolution shall become effective immediately upon passage.
4. All resolutions or parts thereof in conflict herewith are hereby repealed.
5. Should a section, paragraph, clause, sentence, item, word, or provision of this Resolution be declared invalid by a court of competent jurisdiction, such decision shall not affect the validity of the remainder of this Resolution, as a whole or any part hereof, and shall not be declared invalid.

INTRODUCED AND PASSED by the Town Council of the Town of Lake Hamilton this _____ day of _____, 2021.

TOWN OF LAKE HAMILTON, FLORIDA

_____
MICHAEL KEHOE, MAYOR

ATTEST WITH SEAL:

_____
BRITTNEY SANDOVALSOTO, TOWN CLERK

Approved as to form:

_____
HEATHER MAXWELL ESQ., TOWN ATTORNEY

Record of Vote	Yes	No
Roberson	___	___
Tomlinson	___	___
O'Neill	___	___
Wagner	___	___
Kehoe	___	___

Exhibit A

Town of Lake Hamilton: General Fund					
Year End: September 30, 2021					
General Fund Budget to Actual					
Account	Actual	Budget	Variance	Amendment	Adj Budget
10.10 Taxes	1,245,539.00	1,158,753.00	86,786.00	86,786.00	1,245,539.00
10.20 Licenses & Permits	119,379.00	80,743.00	38,636.00	38,636.00	119,379.00
10.30 Intergovernmental Revenue	567,245.00	886,295.00	(319,050.00)	-	886,295.00
10.40 Charges for Services	382,860.00	366,418.00	16,442.00	16,442.00	382,860.00
10.50 Fines & Forfeitures	74,505.00	70,000.00	4,505.00	4,505.00	74,505.00
10.60 Other	67,695.00	48,116.00	19,579.00	19,579.00	67,695.00
30.10 Loan Proceeds	-	-	-	-	-
RESERVES	578,715.00	839,767.00	(261,052.00)	176,052.00	1,015,819.00
TOTAL RESOURCES	3,035,938.00	3,450,092.00	(414,154.00)	342,000.00	3,792,092.00
20.10.10 Council	663,274.00	440,660.00	(222,614.00)	264,000.00	704,660.00
20.10.20 Finance and Administration	232,308.42	245,755.00	13,446.58	-	245,755.00
20.10.30 Building and Planning	240,543.14	168,642.00	(71,901.14)	78,000.00	246,642.00
20.20 Law Enforcement	754,347.00	764,181.00	9,834.00	-	764,181.00
20.30 Sanitation	256,744.00	286,788.00	30,044.00	-	286,788.00
20.40 Streets	797,973.00	1,342,443.00	544,470.00	-	1,342,443.00
20.50 Parks	73,834.00	201,623.00	127,789.00	-	201,623.00
TOTAL APPROPRIATIONS/EXPENDITURES	3,019,023.56	3,450,092.00	431,068.44	342,000.00	3,792,092.00

Town of Lake Hamilton: Enterprise Fund					
Year End: September 30, 2021					
Enterprise Fund - Budget to Actual					
Account	Actual	Budget	Variance	Amendment	Adj. Budget
10.20 Licenses & Permits	44,067	57,983	(13,916)	-	57,983
10.30 Intergovernmental Revenue	2,142,801	1,506,199	636,602	636,602	2,142,801
10.40.01 Water Charges	593,893	629,580	(35,687)	-	629,580
10.40.02 Sewer Charges	37,832	25,000	12,832	-	25,000
10.60 Other	3,189	-	3,189		-
30.10 Loan Proceeds	(471,311)	(432,697)	(38,614)		(432,697)
RESERVES	991,261	740,626	250,635	192,657	933,283
TOTAL REVENUE	3,341,732	2,526,691	815,041	829,259	3,355,950
20.60 Water Expenditures	3,134,517	2,408,426	(726,091)	(717,868)	1,690,558
20.70 Sewer Expenditures	224,130	118,265	(105,865)	(111,391)	6,874
TOTAL EXPENDITURES	3,358,647	2,526,691	(831,956)	(829,259)	1,697,432
CHANGE IN NET POSITION	(16,915)	-	(16,915)	1,658,518	1,658,518

