PRELIMINARY ENGINEERING REPORT

CLEARWATER BEACH MARINA UTILITIES AND DRAINAGE IMPROVEMENTS CITY PROJECT NUMBER 14-005-MA

Prepared for:

100 South Myrtle Avenue

Clearwater, Florida 33756

Prepared by:

URS

7650 West Courtney Campbell Causeway, Suite 700
Tampa, Florida 33607-1462

January 22, 2015

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

Utility services for the Clearwater Beach Marina (Beach Marina) have been installed at various times and the resulting facilities are becoming difficult to access and maintain. Additionally, the Beach Marina does not have a storm water treatment system.

The City of Clearwater (City) would like to reconstruct the utilities that service the Beach Marina customers. The City tasked URS with reviewing the existing utilities and defining options for replacing or relocating them. Based on discussions with City staff, the goal is to consolidate utilities into a common corridor and to provide access for maintenance, modifications, and repairs. All utilities that are in close proximity to the seawall were considered in the recommendations made and additional locations for future utilities were considered. Surveys, markups, and discussions with utilities owned and not owned by the City and were made available to URS and were taken into consideration in this report.

For reasons presented herein, the proposed method for consolidation is to construct a precast utility trench on the north side of the existing sidewalk located adjacent to the seawall. The trench can be ordered and constructed with traffic-rated materials, including concrete covers. If the trench is ordered with sufficient width, it can allow access for drops, pull boxes, and maintenance to existing utilities within the trench. The precast trench, unlike a duct bank, can be constructed in 10 feet sections allowing for the resolution of conflicts. Additionally, the location was recommended due to the presence of seawall tiebacks and dead-men to limit conflicts.

Due to cost considerations, storm water treatment is not recommended as part of this project. The Beach Marina elevation and existing storm water drainage would require either the entire site to be re-graded or a new large collection system and pump station to be constructed. To keep the existing boat slips in substantial use with limited interruption, a pump station would have to be constructed and a storm water pond would need to be constructed offsite. It is unclear where a pond could be constructed in close proximity (less than 1,000 feet) to the site, but the calculated rate of flow for storm water collection would be significant for a pump station application.

Based on review of the existing telephone system, and discussions with the owner (Verizon) it is recommended that the system stay separate but the number of lines be decreased significantly. There are 400 existing telephone service line pairs that provide telephone service to the existing

facility. It was noted that the majority of the lines are now rarely used and are frequently in disrepair, especially the service lines to the individual boat slips along the East Dock and Main Dock.

The estimated construction cost is based on historical values for similar projects with a significant amount of representative projects included for the Florida Department of Transportation. Cost estimates also include the approximate equipment required, similar project experience, and a contingency based on the relative certainty of the project. URS does not control the cost of construction and cannot be held liable for differing costs at the time of design or construction for the project. The estimated construction cost for the replacement of the utility trench is approximately $1,250,000 including updating wiring on the docks. There are also improvements required for the telephone system estimated at $125,000 and the power distribution panel, estimated at $75,000. Storm water treatment improvements are cost prohibitive and estimated at $7,000,000. The Engineer's opinion for construction cost for the recommended improvements totals approximately $1,450,000 including contingencies. An immediate need project was identified during the review of the area, the power feed to the western Main Docks. Based on calculations, the feed is undersized and should be replaced along with the downstream distribution panel. It is estimated that the replacement will cost approximately $150,000. Please see **Appendix A** for a breakdown of each cost estimate.

1.0 INTRODUCTION

1.1 General Description

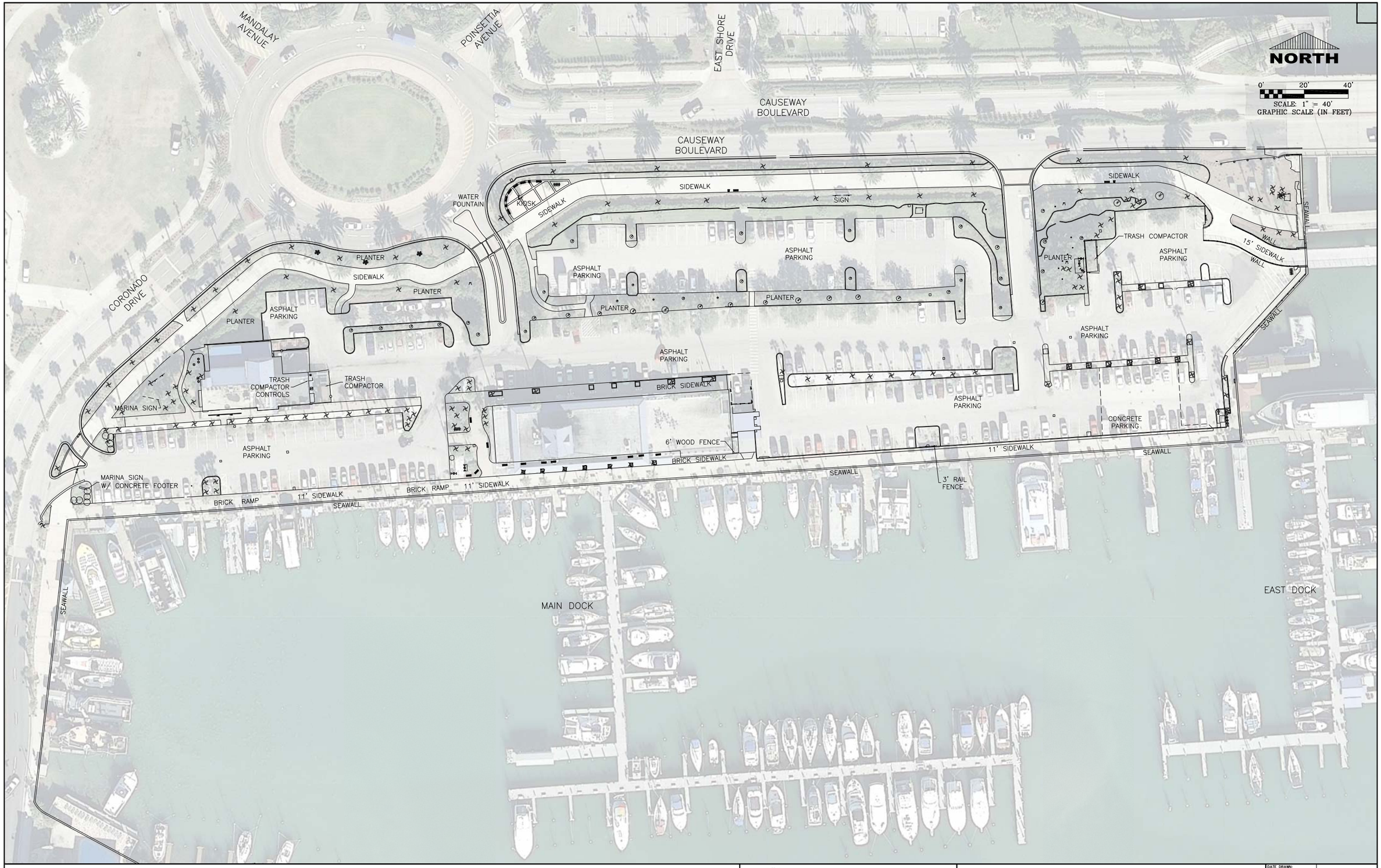
The City of Clearwater (City) owns and operates two marinas that serve as commercial, recreational, and transient docks. The City's two marinas are the Clearwater Harbor Marina (Harbor Marina) and Clearwater Beach Marina (Beach Marina). The Beach Marina was constructed in the 1950s and its main building is located at 25 Causeway Boulevard, just across the round-a-bout from Pier 60 and Clearwater Beach. The Beach Marina has commercial, recreational, and transient docks available for use and includes a total of 207 boat slips. The marina is near capacity of commercial vessels and is heavily utilized. The Harbor Marina was constructed in 2010 with 126 boat slips. Since the utility and drainage system are modern, this City Marina was note evaluated.

Due to the age of the Beach Marina, many upgrades and replacements in utilities have taken place over the years. The location for the utilities has typically been adjacent to or along the seawall as the utilities are present to serve the marina customers. While this location has been ideal for the distribution of utilities, it can lead to conflicts with site access when the utilities are being repaired or maintained as they are installed under the sidewalk. The other option utilized for utility installation has been to install the utilities in a location that may result in a decreased life, such as hanging them from the outside of the seawall.

URS Corporation Southern (URS) was tasked with evaluating the existing utilities and drainage at the Beach Marina and developing a Preliminary Engineering Report with alternatives for consolidating the utilities and addressing drainage issues at the site. A project location map is included as **Figure 1.**

1.2 Purpose

The purpose of this report is to evaluate the existing site utilities present within the Beach Marina along the seawall and provide options for allowing better access to the utilities and to make them more orderly. Additionally, it was noted that during high rain events, storm water flows over the seawall without treatment and it is desired to intercept the storm water and provide treatment.



	CITY OF CLEARWATER, FLORIDA ENGINEERING DEPARTMENT 100 S. Myrtle Ave. Clearwater, Fl 33756	Clearwater Marina Parking Lot PROJECT LOCATION MAP	DATE DRAWN: 10-17-2014 DRAWN BY: JRS CHECKED BY: LR DESIGNED BY: DAW JOB NO.: 2013022 FIGURE NO. 1

The utilities URS was specifically tasked to evaluate were those that provide service to the docks and are typically located beneath the sidewalk. It is anticipated that the sidewalk must be reconstructed after the utilities are relocated or reconstructed and the cost should be included in any of the alternatives selected.

2.0 UTILITIES AT CLEARWATER BEACH MARINA

URS reviewed recent survey data along with markups and as-built drawings from various utility providers for the Beach Marina. Additionally, URS performed a site visit to observe the condition and approximate location of the utilities at the site. The following utilities were present at the site:

1. Fire Water (Local Service)
2. Potable Water (Local Service)
3. Potable Water Transmission
4. Potable Water Distribution
5. Reclaimed Water Transmission
6. Storm Water Collection (Local Service)
7. Gas Distribution
8. Gas (Local Service)
9. Telephone (Local Service)
10. Power Distribution (12.470 kV and 7.2 kV)
11. Power (Local Service, 208/120 V)
12. Traffic Signal Power (Local Service)
13. Cable (Local Service)
14. Fiber Optic (Local Service)
15. Pressure Wastewater (Local Service)
16. Gravity Sewer (Local Service)
17. Fuel (Local Service)

It should be noted that some utilities were recently reconstructed, are main distributors, or only pass through the site and may not require improvements. While the above utilities were present and must be considered in any of the alternatives presented, it was noted that some utilities are not present in the local project site. The main utilities addressed in this report include:

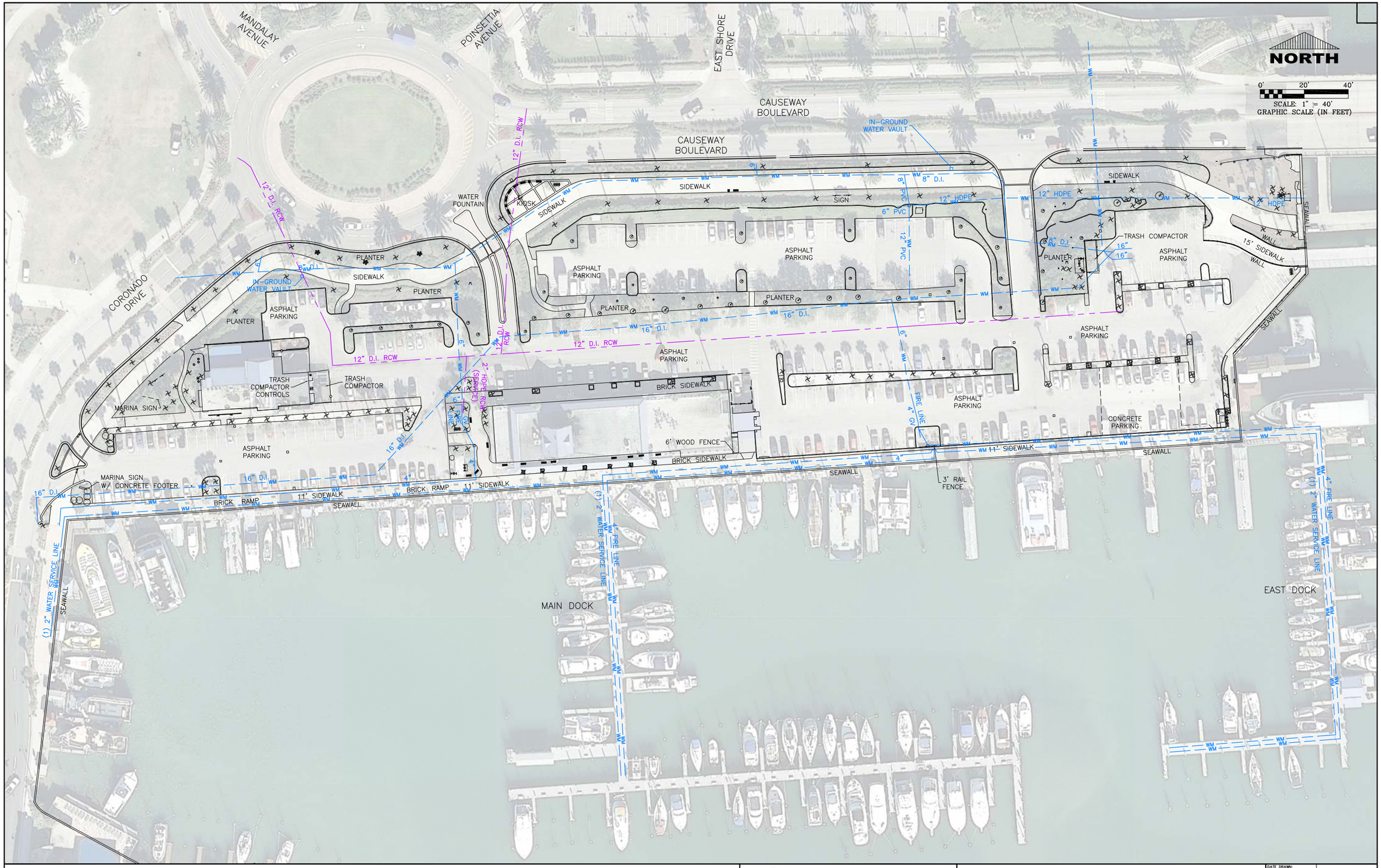
1. Fire Water (Local Service)
2. Potable Water (Local Service)
3. Storm Water Collection (Local Service)
4. Telephone (Local Service)
5. Power (Local Service, 208/120 V)
6. Cable (Local Service)

The following sections summarize the existing utilities and their apparent condition based on the available information.

