DRAINAGE REPORT

Mary Brickell Village
Drainage and Roadway Improvements
Phases I and II
City of Miami Project B-30637

Miami-Dade County, Florida

Prepared for

CITY OF MIAMI

DEPARTMENT OF CAPITAL IMPROVEMENTS

July 2011

Prepared by

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Abbreviations

Some of the abbreviations used in this report are defined here for convenience.

BMP	Best Management Practices
CIT	City of Miami Department of Capital Improvements and Transportation
cfs	Cubic Feet Per Second
CR	County Road
DCIA	Directly Connected Impervious Area
DERM	Miami-Dade Department of Environmental Resources Management
DHW	Design High Water
EPA	United States Environmental Protection Agency
ERP	Environmental Resource Permit
FDOT	Florida Department of Transportation
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FLUCCS	Florida Land Use, Cover and Forms Classification System
fps	Feet Per Second
GDP	General Development Plan
GIS	Geographical Information System
HSG	Hydrologic Soil Group
MDWASD	Miami-Dade Water and Sewer Department
NET	Neighborhood Enhancement Team
NGVD	National Geodetic Vertical Datum of 1929
NRCS	Natural Resources Conservation Service
NW	North West
NWL	Normal Water Level
SFWMD	South Florida Water Management District
SPT	Standard Penetration Test Borings
SR	State Road
SW	South West
SWMM	Storm Water Management Model
SWMMP	Storm Water Management Master Plan
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey

SECTION 1 INTRODUCTION

The City of Miami Department of Capital Improvements Program (CIP) retained the services of T.Y. Lin International | H.J. Ross (TYLI) to prepare the design documents for the Mary Brickell Village Area of the City in order to provide drainage improvements and roadway restoration based on the findings of the accepted Technical Memorandum. **Figure 1** shows the Project Location Map.

1.1 PURPOSE

The purpose of this Drainage Report is to provide a basis for proposed drainage improvements within the above City of Miami community that will address flooding problems. This report will serve as the basis for the design to improve the drainage system and reduce flooding in this community. This report will also identify contributing factors to the flooding conditions, establish drainage requirements, and present the proposed measures to reduce flood stages within the project limits. Drainage improvements presented in this report do not guarantee complete elimination of potential drainage problems. By design, flood levels and the duration of standing water will be reduced, but the potential for flooding cannot be completely eliminated.

1.2 PROJECT LOCATION

The Mary Brickell Drainage Improvement project is located within Section 12, Township 54S, Range 41E, within the City of Miami limits. The project area, as defined by the CIP department, is bounded by and includes SW 9th Street to the north, SE 1st Ave. to the east, SW 12th Street to the south, and SW 1st Avenue to the west. In addition the area along SW 1st Court West of the MDT corridor between SW 9th Street and SW 8th Street will be used for the proposed location of the pump station and possible drainage wells. **Figure 1** shows an Aerial Plan depicting the limits of the Mary Brickell Village project.

This project is located in the heart of Miami's Financial District and is home to many recent development projects such as the shops at Mary Brickell Village and several condominium towers. The area is one of the City's more unique attractions with dozens of restaurants, stores, and night clubs.

Through the center of the project area runs the South Miami Avenue corridor. This corridor is part of the Miami-Dade County right-of-way and is maintained by the County. Currently there are two projects in the works for the South Miami Avenue corridor that are of interest to CIP. The County is initiating a drainage project along South Miami Avenue that will address drainage from SW 10th Street south to SW 13th Street along the corridor. As part of this study, it will be assumed that the contributing basin in this area is captured by the future County system. In addition the City of Miami's Downtown Development Agency (DDA) is currently holding workshops for conceptual designs on aesthetic and vehicular improvements for the corridor. No conflicts between this proposed project and the two ongoing City and County projects are anticipated, but coordination will remain a primary objective.

1.3 NEED FOR IMPROVEMENT

Within the Mary Brickell Village project area there are extreme low-lying areas that frequently experience flooding from routine rainstorm events. The extent and duration of the flooding problems vary from event to event, however, the nature of standing water within the City streets and adjacent properties is often predictable. During the summer months, short, intense storm events are a daily occurrence and city streets routinely flood followed by a slow subsidence when the storm are combined with high tide. Storm events such as Hurricane Irene in October of 1999, Hurricane Leslie in October of 2000, and the storms of 2005 produced water levels of several feet in the streets. In addition several private shops located adjacent to the lowest areas along SE 9th Street and SW 10th Street have experienced flooding and water damage as a result.

The effects of these intense storms and the resulting physical damage to properties and public facilities caused by high water levels are experienced throughout the community. Damages include City roadways that are in need of repair, reduced traffic flows during routine storm events, and several properties that have recurring damages.

The need for improvement lies in three key components. First, the existing storm water management system was constructed in the 1950's when development first began in this area. The existing system is a gravity system with a tidal dependant outfall. The system has not been significantly upgraded over the years. The original box culvert trunk lines, 12" cross drains, and cast iron inlets are still in use. Secondly, High tide elevations are typically around 2.60' (CM Datum) and the lowest grade elevations in the major depressions of the project are below 3.50'. As such there is very little storage in the system, and when intense rainfalls arrive during high tide, extreme flooding occurs and does not subside until the tide recedes.

To exacerbate the situation the land use in the area has significantly changed to the point where the area is practically built out and the percent impervious has reached nearly 100%. Although the developments have been required to address drainage on their sites, the impact of high-rise structures and reduced perviousness has inevitably increased runoff.

Engineered flood mitigation solutions and measures are desperately needed to provide this Miami community relief from the effects of flooding.

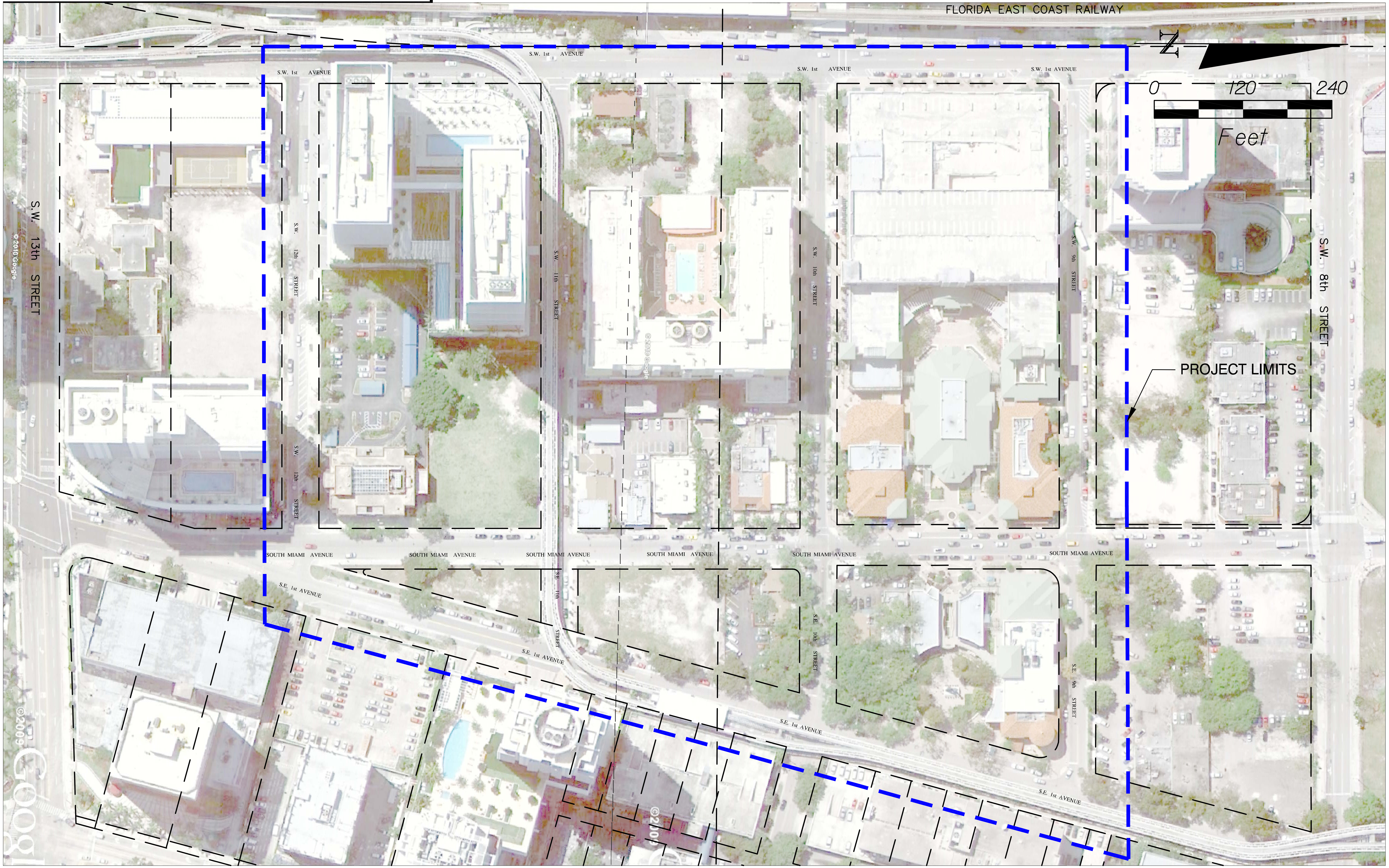

FIGURE 1: MARY BRICKELL VILLAGE PROJECT LOCATION MAP

SECTION 2 EXISTING CONDITIONS

2.1 DRAINAGE WATERSHED

The Mary Brickell Village Drainage Improvements Project is located at the downstream end of the Miami River Watershed (C-5 basin). The project lies downstream of the last South Florida Water Management District (SFWMD) control structures (S-25 and S-25B and S-26) and is subject to tidal conditions. Because of its proximity to the Bay, tidal conditions have a greater influence on the functioning of the drainage system.

Both the SFWMD and the Miami-Dade County Department of Environmental Resources Management (DERM) are conducting hydrologic-hydraulic models of the C-3, C-4, C-5 and the C-6 Canal systems.

2.2 TOPOGRAPHY

The Mary Brickell Village Drainage Improvements Project is in eastern Miami-Dade County in an area of relatively flat or slightly rolling topographic relief. The topography is such that the land surface undulates between extreme low spots and slightly higher ground. The undulating topographic characteristics combined with inadequate existing drainage systems leaves scattered areas vulnerable to recurring flooding conditions.

The existing ground elevations vary from a low of approximately 3.50-feet* in the depressions at SE 9th Street/1st Avenue and SW 10th Street east of 1st Avenue to a high of approximately 10.30-feet at SW 12th Street. The area was topographically surveyed by J. Bonfill and Associates specifically for this project. **Figure 2** depicts the actual surveyed elevation contours throughout the project area.

The project area is extremely low relative to the neighboring arterial roads and properties. SW 8th Street to the North, the Brickell Avenue developments to the east and SW 13th Street to the south are on average 2’-3’ higher than the residential roads in the project area. This topography causes a “soup bowl” effect in this area of the City. With no overland relief the area requires a robust internal drainage system to manage storm water runoff. This report will serve to evaluate the deficiencies of this internal drainage system and propose improvements based on the findings of the technical memorandum.

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* City of Miami Datum unless otherwise noted.

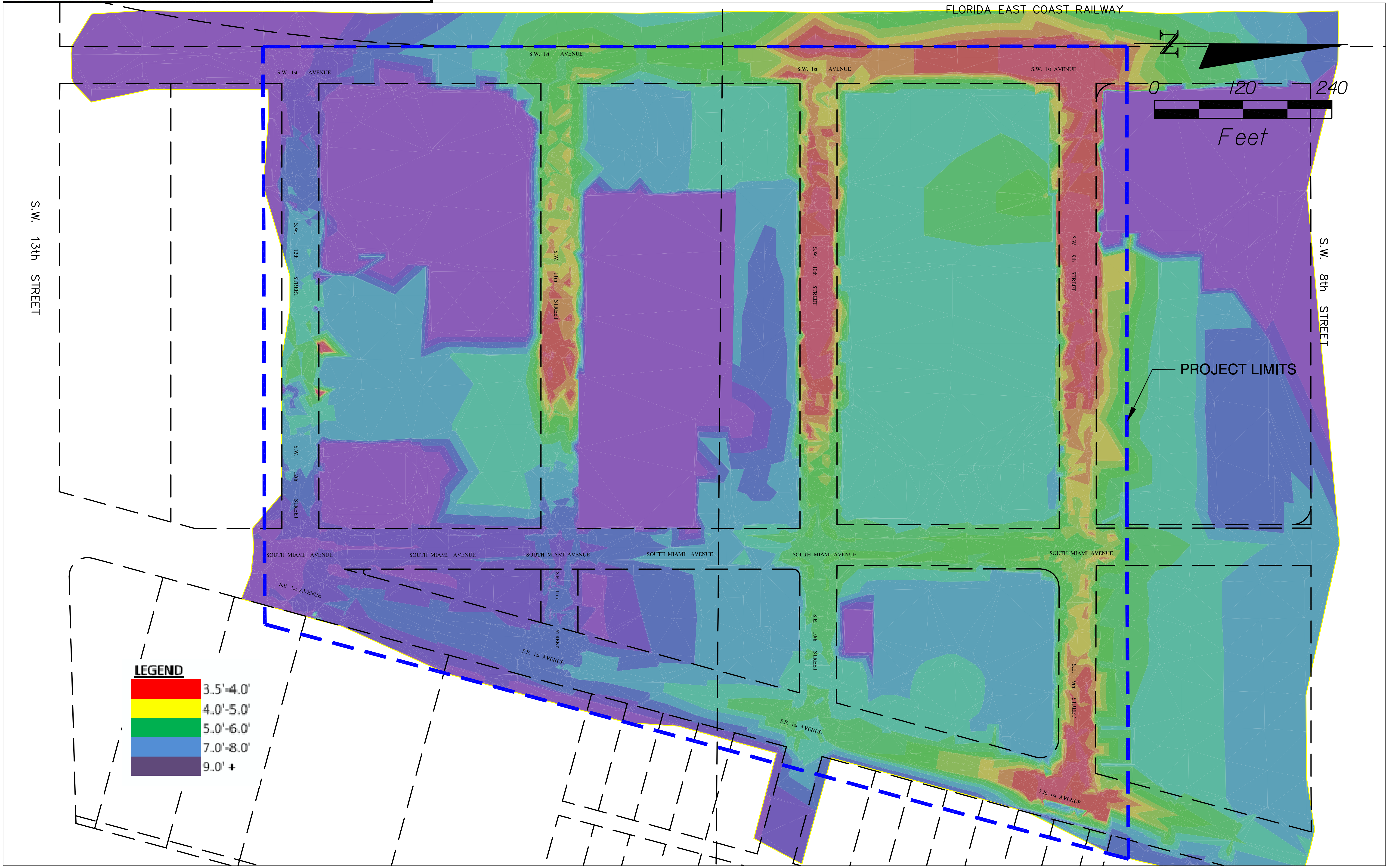


FIGURE 2: MARY BRICKELL VILLAGE PROJECT TOPOGRAPHY

2.3 GROUND WATER TABLE/BOUNDARY CONDITION ELEVATION

The ground water table elevation was obtained from the Miami-Dade County Public Works Department Design Standards Figure W.C. 2.1, Average Yearly Highest Ground Water Level (GWL) 1960-1975, and figure W.C. 2.2, Average October Ground Water Level (GWL) 1960-1975. The average yearly highest GWL is approximately 3.00-feet above mean sea level or 3.25-feet City of Miami Datum (CMD). The average October GWL is 2.00-feet above mean sea level (MSL) or 2.25-feet City of Miami Datum (CMD). See Appendix A for Miami-Dade County Public Works Department Design Standards GWL Figures.

The high tide water level was derived from the nearest NOAA tidal station (id# 8723165) at the Miami Marina near Bayside Marketplace. The elevation was calculated from tidal datum information to correspond to 2.10' City of Miami Datum. The highest observed elevation at this station was found to 3.32' City of Miami Datum. See Appendix C for the NOAA tide station information and datum calculations.

For modeling purposes, field observations of the static water levels were used as the observed levels were higher than the 2.10' derived from the NOAA tide station. This may be due to the fact that the point of discharge at the River is further inland than the NOAA station and may be subject to some head loss through the river section, raising the tailwater elevation. On October 14, 2010, a field survey was taken at high tide (approx. 3:04PM) and the water level was measured to be approximately 2.60' City of Miami Datum. This was used as the design tailwater and water table starting elevation. For the 25 year and 100 year storm events a tailwater elevation equivalent to the highest observed elevation was implemented in the model. Since our observed elevation for the MHHW was approximately 0.5' above the recorded level at the NOAA station, it was deduced that the same incremental elevation could be added to the highest observed elevation of 3.32' yielding a tailwater elevation of approximately 3.80' City of Miami Datum.

2.4 LAND USE

All on-site and adjacent land use types were classified according to the Florida Department of Transportation Florida Land Use, Cover and Forms Classification System (FLUCCS). Land use types were delineated utilizing ArcView, a Geographical Information System software package.

The Mary Brickell Village project area is highly diverse and consists of the following different land use categories:

- Communications, Utilities, Terminals, Plants
- Institutional
- Low-Density Multi-Family
- Office
- Parks (including preserves and conservation)
- Shopping Centers, Commercial, Stadiums, Tracks
- Single Family

- Transient Residential (Hotels/Motels)
- Two-Family (Duplexes)
- Vacant Unprotected

The primary uses are commercial (storefronts and restaurants) and residential condominiums. **Figure 3** shows the existing Land Use Maps for the Mary Brickell Village Area. This map is based on current land use which has been modified within the last ten years. Future land uses within the project areas are expected to remain the same.

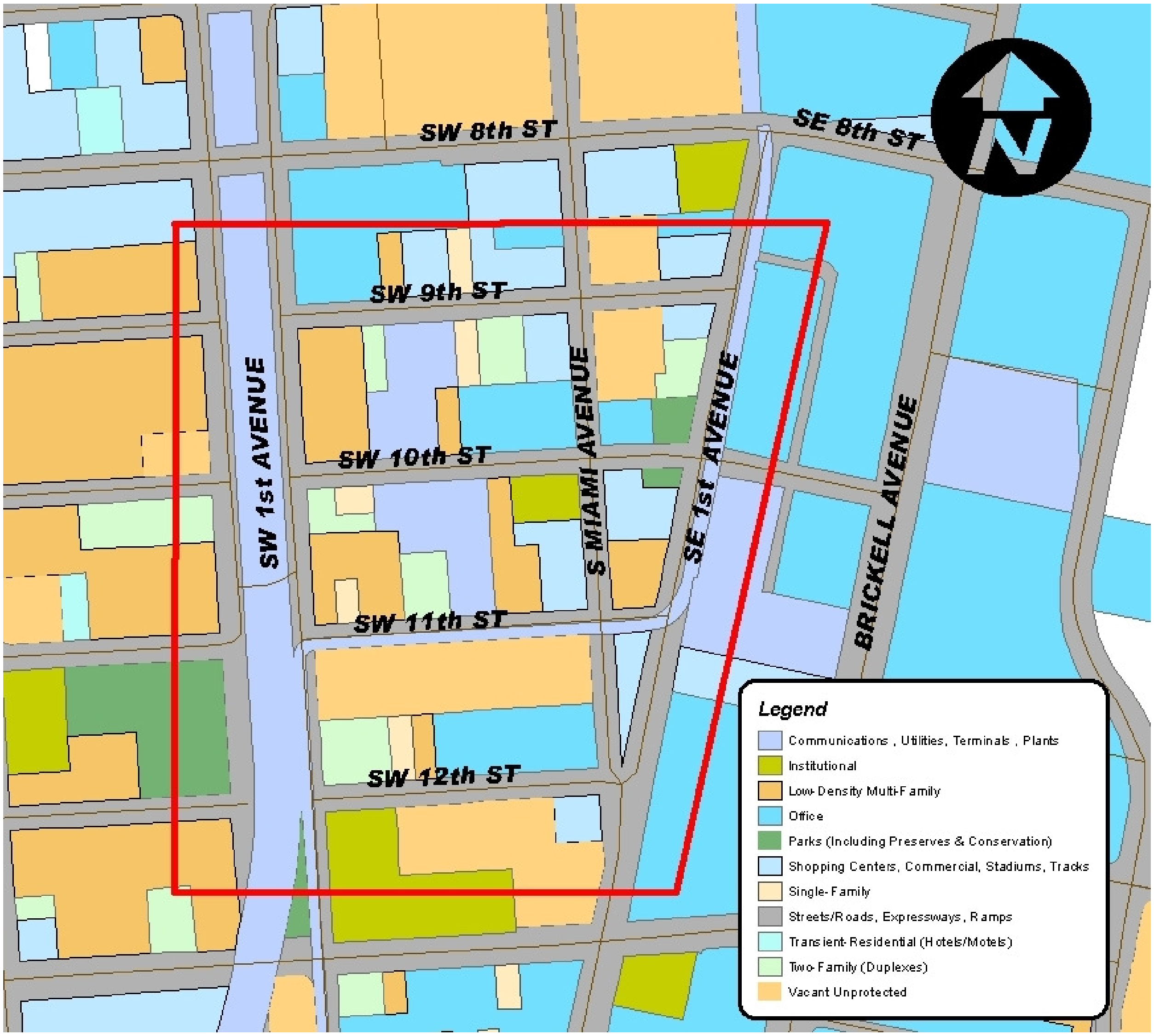


FIGURE 3 MARY BRICKELL VILLAGE PROJECT AREA LAND USE MAP

2.5 SOILS

Soil properties in Miami-Dade County are highly variable. MacTec Engineering and Consulting, Inc. prepared geotechnical reports for the project area. Appendix G includes the geotechnical report.

Because of the extremely low ground elevations and high water table, the use of exfiltration trenches has been dismissed for the lowest elevation basins. As such the geotechnical exploration did not include percolation testing. However SPT borings to determine the condition and type of earth were taken as well as various pavement cores to determine the extent of pavement restoration.

The "Soil Survey of Miami-Dade County, Florida," (1984) published by the Natural Resources Conservation Service (NRCS) was reviewed for near surface and subsurface soil information for the project area. Due to the urban nature of the area the dominant soil type is Urban Land, defined as land covered by more than 70-percent impervious urban development. These soils do not have a hydrologic soil group (HSG) classification.

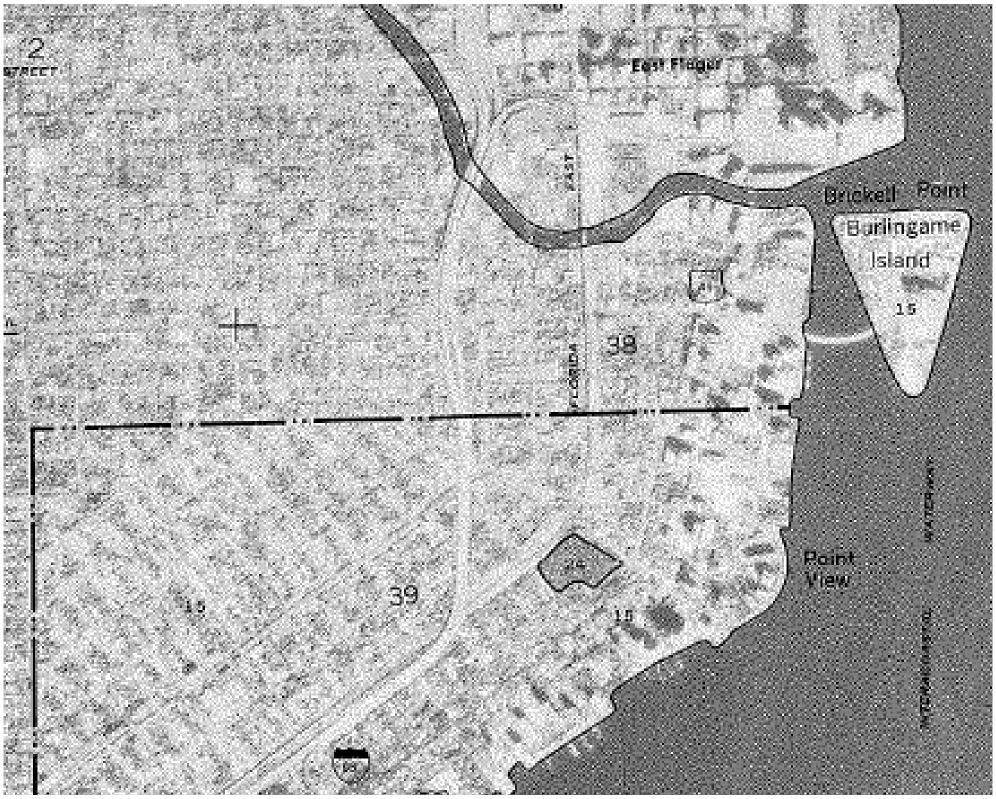


FIGURE 4 NRCS SOILS SURVEY MAP

2.6 FLOOD PLAIN INFORMATION

A review of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) indicates that the project area is primarily located within zone AE with a base flood elevation of 10 as depicted in FIRM Community Panel No. 12086C0314L, dated September 11,

2009. The higher elevation areas around SW 12th Street and 1st Avenue lie within zone X, outside of the 100 yr floodplain. **Figure 5** depicts the FEMA FIRM map for the project area.

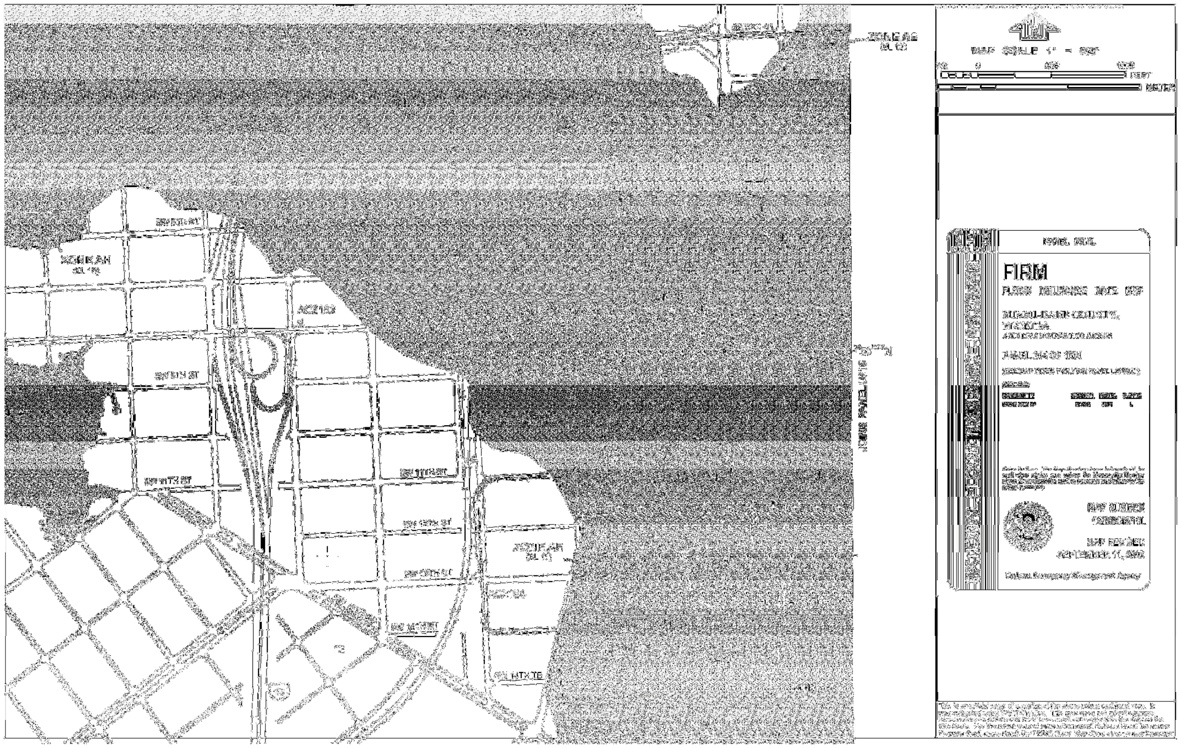


FIGURE 5 FEMA FIRM

2.7 EXISTING DRAINAGE SYSTEM CHARACTERISTICS

The existing storm water management system the Durham Terrace project area consists primarily of curb and gutter street sections with curb inlets, and an interconnected gravity sewer system with direct discharge to the Miami River at SW 1st Court. The curb inlets are primarily cast-iron type F-3 curb inlets with limited capacity. In some locations where valley gutters are present, valley grates are used.

The following is a description of the system beginning downstream at the outfall. The outfall consists of a sand-cement rip-rap reinforced endwall with a 60”x36” concrete box culvert main trunk line. This line proceeds down SW 1st Court where it picks up a small off-site system to the west from SW 9th Street. The main trunk line then crosses the MDT corridor onto SW 1st Avenue and decreases in size to a 54”x30” concrete box culvert. The main trunk line proceeds south along SW 1st Avenue decreasing in size after each street block from 42”x30” to 36”x30” to 21” circular. Per the as-built drawings all culverts are described as concrete. The first Branch to the trunk line extends along SW 10th Street where a 24”x15” culvert collects the major depression just east of SW 1st Avenue. Two other branches extend into SW 11th Street and SW 12th Street collecting the mid-block depressions just east of SW 1st Avenue.

A secondary trunk line branches from the main trunk line at the intersection of SW 1st Avenue and 9th Street and extends down 9th Street to the East. This line begins as a 36”x24” box culvert all along SW/SE 9th Street collecting from the mid-block depression just east of SW 1st Avenue, 4 inlets at South Miami Avenue, and the major depression at SE 1st Avenue. This secondary trunk line continues along SE 1st Avenue and ranges in size from 30”x19” to 23”x14” to 15” circular and collects the inlets at the 10th Street and 11th Street intersections. Throughout the entire system, the trunk and branch lines run within the pavement and are connected to the curb inlets through 12” concrete cross drains. Some cross drains terminate at manhole structures and others are cored directly into the box culverts. **Figure 7** depicts the Mary Brickell Village Project Basin Map and existing drainage system layout.

Currently is has been observed that the existing drainage system is not adequate for disposing of runoff in a reasonable amount of time and within reasonable flood limits. There are two major depressions within the area that the study will focus on in order to determine the efficiency of the proposed improvements when compared the pre-mitigation or existing condition. The major depressions are at the intersection of SE 9th Street and 1st Avenue and along SW 10th Street just east of 1st Avenue. During a recent site visit in December of 2009, extreme flooding was experienced firsthand. **Figure 6** depicts a picture of the flooding experienced at the peak of this particular storm. Unfortunately rainfall data specific to this area is not readily available so a true calibration of the model was not possible, but data from nearby station recorded nearly 1.75” of rainfall in less than an hour. These depressions often experience this level of flooding and beyond, to the point where the adjacent shops have sustain water damage, particularly along SW 10th Street.

FIGURE 6 **FLOODING AT THE INTERSECTION OF SE 9TH STREET AND 1ST AVENUE**

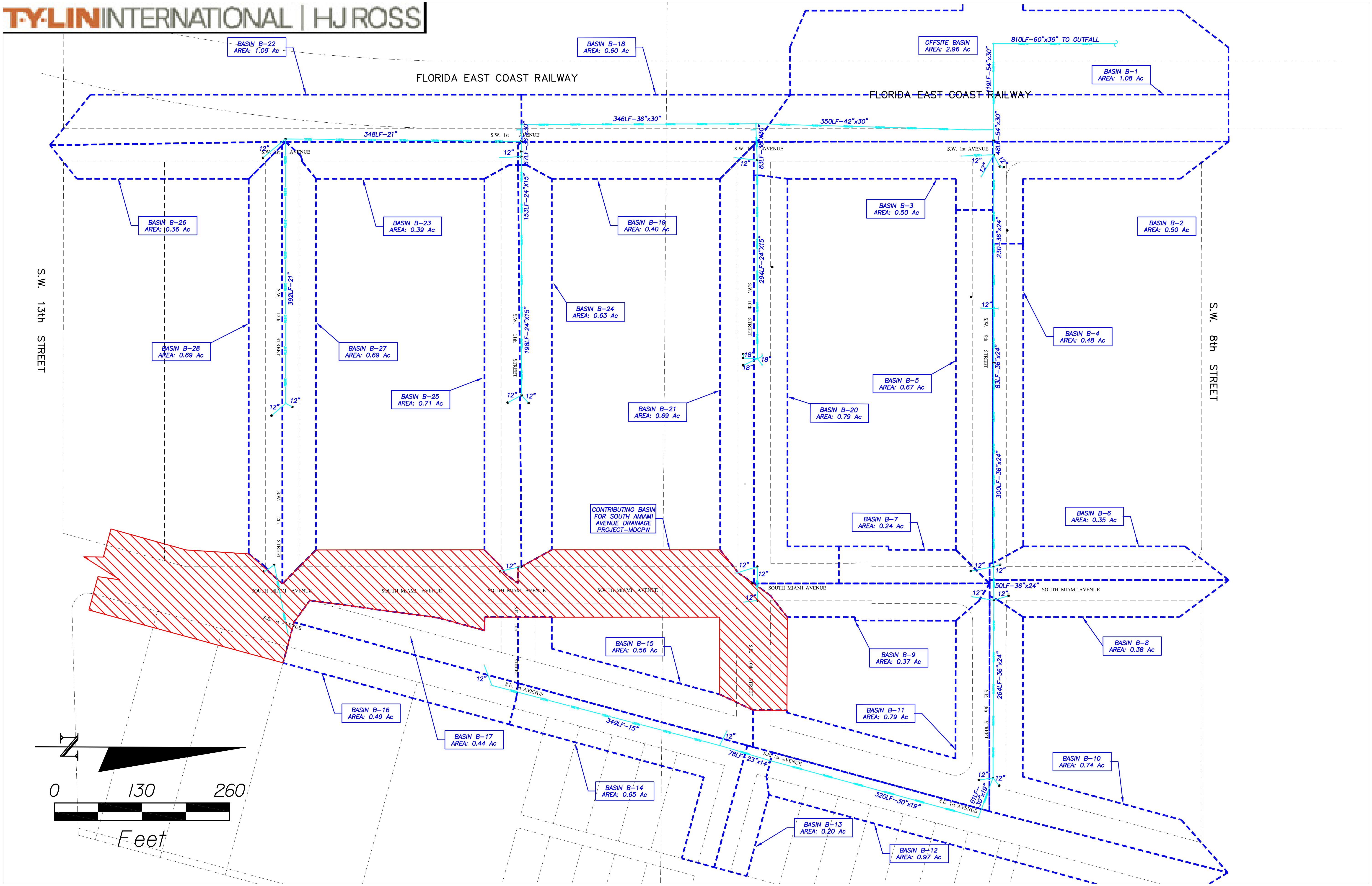


FIGURE 7: MARY BRICKELL VILLAGE PROJECT DRAINAGE MAP

2.8 CONTRIBUTING FACTORS

There are several major contributing factors to the frequent and intense flooding experienced within the project area. The following are some of those factors:

1. ***Outdated and Undersized System and the Impacts of Land Use Changes*** – The existing drainage system was constructed in the 1950's and was sized appropriately for the land uses of the day. In the past decade there has been a massive change in the zoning profile of this community. Where small restaurants and duplex condominiums once stood are now 40 story high rises and expansive shopping plazas. Although most of these developments have in some way mitigated for their impacts, the inevitable increase in runoff to the City streets as a results of the increased impervious area, and massive building faces (which add to the contributing basin areas) have been realized. Currently the system is not sufficiently sized to accommodate for this increase runoff. No major improvements to the original system have been made following the recent developments. The existing inlets, 12" cross drains, and concrete box culverts are still in use. As part of this report the upgrading of key system features will be explored.
2. ***Tidal Dependency*** – The existing drainage is a simple gravity sewer with discharge directly to the Miami River. As with any gravity system, its performance is fully dependant on the tailwater condition which in this case is the water level at the River. The discharge point at the River lies downstream of the final SFWMD control structures and as such is fully susceptible to tidal fluctuations. High tide elevations are on the order of 2.60'. When combined with the low ground elevations at the major depressions and the head losses through the system, there is less than 1' of vertical storage available in the system at these key areas. The results are extreme flooding when rain events coincide with high tide. Flooding typically does not subside until the high tide has passed. To correct this deficiency, a controlled tailwater condition that can be manipulated is required to maintain a functioning gravity system. The method by which this can be accomplished is through the use of a pump station. All of the proposed alternative designs will include a pump station as the primary drainage component.
3. ***High Water Table*** – The October-high water table in this area is above 2.25'. There is very little vertical storage available between this level and that of the low surface elevations.
4. ***Limited Vertical Relief and Extremely Low Surface Grades*** - Existing project area is subjected to the bowl effect. There are two major depressions where adjacent surface elevations are substantially higher isolating runoff to these depressions and not allowing discharge by overland relief. Under some circumstances, runoff may actually flow into, rather than out of these depressions since the head differentials are not present to move water out. The major depressions at SE 9th Street and 1st Avenue, and SW 10th Street just east of 1st Avenue have lowest grade elevations on the order of 3.50' with some grates even lower. When combined with the higher adjacent grades, high boundary condition, and high water table, the extreme flooding witnessed occurs.
5. ***Poor Subsurface Percolation*** – Due to the extremely high water table and low surface elevations, exfiltration trenches are inadequate for primary drainage in this area. They may be useful in some of the basins where higher surface elevations are

present such as along SW 12th Street and the southern portion of SE 1st Avenue, and may be utilized to provide water quality treatment. However, because the primary source of drainage that will be proposed is a pump station, exfiltration trenches will not be widely proposed in order to avoid pumping of ground water.