RESOLUTION R-2021-16

A RESOLUTION OF THE TOWN OF LAKE HAMILTON, FLORIDA; AUTHORIZING THE EXERCISE OF THE TOWN'S POWER OF EMINENT DOMAIN FOR THE PURPOSE OF ACQUIRING THE NECESSARY PROPERTY INTERESTS FOR THE TOWN OF LAKE HAMILTON WATER AND WASTEWATER IMPROVEMENT PROJECT

WHEREAS, the Town of Lake Hamilton, a political subdivision of the state of Florida (the "Town"), is responsible for constructing, improving, and maintaining public water and wastewater assets and utilities within its municipal limits; and

WHEREAS, the Town has determined the acquisition of certain property and property rights is necessary for the public purpose of providing water, wastewater, and utility services (the "Project" ;) and

WHEREAS, Westgate Resorts, Inc., a Florida Corporation, owns and operates a potable water supply, treatment, reuse, irrigation, transmission, and distribution system ("Water System") and a wastewater collection system ("Wastewater System") (with the Water System and Water System being jointly referred to as the "Utility System"), located in Polk County, Florida; and

WHEREAS, the Town has examined the assets comprising the Utility System, has examined their respective existing financial structures, has examined the long-range needs and goals of the Town relative to the provision of water and wastewater service to its present and future citizens, and has determined the acquisition of the Utility System is necessary for the public interest; and

WHEREAS, the Project requires, and therefore the Town intends to acquire the Utility System; and

WHEREAS, the Project will serve to improve the levels of service and public safety of the Town's public water, wastewater and utility services; and

WHEREAS, the Town has the authority to acquire and condemn private property in accordance with the Constitution and laws of the State of Florida including but not limited to Sections 166.401, 166.411, 180.06 and 180.22 and the provisions of Chapters 73 and 74, Florida Statutes; and

WHEREAS, the property described in attached Composite Exhibit "A" and identified as Parcel 100, which is the entire Utility System, is necessary for the Project; and

WHEREAS, the Town hereby finds the property described in Composite Exhibit A as Parcel 100 is necessary for acquisition for the Project as stated herein; and

WHEREAS, the Town has given great consideration to and has weighed the availability of alternative options, environmental factors, long range area planning, safety considerations, and costs, and has determined all necessary permits required by all governmental agencies have been obtained or are reasonably obtainable; and

WHEREAS, the Town has exercised good faith and sound judgment in the study of these factors and in reaching its determination that the acquisition of the Utility System is appropriate.

NOW, THEREFORE, BE IT RESOLVED by the town of lake Hamilton, a political subdivision of the state of Florida, that all of the foregoing facts are true, correct, and incorporated herein by reference; and it is

FURTHER RESOLVED the project is reasonably necessary and is for a public purpose, in the public interest, for the public benefit, and necessary to satisfy the responsibilities and duties of the town; and it is

FURTHER RESOLVED the acquisition of the required utility system for the project is hereby found to be reasonably necessary and for a public purpose, in the public interest, for the public benefit, and necessary to satisfy the responsibilities and duties of the town; and it is

FURTHER RESOLVED the Town Attorney, or his designees, together with the appropriate officials and employees of the Town, are hereby authorized and directed to acquire the necessary property interests by voluntary purchase, gift and/or eminent domain proceedings. In this regard, the Town Attorney or his designees shall proceed forthwith to institute such necessary and proper actions and proceedings and to comply with all legal requirements as may be necessary or proper for the acquisition of the Utility System as reflected in the attached Exhibit A; and it is

FURTHER RESOLVED if any phrase, portion, or part of this resolution is found to be invalid or unconstitutional by a court of competent jurisdiction, such phrase, portion or part shall be deemed a separate, distinct and independent provision and such holding shall not affect the validity of the remainder of the resolution; and it is

FINALLY RESOLVED this Resolution shall take effect immediately upon its adoption as dated below.