2.1 Existing Water and Reclaimed Water Mains

The Beach Marina parking lot appears to have been part of various upgrades to Causeway Boulevard. The parking lot is utilized as a route for transmission of utilities, including an 8-inch line that becomes 12-inch water main on the north end of the parking lot going east-west which is adjacent to Causeway Boulevard. There is also a 16-inch water main running north-south on the eastern half of the parking lot and turning east-west near the eastern entrance to the Beach Marina. Additionally, there is a 12-inch reclaimed water main running primarily east-west through the parking lot approximately 40 feet north of the marina building. While the 8/12-inch water main and 12-inch reclaimed water main appear to stay north of the area of concern, the 16-inch water main turns south as it proceeds west and is installed approximately 10 feet north of the south curb line of the parking lot as it proceeds west of the Beach Marina's main building. **Figure 2** illustrates the existing water mains in the Beach Marina.

There are additional interconnections between the two water mains that apparently allow for better distribution and hydraulic conditions for the mains. However, the two water mains that appear to service the marina site are a 6-inch water main running north-south that is connected to the 16-inch water main on the east side of the marina building and an additional 6-inch water



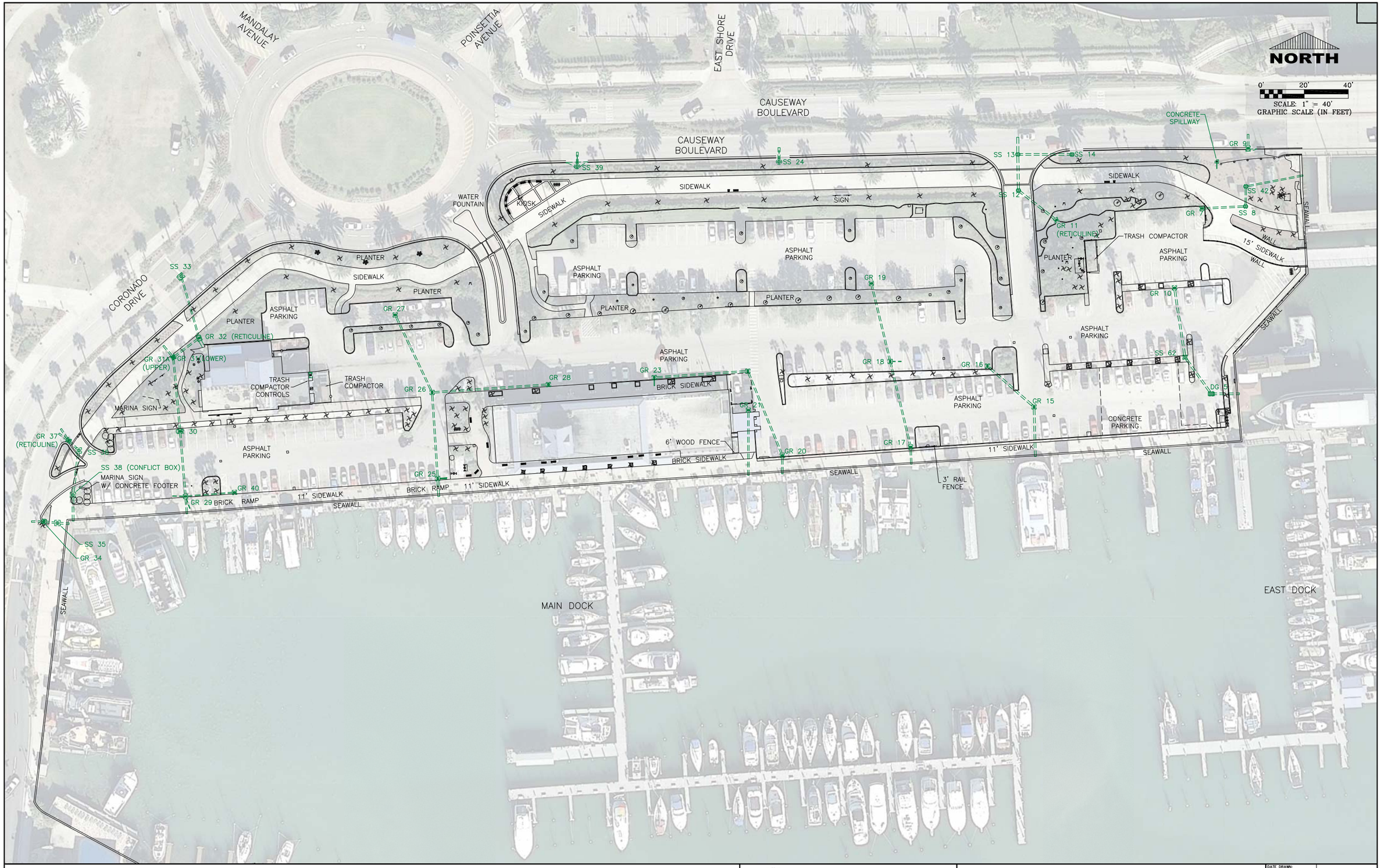
	CITY OF CLEARWATER, FLORIDA ENGINEERING DEPARTMENT 100 S. Myrtle Ave. Clearwater, Fl 33756	Clearwater Marina Parking Lot WATER & RECLAIMED WATER MAINS	DATE DRAWN: 10-17-2014 DRAWN BY: JRS CHECKED BY: LR DESIGNED BY: DAW JOB NO.: 2013022 FIGURE NO. 2

main running north-south that is connected to the 8-inch water main on the west side of the marina building. The reclaimed water main appears to have limited services, primarily for providing irrigation to the various planters throughout the site.

The 6-inch water lines appear to directly feed the 4-inch fire mains that service the marina. The water mains that service the marina appear to be between 1 and 2-inch, depending on the location. It was not determined where the connection was made to the main line but it was apparent from visual inspection that the fire main and the potable service mains remained separated throughout the length of their linear runs and both mains are installed under the sidewalk in an east-west direction.

2.2 Existing Storm Water

The existing storm water system for the Beach Marina facility numerous storm water structures collecting storm water and conveying the water to waters of the marina, directly through the seawall. Approximately 11 storm water outlets were visible discharging storm water to individual seawall outfalls while 1 structure collected storm water and discharges the water to a drainage system in the Causeway Boulevard area. The storm water piping is typically 12 to 18-inch with one smaller 8-inch pipe that appears to have been added for additional collection east of the main marina building. The drainage appears to generally flow from north to south with some collection lines having more than one inlet and the eastern collection system including outlets to the east. It should be noted that all outfalls from the marina appeared to have inverts near or below sea level and the collection system does not include treatment. **Figure 3** illustrates the existing storm water collection system in the Beach Marina.



CITY OF CLEARWATER, FLORIDA
ENGINEERING DEPARTMENT
100 S. Myrtle Ave.
Clearwater, Fl 33756

Clearwater Marina Parking Lot
STORM WATER SYSTEM

DATE DRAWN:	10-17-2014
DRAWN BY:	JRS
CHECKED BY:	LR
DESIGNED BY:	DAW
JOB NO.:	2013022

FIGURE NO. 3

2.3 Existing Wastewater and Fuel Services

The Beach Marina parking lot has limited sewer services and an onsite fueling service. While these two items are typically unrelated, they are installed in close proximity to each other and are discussed together below.

There is an east-west sanitary sewer collector that gathers waste flow and proceeds to the west. The sanitary collection system consists of four manholes that are installed approximately halfway between Causeway Boulevard and the waters of the marina. The first inlet is in manhole 4, as labeled in **Figure 4,** which includes a force main that is connected to an onsite pump station (Lift Station 81). There is an existing pump-out on the easternmost dock near transient boat slips. The pump-out allows emptying of wastewater holding tanks with a pump that was recently replaced. The pump-out conveys its waste directly to the onsite pump station, Lift Station 81, which conveys its flow to the eastern manhole described previously. **Figure 4** illustrates the existing wastewater collection system in the Beach Marina. The photos below are of the existing vacuum waste pump and of the existing Lift Station 81.

Pump out vacuum waste pump

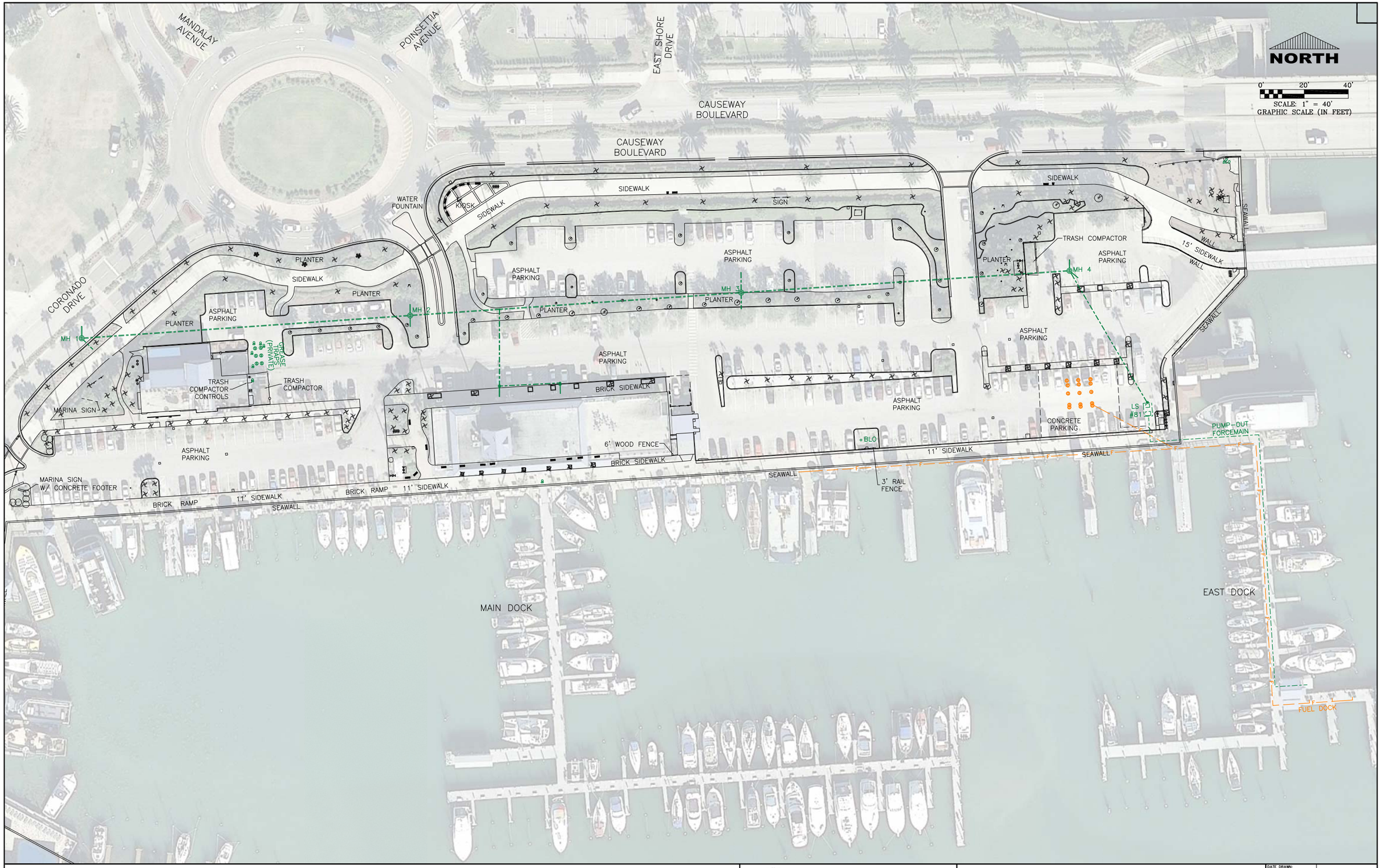
Existing Lift Station 81

As the collected wastewater proceeds to the west, it collects lateral flow from the marina, restaurants, and other sources. The gravity piping eventually discharges from manhole 1, which is located just off-site from the Beach Marina, flowing north to an existing gravity wastewater collection system.

Similar to the wastewater, the fueling system begins in the east end of the Beach Marina. Near the southeast corner of the marina, approximately 50 feet west of the sanitary pump station, lies fuel storage vaults buried beneath the parking lot. According to information provided, the fuel tanks are relatively new and it is not expected that the fuel system will need to be addressed as part of this project. The fuel mains are installed beneath the docks in parallel with the pump-out waste piping and the fueling docks are adjacent to the pump-out location on the East Dock. The fuel and fuel storage facilities are reportedly limited to the southeast corner of the marina, except for a fuel main that extends along the seawall from east to west for use in some of the larger boat slips. **Figure 4** illustrates the existing fuel system in the Beach Marina.