6. ***Limited Maintenance*** – The project area is a highly developed urban landscape with a high volume of vehicular and pedestrian traffic. As such there is a much larger volume of pollutants, including large waste debris, being introduced into the catch basins than would be introduced in a typical residential street. During several site visits, it has been observed that many of the inlets are full of debris or heavily silted. This can greatly diminish the efficiency of the system and certainly cause spot flooding in locations where the catch basins or pipes are clogged with debris. As part of the memorandum, we would recommend that the City increase is maintenance activities in the area to account for the increased use of the City right-of-way.
7. ***No Water Quality Considerations*** - A major deficiency that the existing stormwater management system for the area has is a complete lack of water quality treatment. The system currently has direct discharge to the Miami River with no provisions for retaining the “first-flush” of runoff. As part of this memorandum several options will explored and recommended for addressing water quality as part of the final design.

2.9 EXISTING FLOODING CONDITIONS

To ascertain the extent and level of flooding within the Mary Brickell Village project area, information from several sources was compiled.

- Site visits were conducted during rainfall events and photographs were taken to document the levels of flooding.
- Photographs were collected from the City for flooding conditions during extreme events.
- Meetings were held with DDA representatives in order to assess the complaints of the residents and business owners in the areas.

It was concluded that major areas of concern are along SW 10th Street midblock between SW 1st Avenue and S. Miami Avenue and the intersection of SE 9th Street and SE 1st Avenue. Extreme flooding was reported and witnessed in these areas and will be the focus of the design evaluation.

SECTION 3 DESIGN AND EVALUATION CRITERIA

3.1 DESIGN CRITERIA

The City of Miami Public Works Department establishes design criteria related to their storm water management systems. The project also falls under the jurisdiction of DERM and SFWMD. Design criteria for these projects should follow the most stringent of these agencies requirements.

3.2 WATER QUALITY

The Department of Environmental Resources (DERM) and South Florida Water Management District (SFWMD) have jurisdiction over the stormwater quality criteria for this project. In many instances, geological conditions do not permit full onsite retention of the design runoff due to poor soil infiltration, and in such instances, Miami-Dade County encourages the retention of at least the first inch of runoff. Because most contaminants are considered to be contained in the first inch of runoff, this rule is intended to at least meet the water-quality objectives of stormwater-management systems, even if the water-quantity objectives cannot be met. Supplementary systems, such as emergency overflow pipes that allow excess water to be discharged into off-site surface-water bodies, are used to provide flood protection.

The following are the accepted water quality criteria for the project area per the environmental agencies:

SFWMD:

- The first one inch of runoff times the total project (basin) area.
- The total runoff from 2.5 inches times the impervious area.

DERM:

- Retain one inch of storm water runoff on-site from the farthest point of the drainage basin to the point prior to discharging offsite (DERM criteria).

Of the three criteria, for the project parameters, the DERM criterion is most stringent and will be used to assess water quality.

The primary method of complying with storm water treatment requirements in South Florida is through the use of exfiltration trenches. Due to the low ground elevation and high water table, this method may not be utilized exclusively. If the improvements incorporate a storm water lift station, additional methods such as structural BMP's (vortex separators) and/or injection wells will be utilized as part of the proposed solutions to the flooding problems.

3.3 WATER QUANTITY

Another important aspect of storm water management systems in Florida is water quantity. The South Florida Water Management District (SFWMD) water-quantity requirements for stormwater-management systems must be met in addition to any other local municipal requirements. The SFWMD water-quantity requirements are as follows:

- **Off-site discharge**—The off-site discharge rate is limited to rates that do not cause adverse effects to existing off-site properties, historic-discharge rates, rates determined in previous District permit actions, or other rates specified by the District.
- **Design storm**—Unless otherwise specified by previous District permits or criteria, a storm event having a 25-year / 3-day duration return frequency must be used in computing off-site discharge rates. In instances where there is no off-site discharge, adequate aboveground onsite storage must be available to accommodate the 25-year / 3-day storm.
- **Flood protection of building floors**—Building floors must be at or above the 100-year flood elevations as determined from the most appropriate information, including Federal

Flood Insurance Rate Maps. Both tidal flooding and the 100-year 3-day storm event are considered in determining elevations.

• **Flood protection of roads and parking lots**—In instances where criteria are not specified by local government with jurisdiction, the design criteria used for drainage and flood protection are: 5-year 1-day storm for road centerlines, and 5-year / 1-hour storm for parking lots served by exfiltration systems.

• **Floodplain encroachment**—No net encroachment is allowed into the floodplain between the average wet-season water table and that encompassed by the 100-year event, which will adversely affect the existing rights of others.

• **Historic basin storage**—Provision must be made to replace or otherwise mitigate the loss of historic basin storage provided by the project site.

3.4 ALLOWABLE FLOOD LEVELS

The following are some of the flood level criteria as established by Miami-Dade County:

- All structures (commercial, residential) shall be flood-free during the 100-year storm event.
- Major evacuation routes, shall be passable during the 100-year storm event.
- Minor arterial (4-lane roads) shall be passable during the 10-year storm event.
- Collector and local residential streets shall be passable during the 5-year storm event.

The roadways being addressed as part of this project are considered local residential streets and will be designed to the 5-year storm event criteria. Flood stages cannot encroach upon the crown of the roadway to be defined as passable. Ponding will be defined as stages above the grate elevations and will also be documented as part this report.

3.5 PERMITTING REQUIREMENTS AND ENVIRONMENTAL AGENCY COORDINATION

The following are the required permits for this project depending on the final proposed solutions:

- Environmental Resource Permit (ERP).
- DERM Class II Permits
- USACE permits and DERM Class I Permits will be required if outfall reconstruction is proposed in the final design.

Permit applications have to be submitted to DERM. In addition to this a permit from the Florida Department of Environmental Protection (FDEP) will be required for drainage wells, if ultimately proposed. A permit from the City of Miami Public Works Department will also be required to construct within the right-of-way.

A pre-application meeting will be conducted with DERM and SFWMD staff to further define the project goals. Documentation of the meetings and conversations will be included under separate covers.

SECTION 4 MODEL METHODOLOGY

4.1 APPROACH

A detailed hydrologic/hydraulic analysis was performed to develop flood discharges and stages for the Mary Brickell Village project. The following sections describe the methodology and results of the hydrologic/hydraulic analysis completed for the existing project conditions described in Section 2. To conduct the analysis, a review of the following information was performed:

- Topographic survey of the existing conditions
- Record plans for the existing storm water management systems in the area
- Field reviews and site visits

The initial phase of the model construction was to create an AutoCAD Civil 3D drawing of all known drainage structures including catch basins, storm sewers, and exfiltration trenches from the field surveys and as-built records. In addition the surveyed elevations were used to develop the site topography and create a three dimensional model of the project area in order to identify basins and develop stage-storage relationships. Upon completion, a Drainage Map was produced that identified the drainage basins and drainage patterns and incorporated them into the hydrologic/hydraulic model network.

The model network is constructed of nodes and links where the hydrologic and hydraulic data of the model is stored. The nodes are typically storage nodes, junctions and outfalls whereas the links are the storm pipes and overland flow representations. The model was run for the following four design storm events: 5-year/24-hour, 10-year/24-hour, 25-year/72-hour, and 100-year/72-hour.

4.2 GENERAL MODEL INFORMATION

ICPR is a stormwater management analysis and design tool developed by Streamline Technologies, Inc. ICPR is a hydrodynamic model that simulates hydrologic and hydraulic conditions using conveyance features such as basins, nodes, and links.

The Interconnected Pond Routing (ICPR) computer model (Version 3.10) was used to analyze existing and proposed drainage conditions, and to verify that the required stormwater quantity criteria outlined in Section 3 is in compliance. The ICPR computer model simulated hydrologic and hydraulic conditions by generating runoff hydrographs and dynamically routing these hydrographs through diverging, looped, and/or bifurcated stormwater management systems.

In ICPR, the stormwater management system is divided into networks of nodes or junctions and links or reaches. A node is a discrete location in the drainage system where runoff enters the system and conservation of mass or continuity is maintained. Links represent connections between nodes and are used to transfer or convey stormwater runoff through the system. The links are used to model the hydraulic response of the system for a defined hydrologic condition.

4.3 HYDROLOGIC MODELING

ICPR uses three methods for generating stormwater runoff hydrographs: the Soil Conservation Service (SCS) unit hydrograph method, Santa Barbara Urban Hydrograph (SBUH) method and kinematic overland flow method. For this project, the method selected for hydrograph generation is the Soil Conservation Service (SCS) Unit Hydrograph procedure as outlined in the USDA, SCS, "National Engineering Handbook, Section 4, Hydrology." This is one of the recommended SFWMD procedures found in the Environmental Resource Permit (ERP) Basis of Review (BOR) Manual and is the most appropriate method for the size of the drainage areas, land use, soil condition and regional location.

A dimensionless unit hydrograph with a peak factor of 256 was used for analysis, as is typical in South Florida.

The SCS unit hydrograph procedure requires input data describing the physical features of each drainage sub-basin in the system and generates runoff hydrographs using the following hydrologic parameters:

1. Basin areas (acres);
2. Curve numbers (CN);
3. Rainfall precipitation;
4. Rainfall distribution;
5. Storm Duration;
6. Time of Concentration (TOC).

Basin areas are calculated by analyzing the DTM generated by Civil 3D and is based on the surveyed elevations. Also taken into account when determining basin limits, is the interconnectivity of the storm sewer system. Finally, based on the recommendations of MD-DERM, The City of Miami Public Works Department, and other local agencies, basin areas are limited to the right-of-way area plus 25 feet on either side. In addition to the surface basin areas, ½ of the total high-rise building (over 3 stories) face area was added to the contributing area of the basins. This was done in order to simulate the capturing affect of the building faces when heavy rain falls at an angle. See **Figure 7** for the basis of calculations drainage basin map.

4.3.1 CURVE NUMBER

The Curve Number is dependent on land use, soils and topography.

Existing land use information for project is found in section 2.4.

Soil types for the study area were determined from Miami-Dade County NRCS Soil Survey and the subsurface soil exploration. Soil types were assigned a hydrologic soil group in accordance with *Guidelines for Determining Hydrologic Soils Groups,* see section 2.5.

The information used for relating land use and soil types to curve numbers was based on the imperviousness of the land use using the NRCS publication TR-55, latest edition. The percent impervious was obtained from the aerial shown on **Figure 1**. Due to the built out nature of the project area a curve number of 98 was used for all basins.

4.3.2 RAINFALL PRECIPITATION

Rainfall data is the single most important group of hydrological data required by ICPR. A hyetograph of rainfall intensities versus time is required for the period of the simulation. For single event simulation, the data is usually entered directly as a synthetic design storm.

The following design storm events were simulated in ICPR:

- 5 year – 24 hour
- 10 year – 24 hour
- 25 year – 72 hour
- 100 year – 72 hour

Table 6 depicts the design rainfall precipitation depths as obtained from the South Florida Water Management District Environmental Resource Permit (ERP) Basis of Review (BOR) Manual rainfall maps. See appendix A for the SFWMD rainfall maps.

Table 1 Design Rainfall Depths, inches

Return Period	24-Hour	72-Hour
5-year	6.30	--
10-year	7.90	--
25-year	--	12.00
100-year	--	14.00

4.3.3 RAINFALL DISTRIBUTION

The unit hydrograph was distributed over time using the Florida Modified Type II 24-hour Distribution and the South Florida Water Management District 72-hour Distribution with an antecedent moisture condition (AMC) of II.

The design rainfall distribution defines how the mass rainfall is distributed throughout the storm event. The SFMWD 72-hour distribution was used for the 25-year / 72-hour and 100-year / 72 hour storm events. The SCS Type II Florida Mod distribution was used for the 5-year / 24-hour, and 10-year / 24-hour.

4.3.4 TIME OF CONCENTRATION (TOC)

The drainage basin TOC is the time for a drop of water to reach the basin discharge point from the most hydraulically remote point in the basin. It is typically computed utilizing the kinematic wave equation for overland flow as outlined in the NRCS publication TR-55. However the pre-development and post-development drainage basins of the project are relatively small and highly impervious. The drainage system also offers wide coverage in each of the sub-basins. Because of this the travel times from the most hydraulically remote point to a system catch basin is relatively low. For these reasons, all of the sub-basins are conservatively presumed to have TOC less than 10 minutes. Therefore, a TOC of 10 minutes was assumed for all basins where the majority of runoff occurs via overland flow.

4.4 HYDRAULIC DATA

Peak water-surface elevations for the design storm events were computed using the ICPR computer program. ICPR uses a link-node network to describe the physical model. Nodes are the storage elements and correspond to manholes and junctions. The conduit system is idealized as a series of links or conduits that are connected at nodes or junctions. Once ICPR generates the runoff hydrographs, the program then routes the hydrographs through the model network.

4.4.1 NODE DATA

Node data is required for every node in the network including junction nodes, storage nodes, and outfall nodes. Appendices E and F list the Node Input data for both the pre-development (existing) and post-development models. Following are the node input parameters:

- **Node Name -** the node name is the same as the name of the sub-basin that contains it, and surface runoff from the sub-basin is directed to the node. Not every node in the model has surface runoff directed to it.
- **Node Type –** The project basin nodes with storage will be modeled as stage-volume nodes with stage-volume relationships derived from the Civil 3D generated DTM based on the surveyed topography. Below ground storage is calculated by taking into account the cross-sectional area of the particular drainage structure.
- **Base Flow –** there will be no base flows modeled in this project
- **Initial Stage –** this is the initial node depth or starting water surface elevation. The design boundary condition/river elevation was used for all of the nodes as the initial stage in order to begin with a stable model with no flow.
- **Warning Stage –** warning stages will be set at the lowest grate elevation to display when the inlets are surcharging.

4.4.2 BOUNDARY CONDITIONS

The only boundary condition node for this project will be the surface tail-water elevation at the outfall along the Miami River. The high-high tide elevation will be uses as both the boundary condition and starting ground water level. The design high tide was derived from field observations and corresponds to 2.60' City of Miami Datum. See section 2.3.

4.4.3 LINK DATA

There are several different types of links in the hydraulic model. The main types utilized in this project are pipes, channels, weirs, and rating curves. It should be noted that it is being assumed that the system is clean and free of major debris and/or silt and is modeled as such.

Appendices E and F list the Link Input data for both the pre-development (existing) and post-development models. The size, shape, material, inverts and lengths for the existing culverts were obtained from the topographic survey prepared by J. Bonfill and Associates, Inc. or from the as-built drawings. Following is a description of some of the link input parameters:

- **Manning's Roughness -** Manning's Roughness is a standard indicator of the smoothness of the conduit. Roughness values for culverts and force mains are based on culvert material and condition. A value of 0.012 was used for reinforced concrete pipes and a value of 0.024 for corrugated metal pipes. A value of 0.011 was used for ductile iron pipe force mains. A roughness of 0.08 was estimated for natural overland flow channels. Entrance and exit losses were taken into account based on FDOT standards.
- **Natural Channels (Overland Weirs) -** Occasionally it is necessary to perform routing on the water that floods onto the ground. A Natural channel conduit is constructed for the overland flow paths to transport the flooded water from the ground elevation of the upstream junction to the ground elevation of the downstream junction or vice versa. The natural channel shape consists of coordinate pairs for the positions in feet (**X**) and elevations (**Stage**) at

each coordinate. If the left-most or right-most elevations are less than the maximum value, vertical sides are projected up to the high point as shown in the above figure. Data for the channel cross sections was obtained from the DTM.

4.5 MODEL CALIBRATION

The model was calibrated by modeling the storm event witness on December 17, 2009. The nearest rain gauges recorded approximately 1.22” in an hour near the airport. It was estimated that nearly 2” fell in our area within the hour. This has based on the fact that the storm traveled in an east-west pattern that day and no other rain gauge data is readily available near the project area. The results of the model were within inches of the witnessed flood levels depicted in **Figure 6**. It was determined that the model is adequately calibrated as the model did not take into account the observed debris and silt found in many of the catch basins throughout the project. This reduced efficiency would have no doubt raised the modeled flood levels closer to the observed flood levels.

SECTION 5 ANALYSIS OF PRE-DEVELOPMENT CONDITIONS

Once the ICPR model was completed and the calibration process conducted, the existing conditions system was simulated for the four design storm events. **Figure 9** shows the Existing Conditions Node-Link Diagram. Appendix E contains all the input and output data on the pre-development (existing) ICPR model. Table 2 shows the results of the analysis for the existing condition nodes.

There are several assumptions made during the modeling process. As stated in section 4.3, the drainage basin area taken into account were up to 25’ beyond the right-of-way in either direction plus the high-rise building face area. In addition, the contributing basin along S. Miami Avenue that will be addressed by the Miami-Dade County Public Works drainage project that is currently under construction was disregarded as a contributing area to this model. This model assumes that said project is complete and functioning as designed. The final assumption is that the system is clean and free of debris. Taking these factors into account, the system is being modeled in its optimal state.

As is evident from the results, several of the existing basins have substandard flood conditions. Of the 28 basins, 12 were identified as having flooding conditions beyond the acceptable criteria. Of interest are the particular critical basin nodes which correspond to the major 9th Street and 10th Street depressions. The following basins correspond to the depression at SE 9th Street and SE 1st Avenue: **Basins B-10, B-11, B-12, and B-13.** The following basins correspond to the depression midblock along SW 10th Street east of SW 1st Avenue: **Basins B-21 and B-22.** These basins will serve as the barometer for determining the effectiveness of the proposed alternatives. It should also be mentioned that the maximum discharge rates to the canal for the 25yr-72hr storm event, which serves as the criteria for offsite discharge, was 59.94 CFS.

TABLE 2 PRE-DEVELOPMENT CONDITIONS FLOOD STAGE SUMMARY

Node	5yr-24hr	10yr-24hr	25yr-72hr	100yr-72hr	Warning Stage (Grate or Top Elev.)	Criterion Stage (Lowest Crown Elev.)	5yr Ponding Depth over Grate	5yr Criterion Flood Depth
	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(in)	(in)
B-1	4.20	4.42	5.03	5.17	3.80	4.15	4.79	0.59
B-2	4.73	5.04	5.51	5.73	3.96	4.16	9.22	6.82
B-3	4.40	4.63	5.13	5.28	3.96	4.16	5.27	2.87
B-4	4.65	4.88	5.32	5.48	3.12	4.11	18.36	6.48
B-5	4.70	4.93	5.35	5.51	3.69	4.11	12.16	7.12
B-6	4.92	5.18	5.54	5.71	4.87	5.23	0.65	-
B-7	4.91	5.17	5.54	5.70	5.22	5.54	-	-
B-8	5.03	5.29	5.62	5.79	4.90	5.23	1.58	-
B-9	5.03	5.29	5.62	5.79	4.86	5.54	2.09	-
B-10	5.18	5.45	5.75	5.92	4.11	4.36	12.82	9.82
B-11	5.21	5.47	5.76	5.94	4.06	4.36	13.76	10.16
B-12	5.28	5.57	5.86	6.05	4.15	4.55	13.55	8.75
B-13	5.47	5.80	6.08	6.29	5.87	6.03	-	-
B-14	5.78	6.16	6.45	6.69	5.70	6.16	0.91	-
B-15	5.92	6.30	6.57	6.81	5.66	6.16	3.06	-
B-16	6.41	6.95	7.37	7.75	8.13	8.28	-	-
B-17	6.51	7.07	7.51	7.92	8.15	8.28	-	-
B-18	4.51	4.77	5.29	5.45	4.03	4.84	5.80	-
B-19	4.59	4.87	5.33	5.50	4.37	4.84	2.65	-
B-20	4.78	5.04	5.44	5.62	3.67	4.02	13.32	9.12
B-21	4.79	5.04	5.45	5.62	3.83	4.02	11.47	9.19
B-22	4.73	5.02	5.49	5.68	5.31	5.86	-	-
B-23	4.92	5.24	5.67	5.87	5.34	5.86	-	-
B-24	5.31	5.64	5.98	6.21	4.20	4.60	13.32	8.52
B-25	5.52	5.86	6.18	6.43	4.20	4.60	15.82	11.02
B-26	5.82	5.93	6.41	6.75	9.94	10.33	-	-
B-27	6.38	6.94	7.36	7.71	5.90	6.43	5.75	-
B-28	6.30	6.82	7.22	7.54	5.80	6.43	5.99	-
WATER WAY	2.60	2.60	3.80	3.80	N/A	N/A	N/A	N/A

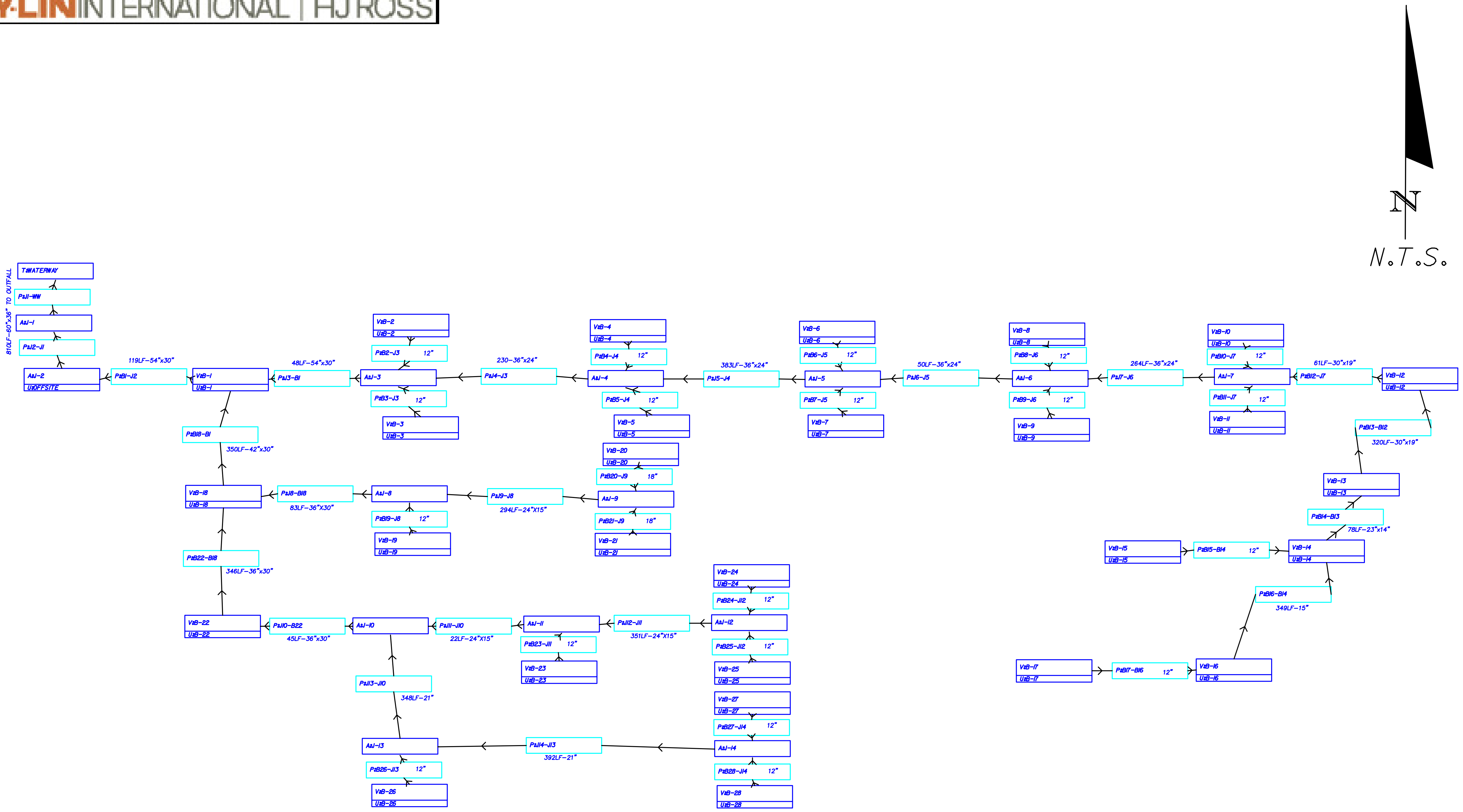


FIGURE 8: PRE-DEVELOPMENT NODE-LINK DIAGRAM

SECTION 6 ANALYSIS OF POST-DEVELOPMENT CONDITIONS

6.1 OBJECTIVES

In order to minimize the cost and environmental impacts of the proposed project, several options for the proposed drainage improvements were analyzed as part of a technical memorandum finalized in February 2011. In all cases the options considered had to meet the objectives listed below:

- Maximize the utilization of existing drainage systems,
- Minimize the need for additional Right-of Way acquisition,
- Minimize environmental impacts, and
- Minimize project cost

In order to minimize project cost and to minimize environmental impacts it was decided to attempt to utilize as much of the existing trunk lines as possible. Furthermore it was decided that due to the restrictive nature of the existing topography and boundary conditions, any improvements proposed would require a pump station as the primary method of discharge.

The following section describes the proposed storm water management improvements that were selected as part of the technical memorandum. Appendix F lists the ICPR model input and output data, and Appendix H lists the Cost Estimates of the improvements.

6.2 ANALYSIS OF PROPOSED IMPROVEMENTS – ALTERNATIVE 1

The first alternative involves the addition of a new pump station to accommodate the runoff from the entire project basin. The pump station location is proposed within the City right-of-way along SW 1st Court west of the MDT Metrorail corridor just north of 9th Street along the existing parking lane. **Figure 9** shows pictures depicting the area where a pump station could be constructed. There are minimal utility conflicts and no encroachment into the MDT right-of-way. This proposed location will also be used for Alternative 2.

For Alternative 1 the entire existing storm sewer system was maintained intact in order to demonstrate the inefficiency of existing cross drains and branch lines to convey water from the depressions to the boundary node which is this case is now the wet well of the pump station. A bypass system was modeled using two additional junction nodes. The pump station itself was modeled with a 15’x25’ wet well node depicting a stage vs. area storage relationship. The pumps were modeled utilizing a rating curve and an operating table defining a head vs. discharge where head is defined and difference between the upstream and downstream stages. For the purposes of determining the optimum pump rate, a constant rate operating table was used where discharge was constant over the full range of possible head levels. Finally “dummy” nodes were introduced to represent the pump outlets, pipes with equivalent lengths were used to model the pump discharge pipes and valves, and a “dummy” node was used to represent the connection of the discharge pipes to the force main. The advantage of the pump station system is that the tail-water elevation can be manipulated to allow for increased flows. For this model the tail-water elevation corresponds to the pump start elevations which were set a 0.00’ and 1.50’ for lead and lag pumps respectively.

For modeling purposes the pump station was set-up as a duplex station with constant rate pumps. In reality a triplex station may be required depending on the horsepower requirements

FIGURE 9 POSSIBLE PUMP STATION LOCATION SW 1ST COURT NORTH OF 9TH STREET

of the specific pumps. Different pump rates were modeled for the design criteria storm (ranging from 40 CFS to 60 CFS pumps). Peak stage elevations in the critical nodes (see section 5) were compared for the various pumping rates, and through the utilization of a "point of diminishing returns" method, an optimal pump rate was chosen.

For purposes of comparison, nodes B-12 and B-22 were chosen as critical nodes and peak stages were compared for various pump rates for the criteria event (5yr). For two 20 CFS pumps the peak stages were 5.00' and 4.51' respectively. For two 30 CFS pumps the peak stages were 4.91' and 4.37' respectively. And for two 40 CFS and even 50 CFS pumps the peak stages were 4.91' and 4.37' respectively. As is evident from the results, extreme variations in the pump rates had no affect on the peak stages at the critical depressions of the project once the total outflow surpassed 60 CFS. This finding demonstrates that the existing drainage system is hydraulically maxed out at between 40CFS and 60CFS of total flow, pumping any more will not yield any gains as the pipes will be controlling or "choking" the flow. In addition although the results demonstrate much reduced peak stages, several nodes including the critical basins continue to show peak stages beyond the criteria. The subsequent alternatives will determine what improvements that must be made to the conveyance system, branch lines, and cross drains in order to take advantage of the controlled tailwater condition created by the use of the pump station and meet the flood criteria. Table 3 shows the results of the analysis of the proposed improvements – Alternative 1 utilizing two 40 CFS pumps (80 CFS total).

TABLE 3 POST-DEVELOPMENT ALTERNATIVE 1 FLOOD STAGE SUMMARY

Node	5yr-24hr	10yr-24hr	25yr-72hr	100yr-72hr	Warning Stage (Grate or Top Elev.)	Criterion Stage (Lowest Crown Elev.)	5yr Ponding Depth over Grate	5yr Criterion Flood Depth
	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(in)	(in)
B-1	3.37	3.76	3.99	4.20	3.80	4.15	-	-
B-2	4.19	4.66	4.90	5.18	3.96	4.16	2.70	0.30
B-3	3.75	4.18	4.38	4.58	3.96	4.16	-	-
B-4	4.12	4.50	4.66	4.86	3.12	4.11	12.04	0.16
B-5	4.25	4.60	4.76	4.96	3.69	4.11	6.74	1.70
B-6	4.45	4.85	5.04	5.25	4.87	5.23	-	-
B-7	4.44	4.83	5.01	5.23	5.22	5.54	-	-
B-8	4.60	5.01	5.19	5.40	4.90	5.23	-	-
B-9	4.61	5.01	5.18	5.39	4.86	5.54	-	-
B-10	4.83	5.20	5.37	5.59	4.11	4.36	8.58	5.58
B-11	4.88	5.24	5.41	5.62	4.06	4.36	9.83	6.23
B-12	4.91	5.33	5.52	5.75	4.15	4.55	9.06	4.26
B-13	5.09	5.57	5.78	6.03	5.87	6.03	-	-
B-14	5.38	5.92	6.18	6.46	5.70	6.16	-	-
B-15	5.53	6.08	6.34	6.61	5.66	6.16	-	-
B-16	5.88	6.58	6.95	7.39	8.13	8.28	-	-
B-17	5.95	6.68	7.07	7.53	8.15	8.28	-	-
B-18	3.81	4.24	4.50	4.74	4.03	4.84	-	-
B-19	3.93	4.41	4.70	4.93	4.37	4.84	-	-
B-20	4.35	4.73	4.91	5.13	3.67	4.02	8.17	3.97
B-21	4.37	4.74	4.92	5.14	3.83	4.02	6.42	4.14
B-22	4.08	4.54	4.84	5.11	5.31	5.86	-	-
B-23	4.34	4.82	5.13	5.42	5.34	5.86	-	-
B-24	5.00	5.38	5.58	5.86	4.20	4.60	9.55	4.75
B-25	5.26	5.66	5.87	6.16	4.20	4.60	12.76	7.96
B-26	5.82	5.93	6.00	6.31	9.94	10.33	-	-
B-27	5.90	6.56	6.91	7.37	5.90	6.43	-	-
B-28	5.84	6.51	6.87	7.26	5.80	6.43	0.43	-
WATER WAY	2.60	2.60	3.80	3.80	N/A	N/A	N/A	N/A

6.3 ANALYSIS OF PROPOSED IMPROVEMENTS – FINAL DESIGN

The intent of final design was to determine what improvements needed to be made to the existing drainage system in order to allow the pump station to function efficiently. The initial iterations of this alternative included major improvements to the main outfall along SW 1st Court. However upon several modeling runs, it was determined that peak stages within the criteria could be achieved through improvements of the branch and secondary systems only. Through a method of trial and error, the model was run repeatedly in order to identify links that were "choking" the system. This was done by comparing upstream and downstream stages, or the head losses, for each link and identifying links with significant head losses. Subsequent model runs with larger pipe sizes were run until optimal sizes were obtained. The following is a list of the improvements proposed to the existing drainage system in addition to the pump station at SW 1st Court and 9th Street as described in section 6.2:

- All cross drains connecting the curb inlets with branch lines within the affected project area will be upgraded to a minimum diameter of 18". The existing system has pipe diameters typically of 12".
- The secondary trunk line along SW/SE 9th Street will be increased in diameter accordingly: 48" from node B-1 to J-4, 42" from node J-4 to J-5 with an intermediate manhole (not modeled) reducing the size to 36". The remainder of the trunk lines will remain the existing sizes.
- The branch line along SW 10th Street will be increased in size from 24"x15" box culvert to a 30" diameter pipe.
- The branch line along SW 11th Street will be increased in size from 24"x15" box culvert to a 30" diameter pipe.
- The system along SW 12th Street will be effectively disconnected from the pump station system. This roadway is at a higher elevation where the use of exfiltration trenches is feasible. An isolated exfiltration trench system will be used here with a control structure installed between it and the pump station system. The control structure will be comprised of an overflow weir. The purpose of this action is to minimize the contributing area to the pump station and was required to meet the flood criteria requirement and also maintain the use of the existing primary trunk lines. See appendix B for the miscellaneous calculations sizing the exfiltration trench for this basin.
- The system at the intersection SE 11th Street and SE 1st Court will also be effectively disconnected from the pump station system. This intersection is at a much higher elevation where the use of exfiltration trenches is feasible. An isolated exfiltration trench system will be used here with a control structure installed between it and the pump station system. The control structure will be comprised of an overflow weir. The purpose of this action is to minimize the contributing area to the pump station and was required to meet the flood criteria requirement and also maintain the use of the existing primary trunk lines. See appendix B for the miscellaneous calculations sizing the exfiltration trench for this basin.
- Finally, although this feature is specifically not modeled, all catch basins and curb inlets within the affected project area will be upgraded from the existing type F-3 curb inlets to FDOT type 3 or 4 style inlets tops in order to increase the throat capacity.

As with Alternative 1, different individual pump rates were modeled for the design criteria storm (ranging from 0 CFS to 40 CFS pumps). Peak stage elevations in the critical nodes (see Appendix C) were compared for the various pumping rates, and through the implementation of a "point of diminishing returns" method, an optimal pump rate was chosen.

Based on the model findings, individual pumping rates beyond 30 CFS did not yield any appreciable reductions in the peak stages. This finding suggests that the conveyance system has reached its hydraulic potential and this is optimal pumping rate. A pumping rate of two 32 CFS pumps was utilized to account for a factor of safety.

As part of the water quantity criteria that will be required of DERM, the proposed system would have to mitigate for the additional flow discharged during the 25yr-72hr storm event. Due to the limited space found in this project area, the only feasible method to dissipate excess flow is the though the use of injection wells. Since the project area is located east of the current salt-water intrusion line, it can be permitted for the use of injection drainage wells with discharge into the G-III aquifer.

From recent projects in the area, it is estimated a conservative rate of 600 gpm/ft of head is available for a given well. It is also known that in this area approximately 1.5 ft of head required to overcome salinity mounding. Per FDEP standards, the maximum permitted peak stage upstream of an injection well is 8.0' NGVD. Taking these factors into account, along with a water table elevation of approximately 2.0' NGVD, a well in this area would have an available head of 4.5'. This would yield a rate of 2700gpm or 6 CFS. It is estimated then that 5 wells will be required to meet the 25 year storm event requirement. In other similar projects with discharge to the bay, the local agencies have been permitted to maintain a certain discharge velocity in lieu of adding wells to mitigate for additional flow. This is due to the excessive cost and space requirements associated with so many injection wells. In said projects DERM usually requested maintaining a discharge velocity of under 5 ft/sec. In this project we are proposing 2 wells to maintain a discharge velocity of **3.51 ft/sec** for the 25yr/72hr event.