INTRODUCED AND PASSED by the Town Council of the Town of Lake Hamilton this _____ day of _____, 2021.

TOWN OF LAKE HAMILTON, FLORIDA

_____

MICHAEL KEHOE, MAYOR

ATTEST WITH SEAL:

_____
BRITTNEY SANDOVALSOTO, TOWN CLERK

Approved as to form:

_____
HEATHER MAXWELL ESQ., TOWN ATTORNEY

Record of Vote	Yes	No
Roberson	___	___
Tomlinson	___	___
O'Neill	___	___
Wagner	___	___
Kehoe	___	___

Memorandum

To: Town Council

From: Sara Irvine, Town Administrator

Date: October 31, 2021

Subject: Monthly Update

TRIM – Once again the town was in compliance with the State TRIM process for budget adoption.

American Rescue Plan Act – Lake Hamilton received $374,639.00 on September 15th. Per CPA Mike, I have put this money into a separate bank account (the former interest account for water line project). I also processed premium pay for certain employees as previously authorized by council. The second tranche of monies should be received in March. We cannot use the money for road improvements.

CDBG Stormwater Project – We have received the reimbursement from the State for this project, $632,912.63.

Audit – Staff is working with CPA Mike and Auditor Ramos on the fiscal year end audit.

Holiday office closures: Thursday, November 11th – Veteran's Day

Thursday and Friday, November 25th-26th – Thanksgiving
Early close Wednesday, December 22nd for holiday party – Place TBD
Thursday and Friday, December 23rd-24th – Christmas eve and day (Saturday)
Friday, December 31st – New Year's Day (Saturday)

Fiscal Coordinator Position – I have received three applications. Only one has municipal experience.

Memorandum

To: Town Council

From: Town Clerk, Brittney Sandovalsoto, CMC

Date: October 29, 2021

Subject: Monthly Update

New water rates have gone into effect for this fiscal year, they were increased by 3.5% per CPI.

Our Business Tax Receipt Ordinance is very outdated, and the schedule of businesses needs to be updated so we are working on that with Heather. We hope to have something ready for the December meeting to update the schedule and raise the rates again to get to a more viable level per Council consensus 2 years ago.

Ashley has been training to receive and review BTR's and she has taken on the duty of reviewing and issuing those. She is also actively training on receiving building permits and learning the requirements for each type of permit. She has adapted to her role and has been delegated further duties with no issues.

There will be an election in Lake Hamilton in 2022, and we will begin preparing for that in the Clerk's office.

Other business as usual.

From the Desk of …

Chief Michael Teague

August 1, 2021

TO: Staff

SUBJECT: Council Report

June Items:

- Officer Gilman left for Haines City PD.
- 4 Applicants attended the Oral Board 3 have moved onto Polygraph.
- Chief attended updated Taser instructor Training.
- ALPR Cameras still to be installed on Speed Trailer.
- Planning and working on Back to School Splash.
- Chief was out with some medical procedures and ended up in the hospital.
-

Michael Teague

LAKE HAMILTON POLICE DEPARMI
PO Box 126, 100 Smith Ave, Lake Hamilton, FL 33851
PHONE: 863-437-4711/ FAX: 863-439-1136