2.4 Existing Gas Services

The Beach Marina has an existing 4-inch natural gas distribution main that is installed east-west in the parking lot just to the north of the restaurant located at 37 Causeway Boulevard,



CITY OF CLEARWATER, FLORIDA
ENGINEERING DEPARTMENT
100 S. Myrtle Ave.
Clearwater, Fl 33756

Clearwater Marina Parking Lot
WASTEWATER & FUEL LINE SYSTEMS

DATE DRAWN:	10-17-2014
DRAWN BY:	JRS
CHECKED BY:	LR
DESIGNED BY:	DAW
JOB NO.:	2013022

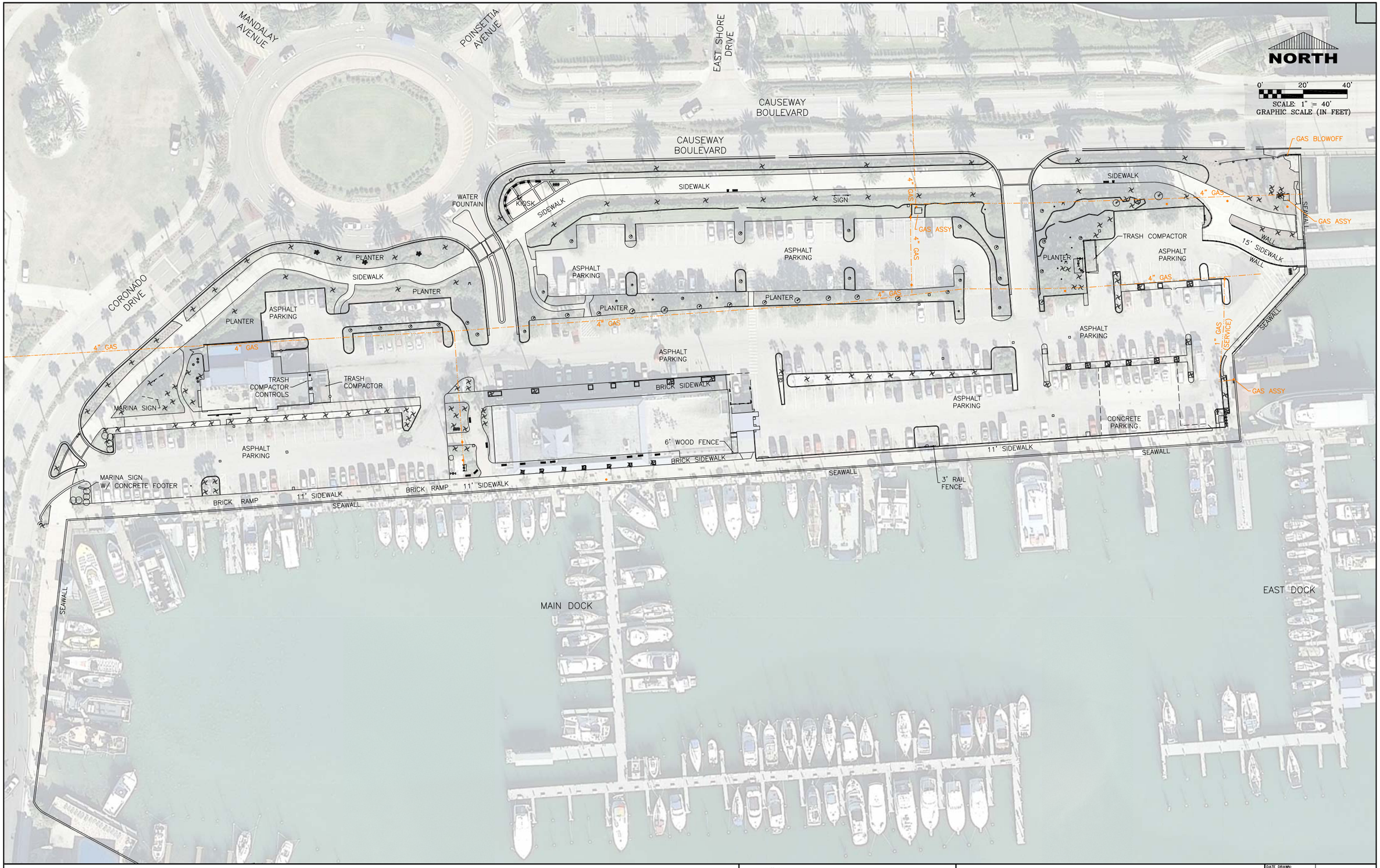
FIGURE NO. 4

approximately 15 feet south of the gravity sewer lines. The main gas service is primarily for the restaurant located at 37 Causeway Boulevard and the restaurant being renovated in the main marina building. Discussions indicated that the docks do not typically utilize the gas service. **Figure 5** illustrates the existing natural gas distribution system in the Beach Marina.

2.5 Existing Telephone Services

The Beach Marina has an existing duct bank of telephone services installed in the center of the sidewalk along the seawall. The lines extend from the northeast corner, traveling south into the site at the southeast corner of the marina. The phone lines are local, only, and reportedly service the docks, marina, and restaurants. Due to the number of dock slips and restaurants present, there are reportedly 400 pairs of wires coming in via two 200 pair cables. The southeast dock has roughly 50 pair while the smaller docks have approximately 5 pair, each. The main dock has an additional 50 pair of wires. This leaves approximately 260 pair going to the marina, restaurant, and commercial docks. The photo below is of a pull box just south of the Beach Marina building.

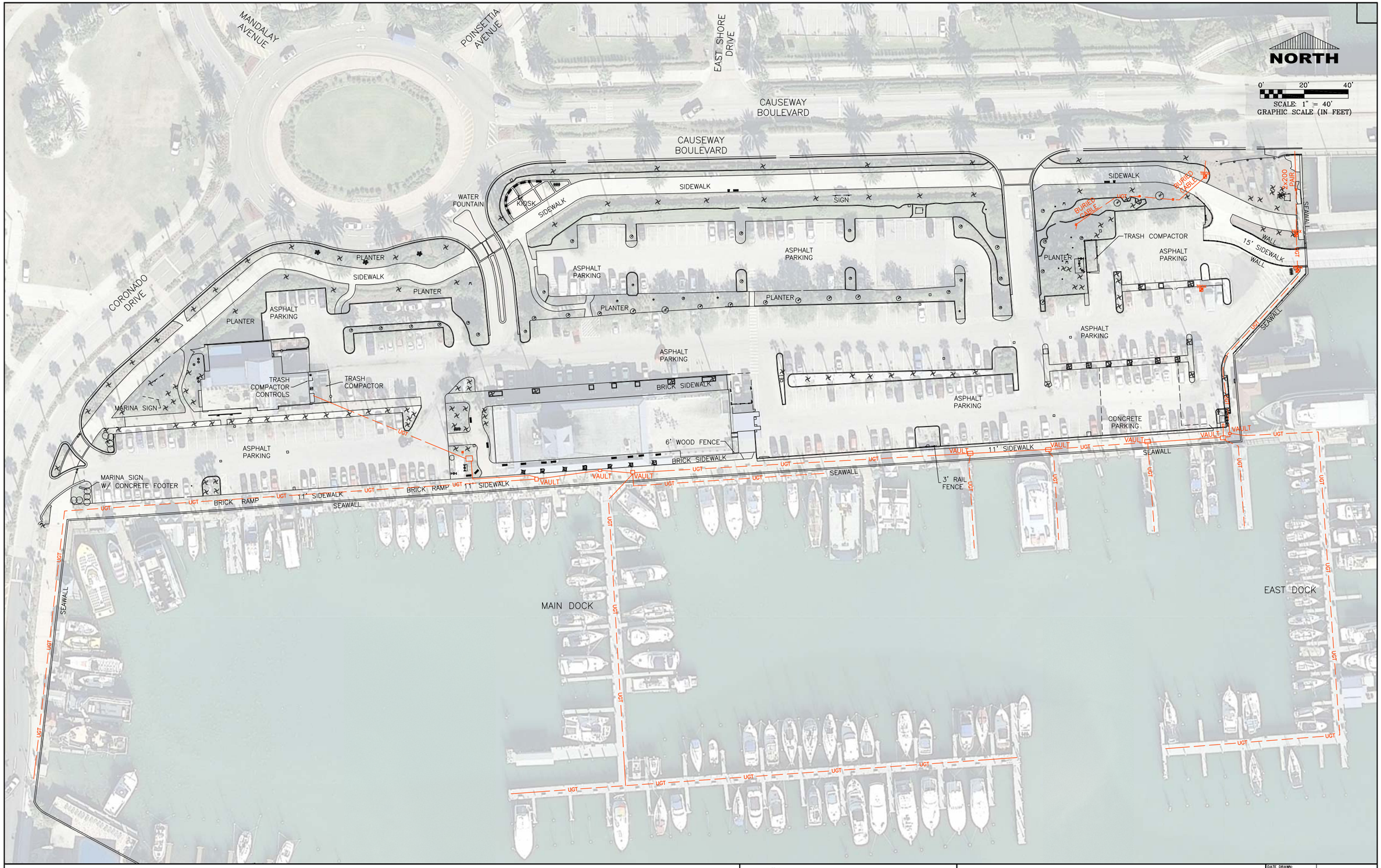
Verizon pull box in sidewalk



	CITY OF CLEARWATER, FLORIDA ENGINEERING DEPARTMENT 100 S. Myrtle Ave. Clearwater, Fl 33756	Clearwater Marina Parking Lot GAS LINES	DATE DRAWN: 10-17-2014 DRAWN BY: JRS CHECKED BY: LR DESIGNED BY: DAW JOB NO.: 2013022 FIGURE NO. 5

While earlier technology necessitated the 400 pair of telephone wires, it was noted that less than 15% of the wires are now typically utilized. There are roughly 25 pair of wire going to the commercial docks, 12 pair to the restaurants, and 25 pair going to the marina that are typically utilized. Based on discussions with Verizon, there have been some recent issues with the wires on the western end of the marina and there have been issues during construction due to the number of telephone wires and their purpose.

Currently the Beach Marina offers telephone connection at each boat slip. However, it has been noted that they are rarely utilized and may no longer be needed. If the phone cables were to be relocated and replaced, Verizon would recommend decreasing the number of pairs present to allow for a more optimized network, decreased footprint, and decreased relocation price. **Figure 6** illustrates the existing telephone service lines in the Beach Marina.



	CITY OF CLEARWATER, FLORIDA ENGINEERING DEPARTMENT 100 S. Myrtle Ave. Clearwater, Fl 33756	Clearwater Marina Parking Lot TELEPHONE LINES	DATE DRAWN: 10-17-2014 DRAWN BY: JRS CHECKED BY: LR DESIGNED BY: DAW JOB NO.: 2013022	FIGURE NO. 6

2.6 Existing Power Mains and Services

The purpose of this section of the report on the facility's infrastructure is to provide a cursory overview of the existing electrical systems based on observation and to develop a preliminary list of items that may need to be considered for maintenance, improvement or replacement. Information contained herein is based upon readily observable conditions and conversations with staff at the marina. The installed electrical equipment appeared to vary from 20-40 (or older) years in age.

Marina Primary Power Distribution

The north right of way of the Beach Marina is a main route for underground power distribution loop from the mainland to Clearwater Beach and Sand Key. The site conveys two circuits of medium voltage power at 12.47/7.2 kV 3 phase, through the area with numerous vaults and buried conduits located in the right of way along the north and west sidewalks bordering Causeway Boulevard to the north and Coronado Drive to the east. Electrical service to the Beach Marina is provided by three loop fed transformers that derive 120/208V 3-phase power. The pad mounted transformers are located in two locations on the site. On the east side of the marina property there is a primary loop that feeds one transformer, and there is a primary loop that supplies two transformers to the west of the marina building.

West Marina Power Distribution

Adjacent to the west side of the marina building is a 300kVA 120/208V step down transformer that supplies power to the marina slips and docks. In addition, Duke Energy has installed a new

second utility transformer to service the marina building and out parcel restaurant. The transformers primary feeder is loop fed via a north-south easement through the parking area to the west of the marina office building from a vault on the north sidewalk. Adjacent to the transformer location is the original concrete transformer vault structure that is partially above ground. While the vault is no longer used to

house transformers, it is being used as a manhole to route the secondary cables.

Interior view of the Duke Energy vault at the west service location

Electrical utility metering on the 300 kVA transformer at the west electrical service consists of two meters for the marina and one meter for the local traffic controls located next to the vault. The outparcel restaurant is metered at the restaurant. The new utility transformer for the marina building is also independently CT metered. Metering for the individual boat slips is provided by private meters located at the slip power pedestals. At this location there are two meters and electric services that supply the marina slips that are discussed further in this report. The first of these meters is the power source for the main dock. The second meter is the power source for the slips located along the seawall.

The first electrical service at the west location is for the main dock and consists of a K-rated meter and an enclosed 700A main circuit breaker disconnect for the 120/208V 3 phase power. This main disconnect provides power to a custom distribution panel centrally located on the main dock. The custom distribution panel provides the junction point for the main dock's electrical feeders to the pedestals. The pedestals are utilized for the shore power to the boat slips on the

main dock. The power feeder on the load side of the 700 amp main disconnect is 2 sets of 4 #3/0 in a single 4-inch conduit. The feeder is routed under the side walk and penetrates the seawall at the connection to the main dock. This feeder is undersized for the over-current protection provided. In addition during discussions with the marina staff there is a significant voltage drop issue on the main dock depending on the number of downstream users. This service provides power to marina slips M1 through M63, M71 and M72.