Table 4 shows the results of the analysis of the final proposed improvements – utilizing two 32 CFS pumps. Figure 11 compares a time vs. stage graph of the critical node B-21 in the pre-mitigation condition and the proposed post-mitigation condition. This comparison serves to demonstrate the effectiveness of the pump station system in not only reducing the peak stages but also the flooding duration.

TABLE 4 POST-DEVELOPMENT FINAL DESIGN FLOOD STAGE SUMMARY

Node	5yr-24hr	10yr-24hr	25yr-72hr	100yr-72hr	Warning Stage (Grate or Top Elev.)	Criterion Stage (Lowest Crown Elev.)	5yr Ponding Depth over Grate	5yr Criterion Flood Depth
	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(in)	(in)
B-1	3.36	4.04	4.24	4.53	3.80	4.15	-	-
B-2	3.56	4.25	4.49	4.82	3.96	4.16	-	-
B-3	3.46	4.13	4.37	4.68	3.96	4.16	-	-
B-4	3.53	4.17	4.41	4.73	3.12	4.11	4.92	-
B-5	3.61	4.24	4.46	4.78	3.69	4.11	-	-
B-6	3.72	4.38	4.63	4.95	4.87	5.23	-	-
B-7	3.70	4.35	4.61	4.92	5.22	5.54	-	-

B-8	3.94	4.58	4.84	5.13	4.90	5.23	-	-
B-9	3.95	4.59	4.86	5.13	4.86	5.54	-	-
B-10	4.18	4.78	5.01	5.30	4.11	4.36	0.84	-
B-11	4.20	4.80	5.03	5.31	4.06	4.36	1.68	-
B-12	4.26	4.88	5.15	5.42	4.15	4.55	1.32	-
B-13	4.37	5.00	5.32	5.60	5.87	6.03	-	-
B-14	4.51	5.20	5.58	5.88	5.70	6.16	-	-
B-15	4.70	5.51	5.92	6.22	5.66	6.16	-	-
B-16	Isolated Exfiltration Trench System - See Water Quality Calculations							
B-17	Isolated Exfiltration Trench System - See Water Quality Calculations							
B-18	3.79	4.42	4.63	4.91	4.03	4.84	-	-
B-19	3.84	4.47	4.68	4.95	4.37	4.84	-	-
B-20	4.03	4.62	4.81	5.07	3.67	4.02	4.32	0.12
B-21	4.06	4.63	4.82	5.08	3.83	4.02	2.76	0.48
B-22	4.01	4.62	4.85	5.14	5.31	5.86	-	-
B-23	4.19	4.79	5.04	5.34	5.34	5.86	-	-
B-24	4.40	5.00	5.23	5.53	4.20	4.60	2.40	-
B-25	4.55	5.13	5.37	5.67	4.20	4.60	4.20	-
B-26	5.82	5.93	6.00	6.09	9.94	10.33	-	-
B-27	Isolated Exfiltration Trench System - See Water Quality Calculations							
B-28	Isolated Exfiltration Trench System - See Water Quality Calculations							
W-1	7.19	7.19	8.00	8.00	8.00	8.00	N/A	N/A
W-2	7.19	7.19	8.00	8.00	8.00	8.00	N/A	N/A
WATER WAY	2.60	2.60	3.80	3.80	N/A	N/A	N/A	N/A
WETWELL	2.10	2.47	2.77	3.15	N/A	N/A	N/A	N/A

Notes:

1. *Junction nodes, identified as J-# in the model, are not depicted in this table. These nodes are representations of manholes and do not exhibit ponding.*
2. *Nodes W-1 and W-2 represent the upstream point of the drainage wells. These elevations are shown to depict compliance with FDEP's maximum allowable head over an injection well which is an elevation of 8.00'.*

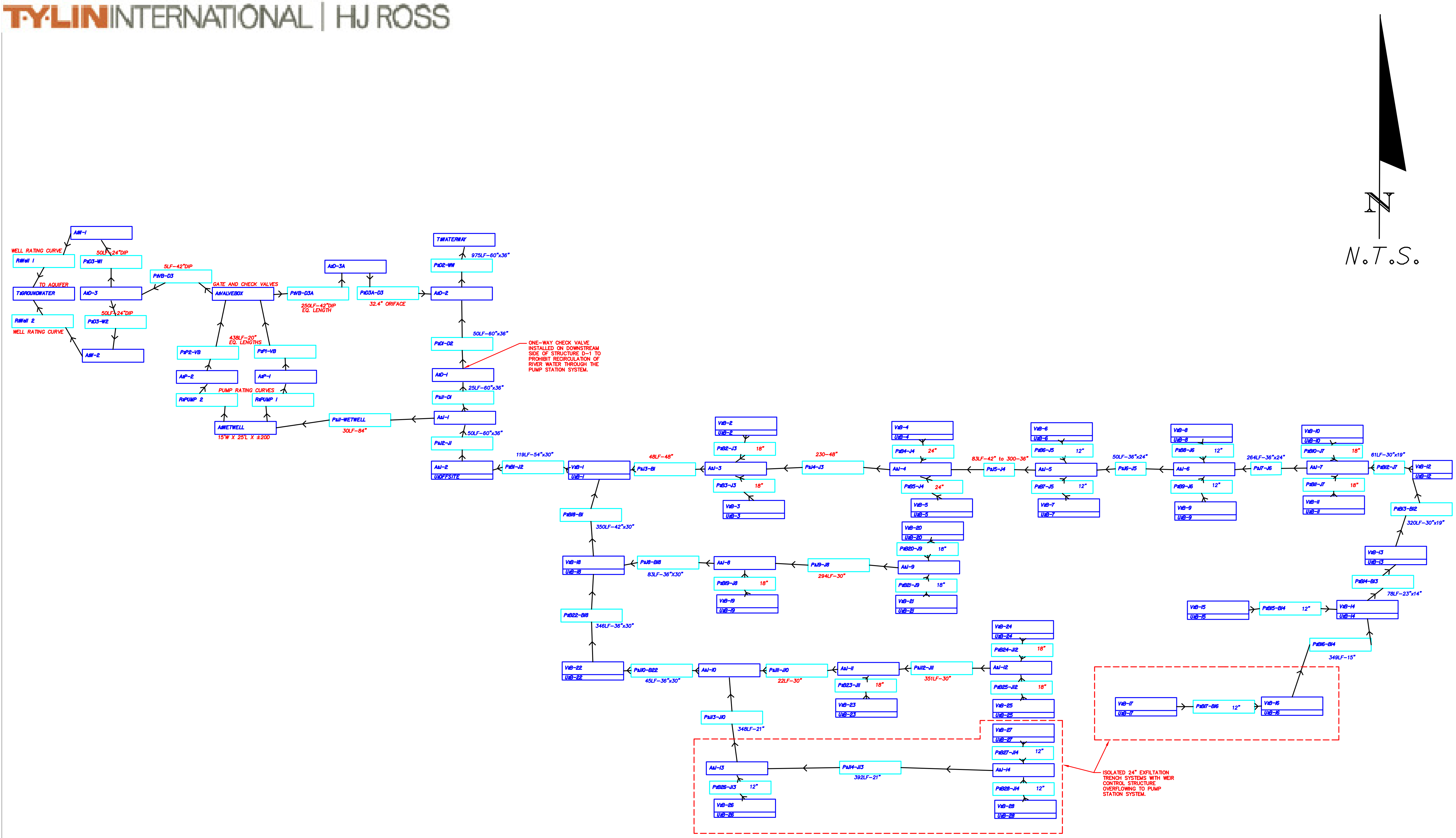


FIGURE 10: POST-DEVELOPMENT NODE-LINK DIAGRAM- FINAL DESIGN

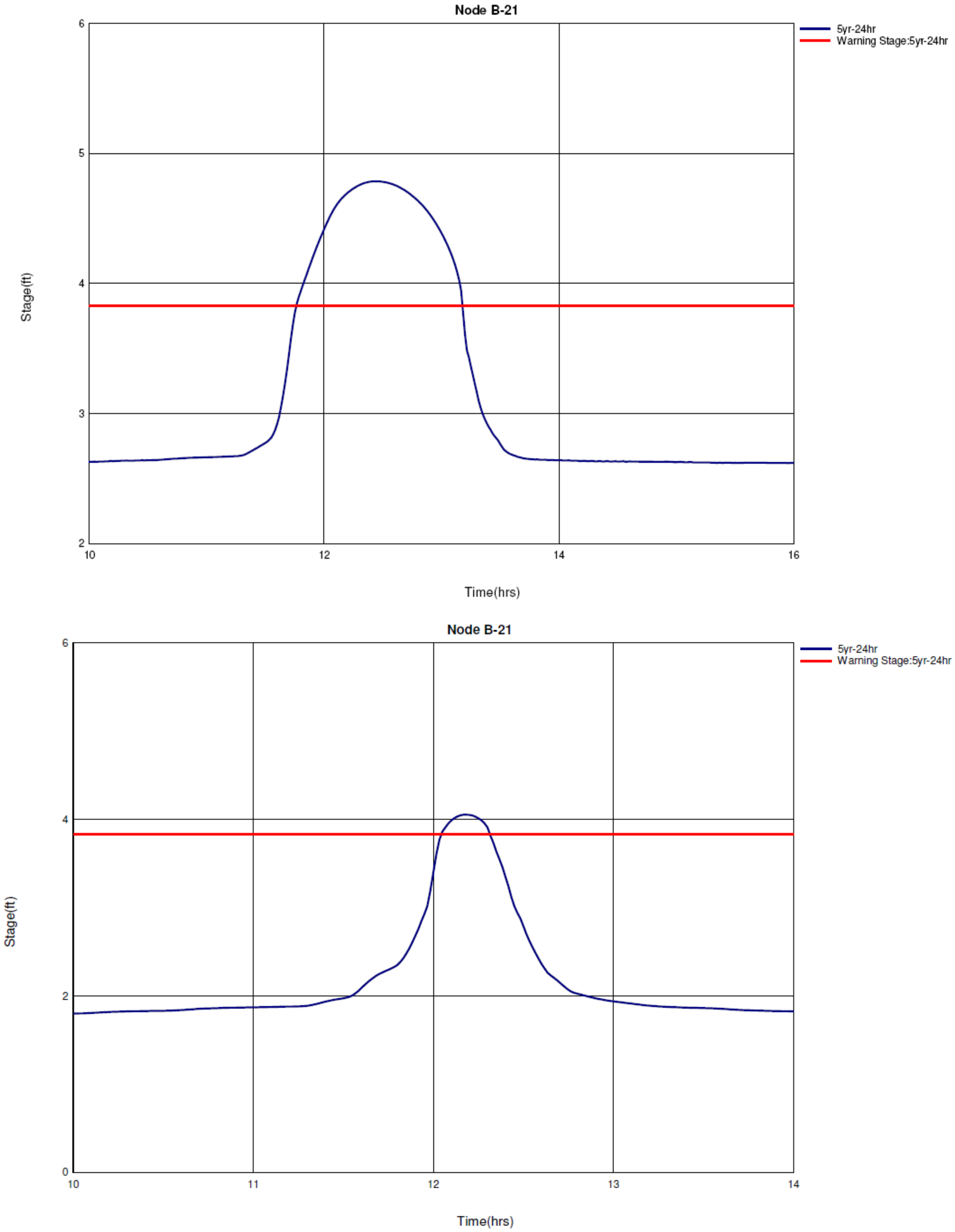


FIGURE 11 TIME VS. STAGE OF B-21 - PRE VS. POST

6.4 OTHER DESIGN CONSIDERATIONS

An option that may be explored, if the budget permits, is “Cured in Place Pipe” (CIPP) liner for restoration of the existing box culverts. The existing lines, although hydraulically adequate, are extremely old (circa 1950’s) and CIPP could be used in lieu of full replacement. This procedure is very effective, preserves the integrity of the pipes, and does not require any impacts to the roadways for installation. In addition they will provide a water tight seal that is critical for the operation of a pump station where leaks can result in an overused and costly system.

The final design consideration should be the reconstruction of the existing outfall structure. As part of the scope of this project, the outfall reconstruction was removed due to funding shortfalls. However, this outfall is in an extreme state of disrepair. Upon recent inspections, the sand-cement rip rap bags that were installed a few years ago to reinforce the structure have collapsed (see figure 12). The County is currently underway on a project to address the outfall structure.

FIGURE 12 CURRENT STATE OF SW 1ST COURT OUTFALL

6.5 WATER QUALITY

In this project, due to the unavailability of space, a structural BMP or water quality structure is the preferred method of achieving the water quality criteria. The method for modeling this type of system begins with determining the volume of runoff requiring treatment. This is achieved through a method developed by Miami Dade DERM of calculating the time to generate 1” of runoff and subsequently calculating a runoff flow generated by the 1” runoff volume. This flow is the basis used to size the water quality structure.

In this project we have chosen Hydro International’s Downstream Defender as the basis for design due to their presence in the area as well as the availability of information. Other approved equal water quality structures may be substituted. The structure was sized based on the manufacture’s sizing criteria and the calculated flows. A weir was then sized to divert the 1” runoff flow to the water quality structure. The weir height was derived by calculating the head losses through water quality system, taking into account the losses through the inflow and outflow pipes, as well the losses through the structure as provided in the manufacturer's literature (See Water Quality Calculations in Appendix D).

In addition to the water quality structure, baffles and a large screen can be incorporated in the pump station wet well to capture heavy debris, oil, and floatable that may bypass said structure.

As part of the proposed alternative the basins B-27, B-28, B-16, and B-17 will be effectively removed from the pump station's contributing area through the use of isolated exfiltration trenches with overflow weir control structures. Consequently, it will be required to size an appropriate exfiltration trench system for these basins. The current geotechnical exploration scope did not include percolation tests. A moderate hydraulic conductivity ("K") value was used; $5x10^{-4}$. For the design phase two percolation tests are recommended in each area in order to determine an accurate hydraulic conductivity value (See Water Quality Calculations in Appendix D).

SECTION 7 ROADWAY IMPROVEMENTS

As part of this project the City right-of-way along 9th, 10th, 11th, and 12th Street between SW 1st Avenue and SE 1st Avenue will be restored and improved. Improvements will include milling and resurfacing, installation of new curb and gutter where required, repair of damaged existing curbs and gutters, base restoration where required, sidewalk repairs, elimination of sod utility strips (request of public works and DDA), and the installation of new larger capacity curb inlets and catch basins. No improvements will be made to the South Miami Avenue right-of-way due to the ongoing drainage project between 10th and 13th Street and the future South Miami Avenue Streetscape project being designed for the DDA.

The following is an outline of the proposed right-of-way improvements for each street:

SW/SE 9th Street:

- In general the roadway is in good condition and will be milled and resurfaced.
- A new curb and gutter will be construction along the north side of the existing roadway from approximately 300' east of SW 1st Avenue to South Miami Avenue. The new curb and gutter will slightly narrow the existing street and better define the northern edge of pavement which currently has no curb and meanders along the length of the road.
- As a result of the new curb and gutter, the existing sidewalk along the north side may require reconstruction in some sections to accommodate the higher grade elevations.
- From approximately 200' to 300' east of SW 1st Avenue the northern parking lane will have to be reconstructed to correct the existing cross slope which drastically exceeds 2%.
- The north side of 9th Street between South Miami Avenue and SE 1st Avenue will require repairs to the existing curb and gutter as well as sidewalk repairs and elimination of the utility strip.
- The south side of 9th Street is a new development with curb, gutters, and sidewalks in good condition. Only minor repairs to cracks and spalls will be proposed.
- The entire roadway will be restriped with two westbound lanes and parking lanes north and south. The roadway will remain one-way.

SW/SE 10th Street:

- In general the roadway is in good condition and will be milled and resurfaced.
- Most of the 10th Street right-of-way is new development with curb, gutters, and sidewalks in good condition. Only minor repairs to cracks and spalls will be proposed. There are several areas near South Miami Avenue on the south side where there is extensive curb and gutter damage, this will be repaired.
- The entire roadway will be restriped for two-way traffic and parking stalls on the north side west of South Miami Avenue, and on the south side east of South Miami Avenue (existing).
- Some of the older areas on the eastern and western ends of the street will have the existing sod utility strips eliminated.

SW/SE 11th Street:

- In general the roadway is in good condition. The recent development restored the pavement up to approximately 300' east of SW 1st Avenue. The remainder of the roadway from that point until SE 1st Avenue (excluding South Miami Avenue) will be milled and resurfaced.
- The western end (up to approximately 300' east of SW 1st Avenue) of the 11th Street right-of-way is mostly new development with curb, gutters, and sidewalks in good condition. Only minor repairs to cracks and spalls will be proposed and repair to some of the older curb and gutter on the northwest end.
- The entire area west of South Miami Avenue up to the recently restored area has extensive curb and gutter damage, this will be repaired. There are 6 curbed islands along the south side of the right-of-way adjacent to the MDT columns that are extensively damaged, these will be repaired.
- The entire roadway will be restriped for two lane one-way westbound traffic and parking stalls on the south side (existing).
- Most of the right-of-way is older development and will have the existing sod utility strips eliminated.

SW 12th Street:

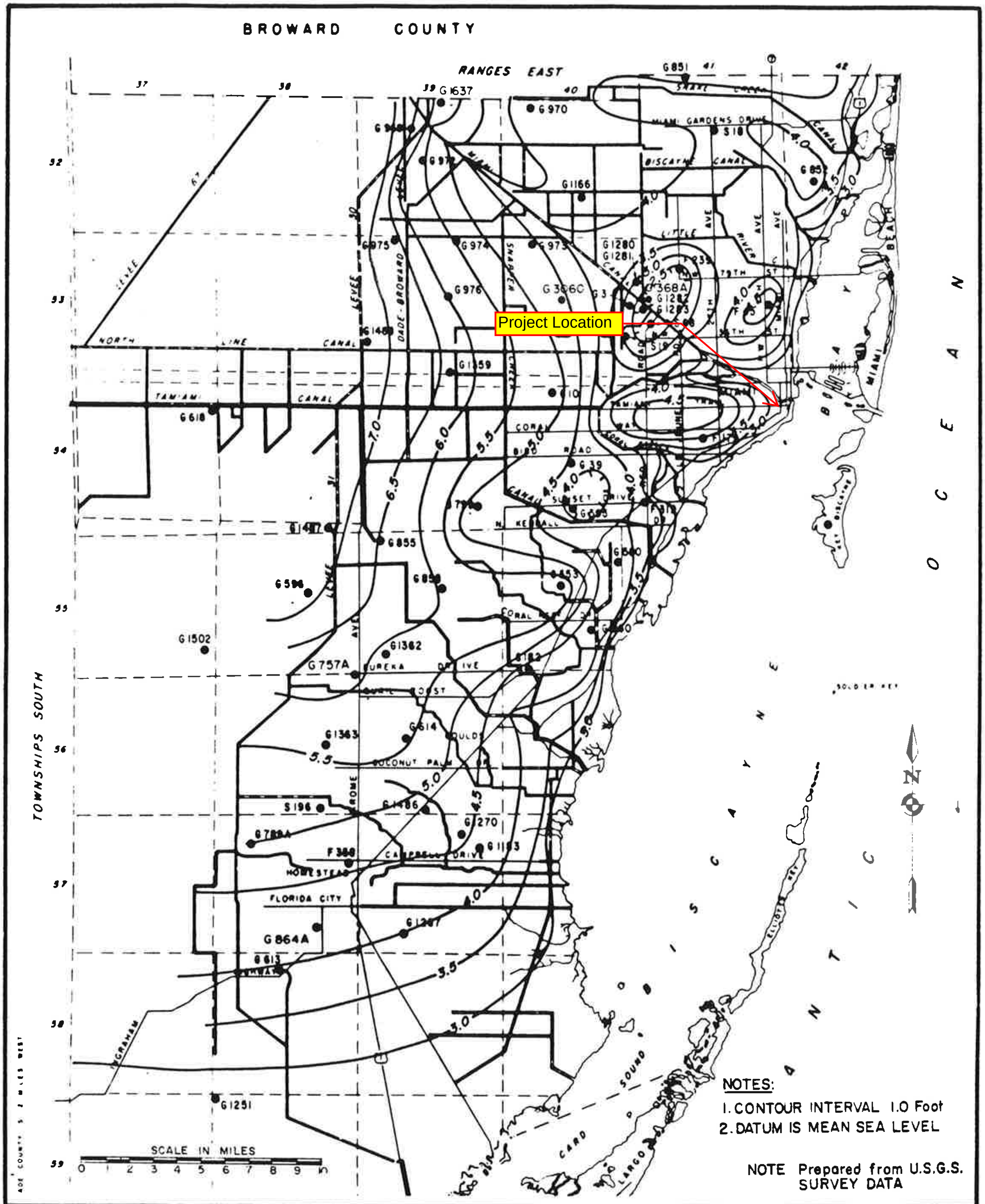
- There is new hotel development being constructed mid-block along SW 12th Street. From recent site visits, it seems the developer is constructing major improvements within the right-of-way. No improvements to the 12th Street right-of-way are being proposed at this time pending a review of the new development permitted construction plans.

SECTION 8 CONCLUSIONS

The proposed improvements will include a new pump station along SW 1st Court between SW 8th Street and SW 9th Street. In addition, improvements will be made to the existing drainage conveyance system. The secondary trunk line along SW/SE 9th Street will be improved by increasing the size of several pipe runs, and the branch line along SW 10th Street and 11th Street will also be upsized. Other improvements will include the replacement of sub-standard curb inlets, all cross drains will be improved to an 18" minimum diameter, and the higher elevation basins at SW 12th Street and SE 11th Street will be converted to isolated exfiltration trench systems to minimize the area of the pump station basin. Finally the implementation of a water quality BMP structure and 2 injection wells will be required to meet permitting requirements.

APPENDIX A – REPORT BACK-UP DOCUMENTATION

- MIAMI DADE COUNTY GROUND WATER LEVEL MAP WC 2.1 AND WC 2.2
- SFWMD RAINFALL MAPS
- CITY OF MIAMI DRAINAGE RECORD DRAWINGS



NOTES:

1. CONTOUR INTERVAL 1.0 Foot
2. DATUM IS MEAN SEA LEVEL

NOTE Prepared from U.S.G.S. SURVEY DATA

METROPOLITAN
DADE COUNTY

PUBLIC WORKS
DEPARTMENT

APPROVED
4/5/72

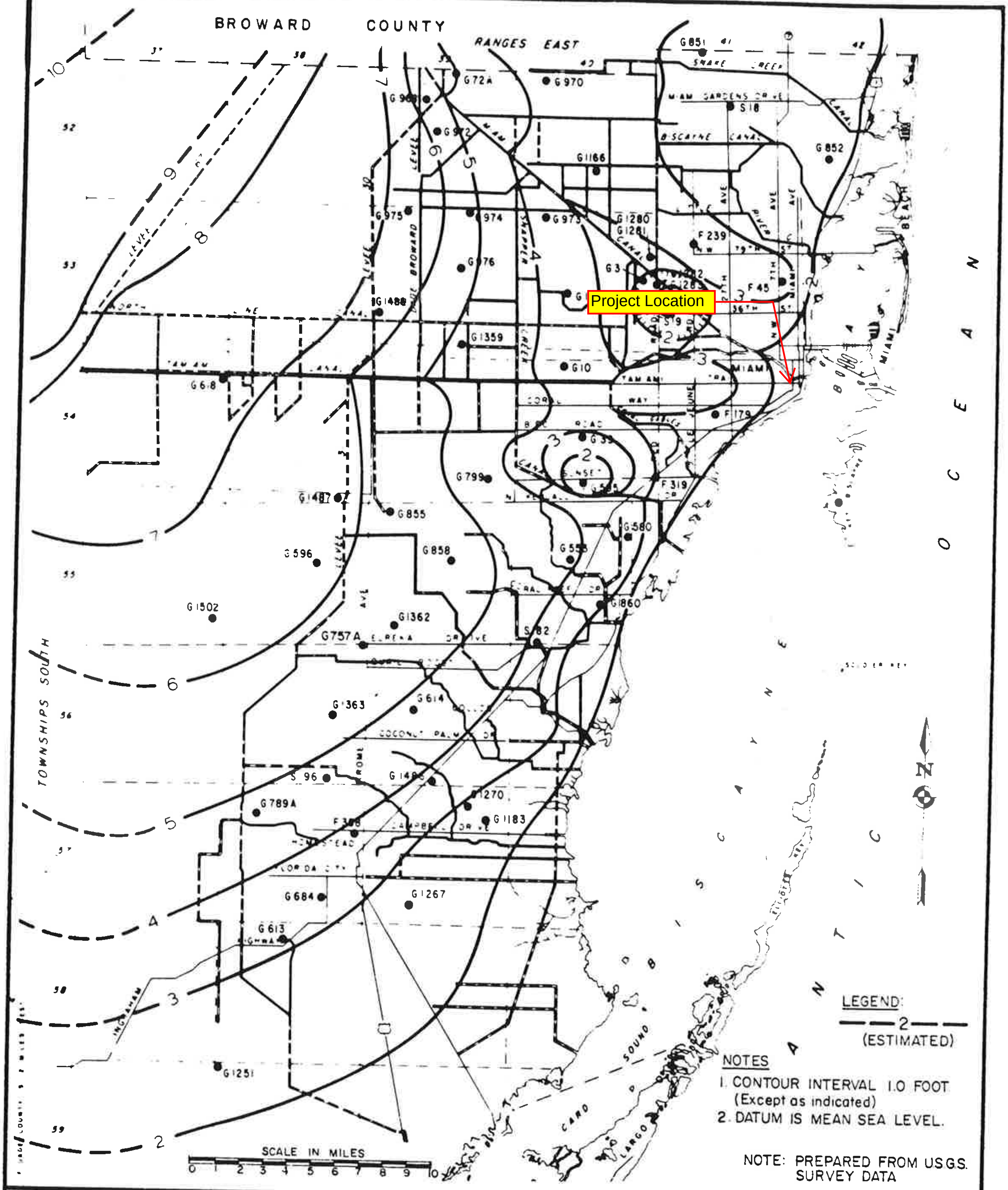
REVISED
2/19/75
4/14/77
2/7/83

DESIGN STANDARDS

AVERAGE YEARLY HIGHEST
GROUND WATER LEVEL
1965 - 78

W.C.
2.1

SHEET 1 OF 1



LEGEND:
— — 2 — — (ESTIMATED)

NOTES
1. CONTOUR INTERVAL 1.0 FOOT (Except as indicated)
2. DATUM IS MEAN SEA LEVEL.

NOTE: PREPARED FROM USGS. SURVEY DATA

METROPOLITAN DADE COUNTY PUBLIC WORKS DEPARTMENT	APPROVED 4/5/72	REVISED 2/19/75 4/14/77	DESIGN STANDARDS AVERAGE OCTOBER GROUND WATER LEVEL 1960-75	W.C. 2.2 SHEET 1 OF 1