OCTOBER 2021 - MONTHLY ACTIVITY REI

	TOTAL CALLS
ABANDONED/ IMPOUNDED	1
ABANDONED / FOUND PROPERTY	0
ABDUCTION	0
AED ASSIST	1
ALARM	7
ANIMAL COMPLAINT	0
ANIMAL COMPLAINT - DOMESTIC	0
ANIMAL COMPLAINT - LIVESTOCK	0
ANIMAL COMPLAINT - WILDLIFE	0
ASSAULT	0
ASSAULT - AGGRAVATED	0
ASSIST OTHER AGENCY	13
ATTEMPT TO CONTACT	2
BATTERY	0
BATTERY - AGGRAVATED	0
BATTERY - DOMESTIC	0
BURGLARY - BUSINESS	0
BURGLARY - CONVEYANCE	0
BURGLARY - RESIDENTIAL	0
BURGLARY - STRUCTURE	0
CHILD ABUSE	0
CRIMINAL MISCHIEF	0
CRUELTY TO ANIMALS	0
CURFEW VIOLATION	0
CUTTING	0
DANGEROUS SHOOTING	0
DEATH INVESTIGATION	0
DIRECTED TRAFFIC ASSIGNMENT	6
DISABLED VEHICLE	8
DISTURBANCE - CIVIL	4
DISTURBANCE - FAMILY	0
DISTURBANCE - JUVENILE	0
DISTURBANCE - NOISE	2
DISTURBANCE - VEHICLE NOISE	0
DISTURBANCE - WEAPON	0
DISTURBANCE	8
DROWNING	0
DRUNK DRIVER	0

DRUNK PERSON	0
ESCAPED PRISONER	0
EXCITED DELIRIUM	0
EXTORTION	0
FELONY	0
FIGHT	0
FILING FALSE REPORT	0
FIRE	1
FIRE ASSIST	0
FIRST RESPONDER REQUEST	0
FRAUD/FORGERY/COUNTERFEITING/UTTERING	1
FUNERAL ESCORT	0
GAMBLING	0
GRAND THEFT	0
HARRASSING PHONE CALLS	1
HIT & RUN FATALITY	0
HIT & RUN INJURIES	0
HIT & RUN PROPERTY DAMAGE ONLY	1
HIT & RUN SERIOUS INJURY TO RESULT IN DEATH	0
HITCHHIKER	0
HIGHWAY OBSTRUCTION	2
IDENTITY THEFT	0
INDUSTRIAL ACCIDENT	0
INFORMATION	88
INJURED PERSON	0
INVESTIGATION	2
LAW ENFORCEMENT CALL	0
LEWD ACT	0
LITTERING	0
LOST PROPERTY	0
LOST/ABANDONED TAG OR DECAL	1
MAIL THEFT	0
MEDICAL ASSIST	0
MENTALLY ILL PERSON	1
MISDEMEANOR	0
MISSING / ENDANGERED PERSON	0
MOLESTING	0
MURDER	0
NARCOTICS VIOLATION	1
NATURAL DISASTER	0
OPEN DOOR / WINDOW	1
OVERDOSE	0
PATROL BUSINESS	861
PATROL REQUEST	1
PATROL RESIDENCE	4
PERIMETER CHECK	35
PETIT THEFT	1

POSS FIREARM BY FELON	0
PROPERTY DAMAGE NON-CRIMINAL	0
PROWLER	0
RESISTING OFFICER	0
RETAIL THEFT	0
RIOT	0
ROBBERY	0
RUNAWAY	0
SERVE CIVIL PROCESS	0
SEXUAL BATTERY (FAMILY,UNK,KNOWN)	0
SHOOTING/THROWING MISSILE INTO BUILDING	0
SHOOTING/THROWING MISSILE INTO VEHICLE	0
SHOOTING/ PERSON	0
SOLICITATION VIOLATION	0
SPECIAL DETAIL	8
STOLEN TAG / DECAL	0
STOLEN VEHICLE	1
STOLEN VEHICLE RECOVERED	0
SUBJECT STOP	0
SUICIDE ATTEMPT	2
SUSPICIOUS AIRCRAFT	0
SUSPICIOUS INCIDENT	2
SUSPICIOUS PERSON	3
SUSPICIOUS VEHICLE	8
TAMPERING	0
THEFT	0
TRAFFIC ASSIGNMENT	0
TRAFFIC COMPLAINT	3
TRAFFIC STOP	52
TRESPASSING	1
UNCONFIRMED EMERGENCY	8
VEHICLE CRASH	11
WORTHLESS CHECK	0
VIOLATION OF INUNCTION	0
WARRANT / CAPIAS ARREST	1
OVERALL TOTAL	**1163**