The second electrical service at the west location is for the boat slips located along the seawall and consists of a 320 amp 3 phase meter and 400 amp main fused disconnect for the 120/208V 3 phase power. The main disconnect appears to provide power to a concrete in ground hand hole located next to the main disconnect. The hand hole is assumed to be a splice point for the feeders from seawall boat slip pedestals to the feeder from the main disconnect. There is no over-current protection, other than the main disconnect, on the feeders to the pedestals along the seawall. A cursory observation of the electrical supply system for the pedestals indicates that a 200 amp 3 phase, 120/208 V feeder in 2-inch conduit is supplied under the sidewalk and then through the seawall to a group of 4 to 5 pedestals. After the raceway penetrates the seawall, the conduit is secured to the exposed side of the seawall and looped between four to five pedestals. This service appears to provide power to marina slips pedestals 1 through 47 along the seawall. An estimated total of twelve 2-inch conduits for power distribution would be expected under this section of sidewalk originating from this service point with half routed east from the service location and half routed west from the service location.

East Marina Power Distribution

Along the east edge of the marina, there is a 75kVA 120/208V step down transformer that supplies power to the marina slips, east dock and the sanitary lift station. The transformer primary feeder is loop fed via a north-south easement through the parking area to the west of the marina restroom building from a vault on the north sidewalk. Adjacent to the transformer location is a sanitary lift station structure. In addition, the underground marina fuel storage is in this vicinity of the parking field.

Electrical utility metering on the 75 kVA transformer at the east electrical service consists of one CT meter for the utility transformer. Metering for the individual boat slips is provided by private meters located at the slip power pedestals on the east dock. Metering for the large docks along the seawall is provided by a 1000 amp meter center with 13 private meters and main circuit breakers. At this location there are two electric services that supply the marina slips that are discussed further in this report. The first of these services is the power source for the east dock. The second service is the power source for the large slips located along the seawall.

East electrical marina services 1 and 2.

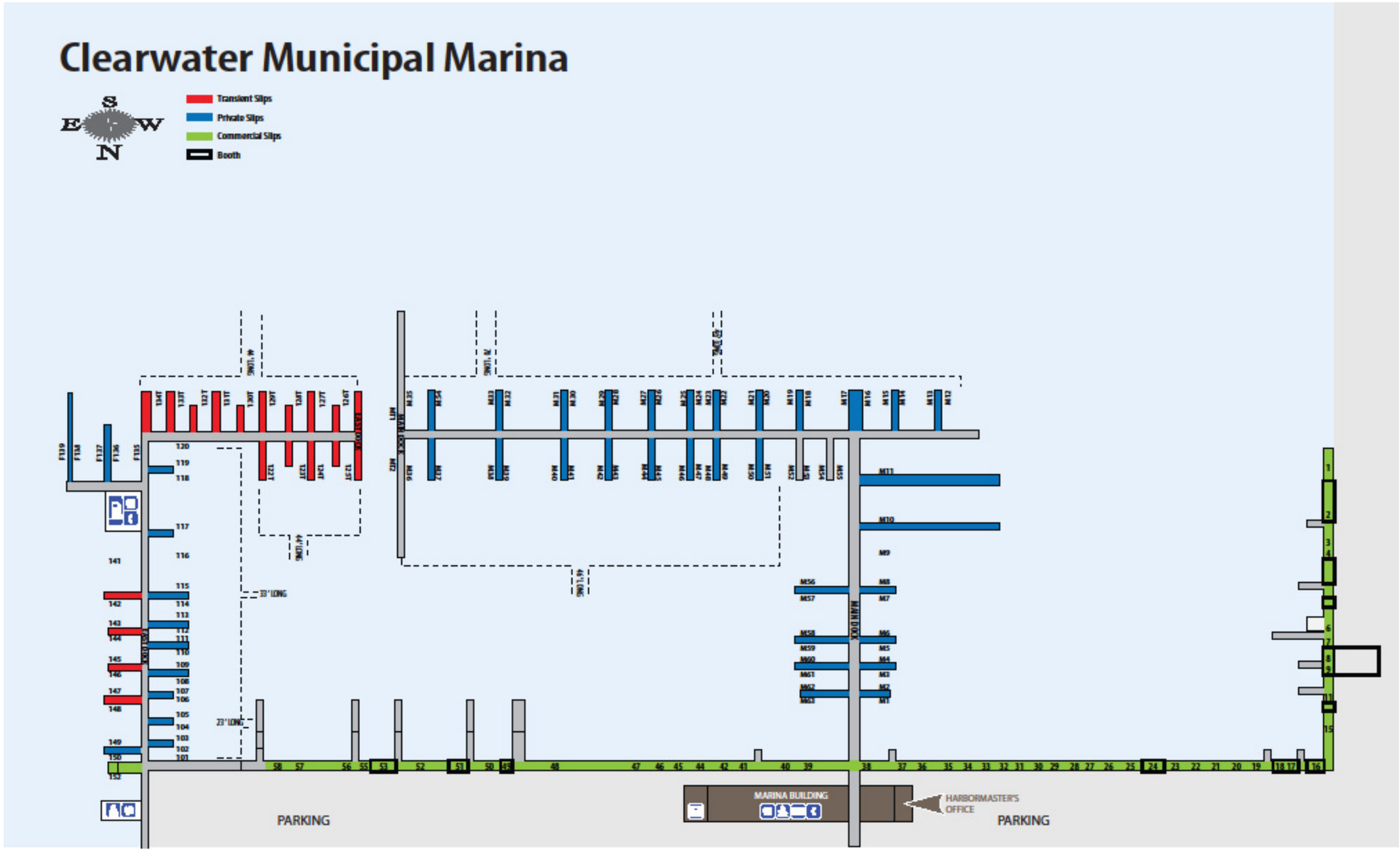
The first electrical service at the east location is for the east dock and consists of a Nema 3R distribution panel with a main circuit breaker for the 120/208V 3 phase power. This main circuit breaker panel provides power to feeders that service the east dock. The distribution panel provides the over-current protection for the east dock's electrical feeders to the pedestals. The pedestals are utilized for the shore power to the boat slips on the east dock. The feeders are routed under the side walk and penetrate the seawall at the connection to the east dock and appear to consist of one 1-1/4-inch conduit, two 2-inch conduits and one 3-1/2-inch conduit. This service provides power to marina slips 100 through 150. Please see the next page for a reference **Schematic 1** of the marina that is located on a City of Clearwater web page.

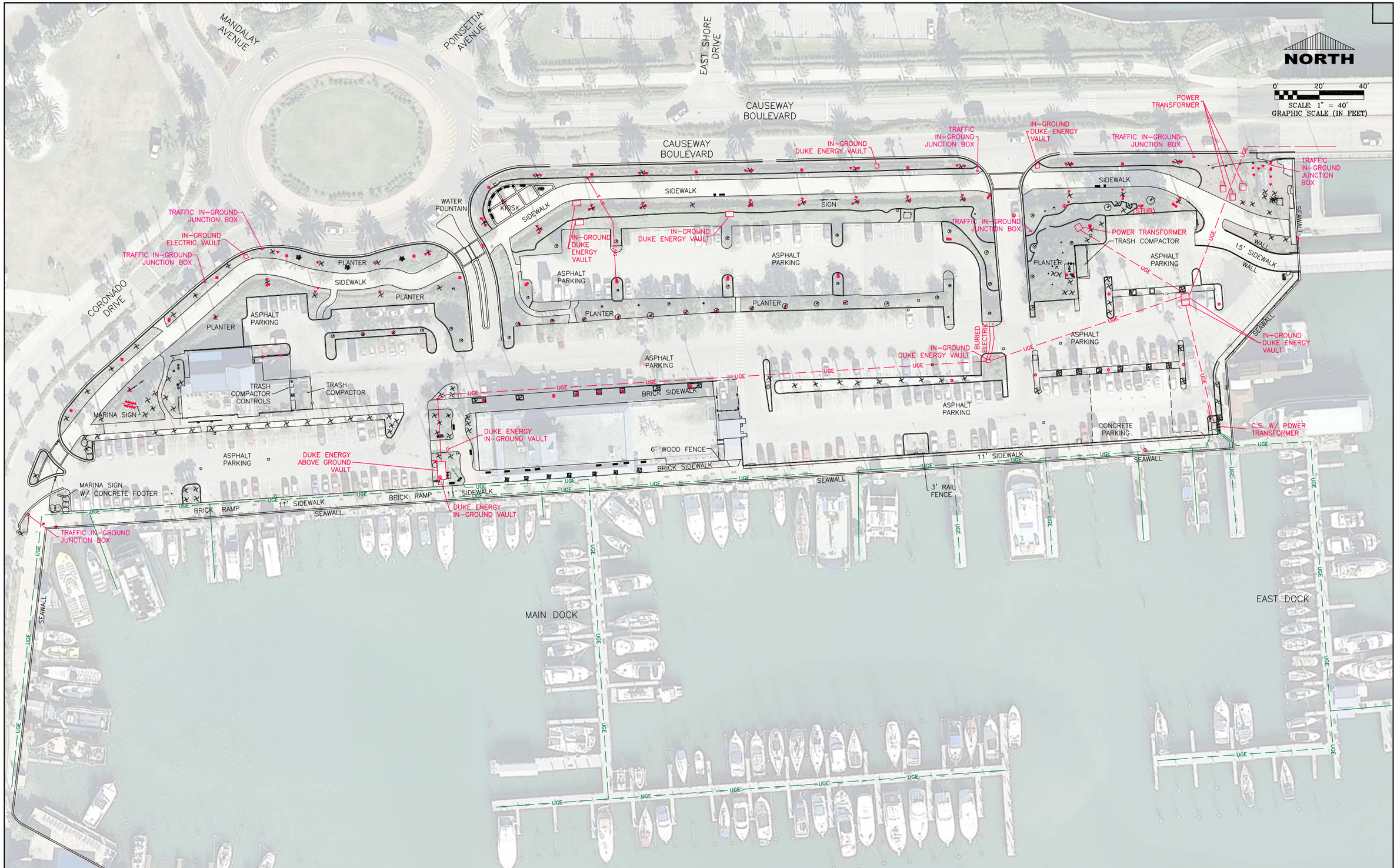
The second electrical service at the east location is for the large boat slips located along the seawall and consists of a 1000 amp 3 phase meter center with thirteen private meters and main circuit breakers for the 120/208V 3 phase power. A cursory observation of the electrical supply system for the large docks indicates that a 100 amp 3 phase, 120/208 V feeder in 2-inch conduit is supplied under the sidewalk and then through the seawall to each large dock. After the raceway penetrates the seawall, the conduit is secured to the underside of the dock at the slip and routed to an electrical panel located on the dock. This service appears to provide power to marina slips 48 through 58 along the seawall, the restrooms and the bait shop. A 150 amp 120/208 V 3 phase service is provided for the bait shop, and a 150 amp 120/208 V 3 phase service is provided for the rest room and administrative office. An estimated total of thirteen 2-inch conduits for power distribution would be expected under this section of sidewalk originating from this service point with the majority routed west from the service location and two or three routed north from the service location to the restroom building and bait shop. **Figure 7** illustrates the existing power utility system in the Beach Marina.

Marina Power Distribution Wiring Methods

Power throughout the marina is provided by conduit and wire. Direct buried PVC conduit is located under the sidewalk. Based on conversations with the marina staff, the conduit systems are installed without utilizing a duct bank structure to organize the conduits making excavation for repairs difficult. In addition, numerous conduit systems are attached to the exposed side of the seawall. The exposed conduit is generally schedule 40 PVC with a mixture of stainless and galvanized supports. There are instances where the exposed conduits are broken or the supports have failed. In general the conduit systems are in need of maintenance but are in fair condition.

Schematic 1: Marina Slip Layout





	CITY OF CLEARWATER, FLORIDA ENGINEERING DEPARTMENT 100 S. Myrtle Ave. Clearwater, Fl 33756	Clearwater Marina Parking Lot POWER LINES	DATE DRAWN: 10-17-2014 DRAWN BY: JRS CHECKED BY: LR DESIGNED BY: DAW JOB NO.: 2013022 FIGURE NO. 7

Typical conduit systems exposed on the seawall

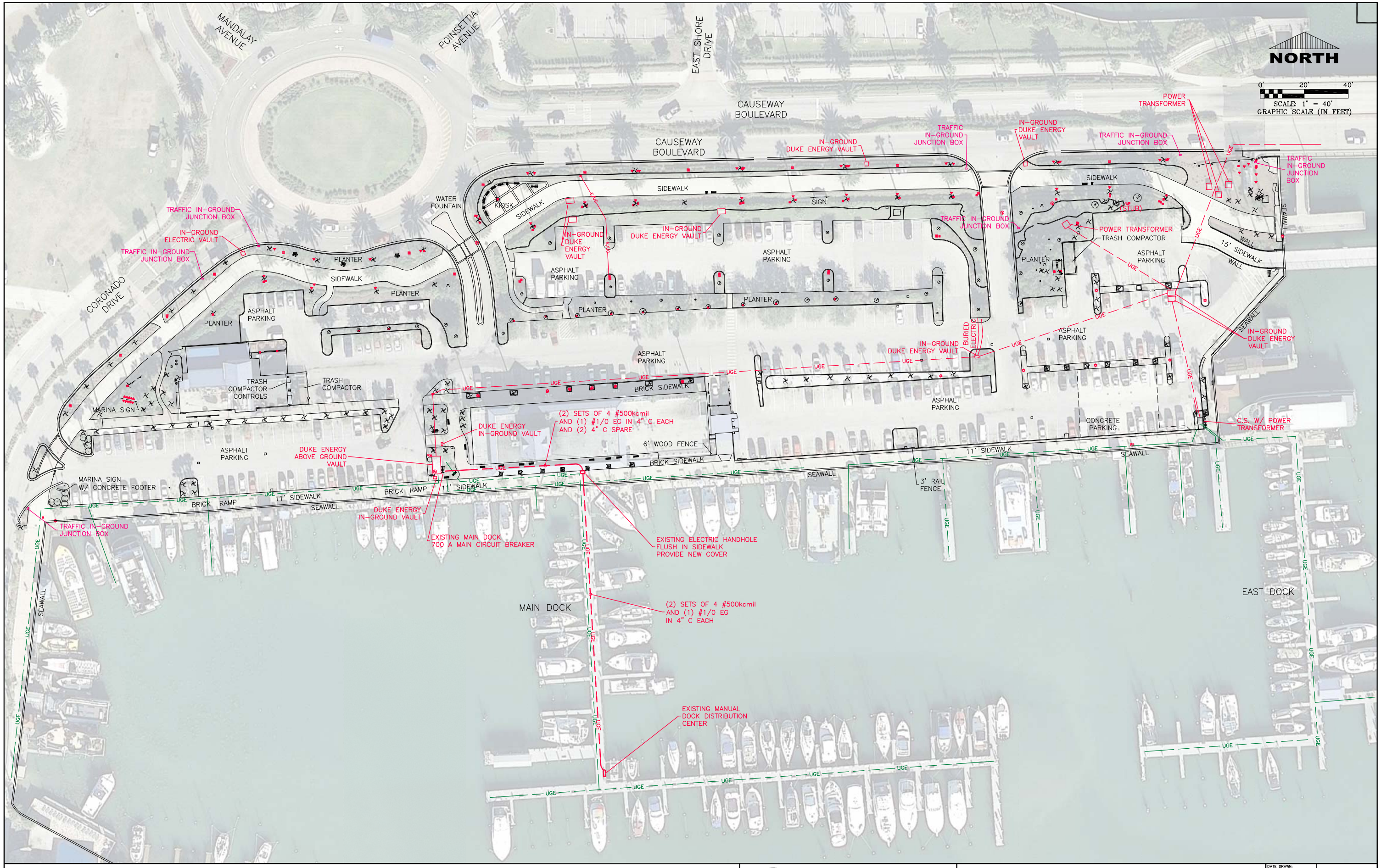
While the site contains a limited number of traffic signal junction boxes, they remain on the North side of the property. It is not expected that the traffic signal boxes will need to be modified for the utility consolidation project.