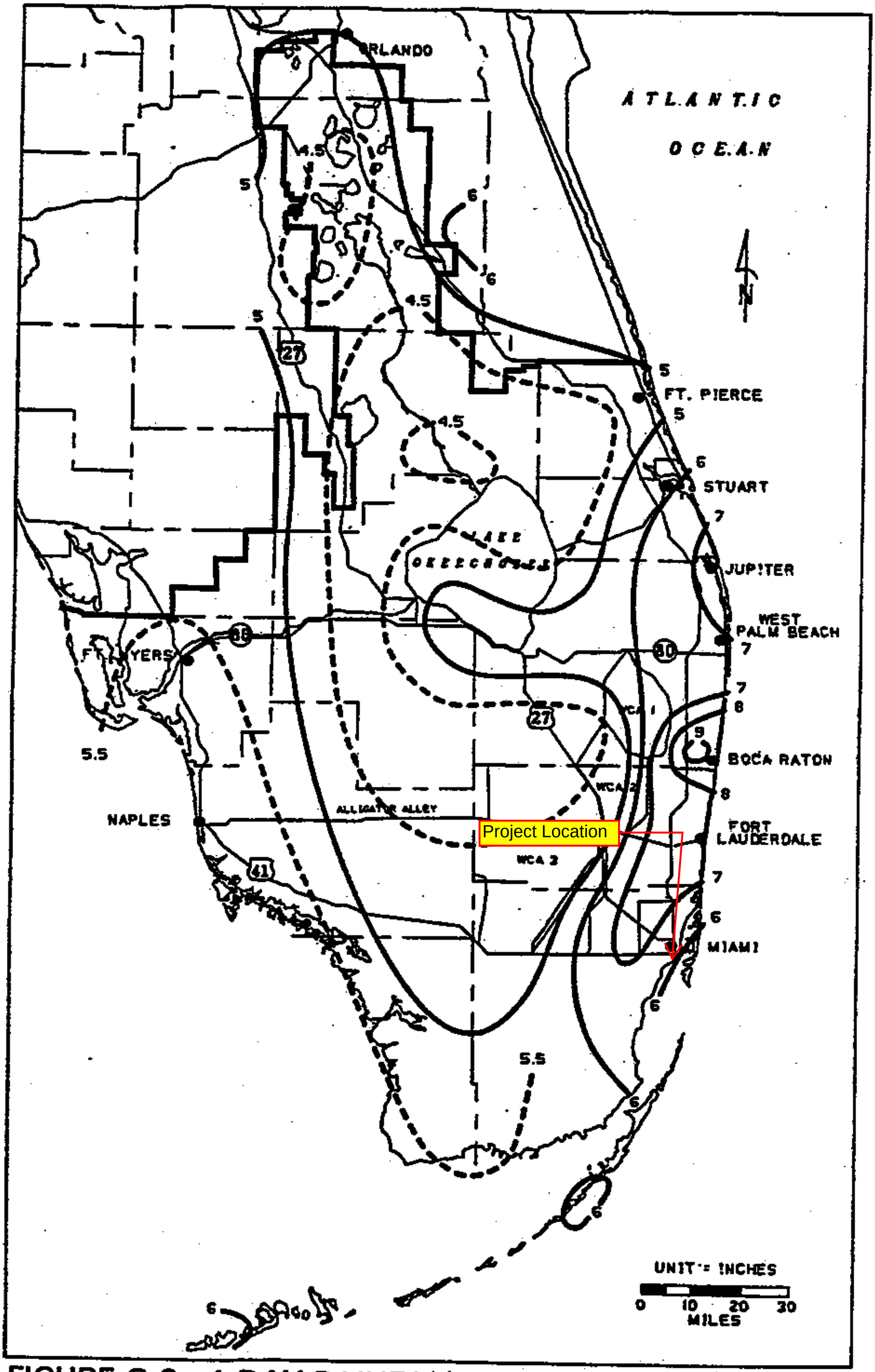


FIGURE C-3. 1-DAY RAINFALL: 5-YEAR RETURN PERIOD

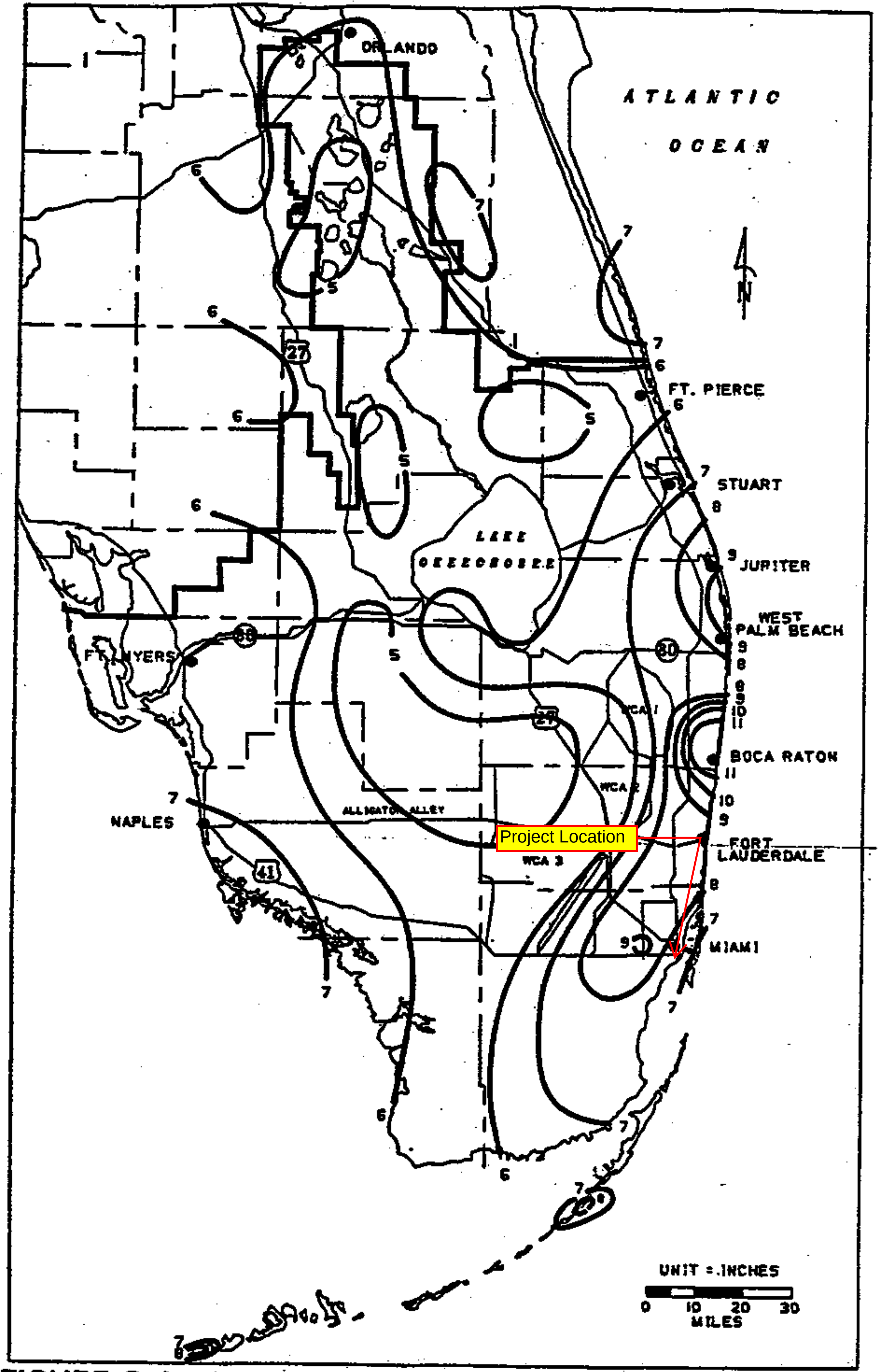


FIGURE C-4. 1-DAY RAINFALL: 10-YEAR RETURN PERIOD

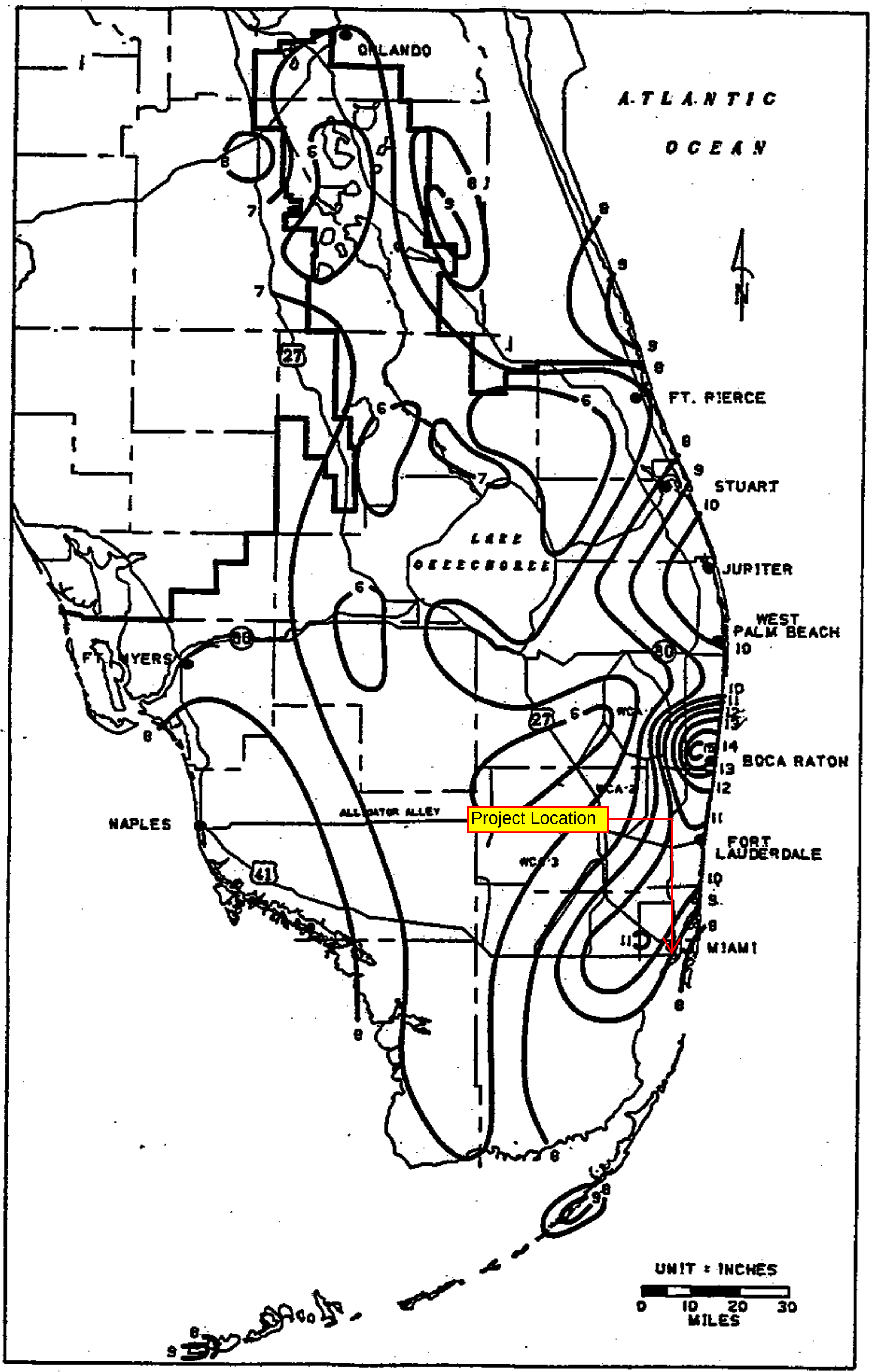


FIGURE C-5. 1-DAY RAINFALL: 25-YEAR RETURN PERIOD

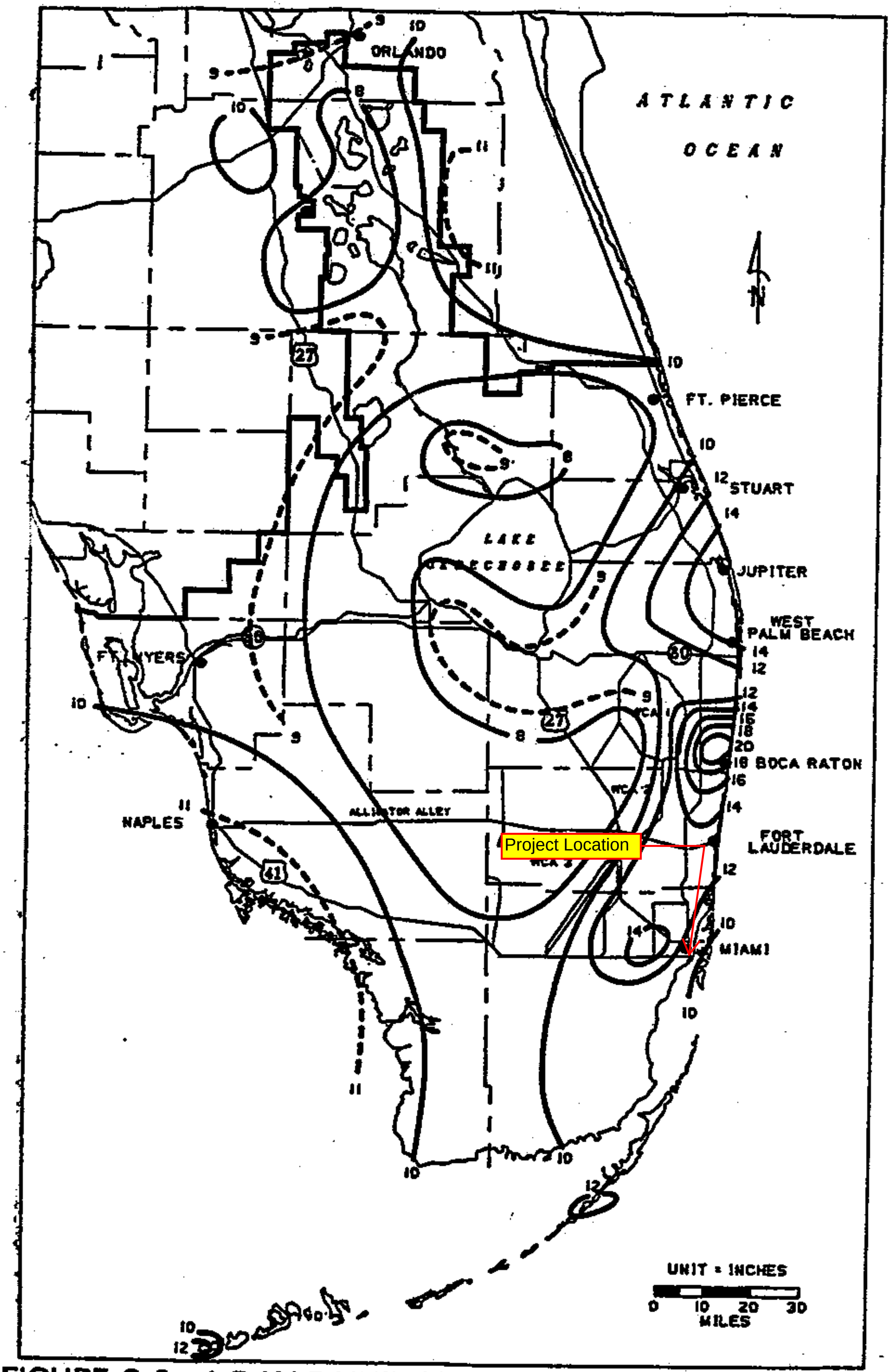


FIGURE C-6. 1-DAY RAINFALL: 100-YEAR RETURN PERIOD

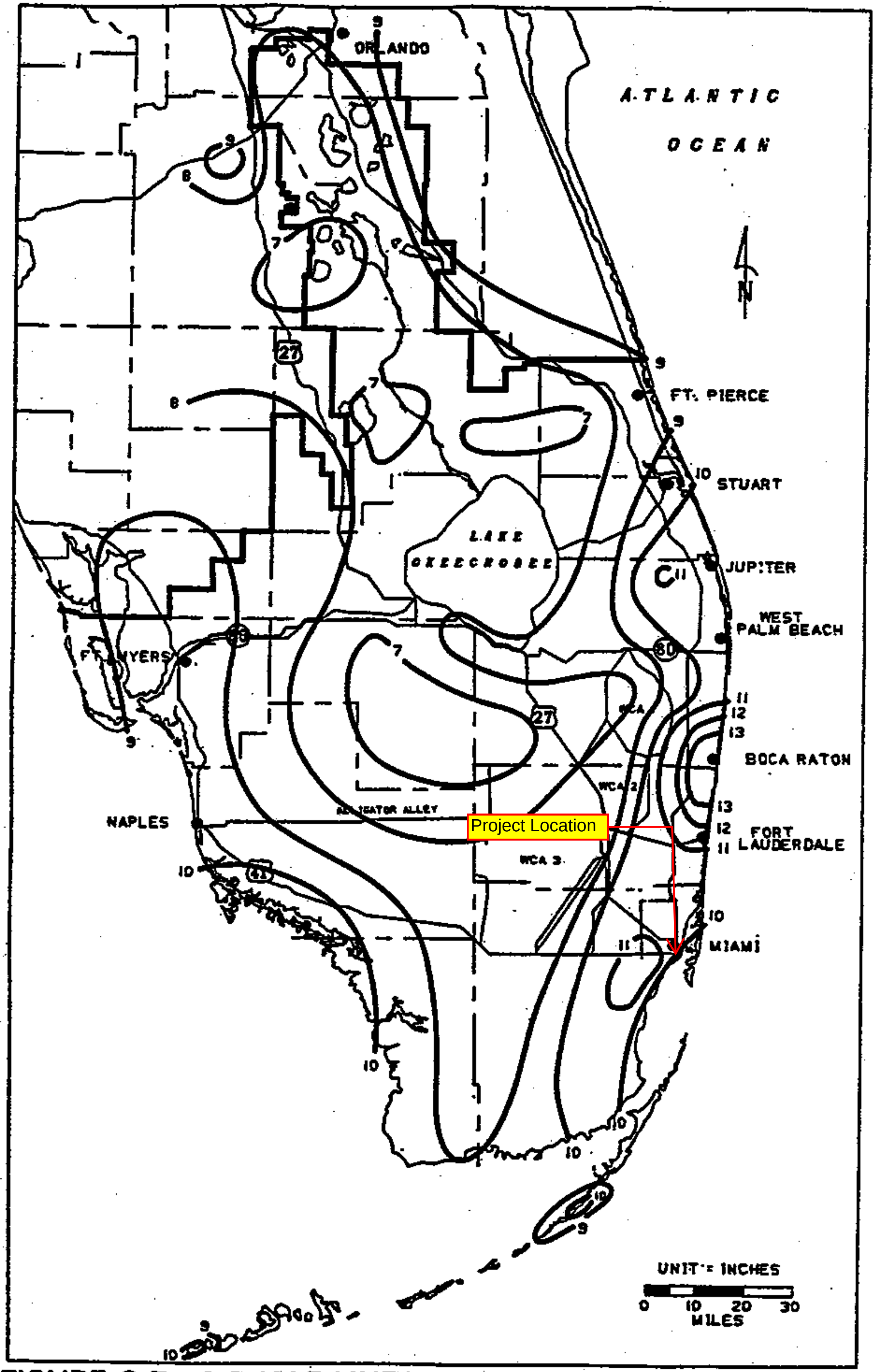


FIGURE C-7. 3-DAY RAINFALL: 10-YEAR RETURN PERIOD

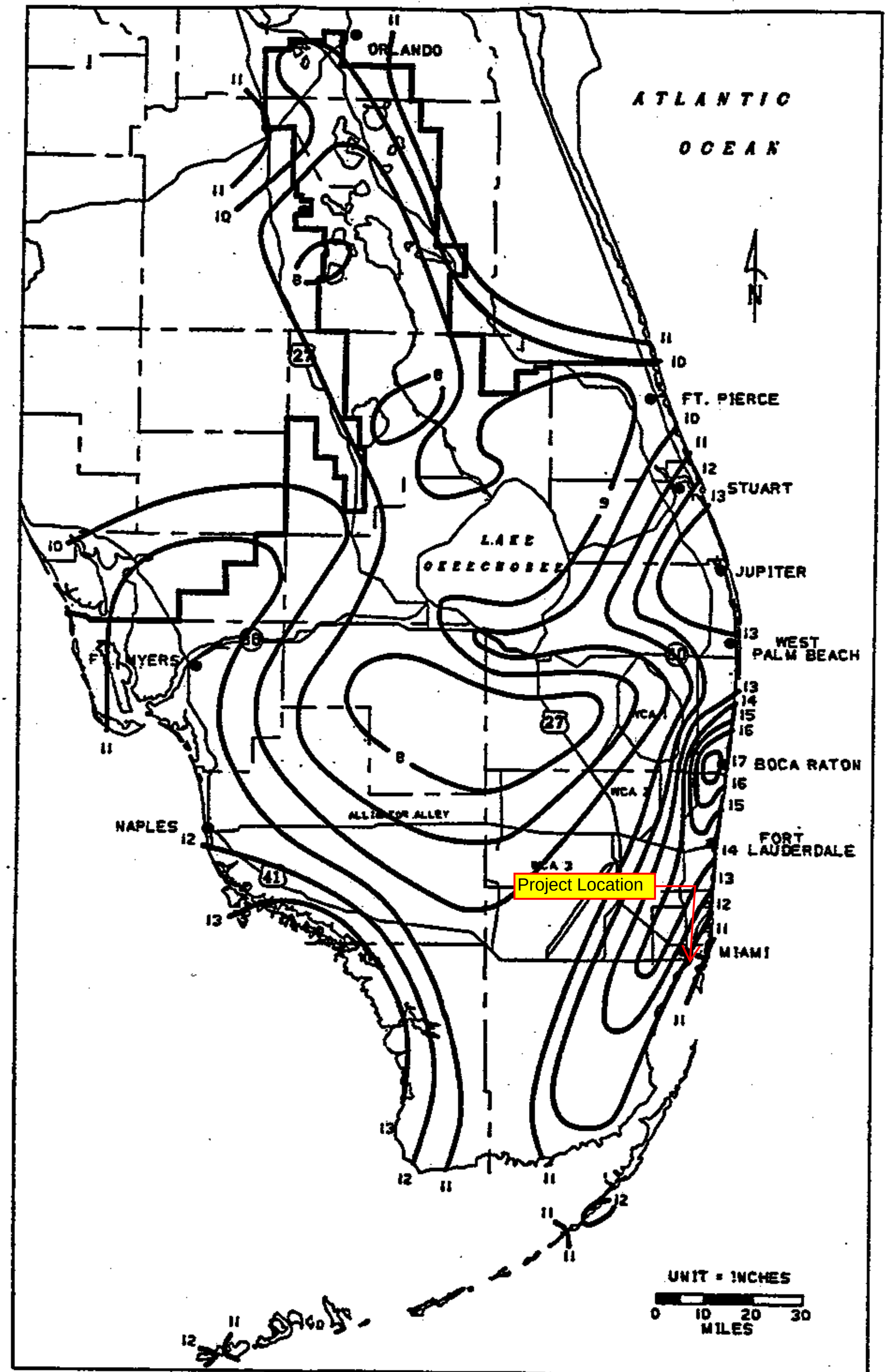


FIGURE C-8. 3-DAY RAINFALL: 25-YEAR RETURN PERIOD

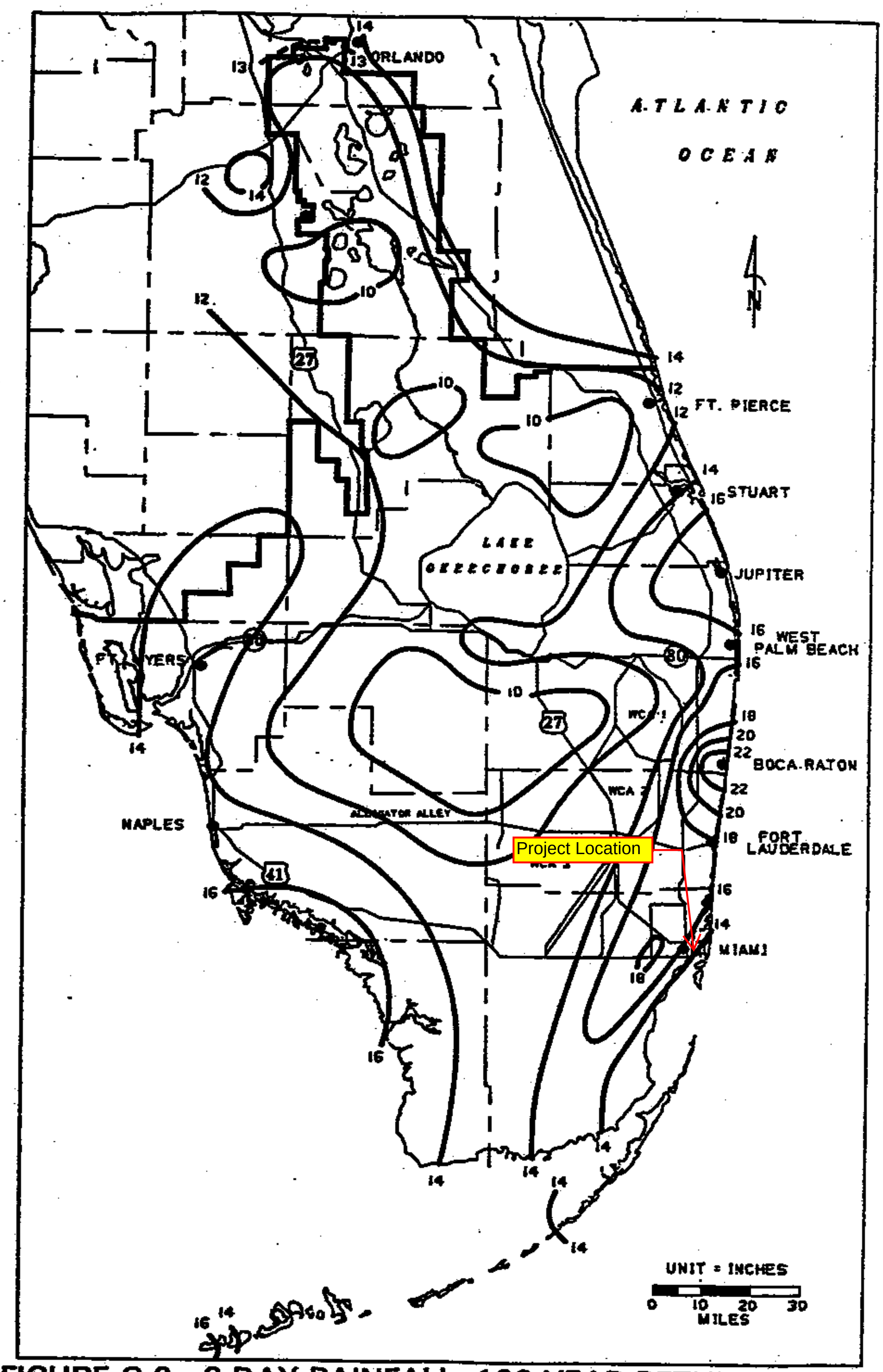


FIGURE C-9. 3-DAY RAINFALL: 100-YEAR RETURN PERIOD

REFERENCES

LAYOUT

FOLIO, 121 A&B
HOPKINS
R/W SECTION
TAX MAPS 95 & 96
AERIAL PHOTO
MISC PLAT .8-27
SURVEY BK 1256-51

SANITARY SEWER

SR. BK. 53-42,43
" " 19-57
U.G." 14-15
" " 120-34
" " 80-48,49,50,51
MISC. SR. 5-12.
SAN. SR. MAP
COUNTER BOOKS
COMPREHENSIVE

STORM SEWER

U.G. BK. 120-34
" " 80-48,49,50,51
STORM SR. MAP
COMPREHENSIVE

TELEPHONE

U.G. BK. 120-34
" " 80-48,49,50,51
" " 24-18,19
" " 129-26
" " 170-60
" " 244-35
" " 243-28
" " 274-35
T-10: Per. 9-21-73
T-11: Per. 5-16-75
T-12: Per 3-28-66

ELECTRIC

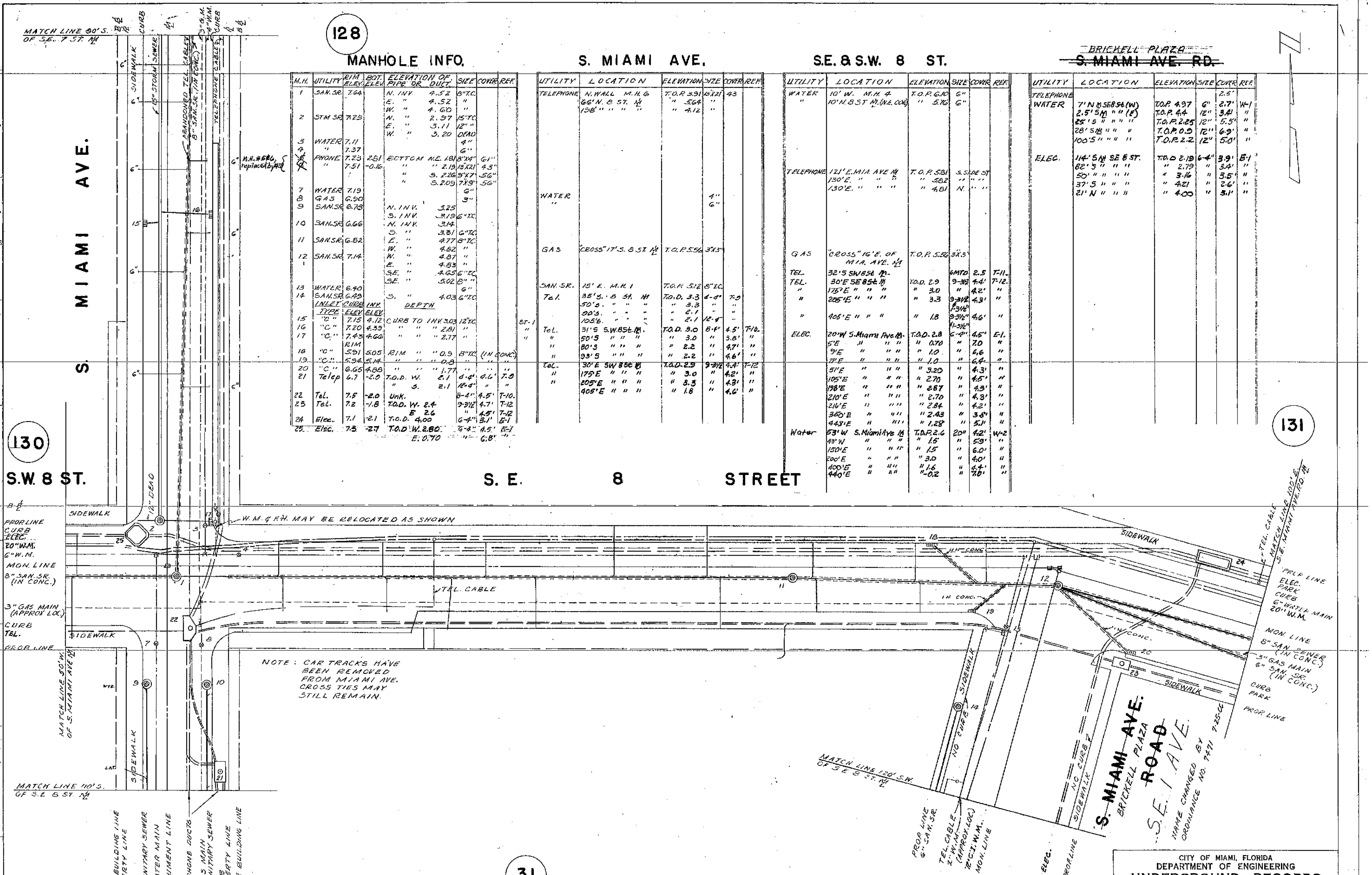
E-1: Per. 3-15-68.

GAS

PHOENIX
GAS ATLAS

WATER

U.G. BK. 12C-34
" " 215-47
" " 80-48,49,50,51
OLD WATER BOOK
COMPREHENSIVE
W-1 : E-8385
W-2 : E-8530



MANHOLE INFO.

M.H.	UTILITY	RIM ELEV.	BOT. ELEV.	ELEVATION OF PIPE OR DUCT		SIZE	COVER	REF.
1	SAN. SR.	7.64		N. INV.	4.52	8" T.C.		
				E. "	4.52	"		
				W. "	4.60	"		
2	STM SR.	7.29		N. "	2.97	15" T.C.		
				E. "	3.11	12" "		
				W. "	3.20	DEAD		
3	WATER	7.11				4"		
4	"	7.37				6"		
~~5~~	PHONE	7.23	2.81	BOTTOM	N.E. 1.81	8"X4"	61"	
~~6~~	"	7.51	-0.16	"	" 2.19	13"X21"	43"	
				"	S. 2.26	9"X7"	56"	
				"	S. 2.09	7"X9"	56"	
7	WATER	7.19				6"		
8	GAS	6.90				3"		
9	SAN. SR.	6.78		N. INV.	3.25			
				S. INV.	3.19	6" T.C.		
10	SAN. SR.	6.66		N. INV.	3.14			
				S. "	3.31	6" T.C.		
11	SAN. SR.	6.82		E. "	4.77	8" T.C.		
				W. "	4.82	"		
12	SAN. SR.	7.14		W. "	4.87	"		
				E. "	4.83	"		
				SE. "	4.65	6" T.C.		
				SE. "	5.02	8" "		
13	WATER	6.40				6"		
14	SAN. SR.	6.49		S. "	4.03	6" T.C.		
	INLET TYPE	CURB ELEV.	INV. ELEV.	DEPTH				
15	"C"	7.15	4.12	CURB TO INV.	3.03	12" T.C.		ST-1
16	"C"	7.20	4.39	" " "	2.81	"		"
17	"C"	7.43	4.66	" " "	2.77	"		"
		RIM						
18	"C"	5.91	5.05	RIM " "	0.9	8" T.C.	(IN CONC.)	
19	"C"	5.94	5.14	" " "	0.8	"	"	"
20	"C"	6.65	4.88	" " "	1.77	"	"	"
21	Telep	6.7	-2.0	T.O.D. W.	2.1	4-4"	4.6'	T-9
				" S.	2.1	12-4"	"	"
22	Tel.	7.5	-2.0	Unk.		8-4"	4.5'	T-10.
23	Tel.	7.2	-1.8	T.O.D. W. 2.4		9-3½"	4.7'	T-12
				E 2.6		"	4.5'	T-12
24	Elec.	7.1	-2.1	T.O.D. 4.00		6-4"	3.1'	E-1
25	Elec.	7.3	-2.7	T.O.D W. 2.80		6-4"	4.5'	E-1
				E. 0.70		"	6.8'	"

S. MIAMI AVE.

UTILITY	LOCATION	ELEVATION	SIZE	COVER	REF.
TELEPHONE	N. WALL M.H. 6	T.O.P. 3.91	13"X21"	43	
	66' N. 8 ST. M/L	" 5.64	"		
	198' " " " "	" 4.12	"		
WATER			4"		
"			6"		
GAS	"CROSS" 17' S. 8 ST. M/L	T.O.P. 5.56	3"X3"		
SAN. SR.	15' E. M.H. 1	T.O.P. 5.12	8" T.C.		
Tel.	35' S. 8 St. M/L	T.O.D. 3.3	4-4"	T-9	
	50' S. " " "	" 3.3	"	"	
	90' S. " " "	" 2.1	"	"	
	105' S. " " "	" 2.1	12-4"	"	
Tel.	31' S S.W. 8 St. M/L	T.O.D. 3.0	8-4"	4.5'	T-10.
"	50' S " " "	" 3.0	"	3.8'	"
"	80' S " " "	" 2.2	"	4.7'	"
"	93' S " " "	" 2.2	"	4.6'	"
Tel.	30' E SW 8 St. M/L	T.O.D. 2.9	9-3½	4.4'	T-12
"	175' E " " "	" 3.0	"	4.2'	"
"	205' E " " "	" 3.3	"	4.3'	"
	405' E " " "	" 1.8	"	4.6'	"

S.E. & S.W. 8 ST.

UTILITY	LOCATION	ELEVATION	SIZE	COVER	REF.
WATER	10' W. M.H. 4	T.O.P. 6.10	6"		
"	10' N. 8 ST M/L (N.E. COR.)	" 5.76	6"		
TELEPHONE	121' E. MIA. AVE M/L	T.O.P. 5.81	S. SIDE ST		
	130' E. " " "	" 5.82	"	" "	
	130' E. " " "	" 4.81	N.	" "	
GAS	"CROSS" 16' E. OF MIA. AVE. M/L	T.O.P. 5.56	3"X3"		
TEL.	32' S SW 8 St. M/L		6 MTD	2.5	T-11.
TEL.	30' E SE 8 St. M/L	T.O.D. 2.9	9-3½	4.4'	T-12.
"	175' E " " "	" 3.0	"	4.2'	"
"	205' E " " "	" 3.3	9-3½ & 1-3½"	4.3'	"
"	405' E " " "	" 1.8	9-3½" & 1-3½"	4.6'	"
ELEC.	20' W S. Miami Ave M/L	T.O.D. 2.8	6-4"	4.5'	E-1.
	5' E " " "	" 0.70	"	7.0	"
	9' E " " "	" 1.0	"	6.6	"
	21' E " " "	" 1.0	"	6.4	"
	51' E " " "	" 3.20	"	4.3'	"
	105' E " " "	" 2.70	"	4.5'	"
	198' E " " "	" 2.87	"	4.3'	"
	210' E " " "	" 2.70	"	4.3'	"
	216' E " " "	" 2.84	"	4.2'	"
	360' E " " "	" 2.43	"	3.8'	"
	448' E " " "	" 1.28	"	5.1'	"
Water	53' W S. Miami Ave M/L	T.O.P. 2.6	20"	4.2'	W-2
	43' W " " "	" 1.5	"	5.9'	"
	150' E " " "	" 1.5	"	6.0'	"
	200' E " " "	" 3.0	"	4.0'	"
	400' E " " "	" 1.6	"	4.4'	"
	440' E " " "	" -0.2	"	7.0'	"

BRICKELL PLAZA

~~S. MIAMI AVE. RD.~~

UTILITY	LOCATION	ELEVATION	SIZE	COVER	REF.
TELEPHONE				2.5'	
WATER	7' N M/L SE 8 St. (W)	T.O.P. 4.97	6"	2.7'	W-1
	2.5' S M/L " " (E)	T.O.P. 4.4	12"	3.4'	"
	25' S " " " "	T.O.P. 2.25	12"	5.5'	"
	28' S M/L " " "	T.O.P. 0.9	12"	6.9'	"
	100' S " " " "	T.O.P. 2.2	12"	5.0'	"
ELEC.	114' S M/L SE 8 ST.	T.O.D 2.19	6-4"	3.9'	E-1
	82' S " " "	" 2.79	"	3.4'	"
	50' " " " "	" 3.16	"	3.5'	"
	37' S " " "	" 4.21	"	2.6'	"
	21' N " " "	" 4.00	"	3.1'	"

Note: S. Miami Avenue North of S.8th Street & S.E. 8th Street East of South Miami Avenue are paved with 6" Concrete Base & 3" Asphalt Surface Course.

DATE	BY	DESCRIPTION
2-22-78	R.B.	REVISED TO DATE.
2-28-66	R.P.B.	REVISED TO DATE (CHECKED FOR ADDIT. AFTER '61) ADDED LATERALS NONE FOUND
7-23-62	B.M.	TRACED & REVISED TO DATE

REVISIONS

CITY OF MIAMI, FLORIDA
DEPARTMENT OF ENGINEERING

UNDERGROUND RECORDS
S.E. & S.W. 8 ST. AT S. MIAMI AVE. & S. MIAMI AVE. RD.

DR. R. A. WILLIAMS DATE 3-25-36 SCALE 1" = 20'
CK. B. M. DEVAY DATE 9-23-58
APPROVED Anthony F. Scarnecchia 7-23-62

36-129

REFERENCES

LAYOUT

R1 OLD MANILA 36-130
R2 HOPKINS VOL. 1 PG. 12
R3 TAX MAPS 95 & 96
R4 AERIAL PHOTOS P7 & P9
R5 L&G BOOK 48-16
R6 SURVEY BK. 897-34
R7 PAVING BK. 461-73
R8 " " 857-106
R9 SURVEY BK. 675-27
R10 " " 925-39
R11 " " 940-26~26
R12 " " 476-4,5
R13 SEWER INSP. CARDS

MISCELLANEOUS

RIGHT OF WAY DEPT

WATER

W1 OLD MANILA 36-130
W2 WATER SHT 219-1
W3 U.G. BOOK 22-28
W4 OLD MIAMI WATER 206
W5 SAN. SR. COUNTER BOOK SW-A-1-8 (ES)
W6 U.G. BOOK 124-22,26
W7 U.G. INSPECTION CARD 293
W8 U.G. BOOK 262-54

SANITARY SEWER

SS1 OLD MANILA 36-130
SS2 COUNTER BKS.
SS3 U.G. BOOK 15A-35
SS4 SEWER BK 5342,43
SS5 INTERCEPTOR AS BUILTS SHT 56
SS6 U.G. BOOK 124-22,26

STORM SEWER

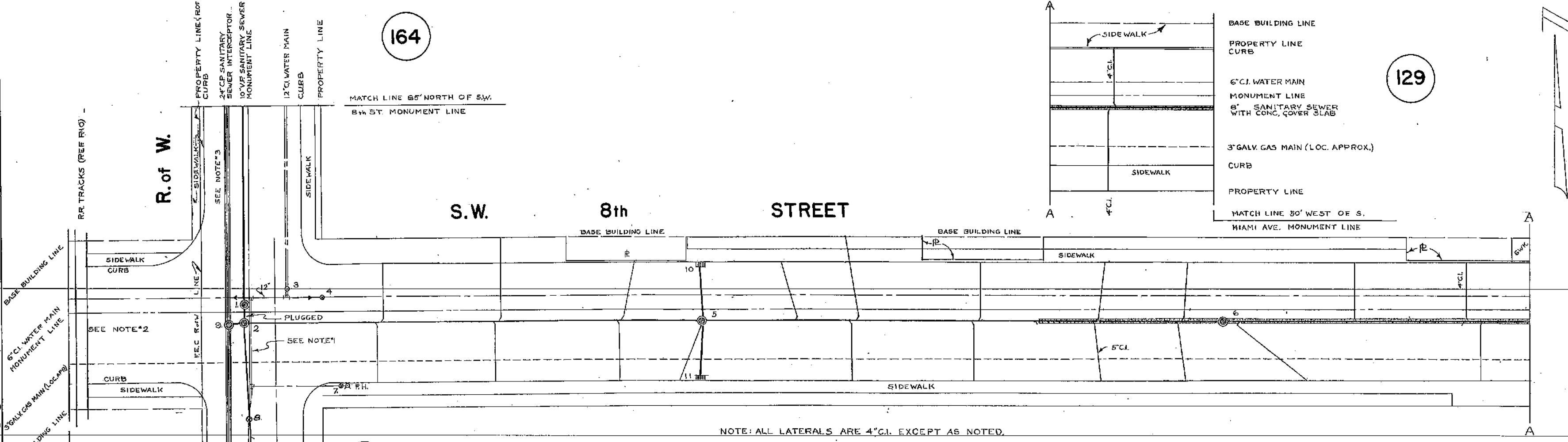
SD1 OLD MANILA 36-130
SD2 U.G. BOOK 14-76
SD3 STORM SR. COMP.
SD4 U.G. BOOK 124-22,26

GAS

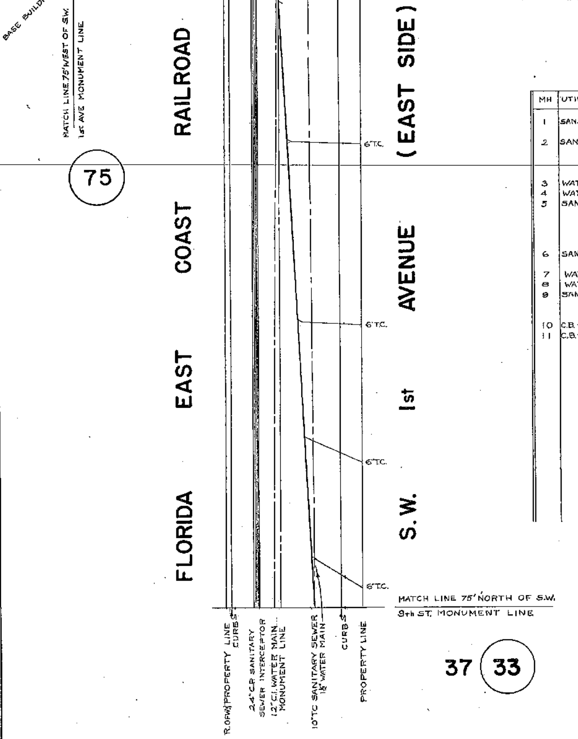
G1 GAS ATLAS SHT. 41
G2 OLD MANILA 36-130
G3 U.G. INSPECTION CARD 293

ELECTRIC

TELEPHONE



NOTE: ALL LATERALS ARE 4" C.I. EXCEPT AS NOTED.