	TOTAL CITATIONS
CRIMINAL TRAFFIC	9
NON-CRIMINAL TRAFFIC	35
PARKING TICKETS	0
WARNINGS	27
OVERALL TOTAL	**35**

	TOTAL WGT / VALUE
Recovered Cannabis	
Recovered Cocaine	

Recovered Meth	
Recovered Heroin	
Recovered Pills	
Seized Currency	
Based on Property received in Prop Room and not marked Dispo=COR Action=FX	

ENT

PORT

TOTAL ARRESTS
0
0
0
0
0
0
0
0
0
0
0
0
0
0
0
0
0
0
0
0
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TOTAL ARRESTS
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TOTAL ARRESTS

STAT SHEET **21-Oct**

Officer		Calls	Reports	Checks	FIR	Arrest-T	Arrest-F	Arrest-M	Arrest-W	R-Cannabis	R-Cocaine	R-K2	Pills	R-Meth	R-Firearms	S-Currency	S-Vehicles	Accidents	Citations	CR-Citations	Warnings	Community Outreach	Training Hours
Teague		40	6	20														4	8		3		
Giffin		49	8	2		1		1										2	4	1	8		
Knecht		337	6	289																			
Lorenzo		84	6	40		1		1										5	1	1	4		
Weissman		534	11	428		7		7										1	15	7	12		14
Hylton		1	1																				
Meyer																							
Total		**1045**	**38**	**779**	**0**	**9**	**0**	**9**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**12**	**28**	**9**	**27**	**0**	**14**
Reserve Hrs																							

STAT SHEET	21-Oct										
Officer		Citations	Reports/SAO	Admin Calls	Evidence Items	Validations	Visitors	Supoenas	Accidents Mailed	Emails Checked	Training Hours
Gina		35	15	106	3		70	4	15	1180	8
Total		**35**	**15**	**106**	**3**		**70**	**4**	**15**	**1180**	**8**

Monthly Proficiency Reports -August 2021
Lake Hamilton Police Department
Patrol

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec	Year to Date	Same Month Last Year	(+ / -) (%)
Patrol															
Calls	2442	1680	1438	1460	1661	1536	1487	1344	1335	1045			**15428**	**2066**	(-) 49%
Lima	63	54	44	34	46	51	33	61	43	38			**467**	**66**	(-) 42%
Warrant Arrest	0	0	3	1	1	0	1	2	0	0			**8**	**1**	(-)100 %
Felony Arrest	4	2	3	1	4	0	0	2	1	0			**17**	**2**	(-)100%
Misd. Arrest	20	8	4	3	15	5	3	10	5	9			**82**	**19**	(-) 53%
Total Arrest	24	10	10	5	20	5	4	12	6	9			**105**	**22**	(-) 59%
Cannabis	7.8	0	0	0	0	0	0	104	0	0			**111.8**	**32.1**	(-) 100%
Cocaine	0	0	0	0	0	0	0	0	0	0			**0**	**0**	(+-) 0%
Methamphetamine	0	0	0	0	0.4	0	0	0	0	0			**0.4**	**0**	(+-) 0%
Firearms	0	0	0	1	0	0	0	0	0	0			**1**	**0**	(+-) 0%
Pills	0	0	0	0	0	0	0	0	0	0			**0**	**6**	(-) 100%
K2	0	0	0	0	0	0	0	0	0	0			**0**	**1.5**	(-) 100%
Traffic															
Citations	123	44	43	35	68	59	49	57	38	28			**544**	**118**	(-) 76%
Criminal Citations	18	8	6	2	15	5	1	9	7	9			**80**	**13**	(-) 37%
Warnings	183	100	117	83	110	51	69	37	54	27			**831**	**331**	(-) 92%
Crashes	9	7	9	16	8	11	4	9	9	12			**94**	**9**	(+) 25%
DUI	0	0	0	0	0	0	0	0	0	0			**0**	**0**	(+-)0%
DRE	0	0	0	0	0	0	0	0	0	0			**0**	**0**	(+-) 0%
K9															
Deployments	0	0	0	0	0	0	0	0	0	1			**1**	0	(+)100%
Apprehensions/Arrests	0	0	0	0	0	0	0	0	0	0			**0**	0	(+-)0%
Hours Trained	0	40	80	0	10	43	17	0	0	14			**204**	0	(+)100%
Demos	0	0	0	0	0	0	0	0	0	1			**1**	0	(+)100%
Searches	0	0	0	0	0	0	0	0	0	1			**1**	0	(+)100%
Heroin	0	0	0	0	0	0	0	0	0	0			**0**	0	(+-)0%
Patrol Cont															
														0	(+-)0%
Seized Vehicles	0	0	0	0	0	0	0	0	0	0			**0**	0	(+-)0%
Deaths	0	0	0	0	0	0	0	0	0	0			**0**	0	(+-)0%
Seized Currency	0	0	0	0	0	0	0	0	0	0			**0**	0	(+-)0%