West Marina Service Immediate Need

As described above, the power feeder on the load side of the 700 amp main disconnect is 2 sets of 4 #3/0 in a single 4-inch conduit which provides services to roughly 65 slips. The power feeder, between the 700 amp main disconnect and the existing dock distribution center, should be 2 sets of 4 500kcmil with an additional #1/0 ground with each set in a 4-inch conduit. The immediate need is shown on **Figure 7a** as it has been expressed by staff that they would like to pursue this earlier than the other projects. It is estimated that the new service will cost approximately $150,000 to replace.

2.7 Existing Cable Television Services

The Beach Marina has an existing duct bank of cable television services that enter the site from the northeast corner of the property. There is a pull box installed to the north of the main sidewalk where the cable turns to the southeast until it intersects the seawall. The cable line appears to be installed in close proximity to the seawall until it approaches the bait shop. The



CITY OF CLEARWATER, FLORIDA
ENGINEERING DEPARTMENT
100 S. Myrtle Ave.
Clearwater, Fl 33756

Clearwater Marina Parking Lot
POWER LINES

DATE DRAWN:	10-17-2014
DRAWN BY:	JRS
CHECKED BY:	LR
DESIGNED BY:	DAW
JOB NO.	2013022

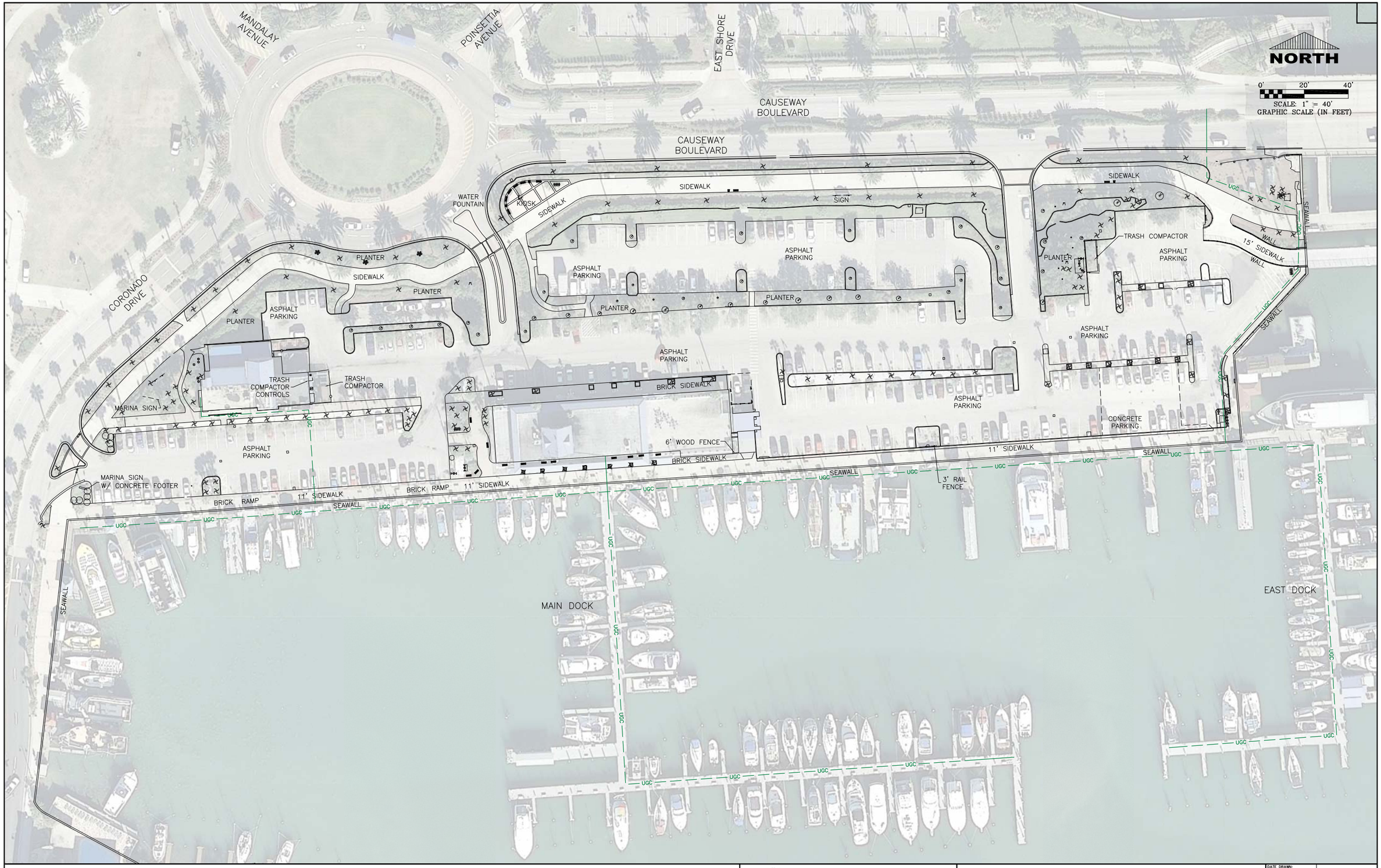
FIGURE NO. 7A

line proceeds directly south, adjacent to Lift Station 81 and the power service meter panel. **Figure 8** illustrates the existing cable television lines in the Beach Marina.

Approaching the East Dock, the line splits to the east and west where it feed individual users at each boat slip via the utility pedestals on the East Dock. The cable continues to the west, fastened to the front of the seawall or attached to the underside of the dock that is running east-west.

The cable lines are installed in parallel with the existing 208V power conduits and are terminated in similar locations at the utility pedestals. The cable line splits again at the Main Dock, again feeding each individual boat slip with the utility pedestal connection. It should be noted that there are several other cable drops to restaurants, the marina, and the commercial boat slips on the front of the docks. The existing cable appears to be loosely fastened to the underside of the existing docks on the front of the seawall. The photo below illustrates the typically condition of the cable wiring.

Existing cable wiring installed beneath dock near water, adjacent to apparent water service main



	CITY OF CLEARWATER, FLORIDA ENGINEERING DEPARTMENT 100 S. Myrtle Ave. Clearwater, Fl 33756	Clearwater Marina Parking Lot CABLE TV	DATE DRAWN: 10-17-2014 DRAWN BY: JRS CHECKED BY: LR DESIGNED BY: DAW JOB NO.: 2013022	FIGURE NO. 8

3.0 UTILITY AND STORM WATER IMPROVEMENTS

Upon review of the utilities that are present, several of the utilities would benefit from relocation and consolidation. The existing power services, cable, water, and fire water mains servicing the boat slips and docks appear to have been installed in multiple occurrences and are no longer well marked. The phone lines appear to be greater than the number needed due to changes in typical service requirements. The storm water presents a different issue as it is desired to treat the storm water but the outfall locations and elevations make the collection difficult. The following sections address the specific changes recommended for utilities and some options for consolidation.

Utilities that do not appear to benefit from consolidation or would be far too difficult and expensive to consider include the power transmission (12.47kV and 7.2kV) and telephone services. The Beach Marina property is currently utilized for power transmission and the medium voltage lines noted above pass through the property. The power lines that are low voltage (208V/120V) would benefit from consolidation as noted above.

3.1 Water Main Changes

There are two water mains that service the Beach Marina docks: the Fire Main and the potable water service line. Fire service requirements are governed by National Fire Protection Agency (NFPA) 303, Fire Protection Standard for Marinas and Boatyards. Based on a review of Chapter 6, the sections being reviewed for upgrades appear to meet the requirements for standpipes and spacing. Additionally, based on discussions with Beach Marina personnel, there did not appear to be issues meeting water and fire flow demands with the existing system. In speaking with the Fire Marshal, the requirement for all fire hydrants and standpipes is a fire flow rate of 500 gpm to meet NFPA 14 requirements, so while the location of the fire services is adequate the level of service may need to be improved.

Based on the review of the site, the survey and discussions with staff, the water mains service issues appear to be the main service lines' location. It is recommended that replacement water mains be installed to the north of the existing sidewalk between the Beach Marina building and the existing sidewalk. It is recommended that the line sizes installed be slightly larger,

potentially a 6-inch main servicing the fire system and a 4-inch main servicing the potable water supply. Providing 500 gpm through a line smaller than 6 inches may not be possible.

To allow access for maintenance, it is recommended that the mains either be installed in a buried accessible precast trench, such as a Trenwa, or they could be installed with regular access locations at connections, similar to duct banks. The trenches can be supplied in a variety of load capabilities, from pedestrian to HS-20 and a variety of covers. The precast trenches have dividers available, and can be ordered in the width and depth needed for their specific use.

The location for the proposed piping was selected due to the seawall's construction. The existing seawall was constructed with tie rods approximately 10 feet back from the seawall. At the end of the tie rod, also known as a tieback, dead-men are set in place to keep the wall in place. Based on photos, it appears installing a trench or utilities in the walkway will result in significant conflicts with the tie rods. Care must also be taken in selecting the location due to the medium voltage utilities present in the area.

While these are the suggested improvements for the water mains, the intent of this report is to address the utilities together. The recommended improvements for other utilities will follow with summary of all utilities recommended in Section 4.

3.2 Storm Water Improvements

While it is apparent that storm water treatment would benefit the Beach Marina, it is not feasible to place a pond onsite for treatment. The primary issue is elevation of the collection system. To achieve drainage and adequately slope the site, storm water inlets on the south side of the property have rim elevation of roughly 3 feet NAVD88. Including the structure and piping necessary to carry the flow, the inverts out of the collection structures are typically at 1 feet NAVD88. The storm water treatment pond would have to be constructed at a lower elevation to be fed by gravity or multiple pump stations would have to be constructed.

The inlets on the south end of the marina, in close proximity to the seawall, have rim elevation of at or under 3.5 feet NAVD88 with two of the southeast structures having elevations below 3 feet NAVD88. Each of those structures has outlet invert elevations between 0.06 feet and 0.90 feet NAVD88.

The site has limited pervious area, the majority of which are decorative planters for separating parking. The northeast entrance and exit has the largest pervious area and includes a planter area with significant brush. This is also the area that includes the storm water inlet that discharges to the Causeway Boulevard area.