MANHOLE DATA

MH	UTILITY	RIM ELEV.	BOT. ELEV.	ELEVATION OF PIPE OR DUCT	SIZE	REF.
1	SAN. SR.	8.87		N. INVERT 0.65 S. " 0.67	10" V.P. " C.P.	SS2&6
2	SAN. S.R.	8.97		E. INVERT 2.15 N. " 0.62 S. " 0.64 W. " 0.53	8" PLUGGED 10" T.C. 8"	SS2&6
3	WATER	8.27			12" C.I.	W1&6
4	WATER	8.11			6" C.I.	W1&6
5	SAN. SR.	6.23		E. INVERT 2.71 W. " 2.70 S.W " 3.38 S. " 2.99 N. " 3.22	8" " 8" 8" 6"	SS6&2
6	SAN. SR.	6.93		W. INVERT 4.81 E " 4.78	8" 8"	SS1&2 &SS6
7	WATER	7.78				W8
8	WATER	8.32			12" C.I.	W8
9	SAN. INT.	9.50		N. INVERT -2.24 S. " -2.24 E. " -0.91	24" C.P. " " 8"	SS5
10	C.B. type "D"			S. INVERT 3.83	6"	SD1&4
11	C.B. type "D"	5.88		N INVERT 3.28	8"	SD1&4

ON S.W. 8th STREET

UTILITY	LOCATION	ELEVATION	SIZE	COVER	REF
WATER	75' W. OF 1st AVE ℳ, TO APPROX. 6' W. OF 1st AVE ℳ	UNK.	6" C.I.	50"±	W4&7
WATER	APPROX. 6' W. TO APPROX. 20' E. OF 1st AVE ℳ	UNK.	12" C.I.	UNK.	W4
WATER	APPROX 20' E. OF 1st ST. ℳ, TO 50' W. OF MIAMI AVE ℳ	UNK.	6" C.I.	UNK.	W4
GAS	75' W. OF 1st AVE. ℳ, TO 50' W. OF MIAMI AVE ℳ	UNK.	3" GALV.	36"±	G1,2,3

ON S.W. 1st AVENUE

UTILITY	LOCATION	ELEVATION	SIZE	COVER	REF
WATER	50' S. OF S.W. 8th ST. ℳ	TOP 3.24	12" C.I.	UNK	W1&3
"	100' " " " " " "	" 1.13	" "	"	"
"	160' " " " " " "	" 1.24	" "	"	"
"	250' " " " " " "	" 0.85	" "	"	"
WATER	75' N. OF 9th ST. ℳ TO VICINITY OF S.W. 8th ST	UNK	1½"	1.2'	W1&5

NOTE #1 ~ WATER MAIN FROM VALVE TO Tee IS SHOWN OFFSET SLIGHTLY TO EAST, ACTUALLY UNDER MONUMENT LINE.
NOTE #2 ~ CITY OF MIAMI DOES NOT HAVE AN EASEMENT OR DEDICATED RIGHT OF WAY ACROSS THE F.E.C. R.R. RIGHT OF WAY.
NOTE #3 ~ OLD RECORDS SHOW A STORM WATER DITCH ON 1st AVE., N. OF 8th ST., INTERCEPTOR CONST. MAY HAVE DESTROYED THIS DITCH. REF. SD2

DATE	BY	DESCRIPTION

REVISIONS

CITY OF MIAMI, FLORIDA
DEPARTMENT OF PUBLIC WORKS

UTILITY RECORDS ON S.W. 8th STREET and S.W. 1st AVENUE (east side)

DR. M.X. BERGIN DATE FEB. 25, 1966 SCALE 1" = 20'
CK. C.B. STEWART DATE APR. 11, 1966
APPROVED

36-130

EFERENCES:

MISCELLANEOUS

- ·1 OLD MANILA 36-128
- ·2 SEWER PERMIT D-18355
- ·3 COUNTER BK. S.E.-5-7-0Y
- 4 " " S.W.-5-7-0
- 5 U.G. BK. 120-32
- 6 U.G. BK. 337-6
- 7 FIELD INVESTAGATION
- 8 COUNTER BOOK S-A-MI-6
- 9 " " S-A-MI-7
- 10 SEWER INSPECTION CARDS

WATER

- -1 U.G. BK. 337-6
- ·2 WATER SHT. E-7839-2
- ·3 WATER VALVE ATLAS
- ·4 U.G. BK. 120-32
- ·5 OLD WATER SHEET #105-106
- ·6 OLD MANILA 36-128
- ·7 WATER COMP. F-14
- 8 U.G. BK. 100-40

GAS

- ·1 GAS ATLAS SHEETS 25 & 41
- ·2 OLD MANILA 36-128
- ·3 MISC. LOCATIONS PICKED UP IN OTHER SURVEYS.
- ·4 STU WILSON

ELEPHONE

- 1 U.G. BK. 254-39
- 2 U.G. BK. 24-18,19
- 3 OLD MANILA 36-128
- 4 PERMIT 7-15-65
- 5 U.G. BK. 129-29
- ·6 U.G. BK. 96-57
- 7 U.G. BK. 93-57,58
- 8 U.G. BK. 100-40
- 9 U.G. BK. 446-14

ANITARY SEWER

- -1 COUNTER BK. S-A-MI-6
- -2 " " S-A-MI-7
- -3 " " S.E.-5-7-0X
- -4 U.G.BK. 120-32
- -5 OLD MANILA 36-128

TORM DRAINAGE

- -1 U.G. BK. 120-32
- -2 MISC. SR. 5-12
- -3 OLD MANILA 36-128

ELECTRIC

MANHOLE DATA

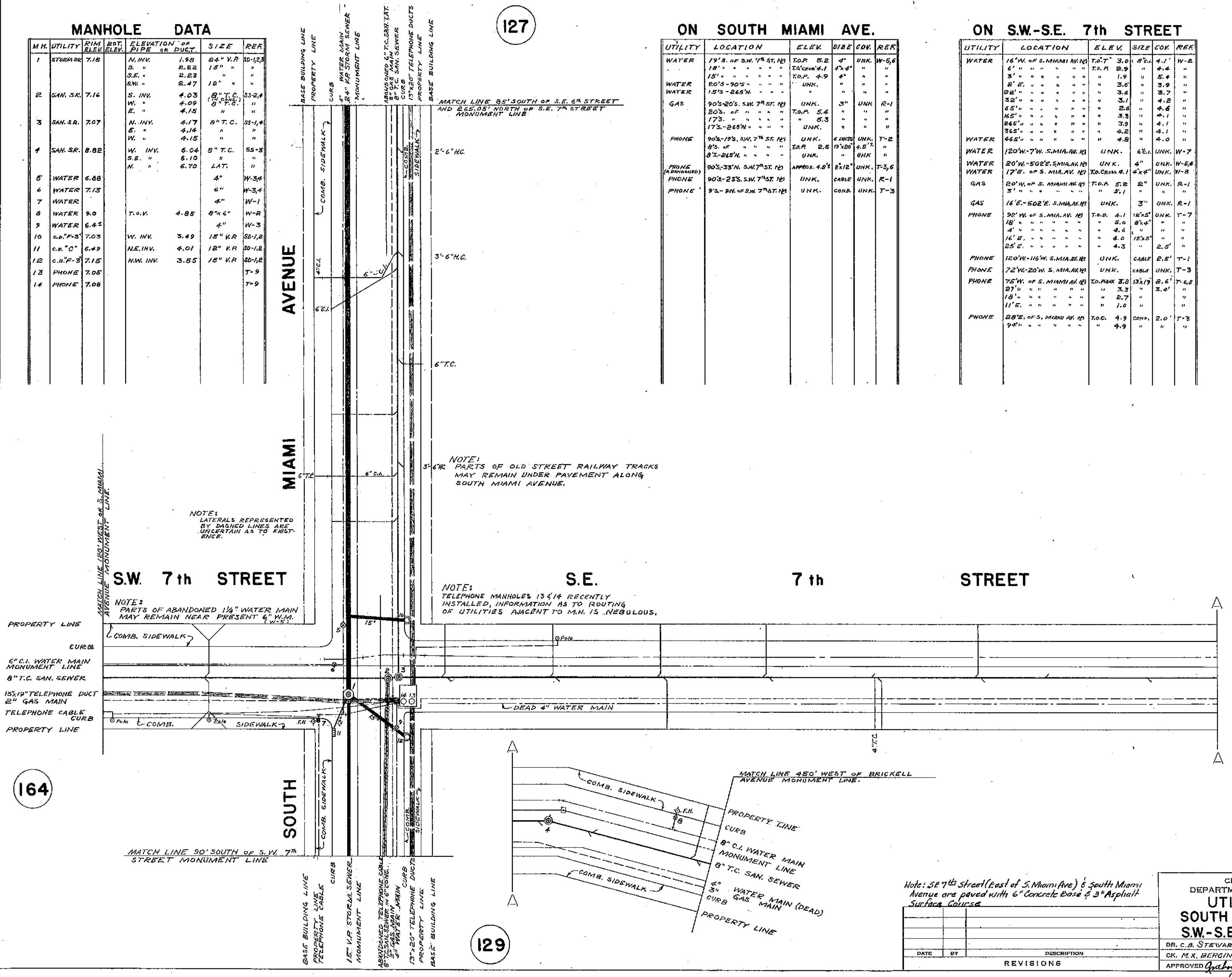
M.H.	UTILITY	RIM ELEV.	BOT. ELEV.	ELEVATION OF PIPE OR DUCT		SIZE	REF.
1	STORM SR.	7.15		N. INV.	1.98	24" V.P.	SD-1,2,3
				S. "	2.22	15" "	"
				S.E. "	2.23	"	"
				S.W. "	2.47	12" "	"
2	SAN. SR.	7.16		S. INV.	4.03	8" T.C. (IN CONC.)	SS-2,4
				W. "	4.09	8" T.C.	"
				E. "	4.15	"	"
3	SAN. SR.	7.07		N. INV.	4.17	8" T.C.	SS-1,4
				E. "	4.14	"	"
				W. "	4.15	"	"
4	SAN. SR.	8.82		W. INV.	6.04	8" T.C.	SS-3
				S.E. "	6.10	"	"
				N. "	6.70	LAT.	"
5	WATER	6.88				4"	W-3,4
6	WATER	7.13				6"	W-3,4
7	WATER					4"	W-1
8	WATER	9.0		T.O.V.	4.85	8"×6"	W-2
9	WATER	6.4±				4"	W-3
10	C.B. "F-3"	7.03		W. INV.	3.49	15" V.P.	SD-1,2
11	C.B. "C"	6.49		N.E. INV.	4.01	12" V.P.	SD-1,2
12	C.B. "F-3"	7.15		N.W. INV.	3.55	18" V.P.	SD-1,2
13	PHONE	7.05					T-9
14	PHONE	7.08					T-9

ON SOUTH MIAMI AVE.

UTILITY	LOCATION	ELEV.	SIZE	COV.	REF.
WATER	19' S. OF S.W. 7th ST. M.L.	T.O.P. 5.2	4"	UNK.	W-5,6
	18' " " " " " "	T.O. CROSS 4.1	4"×4"	"	"
	15' " " " " " "	T.O.P. 4.9	4"	"	"
WATER	20'S-90'S " " " "	UNK.	"	"	"
WATER	15'S-265'N. " " "	"	"	"	"
GAS	90'S-20'S. S.W. 7th ST. M.L.	UNK.	3"	UNK.	R-1
	20'S. OF " " " "	T.O.P. 5.4	"	"	"
	17'S. " " " " "	" 5.3	"	"	"
	17'S.-265'N. " " " "	UNK.	"	"	"
PHONE	90'S.-19'S. S.W. 7th ST. M.L.	UNK.	6 DUCTS	UNK.	T-2
	8'S. OF " " " "	T.O.P. 2.5	13"×20"	4.5'±	"
	8'S.-265'N. " " " "	UNK.	"	UNK.	"
PHONE (ABANDONED)	90'S.-33'N. S.W. 7th ST. M.L.	APPROX. 4.8'±	8"×12"	UNK.	T-3,6
PHONE	90'S.-23'S. S.W. 7th ST. M.L.	UNK.	CABLE	UNK.	R-1
PHONE	9'S.-9'N. OF S.W. 7th ST. M.L.	UNK.	COND.	UNK.	T-3

ON S.W.-S.E. 7th STREET

UTILITY	LOCATION	ELEV.	SIZE	COV.	REF.
WATER	16' W. OF S. MIAMI AV. M.L.	T.O."T" 3.0	8" C.I.	4.1'	W-2
	6' " " " " " "	T.O.P. 2.9	"	4.4	"
	3' " " " " " "	" 1.9	"	5.4	"
	2' E. " " " " "	" 3.5	"	3.9	"
	22' " " " " " "	" 3.6	"	3.7	"
	32' " " " " " "	" 3.1	"	4.2	"
	65' " " " " " "	" 2.6	"	4.6	"
	165' " " " " " "	" 3.3	"	4.1	"
	265' " " " " " "	" 3.9	"	4.1	"
	365' " " " " " "	" 4.2	"	4.1	"
WATER	465' " " " " " "	" 4.8	"	4.0	"
WATER	120'W.-7'W. S. MIA. AV. M.L.	UNK.	6" C.I.	UNK.	W-7
WATER	20'W.-502'E. S. MIA. AV. M.L.	UNK.	4"	UNK.	W-5,6
WATER	17'E. OF S. MIA. AV. M.L.	T.O. CROSS 4.1	4"×4"	UNK.	W-8
GAS	20'W. OF S. MIAMI AV. M.L.	T.O.P. 5.2	2"	UNK.	R-1
	3' " " " " "	" 5.1	"	"	"
GAS	16'E.-502'E. S. MIA. AV. M.L.	UNK.	3"	UNK.	R-1
PHONE	92' W. OF S. MIA. AV. M.L.	T.O.D. 4.1	12"×5"	UNK.	T-7
	18' " " " " " "	" 5.0	8"×4"	"	"
	4' " " " " " "	" 4.6	"	"	"
	16' E. " " " " "	" 4.0	12"×5"	"	"
	25' E. " " " " "	" 4.3	"	2.5'	"
PHONE	120'W.-116'W. S. MIA. AV. M.L.	UNK.	CABLE	2.5'	T-1
PHONE	72'W.-20'W. S. MIA. AV. M.L.	UNK.	CABLE	UNK.	T-3
PHONE	75'W. OF S. MIAMI AV. M.L.	T.O. MANK 3.8	13"×19"	2.6'	T-6,8
	27' " " " " "	" 3.3	"	3.4'	"
	18' " " " " "	" 2.7	"		"
	11' E. " " " " "	" 1.0	"		"
PHONE	28'E. OF S. MIAMI AV. M.L.	T.O.C. 4.9	COND.	2.0'	T-3
	94' " " " " " "	" 4.9	"	"	"



NOTE: PARTS OF OLD STREET RAILWAY TRACKS MAY REMAIN UNDER PAVEMENT ALONG SOUTH MIAMI AVENUE.

NOTE: LATERALS REPRESENTED BY DASHED LINES ARE UNCERTAIN AS TO EXISTENCE.

NOTE: PARTS OF ABANDONED 1¼" WATER MAIN MAY REMAIN NEAR PRESENT 6" W.M. (W-5)

NOTE: TELEPHONE MANHOLES 13 & 14 RECENTLY INSTALLED, INFORMATION AS TO ROUTING OF UTILITIES AJACENT TO M.H. IS NEBULOUS.

Note: SE 7th Street (East of S. Miami Ave) & South Miami Avenue are paved with 6" Concrete Base & 3" Asphalt Surface Course

DATE	BY	DESCRIPTION

REVISIONS

CITY OF MIAMI, FLORIDA
DEPARTMENT OF PUBLIC WORKS

UTILITY RECORDS
SOUTH MIAMI AVENUE at S.W.-S.E. 7th STREET

DR. C.B. STEWART DATE FEB. 9, 1966 SCALE 1"=20"
CK. M.X. BERGIN DATE MAR. 9, 1966
APPROVED Anthony F. Garavaglia 3-9-66

36-128

EFERENCES :

ISC. :
-1: SUR. 1188-50; &
934-49,50,53,54.
-2: UG. 374-35,37; &
UG. 124-21.
-3: Misc. SW17-325 &
DEED BKS.
-4: OLD MANILA 36-164
-5: SR. 332-17,18,25.
-6: MISC. 49-45.

LECTRIC :

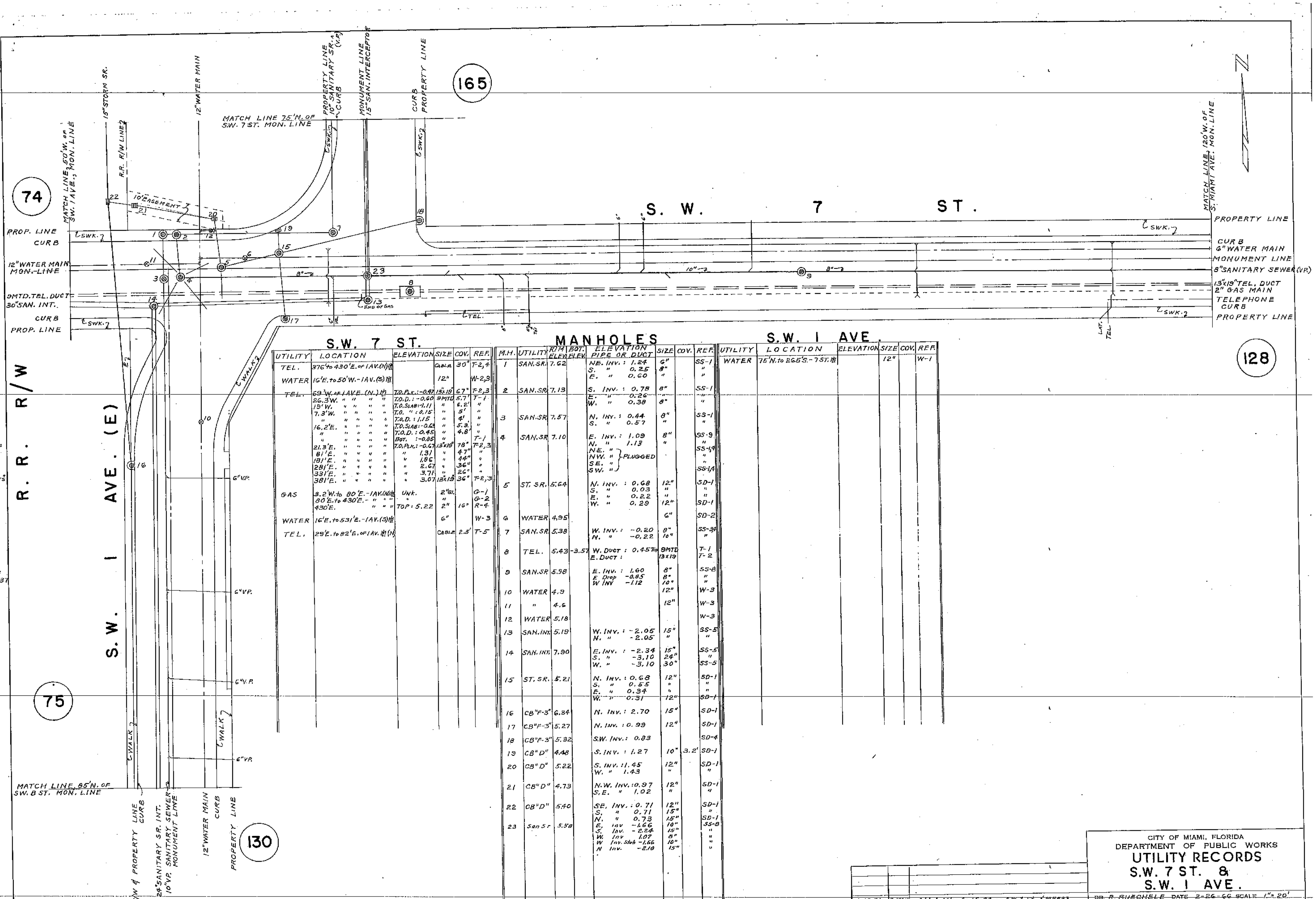
GAS :
G-1: FLA.P.&L., Sh. 31
G-2: GAS ATLAS Sh. 41

SANITARY SEWERS:
SS-1: SEE SD-1
SS-2: " SD-2
SS-3: " SD-3
SS-4: " R-4
SS-5: SAN. INT. "AS BUILTS" P.48, 56
SS-6: SAN. LAT. SHS.: SW-A-1-7 (E.S.); SW-S-7-0
SS-7: MISC. SR. 15-40.
SS-8: Sr 498-55,56
SS-9: UG 443-30

STORM DRAINAGE :
SD-1: UG. 374-35,36,37
SD-2: UG. 124-21.
SD-3: UG. 261-36.
SD-4: See (R-4) REF.
SD-5:

TELEPHONE :
T-1: UG. 313-25.
T-2: R-4
T-3: UG. 100-40,41.
T-4: PERMIT 9-11-50
T-5: " 10-25-49

WATER :
W-1: E219(1).
W-2: E193(3).
W-3: See R-4



S.W. 7 ST.

UTILITY	LOCATION	ELEVATION	SIZE	COV.	REF.
TEL.	376' to 430' E. of 1 AV. (N) ℄		CABLE	30"	T-2,4
WATER	16' E. to 50' W. - 1 AV. (S) ℄		12"		W-2,3
TEL.	69' W. of 1 AVE. (N.) ℄	T.O. PLK.: -0.47	13"x19"	67"	T-2,3
	26.3' W. " " " "	T.O.D.: -0.60	9MTD	5.7'	T-1
	19' W. " " " "	T.O. SLAB: -1.11	"	6.2'	"
	7.3' W. " " " "	T.O. " : 0.15	"	5'	"
	" " " " "	T.O.D.: 1.15	"	4'	"
	16.2' E. " " " "	T.O. SLAB: -0.63	"	5.9'	"
	" " " " "	T.O.D.: 0.45	"	4.8'	"
	" " " " "	BOT. : -0.85	"		T-1
	21.3' E. " " " "	T.O. PLK.: -0.67	13"x19"	78"	T-2,3
	81' E. " " " "	" 1.31	"	47"	"
	181' E. " " " "	" 1.86	"	44"	"
	281' E. " " " "	" 2.67	"	36"	"
	331' E. " " " "	" 3.71	"	26"	"
	381' E. " " " "	" 3.07	13"x19"	36"	T-2,3
GAS	3.2' W. to 80' E. - 1 AV. (N) ℄	UNK.	2" GI.		G-1
	80' E. to 430' E. - " " "	"	"		G-2
	430' E. " " "	TOP: 5.22	2"	16"	R-4
WATER	16' E. to 531' E. - 1 AV. (S) ℄		6"		W-3
TEL.	29' E. to 82' E. of 1 AV. ℄ (N)		CABLE	2.5'	T-5

MANHOLES

M.H.	UTILITY	RIM ELEV.	BOT. ELEV.	ELEVATION PIPE OR DUCT	SIZE	COV.	REF.
1	SAN. SR.	7.62		NE. INV.: 1.24	6"		SS-1
				S. " 0.25	8"		"
				E. " 0.60	"		"
2	SAN. SR.	7.13		S. INV.: 0.78	8"		SS-1
				E. " 0.26	"		"
				W. " 0.38	8"		"
3	SAN. SR.	7.57		N. INV.: 0.44	8"		SS-1
				S. " 0.57	"		"
4	SAN. SR.	7.10		E. INV.: 1.09	8"		SS-9
				N. " 1.13	"		"
				N.E. " } PLUGGED			SS-1,4
				NW. "			"
				SE. "			"
				SW. "			SS-1,4
5	ST. SR.	5.64		N. INV.: 0.68	12"		SD-1
				S. " 0.03	"		"
				E. " 0.22	"		"
				W. " 0.29	12"		SD-1
6	WATER	4.95			6"		SD-2
7	SAN. SR.	5.38		W. INV.: -0.20	8"		SS-3,4
				N. " -0.22	10"		"
8	TEL.	5.43	-3.57	W. DUCT: 0.45 Top	9MTD		T-1
				E. DUCT:	13x19		T-2
9	SAN. SR.	5.98		E. INV.: 1.60	8"		SS-8
				E. Drop -0.85	8"		"
				W INV -1.12	10"		"
10	WATER	4.9			12"		W-3
11	"	4.6			12"		W-3
12	WATER	5.18					W-3
13	SAN. INT.	5.19		W. INV.: -2.05	15"		SS-5
				N. " -2.05	"		"
14	SAN. INT.	7.90		E. INV.: -2.34	15"		SS-5
				S. " -3.10	24"		"
				W. " -3.10	30"		SS-5
15	ST. SR.	5.21		N. INV.: 0.68	12"		SD-1
				S. " 0.55	"		"
				E. " 0.34	"		"
				W. " 0.31	12"		SD-1
16	CB "F-3"	6.84		N. INV.: 2.70	15"		SD-1
17	CB "F-3"	5.27		N. INV.: 0.99	12"		SD-1
18	CB "F-3"	5.32		S.W. INV.: 0.83			SD-4
19	CB "D"	4.48		S. INV.: 1.27	10"	3.2'	SD-1
20	CB "D"	5.22		S. INV.: 1.45	12"		SD-1
				W. " 1.43	"		"
21	CB "D"	4.73		N.W. INV.: 0.97	12"		SD-1
				S.E. " 1.02	"		"
22	CB "D"	5.40		SE. INV.: 0.71	12"		SD-1
				S. " 0.71	15"		"
				N. " 0.73	15"		SD-1
23	San Sr	5.58		E. Inv -1.66	10"		SS-8
				S. Inv. -2.24	15"		"
				W. Inv 1.07	8"		"
				W Inv. Stub -1.66	10"		"
				N Inv. -2.10	15"		"

S.W. 1 AVE.

UTILITY	LOCATION	ELEVATION	SIZE	COV.	REF.
WATER	75' N. to 265' S. - 7 ST. ℄		12"		W-1

DATE	BY	DESCRIPTION
1-15-71	Griffiths	Added Misc Sr 15-40 on S.W. 7 St. & MH #23

REVISIONS

CITY OF MIAMI, FLORIDA
DEPARTMENT OF PUBLIC WORKS
UTILITY RECORDS
S.W. 7 ST. &
S.W. 1 AVE.

DR. R. BUECHELE DATE 2-26-66 SCALE 1"=20'
CK. H. Griffiths DATE 4-29-66
APPROVED

36-164

ON S.W. 1st Ave. (W.)

Utility	Location	Elevation	Size	Cover
Electric	50' S. of S.W. 8 St. M/L	T.O.D. 1.1'	66KV	5.5'
↕	At M/L of S.W. 8 St.	↕ 1.8'		7.1'
	50' N. of S.W. 8 St M/L	2.5'		5.7'
	100'	2.6'		4.0'
	150'	2.4'		4.0'
	200'	2.5'		3.5'
	250'	2.1'		3.7'
	300'	2.0'		3.9'
Electric	201.1' N. of S.W. 8 St M/L	0.97	3MTD	4.9'
Storm Sr.	Along S.W. 1 Ave.		60"x36"	4.1'

M.H.	Utility	Rim Elev.	Bot. Elev.	Elevation of Pipe or Duct		Size	Cover
1	Electric	9.2'	4.95'				
2	Electric						
3	San.Sr.	9.0'		W. Inv.	1.61'	12"	
↕	↕	↕		S. Inv.	1.70	10"	
				N. Inv	1.89	6"	
				E. Inv.		8"	

ON S.W. 8th St.

Utility	Location	Elevation	Size	Cover
Electric	14.1' W. of S.W. 1 Ave M/L	T.O.D. 7.41'	2-4"	
"	110.5' " " " " " "	" 8.63'	"	

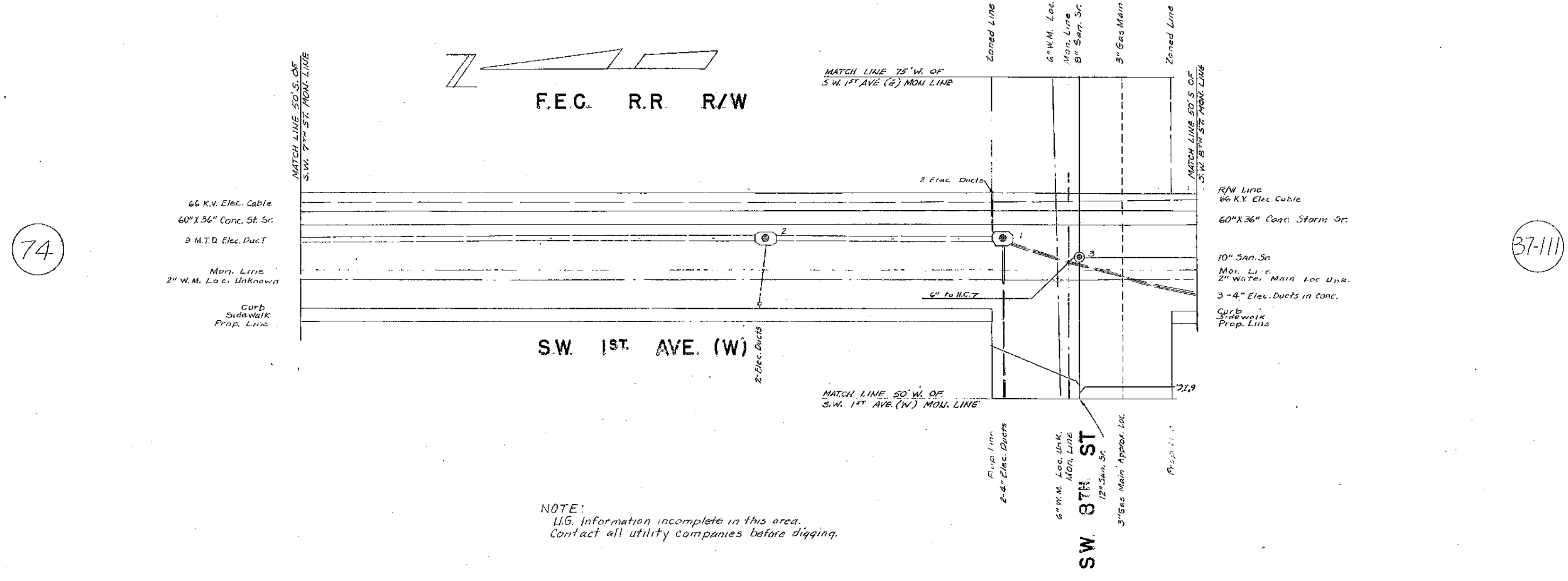
REFERENCES

ELECTRIC
- U.G. BK. 231-3,4
- MIAMI-COC. GROVE PLANS
- U.G. 111-32
- Permit - 12-20-51

SAN. SEWER
- SR. BK. 53-42
- COUNTER BK SHT. S.W.-8-1

STORM SR.
- SR. BK. 260-25

SIDEWALK
- SUR. BK. 897-33
- PAV. BK. 878-29



NOTE:
U.G. Information incomplete in this area.
Contact all utility companies before digging.

157

7-17-67 D.F. Added laterals

CITY OF MIAMI, FLORIDA
DEPARTMENT OF ENGINEERING

UNDERGROUND RECORDS

DR. Mitnan & Menard DATE 8-26-60 SCALE 1" = 20'
CK. R.F. Buecnele DATE 8-29-60
APPROVED
36-75

M.H.	Utility	Rim Elev.	Bot. Elev.	Elevation of Pipe or Duct		Size	Cover
1	San.			W. Inv. N. Inv.	2.46 2.29	8" 10"	30"
2	Storm	5.55		N. Inv. E. " SW. "	0.05 0.09 0.20	3'x5' " 12"	
3		6.15		W. Inv. S. Inv.	1.58 2.64	12" "	
4				Inv.	0.10	54"x30"	50"
5	Storm			Inv.	0.64	42"x30"	56"
6	Water					2"	
7	San. Sr	6.48		N.&W. Inv. S.&E. Inv.	1.88 1.90	8" 8"	
8	San. Sr.	5.66		S. Inv.	2.44	8"	
9	San. Sr	6.02		E. Inv. W. Inv.	0.21 1.38	8" 8"	
10	San. Sr.	4.76		N. Inv. = -1.70 E. Inv. = -1.77	NE. 0.89 W.-1.33		
A	Type "F"	5.20		N.E. Inv. S. Inv.	1.75 0.91	12" 10"	
B	Type "F"	5.19		SE. Inv. NE. Inv.	1.85 1.61	12" 12"	
C	Type "D"	4.70		NW. Inv.	2.11	10"	
D	Type "G"	5.20		W. Inv. E. Inv.	0.34 0.32	3'x5' 3'x5'	
E	Type "F"	6.54		S. Inv.	1.69	12"	
F	Type "F"	6.51		N. Inv.	1.44	12"	
G	Type "D"	5.09		SW. Inv.	2.25	12"	
11	Water			T.O.V.	2.79	6"	3.52"

ON S.W. 1st AVE.

Utility	Location	Elevation	Size	Cover
Water			2"	1.5'
Elec.	At 10 St. Mon. Line	TOP 1.16	69kV	4.5'
	150' N. of 10 St. ML	" 0.86	"	4.5'
	At 9 St. ML (Ext.)	" -0.64	"	6'
	250' N. of 9 St. ML	" 1.65	"	4'
Elec.			2-4" Ducts	24"
Water "	At 10 St. ML 31.5' S. of 10 St. ML	T.O.P. 3.48 T.O.P. 2.79	6" 6"	

ON S.W. 9th ST.

Utility	Location	Elevation	Size	Cover
Water			2"	24"

ON S.W. 10th ST.

Water			2"	24'
Gas	End of Main	TOP 1.20	6"	

REFERENCES

LAYOUT
Tax Map # 100
Hopkins Atlas 4
Sur. 590-57
Sur. 802-34
Pav. 878-37,38,45,54
Pav. 884-51-53
Aerial Photo Atlas P.9
Swk. Imp. Proj. # 121.