Memorandum

To: Town Council

From: Community Development Department, Doug Leonard & Angie Hibbard

Date: October 28, 2021

Subject: Monthly Update

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1. **CDBG Lake Gordon Stormwater Project –** We have received final reimbursement payment and the final close out package has been sent to DEO.
2. **USDA Water Distribution System Improvement Project -** The construction of the project is complete but there is a final verification pending before close out can proceed.
3. **State Road 17 (Scenic Highway) Septic to Sewer Project** – Project is on temporary hold.
4. **The Grand at Lake Hamilton –**ECON Engineering has been sent a letter stating that the application is complete, and we now have 120 days to complete our review. The town engineer and Public Works Director have both started their review. Sara continues to work with Dundee town manager to develop an interlocal, which she will address at the meeting.
5. **Scenic Terrace South –** The application for approval of construction plans has been submitted and is being reviewed by staff and Pennoni.
6. **Hamilton Bluff –** We are still communicating with the developer and anticipate the next submittal before the end of the year.
7. **Planning Project with Calvin, Giordano & Associates (CalGA) –** At the direction of the council we are reopening discussions with the consultant about the Hwy 27 Overlay district and the Land Uses Chart.
8. **FRDAP -** We had a temporary pause for proceeding. We should resume with the project in the next month.
9. **Water Use Permit Renewal –** We have until December 17th for the initial reply to SWFWMD request for additional information (RAI). After a call with Angie, Roger Homann from Pennoni and SWFWMD we understand we can request an additional 90 days to reply and slow the project slightly. We anticipate making this request prior to the 90 days. This will allow us to get some needed agreements from developers as support documents to submit with the RAI and give SWFWMD time to define some directives in the CFWI.
10. **Repaving & Road Project –** Project is on hold. Sara has requested the project to be submitted as a Heartland Headwater project through the PRWC.
11. **Planning Commission** – The planning commission is reviewing the change in permitted uses at the direction of the Council and the sign ordinance. They made the recommendation for a temporary sign moratorium presented at the October special meeting.
12. **39 Mile Yard Sale** – Date is November 6th we are one of only four locations this year and spots are $20 each. Spaces are still available.

Memorandum

To: Town Council

From: The Director of Public Work and Utilities

Date: 10/28/21

Subject: Monthly Update for work performed in October 2021

Sanitation: Lost another employee, but Amanda is going to get her CDL

Parks: Normal Operations.

Streets: We have done a ton of potholing, so the streets are better than usual.

Water: Water distribution project is complete.

Sewer: Normal Operation

Town Hall: Waiting on final inspection and fire inspection