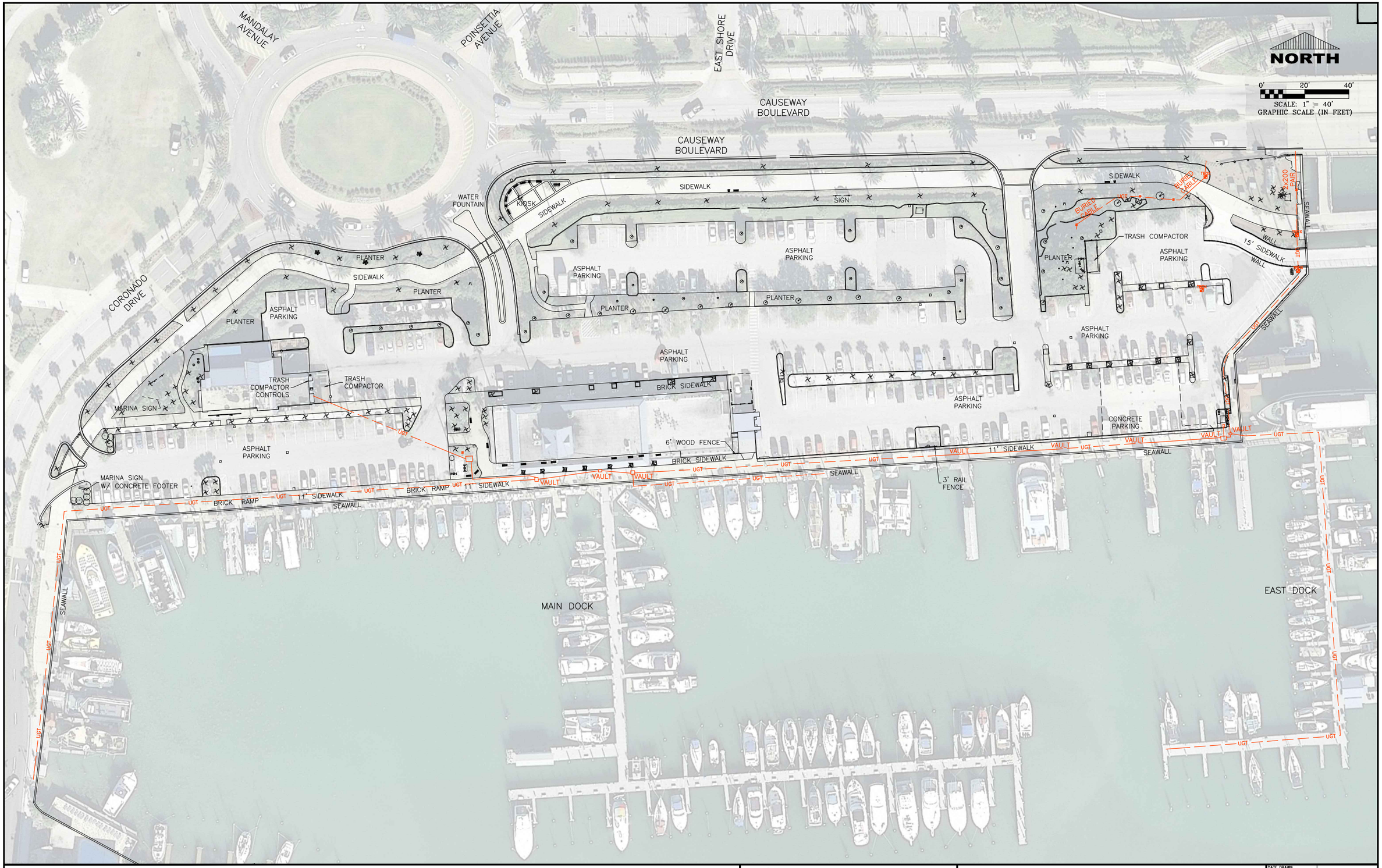
A new storm water system typically includes treatment and attenuation. The Beach Marina was constructed prior to these requirements and has neither. The requirement for storm water treatment without attenuation is ½-inch of rain over the entire basin. The total area of site is approximately 6.5 acres. That would yield a treatment requirement of approximately 0.27 acre-feet of storage to achieve minimum treatment without attenuation. Since this is not feasible to provide on the Marina site URS considered two other options. One option is to collect the storm water on the sidewalk and treat only that storm water. This would require a small drain system and a vortex separation unit to remove debris. While this is an option, there is no location available in close proximity to the need. The storm water drain system would need to be installed in roughly the same location as the proposed utility consolidation system and the vortex system is larger than the area available adjacent to the sidewalk and the fall is inadequate to allow the vortex to function properly.

The second option considered is to slope the sidewalk toward the parking lot. Due to the proposed utility relocation program, some of the storm drains will have to be relocated and the entire sidewalk will have to be reconstructed. This would be an ideal time to reverse the slope of the sidewalk toward the parking lot. This cost is easily built into the cost of redoing the sidewalk adjacent to the seawall. The concern with sloping the sidewalk back to the parking lot is the collection of solids, such as portion of fish or materials remaining from fishing. This could cause odors and create a maintenance issue for the City as the solids pieces may get caught in the manholes. For this reason, sloping the sidewalk back to the parking lot is not recommended.

3.3 Reduced Telephone Line Services

It is recommended that the number of pairs of telephone service wires be closely reviewed with Verizon. The Beach Marina could then consider eliminating phone service to the majority of individual boat slips. The recommendation would still provide service to the commercial slips with vendors present, the marina, and the restaurants. It is preliminarily estimated that the number of pair of phone wires would reduce from 400 to roughly 100 and four main pull boxes may be able to be removed from the sidewalk area. The existing conduits and pull boxes

appeared to be in good condition and relatively orderly. If the number of locations where the phone services are terminated is reduced, the main lines could come in and at least three of the pull/junction boxes could be eliminated. Further, with the reduced number of pairs, the lines could be easier to service when there are problems. Because the phone lines are low voltage communication wires, they must be separated from any type of power line. It would be possible to locate the phone service lines that are post-Verizon trench as long as minimum separations are met. It would likely require shielded conduit upon leaving the trench if power service line are installed within the trench. Please see **Figure 9** for a depiction of the phone service utility with reduced service pairs.



	CITY OF CLEARWATER, FLORIDA ENGINEERING DEPARTMENT 100 S. Myrtle Ave. Clearwater, Fl 33756	Clearwater Marina Parking Lot SIMPIFIED TELEPHONE LINES	DATE DRAWN: 10-17-2014 DRAWN BY: JRS CHECKED BY: LR DESIGNED BY: DAW JOB NO.: 2013022 FIGURE NO. 9

3.4 Power Service Improvements

The following items may be considered for maintenance, improvement and replacement of the current existing electrical distribution system. Items considered for improvement will present several issues for compliance with the National Electrical Code. While the 2008 NEC is currently in effect, the adoption of the 2011 NEC is scheduled. There are significant changes in the 2011 NEC in regards to Marinas. Specifically Ground Fault Protection will be required on the feeders servicing the marina slips.

Currently, the main issue with the power system is voltage drop concerns along the main dock. It should also be noted that the downstream voltage from the transformer for the dock slips is 208V. While this does not affect 120V customers if the service lines are sized accordingly, not all are capable of accepting 208V power. This voltage drop is exaggerated even further for a 120V service.

A summary of the items recommended for maintenance, improvement and replacement follows:

- Maintain, repair and re-support existing electrical conduits located on the exposed side of the seawall and under the existing docks.

- To alleviate the underground conduit systems infra-structure conflicts under the sidewalk, replace the existing feeder system on both the east and west service locations with a duct bank of feeders located in a Trenwa system with removable covers along the entire sidewalk area.

- Replace the west electrical main disconnect servicing the main dock with a GFI protected main circuit breaker.

- Replace and upgrade the feeder to the main dock to improve the voltage drop condition and bring the conductor size and over-current protection into compliance with the NEC.

- Replace the custom distribution panel on the main dock with a suitably rated distribution panel with GFI protection. Verify and replace feeders on the main dock to improve the voltage drop conditions.

- Replace the west electrical service providing service to marina slips 1-47 along the seawall with a distribution panel with the appropriate GFI and over-current protection.

- Verify and replace feeders to slips 1-47 where any voltage drop issues are present if the Trenwa system is not used,

- Replace the east meter center main breaker that services the large seawall slips 47-58 with a GFI protected main breaker.

- Replace the entire meter center if future expansion and maintenance is an issue.

- Replace the east main distribution panel that services the east dock with a new distribution panel with GFI protection.

4.0 UTILITY CONSOLIDATION OPTIONS

URS considered the improvements recommended in Section 3 and considered how they could be combined. As described at the start of Section 3, to provide the most access to the utilities it is recommended that they be installed in trenches. If the trench installation option is not feasible or is considered cost prohibitive, the utilities could be installed with conduits in a duct bank-type scenario. This would make it difficult to combine some of the communication wiring and the power, but should be considered as an option. The duct bank option would require specific access points installed like pull boxes or junction boxes.

It was identified early in the project that the City desires to have a set location for at least three spare utilities within the corridor. The utilities identified as being candidates for consolidation in the common utility corridor include:

- Local Water Service (4-inch main)
- Local Fire Water (6-inch main)
- Local Power Service (208V 3-phase, numerous cables)
- Fiber Optic
- Cable Service Lines
- 3 Spare Locations

The following are descriptions and depictions of the two main options.

4.1 Trench Installation

An option that is frequently utilized for multiple utilities is the Trenwa-type buried trench. The trench would have to be installed to the north of the existing sidewalk to avoid conflict with the tie-backs/tie rods for the seawall. The trench would allow for complete access of utilities, but could be installed with either concrete, polymer composite, or tamper-resistant aluminum plates on top to limit damage and unintended access. The trenches themselves are constructed of 5,000 psi concrete with the covers over them, including sealing around the plates to limit rain water from entering the trenches.

To allow for rain water to exit the trenches, they can be installed with weep holes in the bottom or a largely open bottom with cross beams for support. The depth of the trench will be critical to

limit water from standing in the trenches. Gravel or other fill can be placed in the holes to increase the ability for the trench to drain.

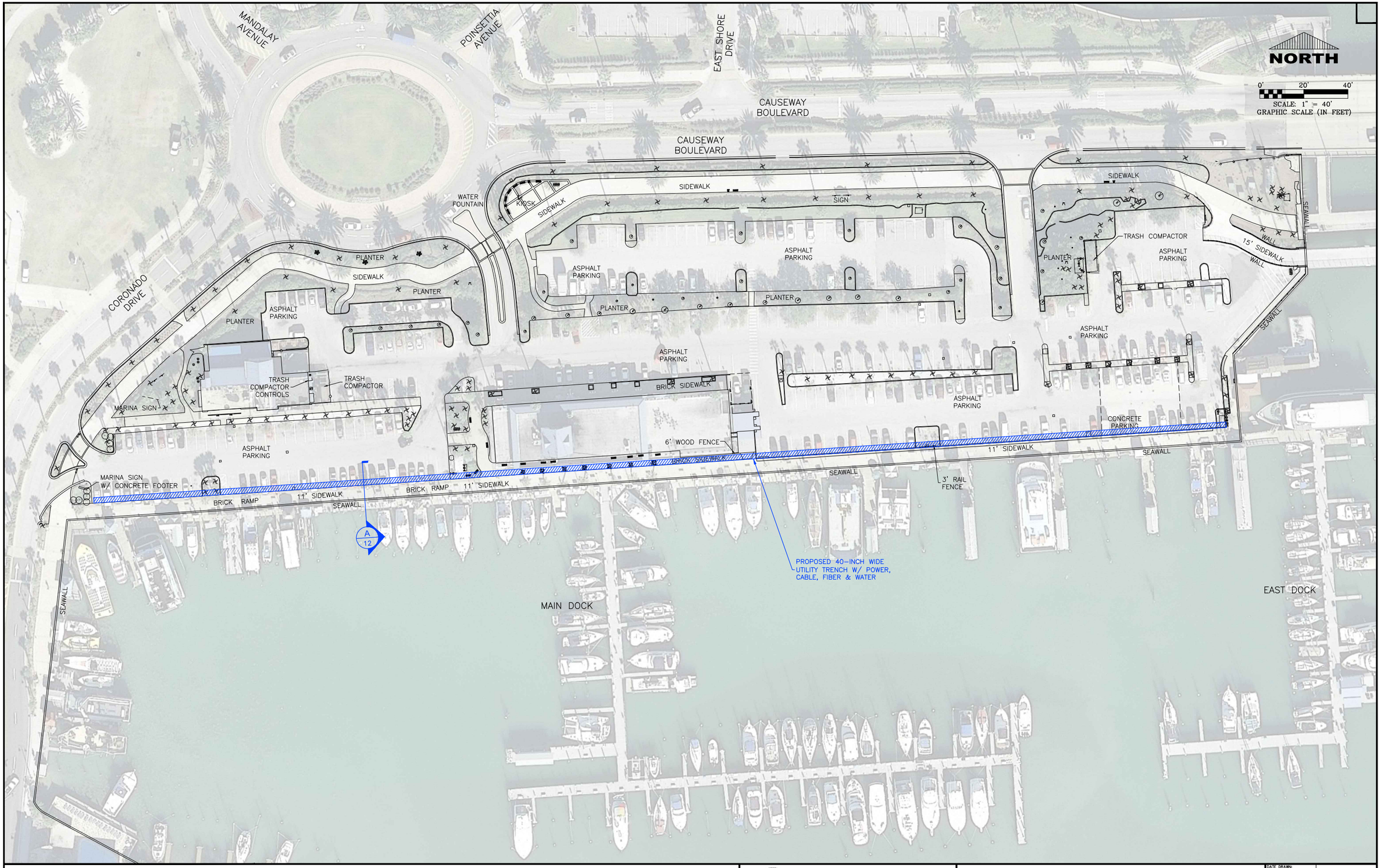
Consolidation of the power service lines could be done either by installing the wiring in conduit within the trench or by installing a cable tray just below the surface. The benefit to the cable tray would be the ability to closely manage the wiring. The disadvantage would be that the water service lines would have limited accessibility. With a cable tray, the cable television wiring could be installed on one side with a separator between the television lines and the power lines. The power conductors must have cable tray-rated insulation to limit induction. The most direct option would be to install conduit, but this decision can be made later during design.

It is recommended that the fiber optic be located in 4-inch sch 80 conduit within the trench to avoid damage. If specific access points are needed for booster or termination points, the conduit can leave the trench through the open bottom of the trench, or a "tee" section of trench can be installed with the communications crossing at 90 degrees to the power lines.

It is recommended that all wiring and conduit be labeled at regular intervals to prevent confusion. For example, if there is a 208V main service line, the circuit's name and two terminal locations should be labeled on the line. Additionally, FIRE WATER and POTABLE WATER should be clearly labeled on the piping at regular intervals.

The largest drawback of the trench installation is the location that would be required. The trench must be installed to the north of the main sidewalk which would likely require removal of the existing palm trees. Transition to a buried duct bank would have to occur on the west side of the marina as the trench would be required to turn south in a frequently walked area of the marina. It appears that section is within the County Road 699 Right of Way which may also be an issue as a trench. This should not be a major issue as there are only 15 boat slips on the north-south portion of the marina. Please reference Page 20 for the layout of boat slips.

Please see **Figure 10** for a plan view depiction of a proposed precast utility trench with the various utilities and **Figure 12** for precast trench cross section details. The section does change slightly over the extended run, but this is approximately the largest number of conduits estimated to be in a given section.