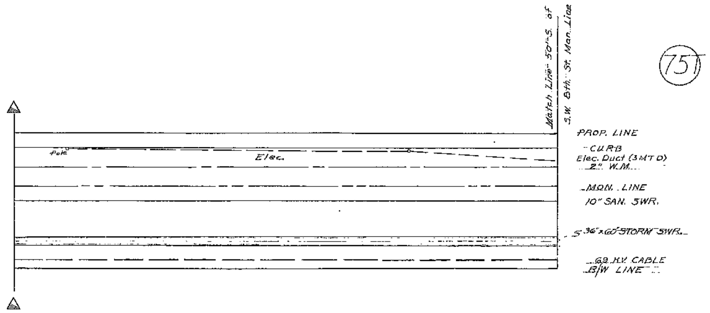
ELECTRIC
UG. 231-4,5
UG. 111-37

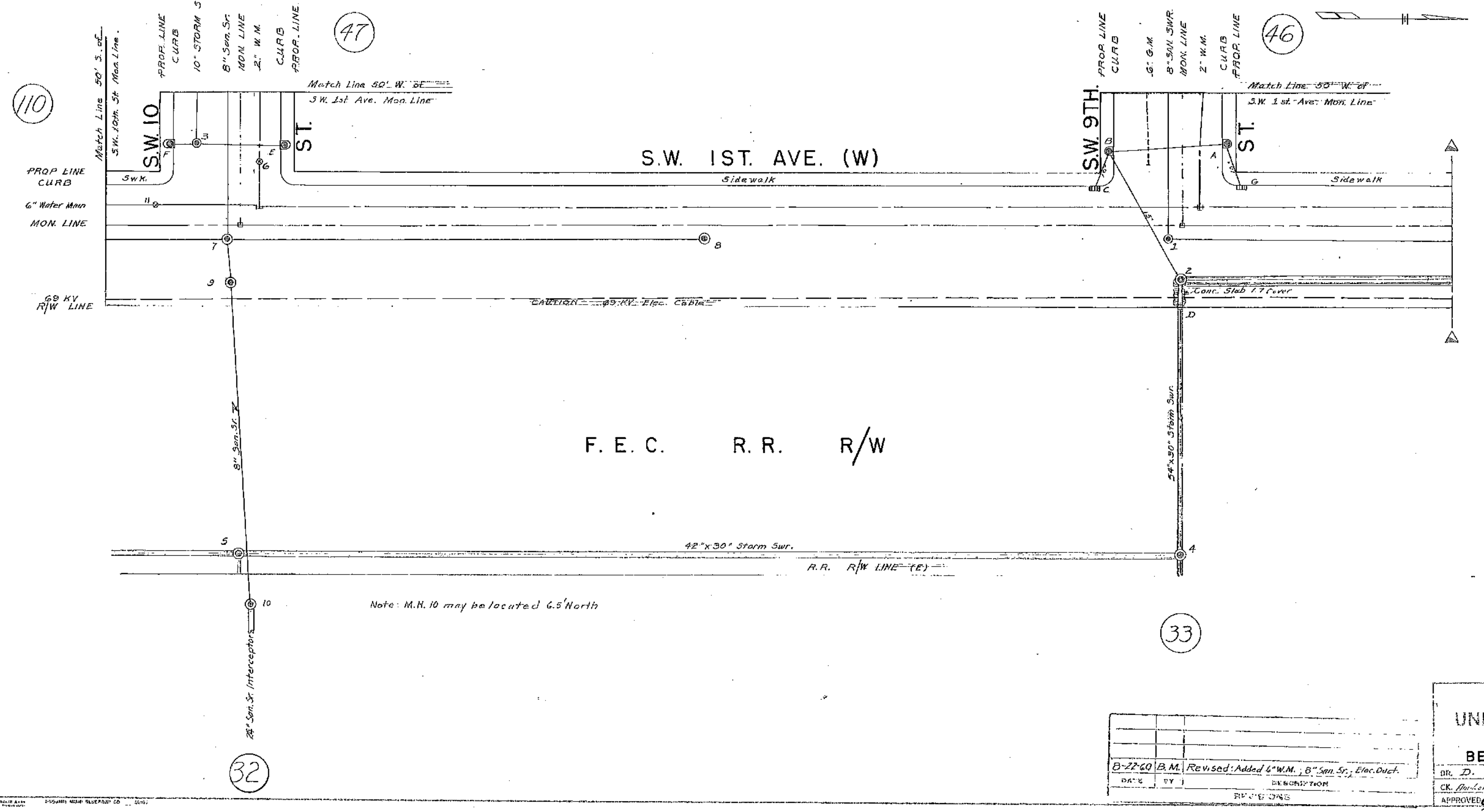
WATER
~~Water Sh. 166 (1)~~
" " 167 (2)
Water Atlas # 11-B
E-7982

SEWERS
Counter Bks
SW-5-9-1
SW-A-1-9
SR. 334-44
SR. 390-11,13,21

STORM SWR.
UG 343-50,51
SR. Cont. # 71 pgs 2-5

GAS
UG. 19-42,46
Atlas # 42





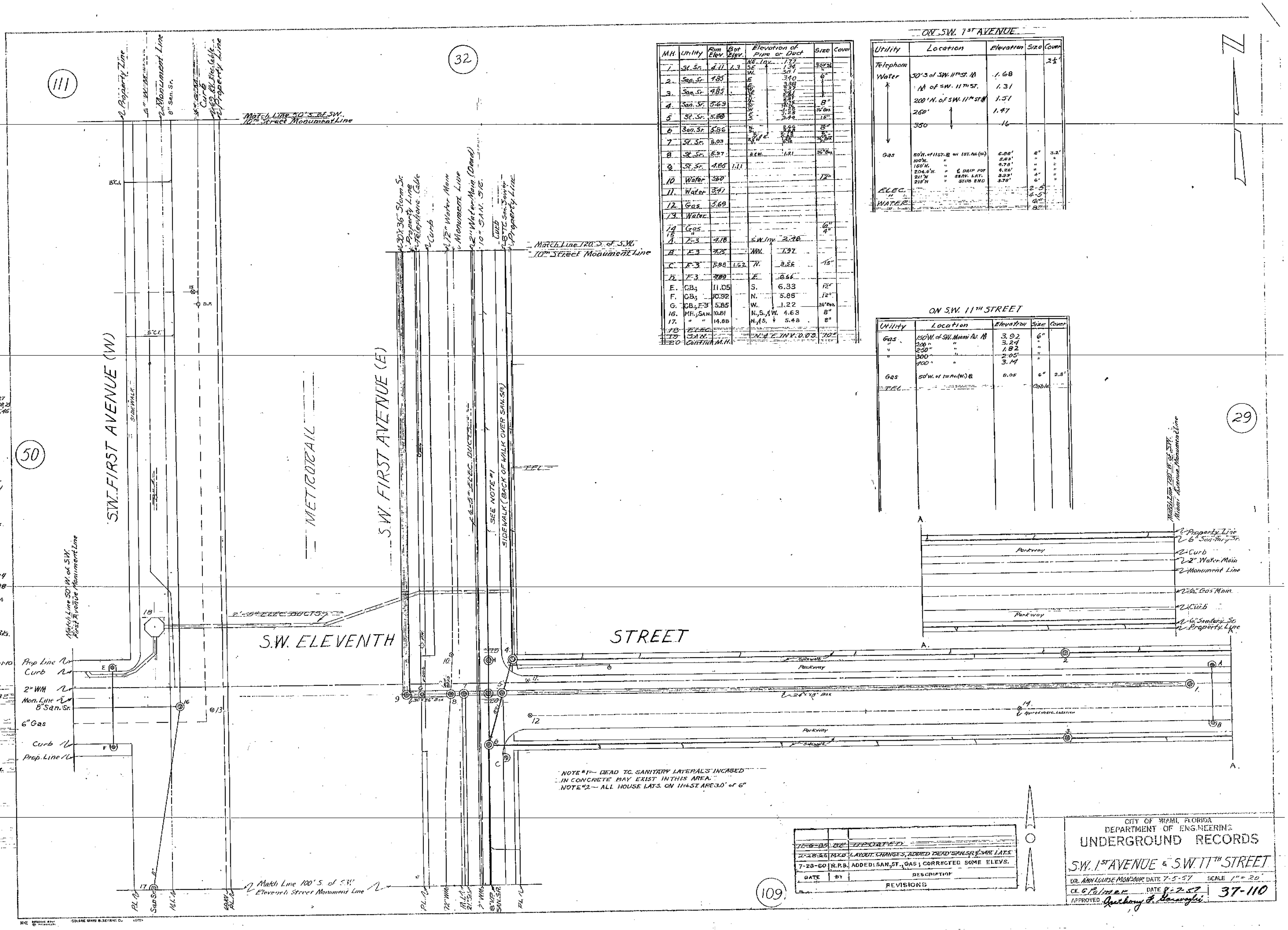
Date	By	Description
8-22-60	B.M.	Revised: Added 6" W.M.; 8" San. Sr.; Elec. Duct.

REVISIONS

CITY OF MIAMI, FLORIDA
DEPARTMENT OF ENGINEERING
UNDERGROUND RECORDS.
S.W. 1ST. AVE. (W)
BET. S.W. 8TH. ST. & 10TH. ST.

DR. D. WEDELL DATE 7-18-57 SCALE 1" = 20'
CK. Andrew Mensur DATE 9-18-57
APPROVED Anthony F. Garavaglia

37-111



M.H.	Utility	Rim Elev.	Bot Elev.	Elevation of Pipe or Duct	Size	Cover
1.	St. Sr.	4.11	1.3	NE. Inv. 1.77 SE 1.34 W. 3.01	30X36 "	
2.	San. Sr.	4.85		E 3.40	6"	
3.	San. Sr.	4.85		E. 3.38 W 3.37 SE 3.41		
4.	San. Sr.	5.69		E. 2.85 N. 2.81 S. 2.75 W 0.76	8" 36" Box	
5	St. Sr.	5.88		W 1.28 E. 1.28 S. 3.40	15"	
6	San. Sr.	5.86		N. 2.66 S. 2.68 E. 2.73	8" 6"	
7.	St. Sr.	6.03		N&E 0.23 E&W 1.28 S. 0.18	10" 36" Box 21"	
8	St. Sr.	5.97		E&W. 1.21	36" Box	
9	St. Sr.	4.85	1.11			
10	Water	5.60			12"	
11.	Water	3.41				
12.	Gas	5.69				
13.	Water					
14 15	Gas "				6" 4"	
A.	F-3	4.18		S.W. Inv. 2.48		
B.	F-3	4.75		NW. 1.97		
C.	F-3	5.88	1.62	N. 3.56	15"	
D.	F-3	4.89		E. 0.66		
E.	CB.;	11.05		S. 6.33	12"	
F.	CB.;	10.92		N. 5.88	12"	
G.	CB.; F-3	5.85		W. 1.22	36" Box	
16.	MH.; SAN.	10.81		N., S., & W. 4.63	8"	
17.	" "	14.88		N., & S. 5.48	8"	
~~18~~	~~ELEC.~~					
~~19~~	~~SAN.~~			~~N. & E. INV. 0.09~~	~~10"~~	
~~20~~	~~Conflict M.H.~~					

ON S.W. 1ST AVENUE

Utility	Location	Elevation	Size	Cover
Telephone				2½'
Water	50' S of SW. 11th St. ℄	1.68		
	℄ of SW. 11th ST.	1.31		
	200' N. of SW. 11th St ℄	1.51		
	260'	1.47		
	350	.16		
Gas	50' N. of 11 ST. ℄ ON 1ST. AV. (W.)	6.88'	6"	3.2'
	100' N. "	5.63'	"	"
	150' N. "	4.78'	"	"
	204.6' N. " ℄ DRIP POT	4.26'	"	"
	211' N " SERV. LAT.	3.93'	4"	"
	218' N " STUB END	3.78'	6"	"
~~ELEC.~~			~~2-5"~~	
~~"~~			~~4-5"~~	
~~WATER~~			~~6"~~	
~~"~~			~~8"~~	

ON S.W. 11TH STREET

Utility	Location	Elevation	Size	Cover
Gas	150' W. of SW. Miami Av. ℄	3.92	6"	
"	200' " "	3.24	"	
"	250' " "	1.82	"	
"	300' " "	2.05	"	
	400' " "	3.14	"	
Gas	50' W. of 1st Av. (W.) ℄	8.05	6"	2.8'
~~TEL~~			Cable	

REFFRENCES
~~Layout~~
Dedications
Plat Book
Monument Dis.
Survey # 675-27
946-28,29
SURVEY BK 1188-45,46
Water:
Underground Bks.
#22-23
#221-13
#124-24
Telephone
Underground Bks.
#213-21
#231-5
Gas:
Underground Bks.
UG 368-13,14; #19-52
Storm Sewers
Sewer Bks.
#260-30
#327-27-34
~~As Built - #10-28~~
UG 221-13;
UG 344-20; 379-31; UG 124-24
Sanitary Sewers
Counter Books
Underground Bks.
#221-13
#120-39
#124-29
INSPECTION CARD SW-A-1-10
~~ELECTRIC~~
~~PERMIT 3-24-82~~
~~TELEPHONE~~
~~UG 402-58~~
~~UG 436-77~~
~~SANITARY~~
~~CASH 3-16-74~~
~~GAS~~
~~1-B-865-1~~
~~WATER~~
~~E-7982~~
~~E-9642~~

NOTE #1— DEAD T.C. SANITARY LATERALS INCASED IN CONCRETE MAY EXIST IN THIS AREA.
NOTE #2— ALL HOUSE LATS. ON 11th ST. ARE 3.0' of 6"

DATE	BY	DESCRIPTION
~~11-6-85~~	~~BE~~	~~UPDATED~~
~~2-28-86~~	~~MXB~~	~~LAYOUT CHANGES, ADDED DEAD SAN. SR. & SAN. LATS.~~
7-28-60	R.P.B.	ADDED: SAN., ST., GAS; CORRECTED SOME ELEVS.

REVISIONS

CITY OF MIAMI, FLORIDA
DEPARTMENT OF ENGINEERING
UNDERGROUND RECORDS
S.W. 1ST AVENUE & S.W. 11TH STREET
DR. ANN LOUISE MONSOUR DATE 7-5-57 SCALE 1" = 20'
CK. G Palmer DATE 8-2-57
APPROVED Anthony F. Garavaglia
37-110

REFERENCE

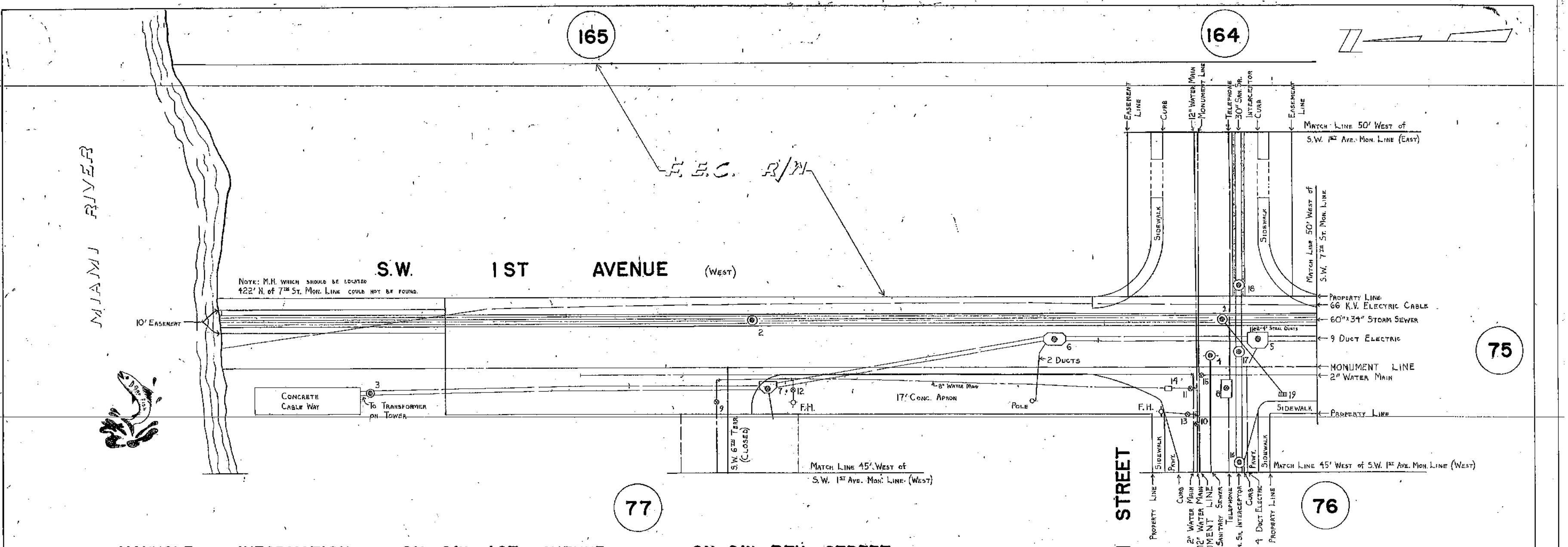
Sanitary Sewer
SS-1: U.G. 408-14
SS-2: Interceptor-As-Built

Storm Drain
SD-1: U.G. 408-14
SD-2: U.G. 263-10
SD-3: U.G. 260-23+24

Water
W-1: U.G. 408-14
W-2: U.G. 236-18
W-3: 208-10 (Old Aqua)
W-4: E-7096
W-5: 193-2
W-6: 194-1

Electric
E-1: U.G. 408-14
E-2: U.G. 263-18
E-3: 9-19-55
E-4: U.G. 312-39
E-5: U.G. 231-3+30
E-6: U.G. 111-31+32

Telephone
T-1: U.G. 408-14
T-2: U.G. 263-18
T-3: 8-4-54
T-4: U.G. 314-57



MANHOLE INFORMATION

M.H.	UTILITY	RIM ELEV.	BOT. ELEV.	ELEVATION OF PIPE OR DUCT	SIZE	COVER	REF.
1	Storm Sr.	8.30		Inv. N. -0.56'	60"x30"		SD-1,2,3
				" S. -0.56'	"		"
2	"	5.68		Inv. N. -0.68'	"		SD-1,3
				" S. -0.68'	"		"
3	Electric	6.41					E-2
4	San. Sewer	7.35		Inv. S. 2.09	8"		SS-1
				" W. 2.15	"		"
				" N. 2.15	"		"
5	Electric	7.52					E-1,2
6	"	5.86					E-2
7	"	6.32					"
8	Telephone	6.48					T-1,2
9	Water Valve				8"		W-3
10	"	5.46			12"		W-2
11	"	5.61			8"		W-2
12	"	6.34			8"		W-2
13	"	5.82			6"		W-1,2
14	Water Meter						W-2
15	Water Valve	5.83			2"		W-2
16	San. Sr. Intc.	5.36		Inv. W. -3.30	30"		SS-2
				" E. -3.30	"		"
17	"	7.33		Inv. W. -3.26	"		"
				" E. -3.26	"		"
18	"	8.96		Inv. W. -3.13	"		"
				" E. -3.13	"		"
19	Storm C.B.	5.34		Inv. N.E. 0.74	12"		SD-1,2

ON S.W. 1ST AVENUE

UTILITY	LOCATION	ELEVATION	SIZE	COVER	REF.
Electric	At 7th St. Mon. L.	66 KV	6" Steel	55"	E-5
"	100' N. of 7th St. Mon. L.	"	"	51"	"
"	150' N " " " " "	"	"	78"	"
"	200' N. " " " " "	"	"	84"	"
"	At River Bulkhead	T.O.D. 1.96	"	90"	"
Electric	20' N. of 7th St. Mon. L.	T.O.D. 2.72	9 Duct		E-4
	56' N. " " " " "	" 2.63	"		"
	98' N. " " " " "	0.99	"		E-6
	127' N. " " " " "	0.86	"		"
	163.7' N. " " " " "	0.42	"		"
	20' S " " " " "	1.96	"		E-4
Water	1.2' N. of 7th St. Mon. L.	3.9	8"		W-4
"	2.5' N. " " " " "	3.7	"		"
"	50' N. " " " " "	4.2	"		"
"	100' N. " " " " "	3.0	"		"
"	150' N. " " " " "	3.0	"		"
"	205.5' N. " " " " "	3.0	"		"
Water			2"		W-3
Electric			2 Duct		E-3

ON S.W. 7TH STREET

UTILITY	LOCATION	ELEVATION	SIZE	COVER	REF.
Water	20' W. of 1st Ave. Mon. L.	3.7	12"		W-5,6
"	30' E. " " " " "	4.2	"		"
"	80' " " " " " "	4.5	"		"
Water			2"		W-6
Telephone	23.8' W. of 1st Ave. Mon. L.	2.15	9MTD		T-3,4
Electric	8' E. of 1st Ave. Mon. L.	3.18	4 Duct		E-4
	At " " " "	3.36			"

DATE	BY	DESCRIPTION
8-13-62	W.R.Mc	Traced & Revised - W.R. McQuinn

REVISIONS

CITY OF MIAMI, FLORIDA
DEPARTMENT OF ENGINEERING
UNDERGROUND RECORDS
S.W. 1ST AVENUE (West of RR)
& S.W. 7TH STREET

DR. R.J. Falkey DATE 5-16-51 SCALE 1" = 20'
CK. L.E. McCrea DATE 5-29-51
APPROVED Anthony F. Garavaglia 8-9-62

36-74

REFERENCE
LAYOUT

TAX MAP #94
SURVEY BK 1256-51
VOID UG SHEET 37-29
HOPKINS - PG12
R/W DEDICATION BOOKS
UG 120-33
" 14-32,15

WATER

WM-1 OLD WATER BOOK - 400,402, 403
~~WM-2 E-8385~~
~~WM-3 E-8600-1~~

GAS

INDEX SHEET #42
U.G. BK. 19-52
G-1 PHOENIX #249-1
G-2 " # 422
~~G-3 7-8-805~~

SANITARY SEWER

COUNTER BOOK
SS-1 U.G. 120-39

STORM SEWER

UG 14-48
~~ST-2 SR 527-54~~

TELEPHONE

T-1 UG 129-23
T-2 " 35A-42
T-3 " 370-37 ~~PER 4-2-70~~
~~T-4 PERMIT 2-27-67~~
~~T-5 " 3-12-68~~
~~T-6 " 9-23-69~~
~~T-7 " 7-15-80~~

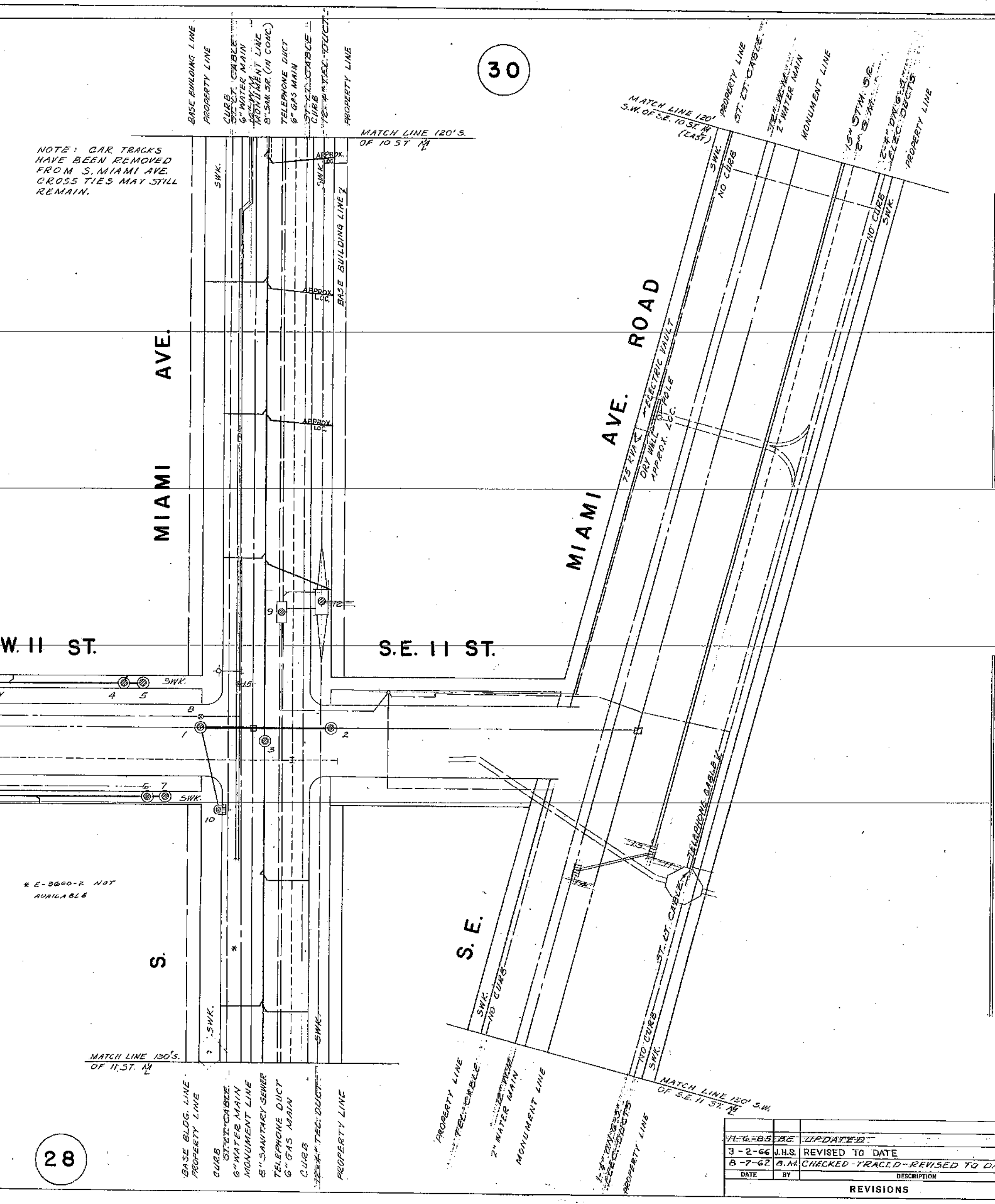
ELECTRIC

E PERMIT 8-2-54
E-2 PERMIT 8-9-63
~~E-3 PERMIT 9-21-66~~
~~E-4 " 7-24-69~~
~~E-5 " 8-22-69~~

MANHOLE INFORMATION

M.H.	UTILITY	RIM ELEV.	BOT. ELEV.	ELEVATION OF PIPE OR DUCT	SIZE	COVER	REF.
1	STORM	8.82		S.E. INV. 4.42	10"		SS-1
				E. " 3.04	10"		SS-1
2	STORM	9.02		W. " 3.35	10"		SS-1
3	SAN.SR.	9.17		N. " 4.11	8"		SS-1
				S. " 4.07	8"		SS-1
4	SAN. SR.	8.31		E. " 4.04	6"		SS-1
				W. " 4.00	6"		SS-1
5	SAN.F.T.	8.53		W. " 4.00	6"		SS-1
6	SAN. SR.	8.61		E. " 3.98	6"		SS-1
				W. " 3.98	6"		SS-1
7	SAN.F.T.	8.80		W. " 4.00	6"		SS-1
8	WATER	8.60			2"		SS-1
9	PHONE	8.84	1.39	BOTTOM N. 3.62	5'X9'	34"	T-2
				" S. 4.33	9'X13'	41"	"
	EL.	CURB		LAT. N. 4.41	4"X4"	49"	"
10	C.B."E"	9.10		INV. 5.69	10"		SS-1
~~11~~	~~ELEC.~~						~~E-5~~
~~12~~	~~TEL.~~						~~T-6~~
~~13~~	~~STM.~~	~~8.09~~		~~N. INV. 2.50~~	~~15"~~		~~ST-2~~
				~~W. INV. 2.50~~	~~12"~~		
~~14~~	~~STM.~~	~~8.11~~		~~E. INV. 2.86~~	~~12"~~		~~ST-2~~
15	W.M.				16"		W-3

NOTE: CAR TRACKS HAVE BEEN REMOVED FROM S. MIAMI AVE. CROSS TIES MAY STILL REMAIN.



* E-8600-2 NOT AVAILABLE

S. MIAMI AVE.

UTILITY	LOCATION	ELEVATION	SIZE	COVER	REF.
GAS	170' N. OF 11 ST. M/L	T.O.P. 4.1	6"		G-1
	70' N. " " " "	" 4.9	6"		G-1
	30' S. " " " "	" 6.1	6"		G-1
	130' S. " " " "	" 6.4	6"		G-1
PHONE					
WATER			6"		WM-1
~~ELEC.~~			~~Cable~~		~~E-3~~
~~TEL.~~			~~12-4"~~		~~T-6~~
~~TEL.~~					~~T-7~~
WM			16"		W-3

S.E. MIAMI AVE. ROAD

UTILITY	LOCATION	ELEVATION	SIZE	COVER	REF.
PHONE	FROM 11 ST. M/L EXT. TO 55.2' S.			24"	T-3
ELECTRIC VAULT	123' N. OF S.E. 11 ST. M/L				E-2
WATER			2"		WM-1
~~WATER~~			~~12"~~		~~WM-2~~
~~ELEC.~~			~~Cable~~		~~E-4~~
~~ELEC.~~			~~6-5"~~		~~E-5~~
~~TEL.~~			~~Cable~~		~~T-5~~
~~GAS~~			~~2"~~		~~G-3~~

S.W. & S.E. 11 STREET

UTILITY	LOCATION	ELEVATION	SIZE	COVER	REF.
GAS	ON MIA. AVE. M/L	T.O.P. 5.9	6"		G-2
	100' W. OF MIA. AVE M/L	" 4.4	6"		G-2
	120' " " " " "	" 4.0	6"		G-2
PHONE	47' E. MIA. AVE. M/L	T.O.P. 6.66		28"	T-1
	12' " " " "	" 6.99		24"	T-1
PHONE	FROM 53.5' TO 184.5' E. OF MIA. AVE. M/L			30"	T-3
WATER	W. OF MIA. AVE. M/L			2"	WM-1
~~TEL.~~			~~Cable~~		~~T-4~~
~~TEL.~~			~~"~~		~~T-5~~

DATE	BY	DESCRIPTION
~~11-6-85~~	~~BE~~	~~UPDATED~~
3-2-66	J.H.S.	REVISED TO DATE
8-7-62	B.M.	CHECKED-TRACED-REVISED TO DATE

REVISIONS

CITY OF MIAMI, FLORIDA
DEPARTMENT OF ENGINEERING
UNDERGROUND RECORDS
S.E.& S.W. 11 ST. AT S. MIA. AVE.
S.E. 11 ST. AT S. MIA. AVE. RD.

DR. R.A. WILLIAMS DATE 4-2-36 SCALE 1" = 20'
CK. B. MENARD DATE 8-6-62
APPROVED Anthony F. Garavaglia 8-9-62
37-29T

REFERENCE

LAYOUT
DETAIL PLAT #34
LEG 192-20
" 215-14
SUR. BK. 1256-51
R/W DEDICATION BK.

WATER

WM-1 U.G. 204-24
WM-2 OLD WATER BK. 400402, 403
WM-3 E-7888
WM-4 E-8385

GAS

G-1 PHOENIX # 249
G-2 UG 171-38
G-3 FLORIDA GAS CO. 1-8-805

TELEPHONE

T-1 UG 129-24
T-2 PERMIT DATE 2-27-67
T-3 " " 5-16-75
T-4 " " 9-23-69
T-5 " " 5-11-73

SANITARY SEWER

SS-1 UG 120-3738
SS-2 AS BUILT INTERCEPTOR PLANS # 56
COUNTER BOOK
SS-3 SE.540-18

STORM SEWER

SD-1 SEWER BOOK 527

ELECTRIC

E-1 PERMIT DATE 8-22-69
E-2 PERMIT DATE 3-15-86

T.V. CABLE

TVC-1 PERMIT DATE 1-18-85

MANHOLE INFORMATION

M.H.	UTILITY	RIM ELEV.	BOT. ELEV.	ELEVATION OF PIPE OR DUCT	SIZE	COVER	REF.
1	SAN.SR.	5.44		N. INV. 3.22	6"		SS-1
				S. " 3.28	STUB OR		LAT.
2	STORM	5.75		E. " (-) 0.20	18"		SS-1
				SE. " 0.98	10"		
3	STORM	5.88		W. " (-) 0.11	18"		SS-1
				S. " 0.67	10"		
4	SAN.SR.	6.09		S. " 3.46	8"		SS-1
				E. " 3.51	8"		SS-1
				W. " 3.40	8"		SS-1
				N. " 3.43	8"		SS-2
5	PHONE	5.90					SS-1
6	SAN.SR.	5.76		W. " 2.27	8"		SS-1
				E. " SEALED	STUB		
7	WATER	5.55			6"		SS-1
8	WATER	5.72			6"		SS-1
9	WATER	6.74			6"		SS-1
10	SAN. SR.	7.06		W. INV. 3.91	8"		SS-1
				S.E. " 4.01	8"		SS-1
11	WATER						WM-1
12	SAN. SR.	6.17		E. INV. (-) 0.88	24"		SS-2
				W. " (-) 0.88	24"		SS-2
				S. " 3.09	8"		SS-2
13	SAN.SR	6.41		W. " (-) 0.67	24"		SS-2
		CURB		SE. " (-) 0.67	24"		SS-2
14	C.B."E"	5.97		N.W. " 2.19	10"		SS-1
15	" "	5.66		N.W. " 1.58	10"		SS-1
16	" "D"	RIM 5.57		S. E. " 2.86	8"		SS-1
17	" "D"	5.93		N.W. " 3.75	8"		SS-1
18	SAN.SE.	6.31		N. INV. 0.13	8"		SS-3
				E. INV. -0.84	24"		SS-3
				W. INV. -0.82	24"		SS-3
19	SAN.SE.	4.84		S. INV. 1.10	8"		SS-3
20	STORM SE	5.74		N. INV. 2.16	14"x23"		SD-1
				S. INV. 2.16	15"		"
				W. INV 2.03	12"		"
21	" "	5.68		E. INV. 2.00	12"		"
22	" "	5.75		N INV. 1.59	19"x30"		"
				S. INV. 2.03	14"x23"		"
23	WATER				6"		WM-4
24	ELEC.				6.4" Duct		T-2
25	TEL.				CABLE		T-3
26	"				"		T-4

S. MIAMI AVENUE

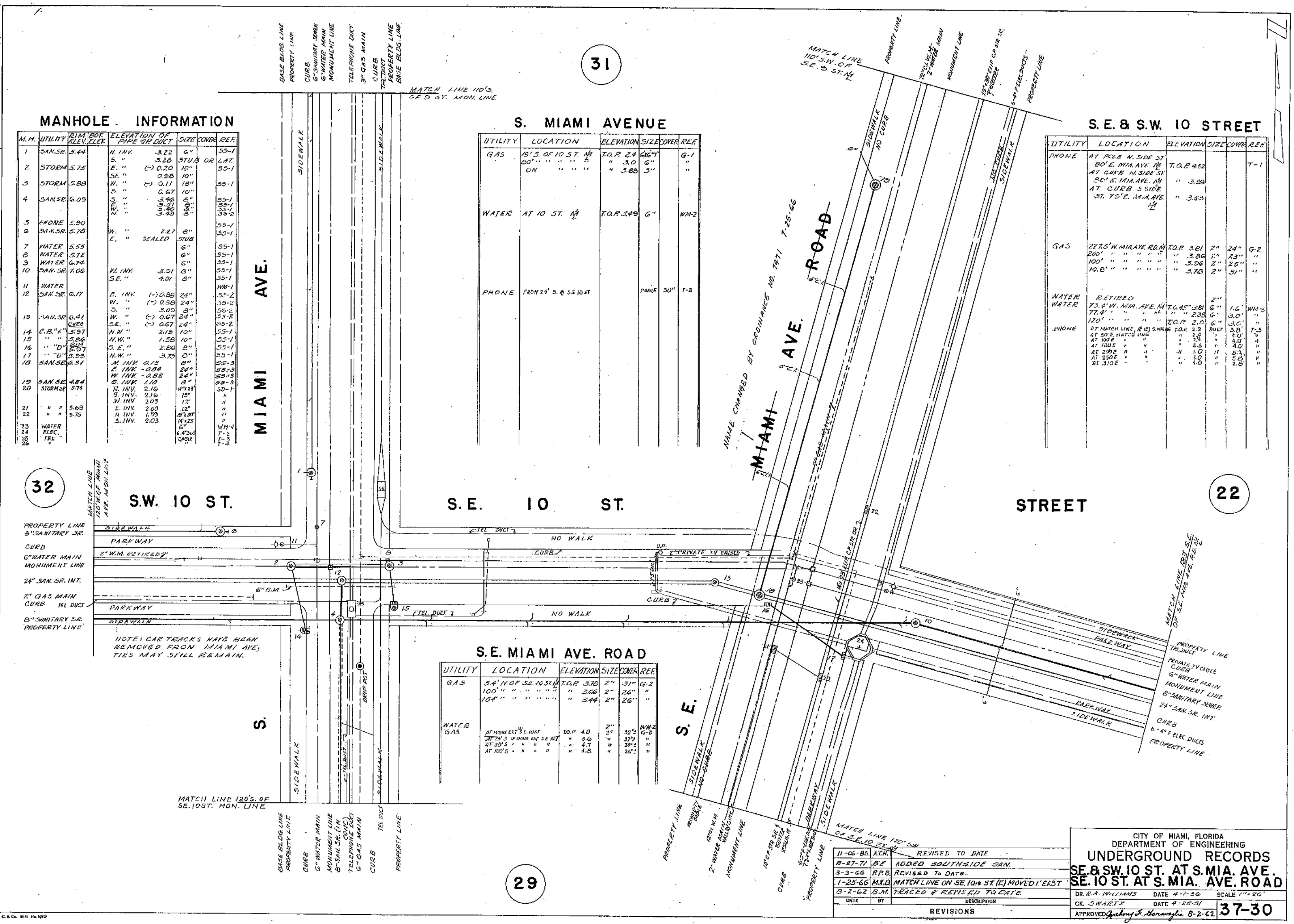
UTILITY	LOCATION	ELEVATION	SIZE	COVER	REF.
GAS	19' S. OF 10 ST. ℄	T.O.P. 2.4	6X6"T		G-1
	80' " " " " "	" 3.0	6"		"
	ON " " "	" 3.88	3"		"
WATER	AT 10 ST. ℄	T.O.P. 3.49	6"		WM-2
PHONE	FROM 25' S. ℄ S.E 10 ST		CABLE	30"	T-2

S. E. & S.W. 10 STREET

UTILITY	LOCATION	ELEVATION	SIZE	COVER	REF.
PHONE	AT POLE N. SIDE ST. 80' E. MIA. AVE. ℄	T.O.P. 4.52			T-1
	AT CURB N. SIDE ST. 80' E. MIA. AVE. ℄	" 3.99			
	AT CURB S. SIDE ST. 75' E. MIA. AVE. ℄	" 3.65			
GAS	227.5' W. MIA. AVE. RD. ℄	T.O.P. 3.81	2"	24"	G-2
	200' " " " " "	" 3.86	2"	23"	"
	100' " " " " "	" 3.96	2"	25"	"
	10.8' " " " " "	" 3.78	2"	31"	"
WATER	RETIRED		2"		
WATER	73.4' W. MIA. AVE. ℄	T.O.15" 3.81	6"	1.6'	WM-3
	77.4' " " " ℄	" " 2.38	6"	3.0'	"
	120' " " " "	T.O.P. 2.0	6"	3.0'	"
PHONE	AT MATCH LINE, ℄ (E) S.MIA AVE	T.O.P. 2.2	DUCT	3.8'	T-5
	AT 50' E. MATCH LINE	" 2.4	"	4.0'	"
	AT 100'E " "	" 2.4	"	4.0'	"
	AT 180'E " "	" 2.6	"	4.0'	"
	AT 200'E " "	" 1.0	"	5.2'	"
	AT 250'E " "	" 1.0	"	5.8'	"
	AT 310'E " "	" 4.0	"	2.8'	"

S.E. MIAMI AVE. ROAD

UTILITY	LOCATION	ELEVATION	SIZE	COVER	REF.
GAS	5.4' N. OF S.E. 10 ST. ℄	T.O.P. 3.78	2"	31"	G-2
	100' " " " " " "	" 3.66	2"	26"	"
	154' " " " " " "	" 3.44	2"	26"	"
WATER			2"		WM-2
GAS	AT MONU. EXT (S) S.E. 10 ST	T.O.P 4.0	2"	32"±	G-3
	AT 23' S OF MONU EXT S.E. 10 ST	" 3.6	"	37"±	"
	AT 50' S " " " "	" 4.7	"	28"±	"
	AT 100' S " " " "	" 4.8	"	26"±	"



NOTE: CAR TRACKS HAVE BEEN REMOVED FROM MIAMI AVE; TIES MAY STILL REMAIN.

DATE	BY	DESCRIPTION
11-06-85	A.C.H.	REVISED TO DATE
8-27-71	BE	ADDED SOUTHSIDE SAN.
3-3-66	R.P.B.	REVISED To DATE
1-25-66	M.X.B.	MATCH LINE ON SE. 10th ST. (E) MOVED 1' EAST
8-2-62	B.M.	TRACED & REVISED TO DATE

REVISIONS

CITY OF MIAMI, FLORIDA
DEPARTMENT OF ENGINEERING
UNDERGROUND RECORDS
SE. & SW. 10 ST. AT S. MIA. AVE.
SE. 10 ST. AT S. MIA. AVE. ROAD

DR. R.A. WILLIAMS DATE 4-1-36 SCALE 1"=20'
CK. SWARTZ DATE 4-25-51
APPROVED Anthony F. Garavaglia 8-2-62
37-30

REFERENCES

LAYOUT

OLD MANILA
AERIAL PHOTO
MON. DIST. MAP
SURVEY BOOK
1188-46

SANITARY SEWER

SS-1 UG124-23
SS-2 INTERC. AS-BUILTS P. 56
SS-3 INSP. CARD (DATE OCT.-26)
SS-4 INSP. CARD (DATE MAY-26)
SS-5 UG BK 354-37
SR BK 390-21
SS-6 SR BK 51-120
SR BK 73-2
SR BK 35-86
SS-7 CASH 5-16-74

WATER

W-1 UG 82-43, 124-23
W-2 UG 22-23, 24
E-219-1
W-3 E-7888-1
WATER VALVE ATLAS
W-4 MIAMI WATER
SHEET 5, 6

TELEPHONE

T-1 UG 213-21
T-2 PERMIT 2-25-68
T-3 " 11-8-83

GAS

G-1 - PHOENIX
P-315
G-2 GAS ATLAS
SHEET #42

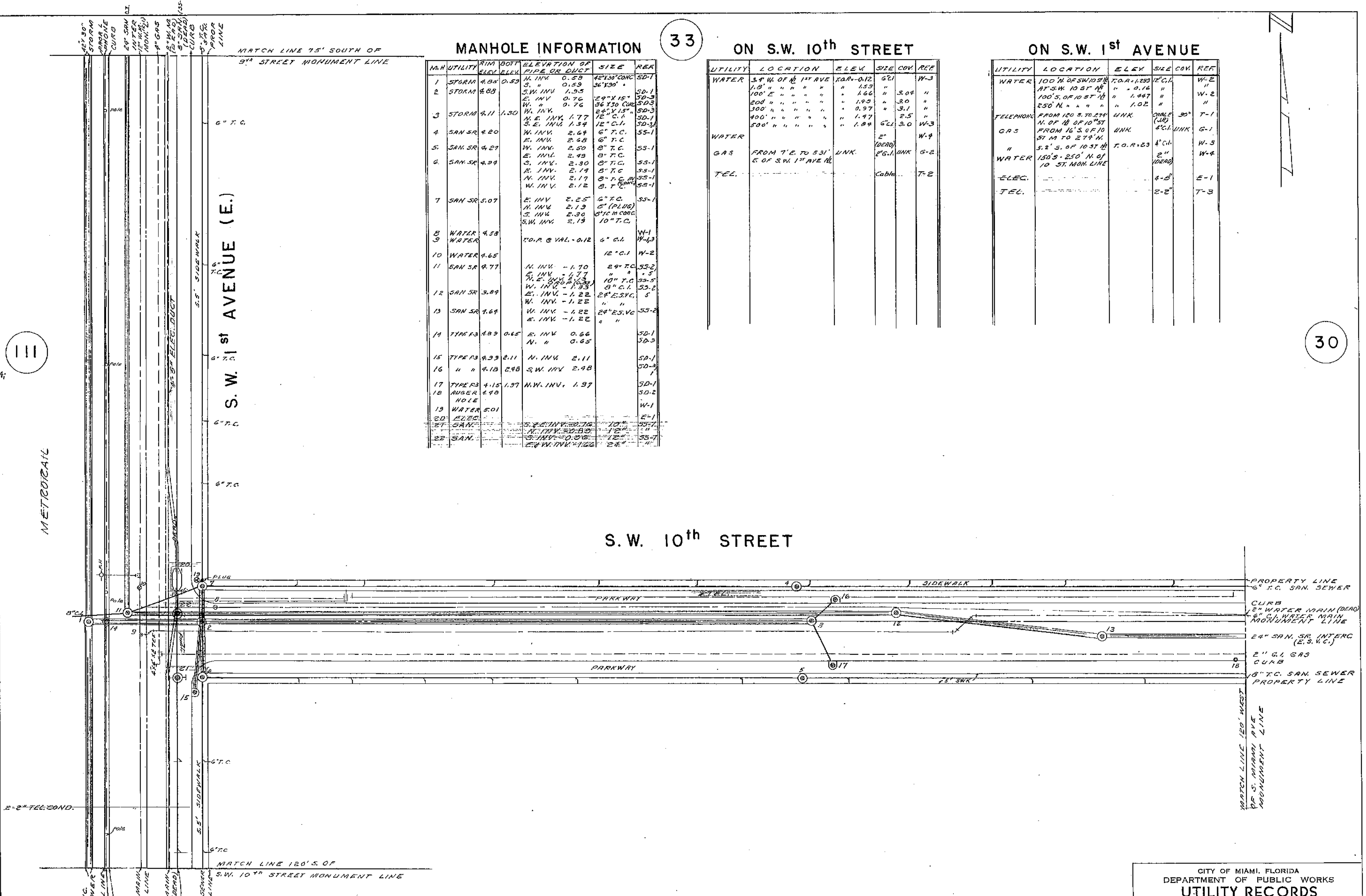
STORM SEWER

SD-1 UG 124-23
MISC. SR 4-11

SD-2 UG 884-47
SD-3 SR CONTRACT
#71

ELECTRIC.

E-1 PERMIT 3-24-82



MANHOLE INFORMATION

M.H	UTILITY	RIM ELEV.	BOTT ELEV.	ELEVATION OF PIPE OR DUCT	SIZE	REF.
1	STORM	4.85	0.59	N. INV. 0.59 S. " 0.59	42"X30" CONC 36"X30" "	SD-1
2	STORM	4.88		S.W. INV 1.95 E. INV 0.76 W. " 0.76	 29"X15" 36 X30 CONC	SD-1 SD-3 SD3
3	STORM	4.11	1.30	W. INV. N.E. INV. 1.77 S.E. INV. 1.34	24"X15" " 12" C.I. 12" C.I.	SD-3 SD-1 SD-3,1
4	SAN SR	4.20		W. INV. 2.64 E. INV. 2.68	6" T.C. 6" T.C	SS-1
5.	SAN. SR	4.27		W. INV. 2.50 E. INV. 2.49	8" T.C. 8" T.C.	SS-1
6.	SAN. SR	4.94		S. INV. 2.30 E. INV. 2.19 N. INV. 2.17 W. INV. 2.12	8" T.C. 8" T.C 8" T.C. IN (CONC) 8. T C.	SS-1 SS-1 SS-1 SS-1
7	SAN SR	5.07		E. INV 2.25 N. INV 2.19 S. INV 2.30 S.W. INV. 2.19	6" T.C. 8" (PLUG) 8" TC in conc 10" T.C.	SS-1
8	WATER	4.58				W-1
9	WATER			T.O.P. @ VAL. -0.12	6" C.I.	W-1,3
10	WATER	4.65			12" C.I	W-2
11	SAN SR	4.77		N. INV. -1.70 E. INV. -1.77 N.E. INV. 2.13 DROP (0.83) W. INV. -1.33	24" T.C. " " 10" T.C 8" C.I.	SS-2, 5 SS-5 SS-2
12	SAN SR	3.84		E. INV. -1.22 W. INV. -1.22	24" E.S.V.C. " "	5
13	SAN SR	4.64		W. INV. -1.22 E. INV. -1.22	24" E.S.V.C " "	SS-2
14	TYPE F-3	4.89	0.65	E. INV. 0.66 N. " 0.65		SD-1 SD-3
15	TYPE F3	4.99	2.11	N. INV. 2.11		SD-1
16	" "	4.18	2.48	S.W. INV 2.48		SD-3, 1
17	TYPE F3	4.15	1.97	N.W. INV. 1.97		SD-1
18	AUGER HOLE	4.48				SD-2
19	WATER	5.01				W-1
20	ELEC.					E-1
21	SAN.			S.&E. INV. -0.76 N. INV. -0.89	10" 12"	SS-7 "
22	SAN.			S. INV. -0.96 E.&W. INV. -1.66	12" 24"	SS-7 "

ON S.W. 10th STREET

UTILITY	LOCATION	ELEV.	SIZE	COV.	REF.
WATER	3.4' W. OF ℄ 1ST AVE 1.8' " " " " " 100' E " " " " 200' " " " " " 300' " " " " " 400' " " " " " 500' " " " " "	T.O.P. -0.12 " 1.59 " 1.66 " 1.49 " 0.97 " 1.47 " 1.84	6" C.I " " " " 6" C.I.	 3.04 3.0 3.1 2.5 3.0	W-3 " " " " W-3
WATER			2" (DEAD)		W-4
GAS	FROM 7' E. TO 531' E. OF S.W. 1ST AVE ℄	UNK.	2" G.I.	UNK	G-2
TEL.			Cable		T-2

ON S.W. 1st AVENUE

UTILITY	LOCATION	ELEV.	SIZE	COV.	REF.
WATER	100' N. OF SW 10 ST ℄ AT S.W. 10 ST ℄ 100' S. OF 10 ST ℄ 250' N. " " " "	T.O.R. = 1.293 " -0.16 " 1.447 " 1.02	12" C.I. " " "		W-2 " W-2 "
TELEPHONE	FROM 120 S. TO 274' N. OF ℄ OF 10th ST	UNK.	CABLE (JR)	30"	T-1
GAS	FROM 16' S. OF 10 ST ℄ TO 274' N.	UNK.	4" C.I.	UNK	G-1
"	5.2' S. OF 10 ST ℄	T.O.R. = 23	4" C.I.		W-3
WATER	150' S - 250' N. of 10 ST. MON. LINE		2" (DEAD)		W-4
~~ELEC.~~			4-5"		E-1
TEL.			2-2"		T-3

DATE	BY	DESCRIPTION
11-6-85	BE	UPDATED

REVISIONS

CITY OF MIAMI, FLORIDA
DEPARTMENT OF PUBLIC WORKS

UTILITY RECORDS
S.W. 10th STREET
AT S.W. 1st AVENUE (E)

DR. J. H. DOTZLER DATE 2-18-66 SCALE 1" = 20'
CK. J. H. STARK DATE 2-19-66
APPROVED

37-32

REFERENCES

LAYOUT

FOLIO 121 B
TAX MAP 35
SURVEY BOOK 1256-51
U.G. BK. 120-36

WATER

WM-1 OLD WATER BOOK SHEETS 402&403
WM-2 E-7779

SANITARY SEWER

SS-1 U.G. 195-60 COUNTER BOOK

STORM SEWER

SD-1 UG 120-35,36
SD-2 " 406-29

TELEPHONE

T-1	UG	321-11
T-2	"	274-55
T-3	"	244-35
T-4	"	129-25
T-5	"	235-4

GAS

GAS ATLAS PHOENIX

MATCH LINE 110'S. OF S.W. 8 ST. M/L

MANHOLE INFORMATION

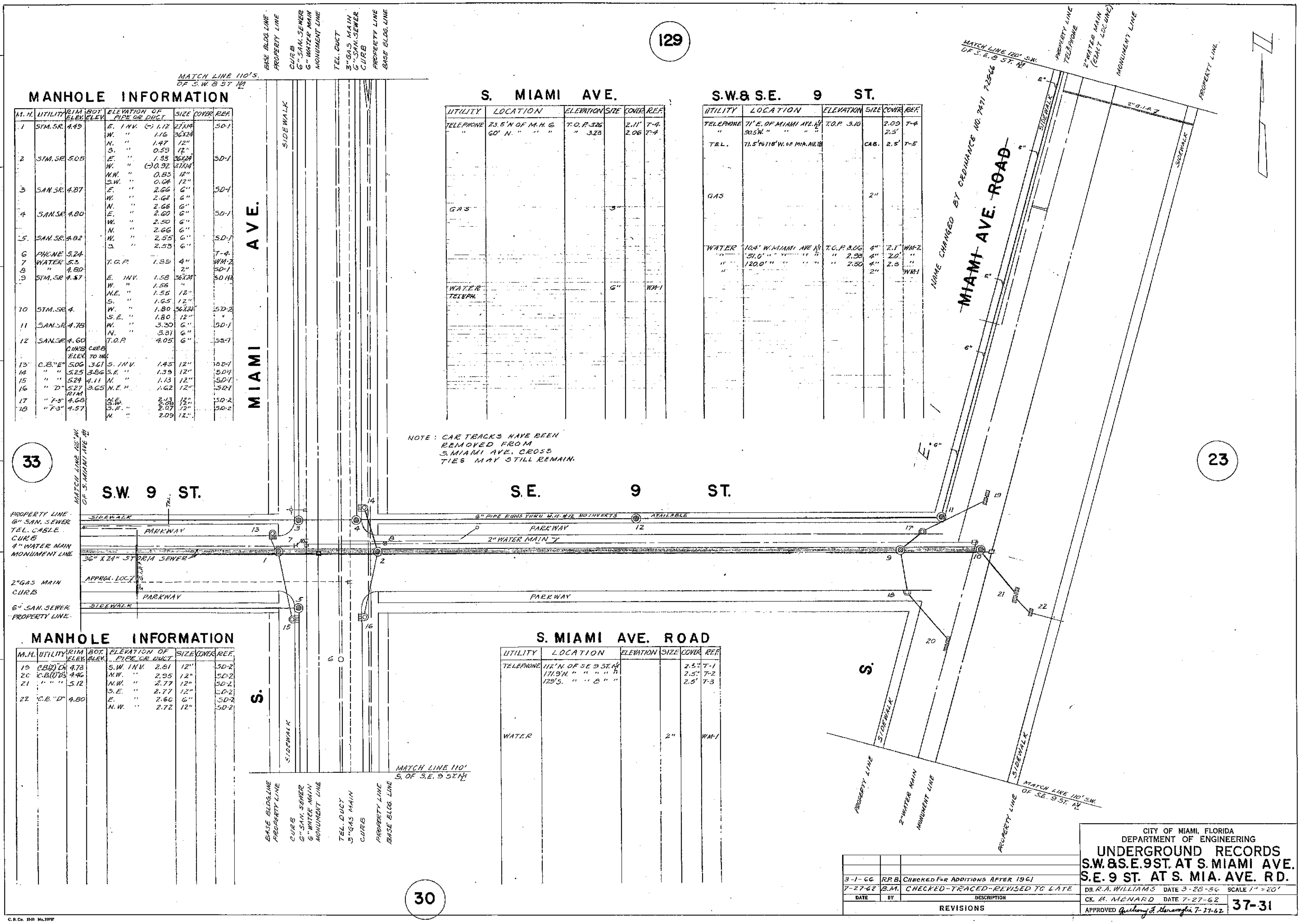
M. H.	UTILITY	RIM ELEV.	BOT. ELEV.	ELEVATION OF PIPE OR DUCT		SIZE	COVER	REF.
1	STM. SR.	4.49		E. INV.	(-) 1.12	27"X14"		SD-1
				W. "	1.16	36"X24"		
				N. "	1.47	12"		
				S. "	0.59	12"		
2	STM. SR.	5.05		E. "	1.33	36"X24"		SD-1
				W. "	(-)0.92	27"X14"		
				N.W. "	0.83	12"		
				S.W. "	0.64	12"		
3	SAN. SR.	4.87		E. "	2.66	6"		SD-1
				W. "	2.62	6"		
				N. "	2.66	6"		
4	SAN. SR.	4.80		E. "	2.60	6"		SD-1
				W. "	2.50	6"		
				N. "	2.66	6"		
5	SAN. SR.	4.82		W. "	2.55	6"		SD-1
				S. "	2.53	6"		
6	PHONE	5.24						T-4
7	WATER	5.3		T.O.P.	1.89	4"		WM-2
8	"	4.80				2"		SD-1
9	STM. SR.	4.57		E. INV.	1.58	36"X24"		SD 1&2
				W. "	1.56	"		
				N.E. "	1.55	12"		
				S. "	1.65	12"		
10	STM. SR.	4.		W. "	1.80	36"X24"		SD-2
				S.E. "	1.80	12"		"
11	SAN. SR.	4.78		W. "	3.30	6"		SD-1
				N. "	3.31	6"		
12	SAN. SR.	4.60		T.O.P.	4.05	6"		SS-1
		CURB ELEV.	CURB TO INV.					
13	C.B. "E"	5.06	3.61	S. INV.	1.45	12"		SD-1
14	" "	5.25	3.86	S.E. "	1.39	12"		SD-1
15	" "	5.24	4.11	N. "	1.13	12"		SD-1
16	" "D"	5.27	3.65	N.E. "	1.62	12"		SD-1
		RIM						
17	" "F-3"	4.68		N.E. S.W.	2.13 2.09	12" 12"		SD-2
18	" "F-3"	4.57		S.E. "	2.07	12"		SD-2
				N. "	2.09	12"		

S. MIAMI AVE.

UTILITY	LOCATION	ELEVATION	SIZE	COVER	REF.
TELEPHONE	23.5'N OF M.H. 6	T.O.P. 3.26		2.11'	T-4
"	60' N. " " "	" 3.23		2.06	T-4
GAS			3"		
WATER			6"		WM-1
TELEPH.					

S.W.& S.E. 9 ST.

UTILITY	LOCATION	ELEVATION	SIZE	COVER	REF.
TELEPHONE	71' E. OF MIAMI AVE. M/L	T.O.P. 3.10		2.09	T-4
"	90.5'W. " " " "			2.5'	
TEL.	71.5' to 118' W. of MIA. AV. M/L		CAB.	2.5'	T-5
GAS			2"		
WATER	10.4' W. MIAMI AVE M/L	T.O.P. 3.06	4"	2.1'	WM-2
"	51.0' " " " "	" 2.93	4"	2.0'	"
"	120.0' " " " "	" 2.50	4"	2.3	"
"			2"		WM-1



NOTE: CAR TRACKS HAVE BEEN REMOVED FROM S. MIAMI AVE. CROSS TIES MAY STILL REMAIN.

MANHOLE INFORMATION

M.H.	UTILITY	RIM ELEV.	BOT. ELEV.	ELEVATION OF PIPE OR DUCT		SIZE	COVER	REF.
19	C.B.(2)"D"s	4.78		S.W. INV.	2.81	12"		SD-2
20	C.B.(2)"D"s	4.46		N.W. "	2.95	12"		SD-2
21	" " "	5.12		N.W. "	2.77	12"		SD-2
				S.E. "	2.77	12"		SD-2
22	C.B. "D"	4.80		E. "	2.60	6"		SD-2
				N.W. "	2.72	12"		SD-2

S. MIAMI AVE. ROAD

UTILITY	LOCATION	ELEVATION	SIZE	COVER	REF.
TELEPHONE	112'N. OF SE 9 ST. M/L			2.5'	T-1
	171.9'N. " " " " "			2.5'	T-2
	129'S. " " 8 " "			2.5'	T-3
WATER			2"		WM-1

DATE	BY	DESCRIPTION
3-1-66	R.P.B.	CHECKED FOR ADDITIONS AFTER 1961
7-27-62	B.M.	CHECKED-TRACED-REVISED TO DATE

REVISIONS

CITY OF MIAMI, FLORIDA
DEPARTMENT OF ENGINEERING

UNDERGROUND RECORDS
S.W. & S.E. 9 ST. AT S. MIAMI AVE.
S.E. 9 ST. AT S. MIA. AVE. RD.

DR. R.A. WILLIAMS DATE 3-28-56 SCALE 1" = 20'
CK. B. MENARD DATE 7-27-62
APPROVED Anthony J. Genovaglia 7-27-62

37-31

REFERENCES:

MISC.:
R-1: PV. BK. 884-51 &
SK121, SUR. 1188-47
R-2: UG. 124-22, 26.
R-3: SUR. BK. 675-27
R-4: PV. BK. 333-33
R-5: OLD MANILA 37-33

ELECTRIC:

GAS:
G-1: PHOENIX 315; &
GAS ATLAS SH. 42.
G-2: UG. 124-22, 26

SANITARY SEWER:
SS-1: R-2, 5; & UG. 82-42, 46.
SS-2: SAN. LATERAL SHS.:
SW-S-9-0, N.S. & S-S.;
SW-A-1-3 & SW-A-1-8 (85);
SS-3: INT. "AS BUILTS" (56);
& UG. 390-34.

STORM DRAINAGE:
SD-1: UG. 124-22, 26;
OLD MANILA 37-33
SD-2: SR. 260-27, 28, 32
& MISC. SR. 4-11.

TELEPHONE:
T-1: PERMIT 8-5-53.

WATER:
W-1: UG. 22-24; E-219 (1).
W-2: E-7773.
W-3: UG. 124-22, 26

MANHOLES

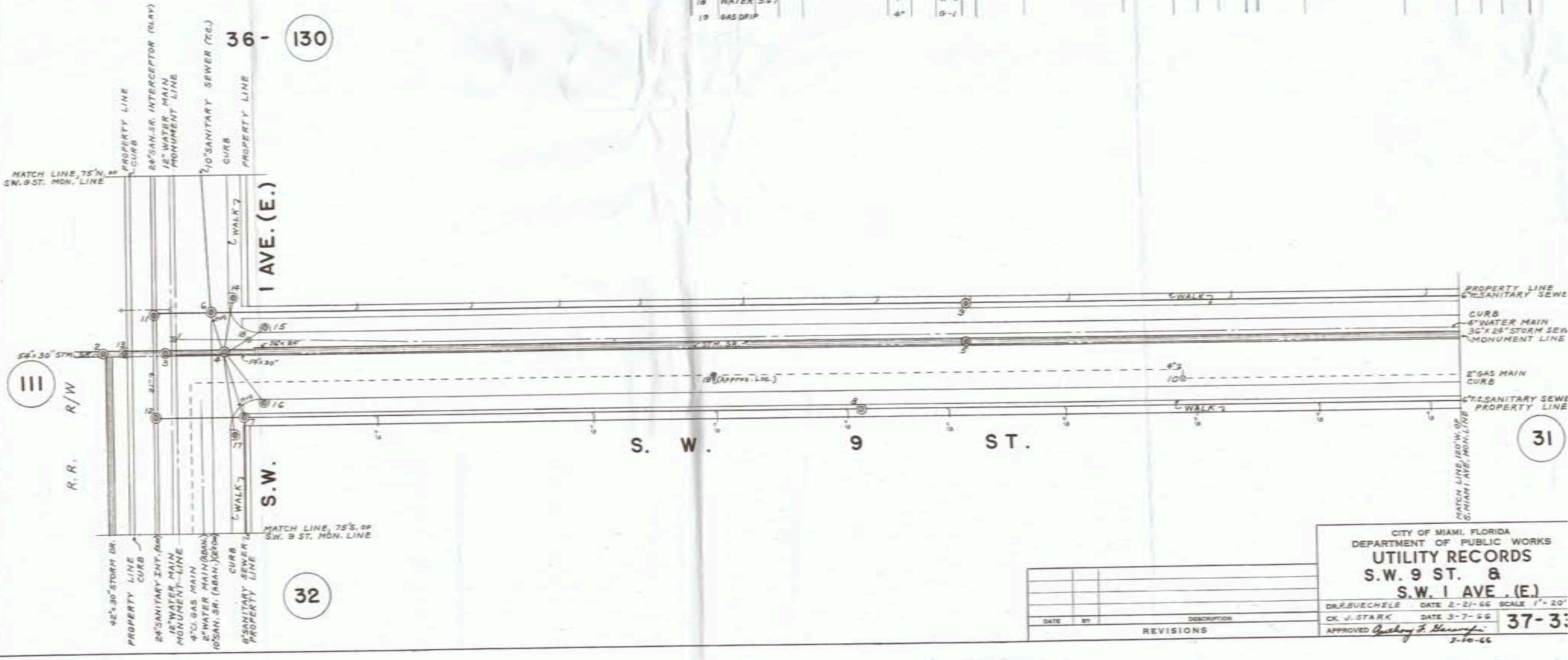
M.H.	UTILITY	RIM ELEV.	BOT. ELEV.	ELEVATION OF PIPE OR DUCT	SIZE	COV.	REF.
1	WATER	4.2		T.O.P.@ VAL.: 1.05	4"		W-2
2	STM. SR.	4.35	0.15	W. INV.: 0.15 S. " E. " 0.15	54x30 42x30 30"		SD-1,2 " "
3	STM. SR.	4.12		W. INV.: 0.15	54x30		SD-1,2
4	STM. SR.	3.95	0.69	E. & W. INV.: 0.68 N.-NE. INV.: 0.81 N.E. " S.-SE. " 0.87 SE. " 0.79	30" 12" " " 12"		SD-1,2 " " " SD-1,2
5	STM. SR.	4.42	0.75	E. & W. INV.: 0.75	36x24"		SD-1,2
6	SAN. SR.	3.89		W. INV.: 0.95 SE. " 1.46 E. " 1.37 N. " 1.10	8" 10" 6"T.C. 10"T.C.		SS-3 SS-1,2 " SS-1,2
7	SAN. SR.	3.85		NW. INV.: 1.41 S. " 1.43 E. " 1.43 W. " 1.37	10" 8" 6"T.C. 8"		SS-1,2 " " SS-3
8	SAN. SR.	4.26		E. INV.: 1.69 W. " 1.73	6"T.C. "		SS-2 "
9	SAN. SR.	4.41		E. INV.: 1.82 W. 1.80	6"T.C. "		SS-2 "
10	GAS				2"		G-1,2
11	SAN. SR.	4.09		N. & S. INV.: -2.04 E. " -0.71	24", 21" 8"		SS-3 "
12	SAN. SR.	3.88		N. & S. INV.: -2.04 E. -0.70	21", 24" 8"		SS-3 "
13	CB "F-5"	4.23	-0.01	E. INV.: 0.21			SD-1
14	CB "F-3"	4.01		S. INV.: 0.51	12"		SD-1
15	CB "F-3"	3.88		SW. INV.: 0.55	12"		SD-1
16	CB "F-3"	3.87		N.W. INV.: 1.54	12"		SD-1
17	CB "F-3"	3.94		N. INV.: 1.27	12"		SD-1
18	WATER	3.67			4"		W-3
19	GAS DRIP				4"		G-1

S.W. 9 ST.

UTILITY	LOCATION	ELEVATION	SIZE	COV.	REF.
WATER	2.1' W. of 1 AVE. ℄	T.O.P.: 1.95	4" C.I.		W-2
	14.6' E. " " "	" -0.38	"		"
	26.7' E. " " "	" -0.27	"		"
	75.5' E. " " "	" 1.85	"		"
	100' E. " " "	" 1.31	"		"
	200' E. " " "	" 1.69	"		"
	300' E. " " "	" 1.82	"		"
	400' E. " " "	" 2.23	"		"
	500' E. of 1 AVE. ℄	T.O.P.: 2.41	4" C.I.		W-2
GAS	5.5' to 53.3' E. - 1 AV. ℄	UNK.	4" C.I. & S.W.		G-1

S.W. 1 AVE.

UTILITY	LOCATION	ELEVATION	SIZE	COV.	REF.
GAS	12' to 75' S. of 9 ST. ℄		4" C.I.		G-1
	65.5' S. " " "	T.O.P.: 5.7	"		"
WATER	100' N. of 9 ST. ℄	T.O.P.: 0.83	12"		W-1
	℄ " " "	" 0.71	"		"
	15' S. " " "	" 0.59	"		"
	50' S. " " "	" 1.01	"		"
	100' S. " " "	T.O.P.: 1.02	12"		W-1



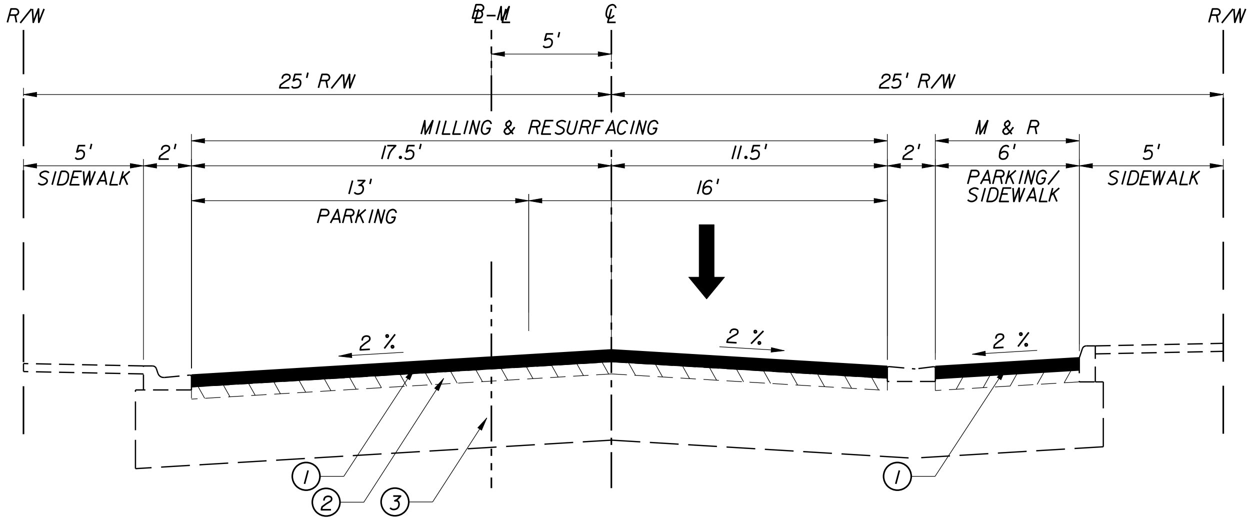
DATE	BY	DESCRIPTION

REVISIONS

CITY OF MIAMI, FLORIDA
DEPARTMENT OF PUBLIC WORKS
UTILITY RECORDS
S.W. 9 ST. & S.W. 1 AVE. (E.)

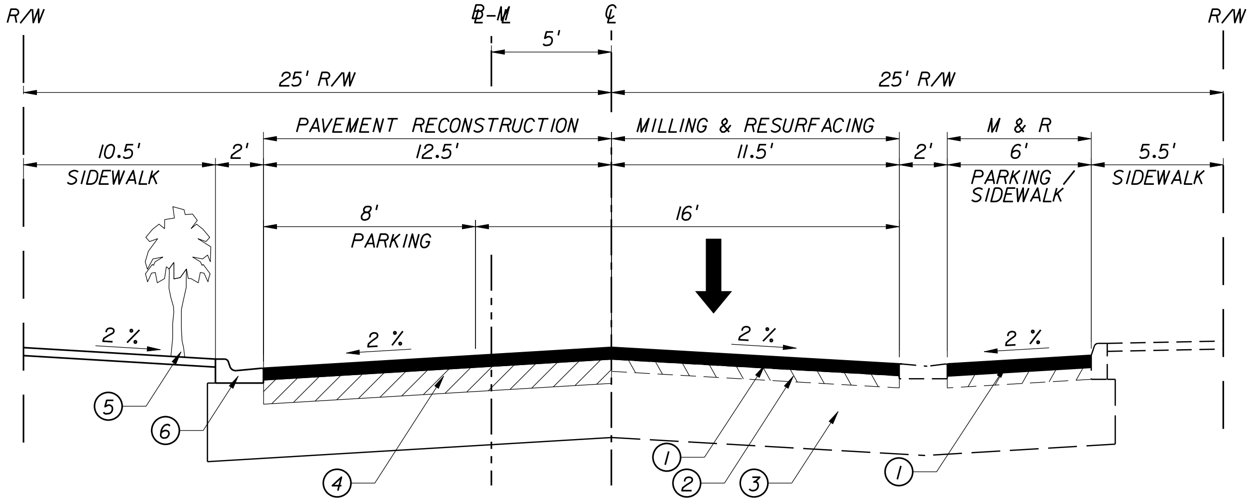
DR. R. BUECHELE DATE 2-21-66 SCALE 1" = 20'
CK. J. STARK DATE 3-7-66
APPROVED Anthony F. Gerwaski 3-10-66
37-33

APPENDIX B – ROADWAY TYPICAL SECTIONS



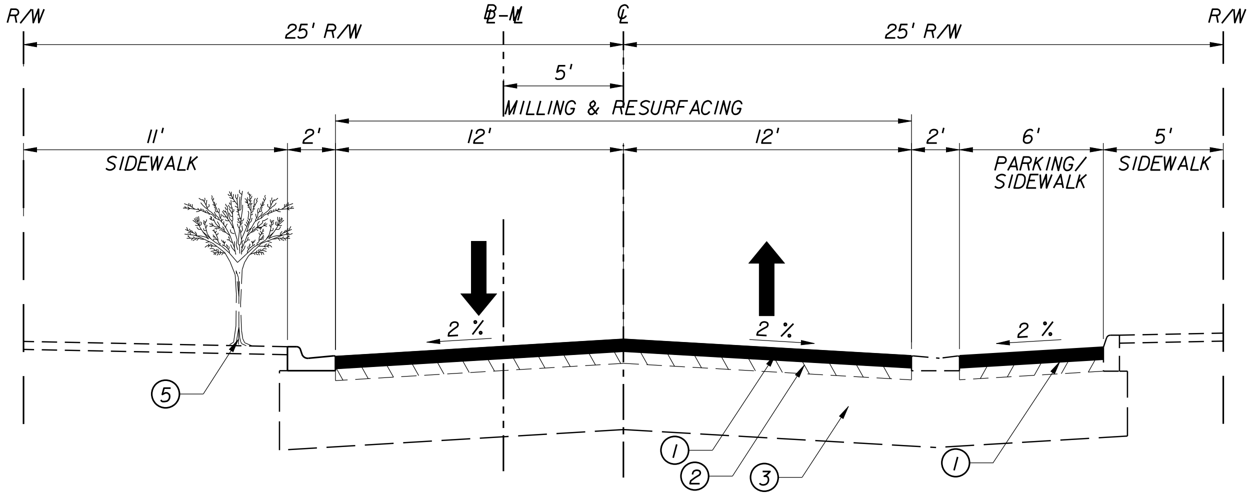
TYPICAL SECTION S.W. 9th STREET

FROM STA. 10+00.00 TO STA. 12+29.60
N.T.S.