CITY OF CLEARWATER, FLORIDA
ENGINEERING DEPARTMENT
100 S. Myrtle Ave.
Clearwater, Fl 33756

Clearwater Marina Parking Lot
PRECAST UTILITY TRENCH

DATE DRAWN:	10-17-2014
DRAWN BY:	JRS
CHECKED BY:	LR
DESIGNED BY:	DAW
JOB NO.:	2013022

FIGURE NO. 10

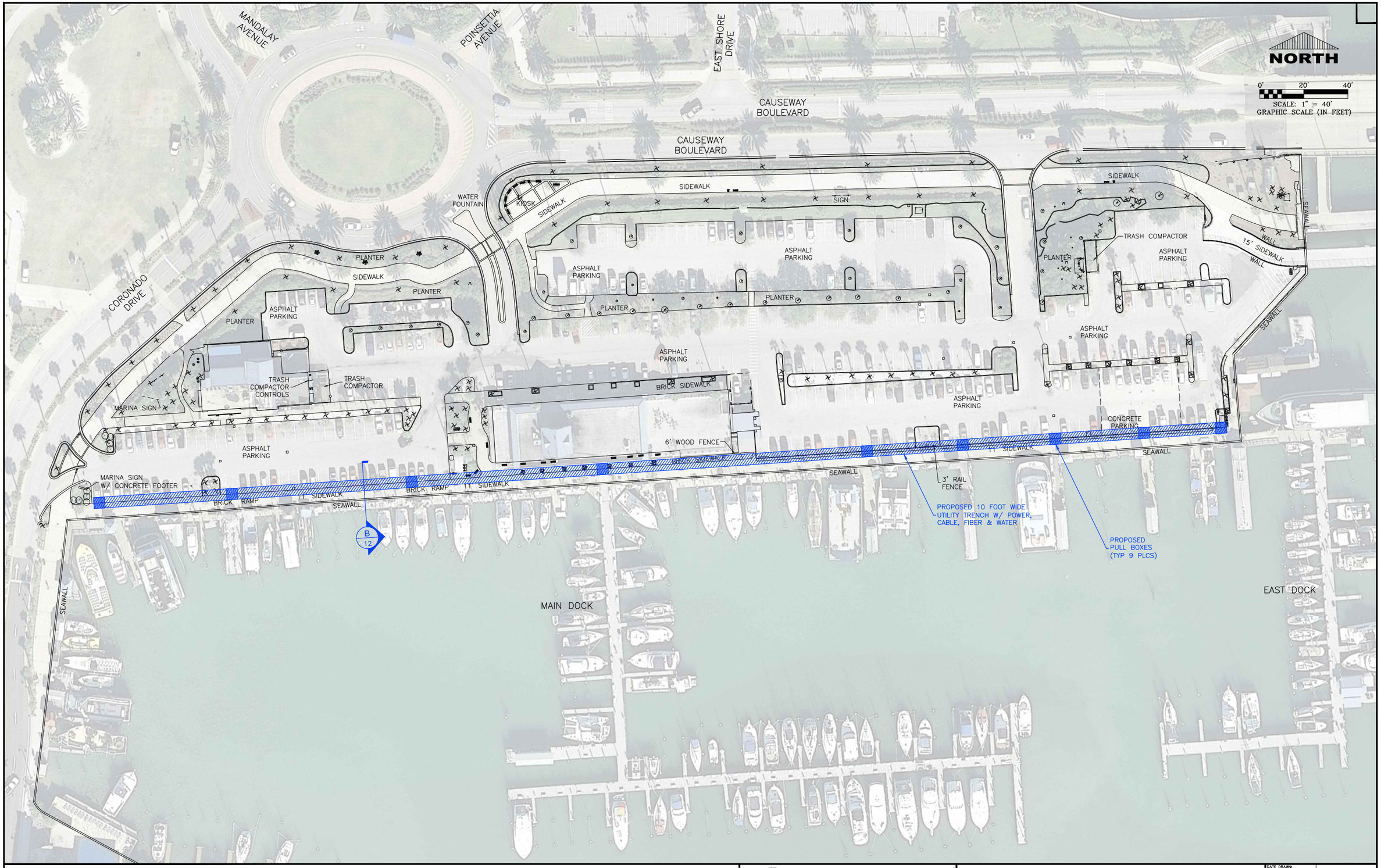
4.2 Duct Bank Installation

An alternative to the trench installation is to install the utilities in a duct bank configuration. This would involve the installation of parallel piping and conduits with regular access in large boxes that would be similar to pull boxes. The duct bank configuration would have to be larger in size that the trench-type installation as the piping and conduits would have to be laid out and buried in place rather than installed within a trench.

Advantages of the duct bank are that it may be possible to layout the duct bank installation parallel to the existing telephone system. This may allow the duct bank to be installed in the sidewalk area, pending performing some field locates on the tie-backs/tie rods for the seawall.

There are many disadvantages to the duct bank installation. One disadvantage is that it is typical to encase duct banks in concrete. If that were done, the conduit, casing, or piping could not be easily modified after it is in place. If the duct bank is concrete encased it would make it extremely difficult to service piping that may be installed in the utility corridor. An additional disadvantage to the duct bank is that it may not be feasible to install the duct bank within the sidewalk area while keeping the existing services intact. That would negate the potential benefit of duct bank location and would require the duct bank to be installed to the north of the sidewalk similar to the trench installation. That would also result in the loss of the existing palm trees. The duct bank would be extremely wide to allow for proper spacing and access of conduit. While it may cost less for the duct bank, it has a high risk of service disruption and may not be possible. Temporary wiring and service costs could make a duct bank-type installation far more expensive than the trench due to unknowns.

Please see **Figure 11** for a plan view of a proposed duct bank installation with the various utilities and **Figure 12** for duct bank details. **Figure 13** addressed the approximate changes needed for the existing storm water inlets that are in conflict with the proposed utility trench.

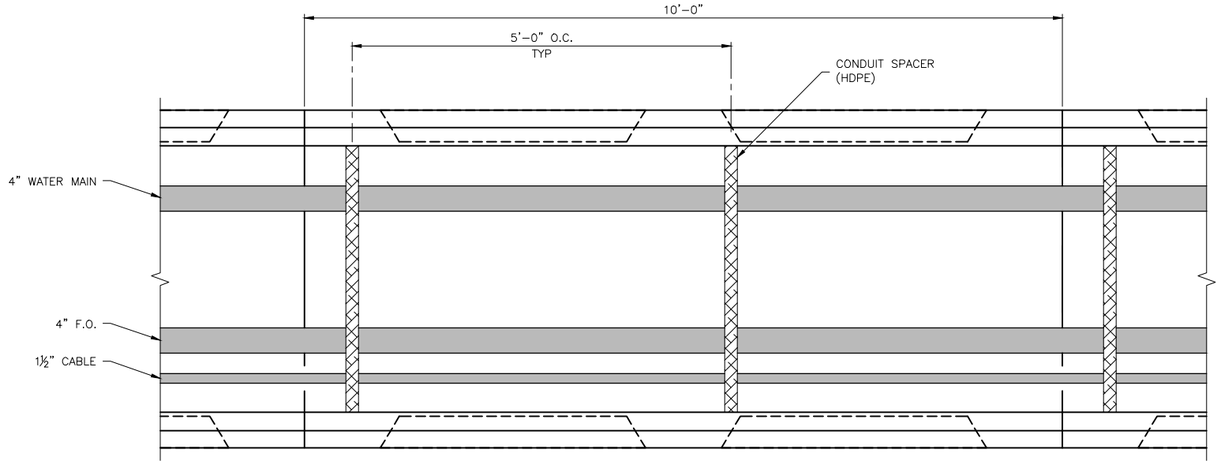


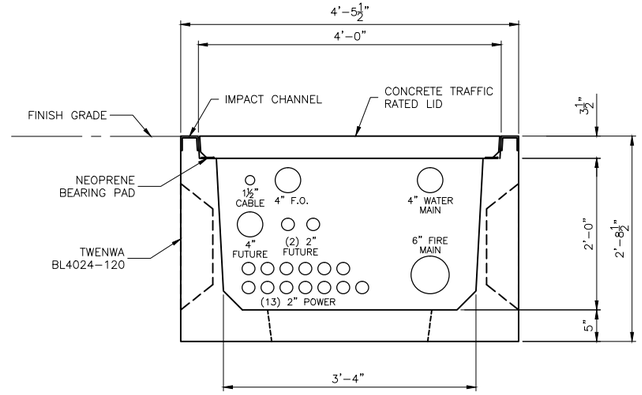
CITY OF CLEARWATER, FLORIDA
ENGINEERING DEPARTMENT
100 S. Myrtle Ave.
Clearwater, Fl 33756

Clearwater Marina Parking Lot
PROPOSED UTILITY DUCT BANK

DATE DRAWN:	10-17-2014
DRAWN BY:	JRS
CHECKED BY:	LR
DESIGNED BY:	DAW
JOB NO.:	2013022

FIGURE NO. 11

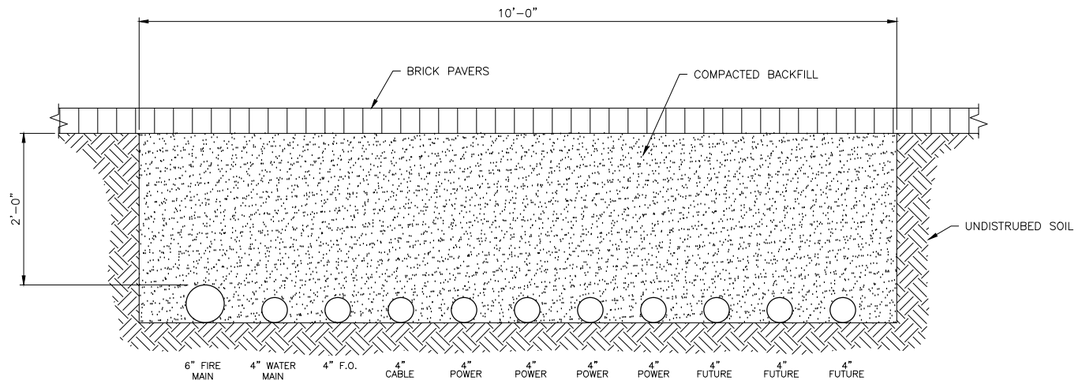




UTILITY TRENCH DETAIL WITH
CONCRETE LID 40"W x 24"D

SCALE: 1"=1'-0"

A
10



DUCT BANK SECTION BRICK PAVER
COVERING 10' W x 30"D

SCALE: 1"=1'-0"

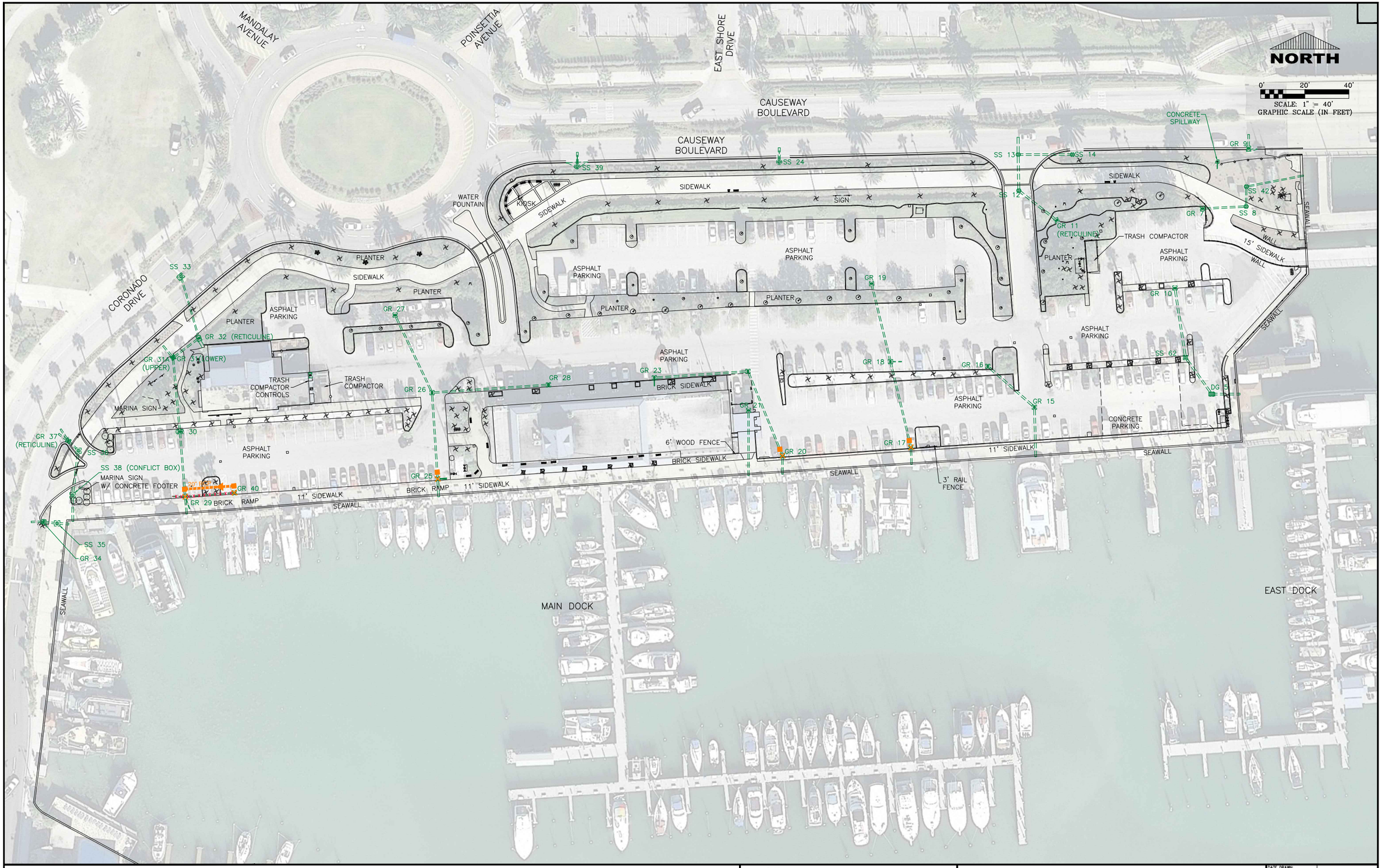
B
11

CITY OF CLEARWATER, FLORIDA
ENGINEERING DEPARTMENT
100 S. Myrtle Ave.
Clearwater, Fl 33756

Clearwater Marina Parking Lot
TYPICAL TRENCH & DUCT BANK
DETAIL

DATE DRAWN:	10-17-2014
DRAWN BY:	JRS
CHECKED BY:	LR
DESIGNED BY:	DAW
JOB NO.:	2013022

FIGURE NO.
12



CITY OF CLEARWATER, FLORIDA
ENGINEERING DEPARTMENT
100 S. Myrtle Ave.
Clearwater, Fl 33756

Clearwater Marina Parking Lot
PROPOSED STORM WATER SYSTEM

DATE DRAWN:	10-17-2014
DRAWN BY:	JRS
CHECKED BY:	LR
DESIGNED BY:	DAW
JOB NO.:	2013022

FIGURE NO. 13

4.3 Summary of Utility Consolidation Construction Alternatives

A matrix comparison of the utility consolidation and improvement efforts is presented in **Table 4-1** below. Please note that the Utility Trench and Utility Duct Bank are presented as two options while the Storm Water Treatment and Telephone Wiring Update are presented as adders to either of the two base options.

4-1 Comparison of Utility Consolidation Construction Options

COMPARISON ITEM	1A: UTILITY TRENCH	1B: UTILITY DUCT BANK	2: STORM WATER FROM SIDEWALK (REDIRECTED)	3: TELEPHONE WIRING UPDATE	4: POWER DISCONNECT AND METERING UPDATES
Opinion of Cost for Project	$1,250,000	$1,500,000 to $1,700,000	$0 – In 1A or 1B	$125,000	$75,000 – Wiring in 1A and 1B
Installation area requirements	Small Area	Larger than Trench	Limited, Sloping of Sidewalk (Not Recommended)	Decreased Footprint	Small Area
Risk of conflicts	Medium	High	Low	Low	Low
Future maintenance and access	Extremely Flexible	Limited Access	N/A	N/A	N/A
Future space for other utilities	Easily Added	Limited but Some	N/A	N/A	N/A
Future space for other utilities	Easily Added	Limited but Some	N/A	N/A	N/A

5.0 RECOMMENDED IMPROVEMENTS AND REQUIRED PERMITS

Based on the review of crossing options presented in **Table 4-1,** it is recommended that the City consider the utility trench installation. The installation should be much simpler as it would not be located in the identical location to the existing utilities. This should limit construction issues and outages for existing customers. The trench can also be installed in 10 feet long sections with the conflicts resolved one section at a time.

While storm water improvements are a consideration, the cost and benefits to the City are limiting at this time. Treatment of storm water runoff is sometimes recommended but the lift station and offsite treatment system is too costly. Option 2, sloping the rebuilt sidewalk to the north, would mitigate the storm water flowing over the seawall and allow the existing collection system to convey it through the seawall. This should be a no cost option as the entire sidewalk will have to be reconstructed as part of the utility relocation and abandonment project. The reason it is not recommended is the potential of gathering odor-causing solids within the collection system.

As part of the utility relocation and trench installation, it is recommended that the telephone system be considered for simplification. The number of services currently present appears to be far greater than the number needed. Further, the number of unused services appears to be confusing and leading to further issues in the system.

The following is a list of permits that are anticipated:

Florida Department of Environmental Protection

Pursuant to Chapter 62-555.900, Florida Administrative code (F.A.C.), a Florida Department of Environmental Protection (FDEP) permit is required for the addition of a new potable main to the existing water distribution system.

A completed FDEP application form 62-555.900(7) Notice of Intent to Use the General Permit for Construction of Water Main Extensions for PWSs with the respective fees must be completed and submitted to FDEP or a local health department that is provided authority through FDEP for review and approval.

Environmental Resource Permit

It is not anticipated that an Environmental Resource Permit (ERP) also from the Southwest Florida Water Management District (SWFWMD). It is more typical that notification of the project would be provided. The proposed area that will be disturbed is impervious and this project is not anticipated to add impervious area. If storm water treatment is desired in the future, the proper calculations would need to be performed for stage/storage at the treatment pond to confirm the attenuated water does not discharge faster than the "preconstruction" condition.

In addition to the ERP, a National Pollutant Discharge Elimination System (NPDES) permit will be required pursuant to 40 CFR Part 122 for point source discharges of stormwater associated with construction of the utilities. Under FDEP's delegated authority to administer the NPDES program, operators that have stormwater discharge associated with one acre or more of construction clearing must file for and obtain either coverage under an appropriate generic permit contained in Chapter 62-621, F.A.C. (one to five acres of construction), or an individual permit issued pursuant to Chapter 62-620, F.A.C. (greater than 5 acres of construction). A major component of the NPDES permit is the development of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP identifies potential sources of pollution that may reasonably be expected to affect the quality of stormwater discharges from the site and discusses good engineering practices that will be used to reduce the pollutants. The contractor is required to obtain the NPDES permit.

Dewatering Permit

The project site is at a relatively low elevation and will therefore likely require a dewatering permit from the SWFWMD. It is expected that the project will require a Dewatering General Use Permit, as described in Rule 40E-20.302(2) F.A.C. The rule requires that the project discharge less than 10 million gallons per day with a total project duration of less than one year and a total project discharge volume of less than 1,800 million gallons.

Building Permit

It is anticipated that a permit would be required with the City of Clearwater Building Department for the proposed electrical improvements. While a permit is typically required, permit fees may be waived as the permitting agency and project owner are the same agency.

APPENDIX A – COST ESTIMATES FOR EACH PROJECT AND SUBPROJECT

City of Clearwater -
Utility Consolidation

Budgetary Cost Estimate

Installation Factor:	25%
General Conditions:	10%
Contractor Markup:	10%
Contingency Factor:	30%

Component Description	Field Construction Costs				Equipment Installation Costs		Total
	Unit Basis	Unit Cost	Quantity	Extension	Contractor Markup	Installation	
Trench and Water Mains							
6-inch Water Mains (Inc. Hangers)	LF	$50	500	$25,000			$25,000
4-inch Water Mains (Inc. Hangers)	LF	$35	500	$17,500			$17,500
Concrete Trench (Inc. Separator, Unistrut, and Aluminum Plating)	LF	$400	500	$200,000	$20,000	$100,000	$320,000
6-inch Water Main Main Connections	EA	$2,000	2	$4,000			$4,000
4-inch Water Main Main Connections	EA	$2,000	2	$4,000			$4,000
Taps for 6-inch WM	EA	$500	6	$3,000			$3,000
Services from 4-inch WM	EA	$250	50	$12,500			$12,500
Demo Existing Mains	LF	$15	2,200	$33,000			$33,000
Stormwater Collection							
18-inch Stormwater	LF	$50	100	$5,000			$5,000
Repair and Depth Adder	LF	$100	100	$10,000			$10,000
Storm Water Structures	EA	$2,500	6	$15,000			$15,000
New Sidewalk Installation							
Pavers	SF	$12	6,000	$72,000			$72,000
Knee Wall	CY	$1,000	30	$30,000			$30,000
Support and Excavation for Sidewalk	SF	$5	6,000	$30,000			$30,000
Electrical, Control, Communication Wiring							
4-Inch Conduits (Assume 4 Needed)	LF	$9	4,400	$39,600	$3,960	$9,900	$53,460
1-Inch Conduits	LF	$2	3,300	$6,600	$660	$1,650	$8,910
Demo Existing Coduits	LF	$1	6,600	$6,600			$6,600
Cable Wiring	LF	$2	2,000	$4,000	$400	$1,000	$5,400
Fiber Optic Wiring	LF	$2	500	$1,125	$113	$281	$1,519
Power Wiring	LF	$50	2,500	$125,000	$12,500	$31,250	$168,750
Electrical and Rework							
Electrical Service - 1200A, 3 Phase - 4 Wire	EA	$16,200	1	$16,200	$1,620	$4,050	$21,870
Subtotal:	---	---	---	**$660,125**	**$39,253**	**$148,131**	**$847,509**
General Conditions	---	---	---	---	---	---	$84,751
Contingency:	---	---	---	---	---	---	$254,253
Total:	---	---	---	---	---	---	**$1,187,000**

Clarifications and Miscellaneous Work Not Included in Costs
Additional Paving, Grading, Drainage or Structural Items. Only includes repair for install of drainage
MCC Building Not Included

City of Clearwater -
Utility Consolidation

Budgetary Cost Estimate

Installation Factor:	25%
General Conditions:	10%
Contractor Markup:	10%
Contingency Factor:	30%

Component Description	Field Construction Costs				Equipment Installation Costs		Total
	Unit Basis	Unit Cost	Quantity	Extension	Contractor Markup	Installation	
Trench and Water Mains							
6-inch Water Mains (Duct Bank Install)	LF	$50	500	$25,000			$25,000
4-inch Water Mains (Dcut Bank Install)	LF	$35	500	$17,500			$17,500
Access Boxes	EA	$15,000	6	$90,000	$9,000	$45,000	$144,000
6-inch Water Main Main Connections	EA	$2,000	2	$4,000			$4,000
4-inch Water Main Main Connections	EA	$2,000	2	$4,000			$4,000
Taps for 6-inch WM	EA	$500	6	$3,000			$3,000
Services from 4-inch WM	EA	$250	50	$12,500			$12,500
Demo Existing Mains	LF	$15	2,200	$33,000			$33,000
New Sidewalk Installation							
Pavers	SF	$12	6,000	$72,000			$72,000
Demo of Existing Sidewalk	SF	$2	7,000	$14,000			$14,000
Knee Wall	CY	$1,000	30	$30,000			$30,000
Support and Excavation for Sidewalk	SF	$5	6,000	$30,000			$30,000
Electrical, Control, Communication Wiring							
4-Inch Conduits (Assume 5 Needed)	LF	$9	5,500	$49,500	$4,950	$12,375	$66,825
1-Inch Conduits	LF	$2	3,300	$6,600	$660	$1,650	$8,910
Demo Existing Coduits	LF	$1	6,600	$6,600			$6,600
Cable Wiring	LF	$2	2,000	$4,000	$400	$1,000	$5,400
Fiber Optic Wiring	LF	$2	500	$1,125	$113	$281	$1,519
Power Wiring	LF	$50	2,500	$125,000	$12,500	$31,250	$168,750
Electrical and Rework							
Electrical Service - 1200A, 3 Phase - 4 Wire	EA	$16,200	1	$16,200	$1,620	$4,050	$21,870
Temp Service Additions and Reworks	EA	$2,000	200	$400,000			$400,000
Subtotal:	---	---	---	**$944,025**	**$29,243**	**$95,606**	**$1,068,874**
General Conditions	---	---	---	---	---	---	$106,887
Contingency:	---	---	---	---	---	---	$320,662
Total:	---	---	---	---	---	---	**$1,497,000**

Clarifications and Miscellaneous Work Not Included in Costs
Additional Paving, Grading, Drainage or Structural Items. Only includes repair for install of drainage
MCC Building Not Included

City of Clearwater -
Telephone Reduction

Budgetary Cost Estimate

Installation Factor:	25%
General Conditions:	10%
Contractor Markup:	10%
Contingency Factor:	30%

Component Description	Field Construction Costs				Equipment Installation Costs		Total
	Unit Basis	Unit Cost	Quantity	Extension	Contractor Markup	Installation	
Telephone Reduction							
Pr Telephone Wires	LF	$1	150,000	$75,000			$75,000
Demo Existing Vaults	EA	$1,000	4	$4,000			$4,000
Reterminate Wiring	EA	$50	100	$5,000			$5,000
Subtotal:	---	---	---	**$84,000**	**$0**	**$0**	**$84,000**
General Conditions	---	---	---	---	---	---	$8,400
Contingency:	---	---	---	---	---	---	$25,200
Total:	---	---	---	---	---	---	**$118,000**

Clarifications and Miscellaneous Work Not Included in Costs
Additional Paving, Grading, Drainage or Structural Items. Only includes repair for install of drainage
MCC Building Not Included

City of Clearwater -
Electrical Service Replacement

Budgetary Cost Estimate

Installation Factor:	25%
General Conditions:	10%
Contractor Markup:	10%
Contingency Factor:	15%

Component Description	Field Construction Costs				Equipment Installation Costs		Total
	Unit Basis	Unit Cost	Quantity	Extension	Contractor Markup	Installation	
Rehab for Installation							
Pavers	SF	$12	240	$2,880			$2,880
Support and Excavation for Sidewalk	SF	$5	500	$2,500			$2,500
Electrical, Control, Communication Wiring							
4-Inch Conduits (Assume 4 Needed)	LF	$9	1,160	$10,440	$1,044		$11,484
Power Wiring	LF	$50	880	$44,000	$4,400		$48,400
Electrical and Rework							
New Panel Box	EA	$40,000	1	$40,000	$4,000	$10,000	$54,000
Subtotal:	---	---	---	**$99,820**	**$9,444**	**$10,000**	**$119,264**
General Conditions	---	---	---	---	---	---	$11,926
Contingency:	---	---	---	---	---	---	$17,890
Total:	---	---	---	---	---	---	**$150,000**

Clarifications and Miscellaneous Work Not Included in Costs
Additional Paving, Grading, Drainage or Structural Items. Only includes repair for install of electrical service.