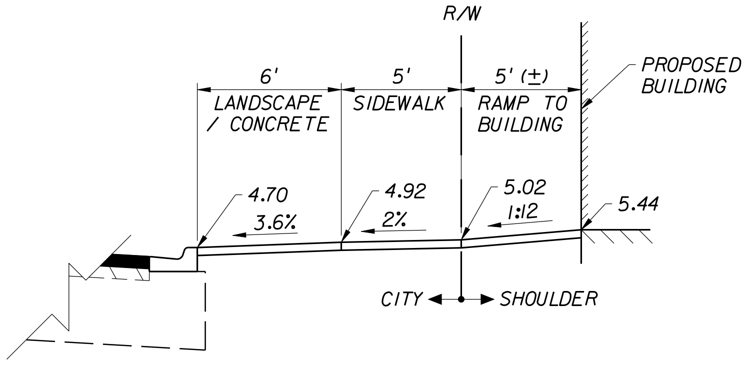
TYPICAL SECTION S.W. 9th STREET

FROM STA. 12+29.60 TO STA. 16+42.85
N.T.S.



TYPICAL SECTION S.E. 9th STREET

FROM STA. 16+81.21 TO STA. 19+67.76
N.T.S.



SECTION A-A

(SEE SHEET No. 13)
N.T.S.

① PROPOSED MILLING & RESURFACING (MILL 1" AND RESURFACE WITH 1" OF SUPERPAVE ASPHALT PER DOT STANDARDS), REFER TO PLANS FOR LIMITS.

② EXISTING LIMEROCK BASE (8" MINIMUM THICKNESS)

③ EXISTING SUBGRADE.

④ RECONSTRUCT PAVEMENT SECTION PER CITY OF MIAMI PUBLIC WORKS STANDARD 35-85-37. REFER TO SHEET No. 17 AND No. 23.

⑤ REFER TO ROADWAY PLANS FOR PLANTER LOCATIONS.

⑥ PROPOSED CURB AND GUTTER TYPE "F", REFER TO ROADWAY PLANS FOR LOCATIONS.

REVISIONS

DATE	DESCRIPTION	DATE	DESCRIPTION

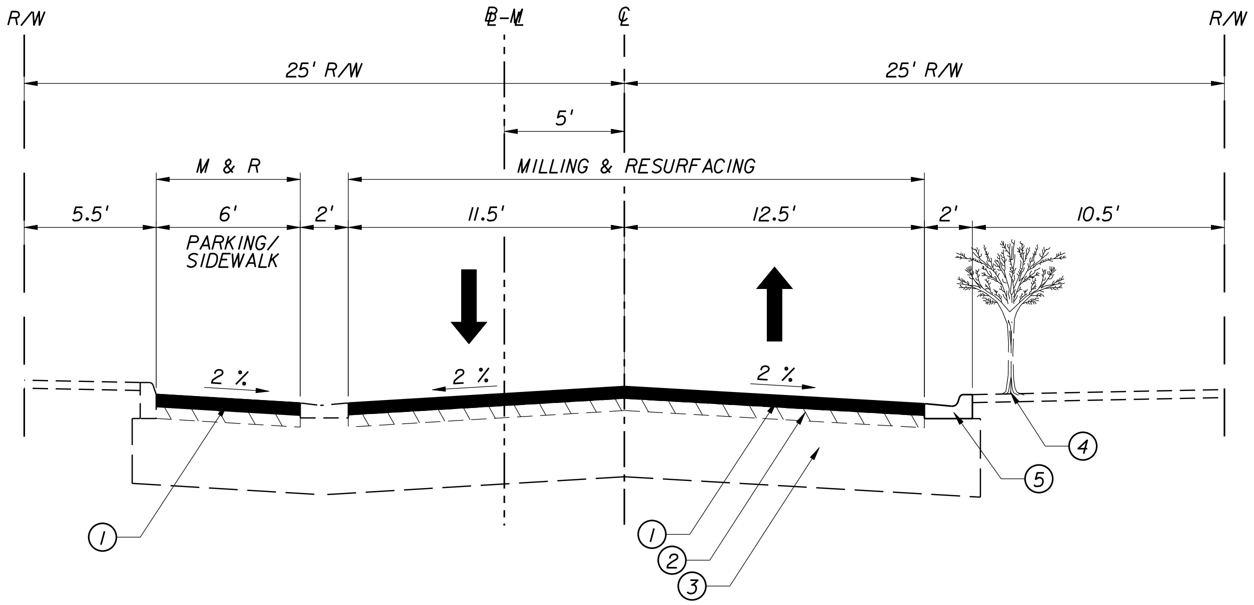
T·Y·LIN INTERNATIONAL
201 ALHAMBRA CIRCLE SUITE 900
Coral Gables, Florida. 33134
Phone: 305 / 567-1888 Fax: 305 / 567-1771

CITY OF MIAMI
MARY BRICKELL VILLAGE
DRAINAGE AND ROADWAY IMPROVEMENTS - PHASE 1
SW/SE 9th STREET FROM W 1st AVENUE TO E 1st AVENUE (BRICKELL PLAZA)
SW/SE 10th STREET FROM W 1st AVENUE TO E 1st AVENUE (BRICKELL PLAZA)
SW/SE 11th STREET FROM W 1st AVENUE TO SOUTH MIAMI AVENUE
SW 12th STREET FROM W 1st AVENUE TO SE 1st AVENUE (BRICKELL PLAZA)
CITY OF MIAMI PROJECT NUMBER: B-30637

TYPICAL SECTION
S.W./S.E. 9th STREET

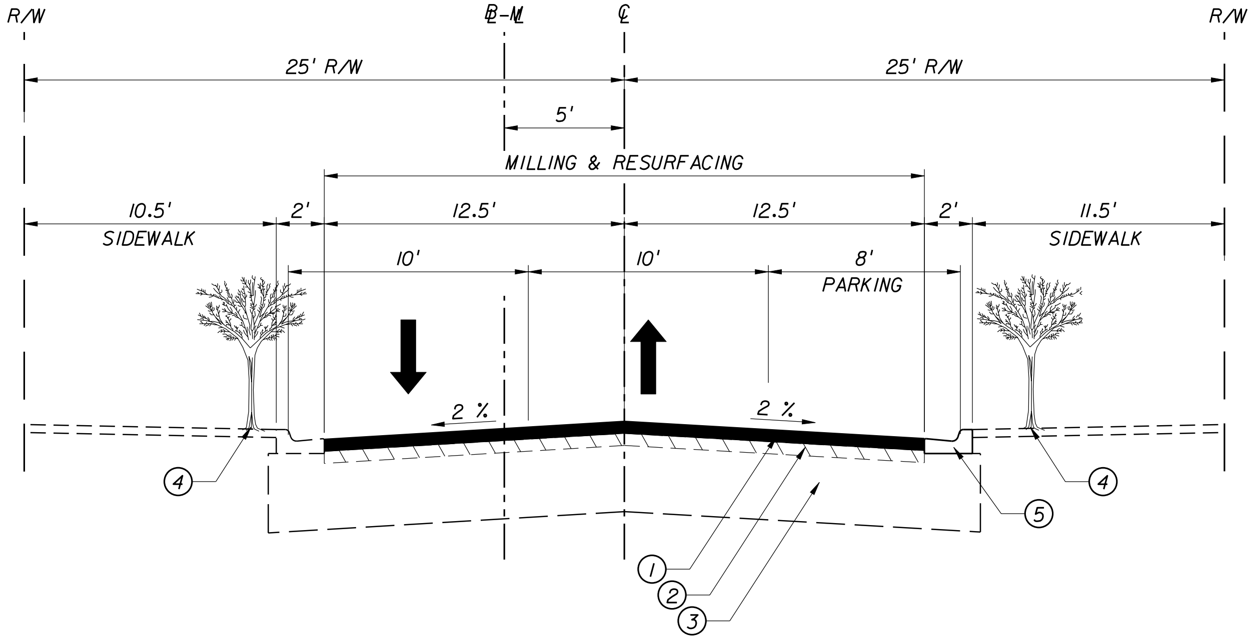
SHEET NO.
4

FOR CONSTRUCTION 100% PLANS



TYPICAL SECTION S.W. 10th STREET

FROM S.W. 1st AVENUE TO SOUTH MIAMI AVENUE
N.T.S.



TYPICAL SECTION S.E. 10th STREET

FROM SOUTH MIAMI AVENUE TO
S.E. 1st AVENUE (BRICKELL AVENUE)
N.T.S.

① PROPOSED MILLING & RESURFACING (MILL 1" AND RESURFACING WITH 1" OF SUPERPAVE ASPHALT PER DOT STANDARDS), REFER TO PLANS FOR LIMITS.

② EXISTING LIMEROCK BASE (8" MINIMUM THICKNESS)

③ EXISTING SUBGRADE.

④ REFER TO ROADWAY PLANS FOR PLANTER LOCATIONS.

⑤ REPLACE CURB AND GUTTER TYPE "F", REFER TO ROADWAY PLANS FOR LOCATIONS.

REVISIONS

DATE	DESCRIPTION	DATE	DESCRIPTION

T·Y·LIN INTERNATIONAL
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Coral Gables, Florida. 33134
Phone: 305 / 567-1888 Fax: 305 / 567-1771

CITY OF MIAMI
MARY BRICKELL VILLAGE
DRAINAGE AND ROADWAY IMPROVEMENTS - PHASE 1
SW/SE 9th STREET FROM W 1st AVENUE TO E 1st AVENUE (BRICKELL PLAZA)
SW/SE 10th STREET FROM W 1st AVENUE TO E 1st AVENUE (BRICKELL PLAZA)
SW/SE 11th STREET FROM W 1st AVENUE TO SOUTH MIAMI AVENUE
SW 12th STREET FROM W 1st AVENUE TO SE 1st AVENUE (BRICKELL PLAZA)
CITY OF MIAMI PROJECT NUMBER: B-30637

TYPICAL SECTION
S.W./S.E. 10th STREET

SHEET NO.
5

FOR CONSTRUCTION 100% PLANS

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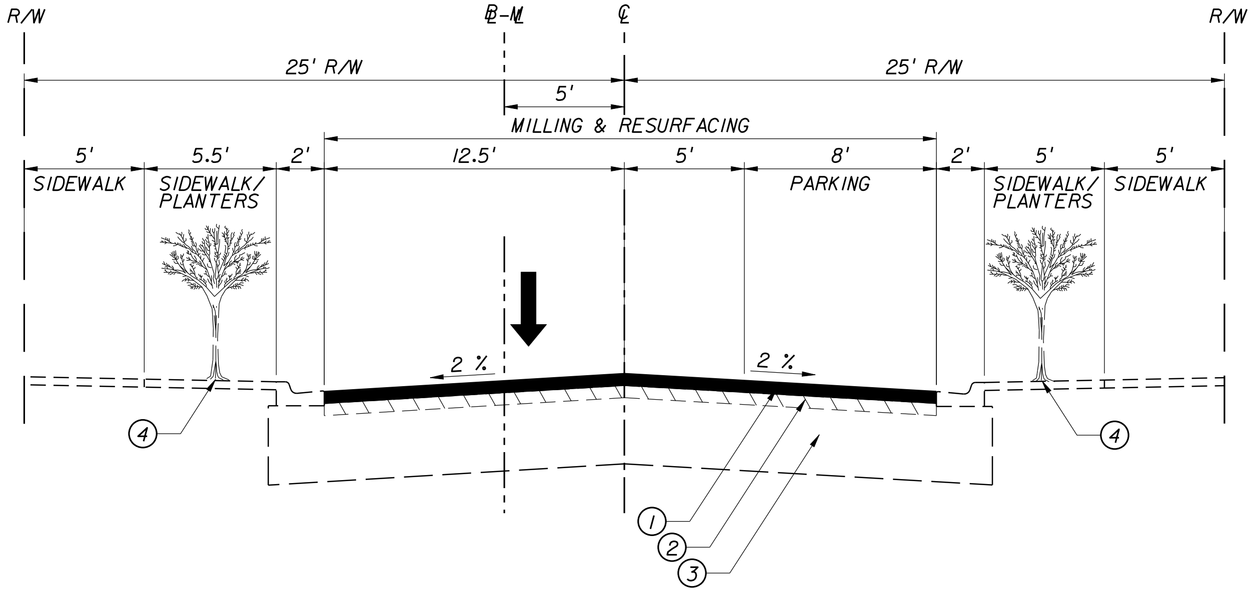
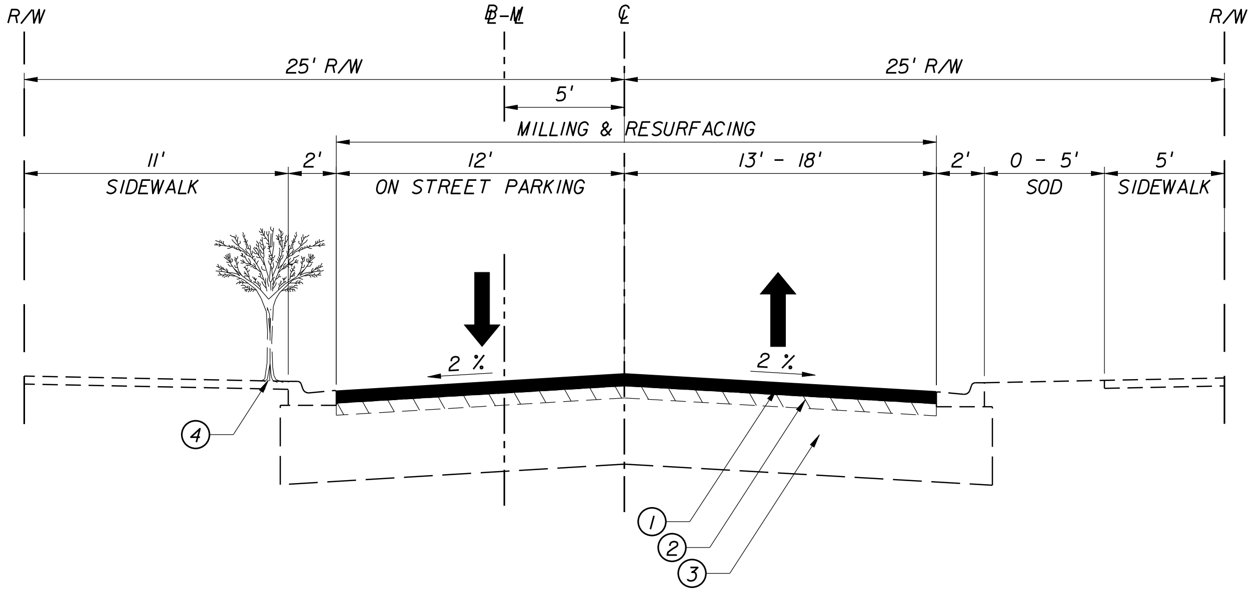


TYPICAL SECTION S.W. 11th STREET

FROM S.W. 1st AVENUE TO SOUTH MIAMI AVENUE
N.T.S.



TYPICAL SECTION S.W. 12th STREET

FROM S.W. 1st AVENUE TO SOUTH MIAMI AVENUE
N.T.S.

① PROPOSED MILLING & RESURFACING (MILL 1" AND RESURFACING WITH 1" OF SUPERPAVE ASPHALT PER DOT STANDARDS), REFER TO PLANS FOR LIMITS.

② EXISTING LIMEROCK BASE (8" MINIMUM THICKNESS)

③ EXISTING SUBGRADE.

④ REFER TO ROADWAY PLANS FOR PLANTER LOCATIONS

FOR CONSTRUCTION 100% PLANS

REVISIONS

DATE	DESCRIPTION	DATE	DESCRIPTION

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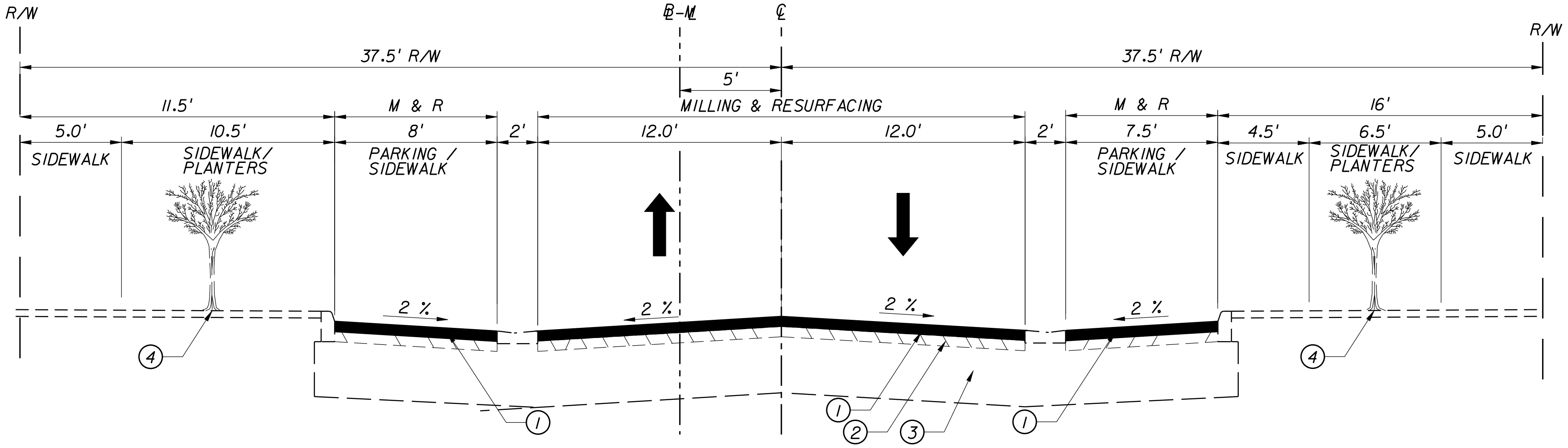
Coral Gables, Florida. 33134
Phone: 305 / 567-1888 Fax: 305 / 567-1771

CITY OF MIAMI
MARY BRICKELL VILLAGE
DRAINAGE AND ROADWAY IMPROVEMENTS - PHASE 1
SW/SE 9th STREET FROM W 1st AVENUE TO E 1st AVENUE (BRICKELL PLAZA)
SW/SE 10th STREET FROM W 1st AVENUE TO E 1st AVENUE (BRICKELL PLAZA)
SW/SE 11th STREET FROM W 1st AVENUE TO SOUTH MIAMI AVENUE
SW 12th STREET FROM W 1st AVENUE TO SE 1st AVENUE (BRICKELL PLAZA)
CITY OF MIAMI PROJECT NUMBER: B-30637

TYPICAL SECTION
S.W. 11th STREET
& S.W. 12th STREET

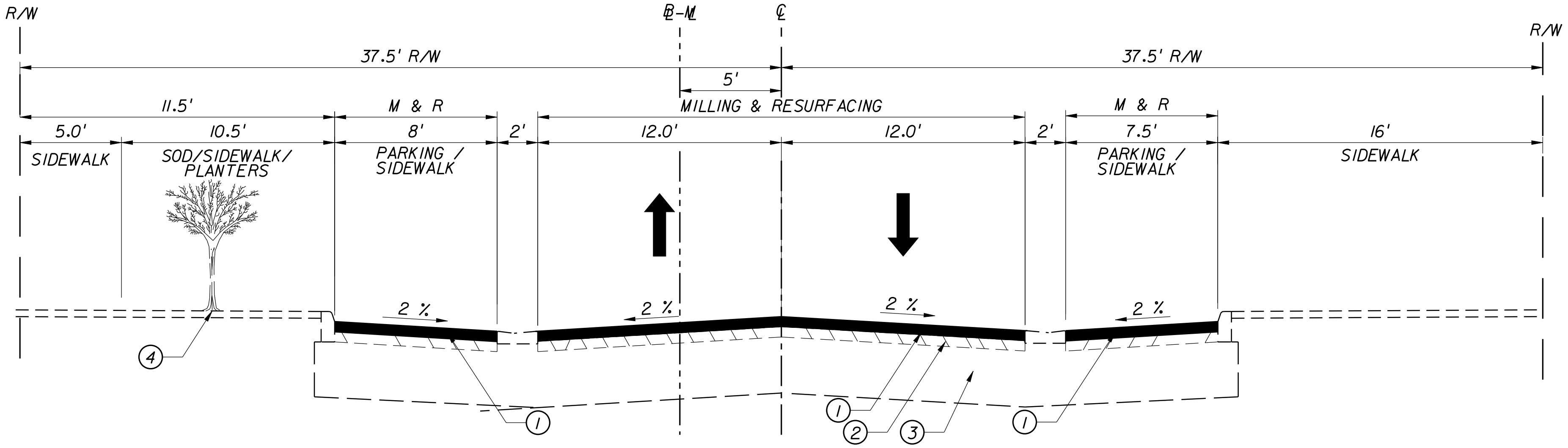
SHEET NO.
6

JLlama 12/20/2011 8:45:50 AM K:\Projects\550860.15_CM Mary Brickell Village\B30637\roadway\TYPSRD01.DGN



TYPICAL SECTION S.E. IST AVENUE

FROM 262.93' RIGHT TO 23' LEFT OF SW 9TH STREET
N.T.S.



TYPICAL SECTION S.E. IST AVENUE

FROM 59.60' RIGHT TO 65.50' LEFT OF SW 11TH STREET
N.T.S.

① PROPOSED MILLING & RESURFACING (MILL 1" AND RESURFACING WITH 1" OF SUPERPAVE ASPHALT PER DOT STANDARDS), REFER TO PLANS FOR LIMITS.

② EXISTING LIMEROCK BASE (8" MINIMUM THICKNESS)

③ EXISTING SUBGRADE.

④ EXISTING PLANTER LOCATIONS

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SW 12th STREET FROM W 1st AVENUE TO SE 1st AVENUE (BRICKELL PLAZA)
CITY OF MIAMI PROJECT NUMBER: B-30637

TYPICAL SECTION
S.E. 1st AVENUE
(BRICKELL PLAZA)

SHEET NO.
7

FOR CONSTRUCTION 100% PLANS

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APPENDIX C – MISCELLANEOUS CALCULATIONS

- TABULATION OF PROJECT AREAS
- TABULATION OF SUB-BASIN STORAGE VOLUMES
- CALCULATION OF BOUNDARY CONDITION ELEVATION (NOAA TIDAL DATA)
- PUMP DISCHARGE OPTIMIZATION CALCULATIONS
- PUMP SIZING CALCULATIONS AND MODEL SELECTION

BASIN ID	LOWEST GRATE ELEVATION	BASIN AREA (ACRES)	CN	ADDITIONAL AREA DUE TO HIGH RISE BLDGS. (1/2 OF FACE AREA)	TOTAL DRAINAGE AREA (ACRES)	ADJACENT BUILDING DIMENSIONS			
						WIDTH	STORIES	HEIGHT	AREA (Acres)
OFFSITE	N/A	2.96	98	0.00	2.96			0.00	0.00
B-1	3.80	1.10	98	0.00	1.10			0.00	0.00
B-2	3.96	0.50	98	0.75	1.25	250.00	26.00	260.00	1.49
B-3	3.95	0.50	98	0.12	0.62	340.00	3.00	30.00	0.23
B-4	3.12	0.48	98	0.23	0.71	77.00	26.00	260.00	0.46
B-5	3.69	0.67	98	0.29	0.96	425.00	6.00	60.00	0.59
B-6	4.87	0.35	98	0.00	0.35			0.00	0.00
B-7	5.22	0.24	98	0.00	0.24			0.00	0.00
B-8	4.90	0.38	98	0.00	0.38			0.00	0.00
B-9	4.86	0.37	98	0.00	0.37			0.00	0.00
B-10	4.11	0.74	98	0.00	0.74			0.00	0.00
B-11	4.06	0.79	98	0.10	0.89	210.00	4.00	40.00	0.19
B-12	4.15	0.97	98	0.00	0.97			0.00	0.00
B-13	5.87	0.20	98	0.00	0.20			0.00	0.00
B-14	5.70	0.65	98	0.00	0.65			0.00	0.00
B-15	5.66	0.56	98	0.00	0.56			0.00	0.00
B-16	8.13	0.49	98	0.00	0.49			0.00	0.00
B-17	8.15	0.44	98	0.00	0.44			0.00	0.00
B-18	4.03	0.60	98	0.00	0.60			0.00	0.00
B-19	4.37	0.40	98	0.00	0.40			0.00	0.00
B-20	3.67	0.79	98	0.34	1.13	373.00	8.00	80.00	0.69
B-21	3.83	0.69	98	0.43	1.12	250.00	15.00	150.00	0.86
B-22	5.31	1.09	98	0.00	1.09			0.00	0.00
B-23	5.34	0.39	98	0.00	0.39			0.00	0.00
B-24	4.20	0.63	98	0.43	1.06	250.00	15.00	150.00	0.86
B-25	4.20	0.71	98	1.06	1.77	220.00	42.00	420.00	2.12
B-26	9.94	0.36	98	0.00	0.36			0.00	0.00
B-27	5.90	0.69	98	1.06	1.75	220.00	42.00	420.00	2.12
B-28	5.80	0.69	98	0.26	0.95	100.00	23.00	230.00	0.53
TOTAL BASIN AREA (acres):		16.5	TOTAL DRAINAGE AREA (acres):		21.5				
BASIN AREA FOR BMP STRUCTURE CALCULATIONS		13.8							

Surface Storage - Basin Stage (elev. CMD) vs. Storage (acre-ft) (based on Civil 3D DTM)

Basin ID	Structure Storage	3.5	4	4.5	5	6	7	8	9	10.5	12
B-1	0.0013	-	0.0031	0.0387	0.1734	0.7710	1.5717	2.4696	3.4703	5.0287	6.5871
B-2	0.0014	-	-	0.0200	0.0808	0.2586	0.5060	0.7940	1.1270	1.6521	2.1918
B-3	0.0013	-	0.0014	0.0278	0.1191	0.4511	0.8571	1.3610	1.8650	2.6209	3.3768
B-4	0.0009	0.0013	0.0092	0.0446	0.1445	0.5415	0.9754	1.4128	1.8534	2.5198	3.1921
B-5	0.0012	-	0.0030	0.0429	0.1588	0.5515	1.0384	1.7077	2.3797	3.3877	4.3958
B-6	0.0019	-	-	-	0.0024	0.0311	0.1475	0.3786	0.6798	1.2133	1.7468
B-7	0.0021	-	-	-	-	0.0423	0.2196	0.4621	0.7046	1.0684	1.4322
B-8	0.0019	-	-	-	0.0024	0.0444	0.2148	0.5568	0.9400	1.5148	2.0896
B-9	0.0019	-	-	-	0.0019	0.0762	0.3260	0.6753	1.0444	1.5980	2.1516
B-10	0.0014	-	-	0.0050	0.0546	0.3749	0.9191	1.6202	2.3451	3.4326	4.5200
B-11	0.0014	-	-	0.0084	0.0546	0.3151	0.8961	2.0271	3.4190	5.5068	7.5946
B-12	0.0015	-	-	0.0039	0.0304	0.1711	0.4770	0.9524	1.5624	2.6467	3.7310
B-13	0.0025	-	-	-	-	0.0026	0.0224	0.0686	0.1424	0.3642	0.6021
B-14	0.0024	-	-	-	-	0.0032	0.0515	0.1856	0.4534	1.1248	1.9320
B-15	0.0023	-	-	-	-	0.0033	0.0798	0.3051	0.6773	1.4554	2.2945
B-16	0.0037	-	-	-	-	-	-	-	0.0740	0.5881	1.2283
B-17	0.0038	-	-	-	-	-	-	-	0.0596	0.6260	1.3156
B-18	0.0014	-	-	0.0064	0.0359	0.2829	0.8156	1.3831	1.9506	2.8019	3.6532
B-19	0.0016	-	-	0.0016	0.0073	0.1121	0.3848	0.7395	1.1411	1.7434	2.3458
B-20	0.0012	-	0.0031	0.0347	0.1211	0.4812	1.0491	1.8381	2.6272	3.8107	4.9943
B-21	0.0013	-	0.0016	0.0307	0.1330	0.4696	0.9242	1.4315	2.1144	3.1559	4.1974
B-22	0.0021	-	-	-	-	0.0197	0.1241	0.3267	0.6524	1.3352	2.2350
B-23	0.0021	-	-	-	-	0.0172	0.0886	0.2126	0.3729	0.7495	1.2461
B-24	0.0015	-	-	0.0020	0.0251	0.2376	0.5373	0.8959	1.3047	1.9634	2.8260
B-25	0.0015	-	-	0.0035	0.0453	0.3025	0.6905	1.2048	1.7916	2.7538	3.8005
B-26	0.0048	-	-	-	-	-	-	-	-	0.0099	0.0891
B-27	0.0025	-	-	-	-	0.0222	0.1041	0.3342	0.7004	1.4681	2.3786
B-28	0.0024	-	-	-	-	0.0025	0.0395	0.1565	0.3610	0.8406	1.4000

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Service

Datums Page

Station ID:	**8723165**	**PUBLICATION DATE:**	**05/07/2003**
Name:	**MIAMI, BISCAYNE BAY FLORIDA**		
NOAA Chart:	**11468**	**Latitude:**	**25° 46.7' N**
USGS Quad:	**MIAMI**	**Longitude:**	**80° 11.1' W**

To reach the tidal bench marks from the intersection of Biscayne Boulevard and Port Boulevard in Miami, proceed south on Biscayne Boulevard one block to the entrance of Miamarina on the left. The bench marks are located in the vicinity of the marina and the west end of the Port Avenue bridge to the Port of Miami on Dodge Island. The tide gage and staff are located at the NW end of the northernmost pier of the marina.

TIDAL BENCH MARKS

PRIMARY BENCH MARK STAMPING: 3165 A 1985
DESIGNATION: 872 3165 A

MONUMENTATION:	Tidal Station disk	VM#:	5770
AGENCY:	National Ocean Service (NOS)	PID:	
SETTING CLASSIFICATION:	Concrete wall		

The primary bench mark is a disk set flush in the center of a 1 m (3 ft) wide concrete wall around the parking lot, near the SE end of the northernmost pier of Miamarina, 145 m (475 ft) NNE of the inside corner of the seawall at the north side of the marina restaurant, 43 m (140 ft) west of the east face of the concrete wall on the east side of Miamarina (on the Intracoastal Waterway), 30 m (97 ft) north along the top of the concrete wall from the north end of the Dockmaster building, 23 m (77 ft) south of the NE corner of the concrete marina dock, 1 m (3 ft) above dock level, and 0.24 m (0.8 ft) above the level of the parking lot.

BENCH MARK STAMPING: MH 16 1962
DESIGNATION: MH 16
ALIAS: 872 3165 TIDAL USE

MONUMENTATION:	Survey disk	VM#:	5767
AGENCY:	US Army Corps of Engineers (USE)	PID#:	AC2177
SETTING CLASSIFICATION:	Concrete bulkhead		

The bench mark is a disk set flush in the top of a concrete bulkhead near its SE corner on the north side of Miamarina, near the west end of the Port Boulevard bridge leading to the Port of Miami, 10 m (33 ft) south of the south edge of the bridge, 1.83 m (6.0 ft) west of the east end of the bulkhead, and 0.64 m (2.1 ft) north of the south face of the bulkhead.

Station ID:	**8723165**	**PUBLICATION DATE:**	**05/07/2003**
Name:	**MIAMI, BISCAYNE BAY** **FLORIDA**		
NOAA Chart:	**11468**	**Latitude:**	**25° 46.7' N**
USGS Quad:	**MIAMI**	**Longitude:**	**80° 11.1' W**

TIDAL BENCH MARKS

BENCH MARK STAMPING: MH 16 RM 1 1962
DESIGNATION: MH 16 RM 1
ALIAS: 872 3165 TIDAL USE

MONUMENTATION:	Survey disk	VM#:	5768
AGENCY:	US Army Corps of Engineers (USE)	PID#:	AC2178
SETTING CLASSIFICATION:	Concrete bulkhead		

The bench mark is a disk set flush in the top of a concrete bulkhead on the north side of Miamarina, 17.37 m (57.0 ft) west of the east end of the bulkhead, 16 m (51 ft) west of bench mark MH 16 1962, 10 m (32 ft) south of the SW corner of the Port Boulevard bridge, and 0.64 m (2.1 ft) north of the south face of the bulkhead.

BENCH MARK STAMPING: MH 16 RM 2 1962
DESIGNATION: MH 16 RM 2
ALIAS: 872 3165 TIDAL USE

MONUMENTATION:	Survey disk	VM#:	5769
AGENCY:	US Army Corps of Engineers (USE)	PID#:	AC2179
SETTING CLASSIFICATION:	Concrete bulkhead		

The bench mark is a disk set flush in the top of a concrete bulkhead near the west end of the Port Boulevard bridge leading to the Port of Miami, 27 m (87 ft) north of bench mark MH 16 1962, and 6 m (20 ft) south of the north end of the bulkhead.

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Service

Station ID:	**8723165**	**PUBLICATION DATE:**	**05/07/2003**
Name:	**MIAMI, BISCAYNE BAY** **FLORIDA**		
NOAA Chart:	**11468**	**Latitude:**	**25° 46.7' N**
USGS Quad:	**MIAMI**	**Longitude:**	**80° 11.1' W**

TIDAL BENCH MARKS

BENCH MARK STAMPING: 3165 B 1985
DESIGNATION: 872 3165 B

MONUMENTATION:	Tidal Station disk	VM#:	5771
AGENCY:	National Ocean Service (NOS)	PID:	
SETTING CLASSIFICATION:	Concrete sea wall		

The bench mark is a disk set flush in the center of the top of the concrete seawall cap which is parallel to Port Boulevard on the north side of Miamarina, 72 m (237 ft) west along the seawall from its east corner, 37 m (120 ft) east of the inside west corner of the seawall at the NW corner of the marina, 11 m (37 ft) south of the centerline of the eastbound lane of Port Boulevard, and 2.96 m (9.7 ft) south of the north edge of the asphalt sidewalk along the seawall.

BENCH MARK STAMPING: MIAMI EL 15.491
DESIGNATION: 15.491

MONUMENTATION:	Nail	VM#:	5772
AGENCY:		PID#:	AC2183
SETTING CLASSIFICATION:	Concrete wing wall		

The bench mark is a nail with washer set in the SW wing wall of the Port Boulevard bridge leading to the Port of Miami, 10.85 m (35.6 ft) north of bench mark MH 16 RM 1 1962, 2.07 m (6.8 ft) south of the south curb of the bridge, 1.10 m (3.6 ft) NE of the SW end of the wingwall, and 0.30 m (1.0 ft) above the sidewalk.

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Service

Station ID:	**8723165**	**PUBLICATION DATE:**	**05/07/2003**
Name:	**MIAMI, BISCAYNE BAY FLORIDA**		
NOAA Chart:	**11468**	**Latitude:**	**25° 46.7' N**
USGS Quad:	**MIAMI**	**Longitude:**	**80° 11.1' W**

TIDAL DATUMS

Tidal datums at MIAMI, BISCAYNE BAY based on:

LENGTH OF SERIES:	2 YEARS
TIME PERIOD:	January 1985 - December 1986
TIDAL EPOCH:	1983-2001
CONTROL TIDE STATION:	8724580 KEY WEST

Elevations of tidal datums referred to Mean Lower Low Water (MLLW), in METERS:

HIGHEST OBSERVED WATER LEVEL (09/16/1985) = 1.103
MEAN HIGHER HIGH WATER (MHHW) = 0.723
MEAN HIGH WATER (MHW) = 0.703
NORTH AMERICAN VERTICAL DATUM-1988 (NAVD) = 0.643
MEAN SEA LEVEL (MSL) = 0.371
MEAN TIDE LEVEL (MTL) = 0.371
MEAN LOW WATER (MLW) = 0.040
MEAN LOWER LOW WATER (MLLW) = 0.000
LOWEST OBSERVED WATER LEVEL (04/07/1985) = -0.345

National Geodetic Vertical Datum (NGVD 29)

Bench Mark Elevation Information In METERS above:

Stamping or Designation	MLLW	MHW
3165 A 1985	2.154	1.451
MH 16 1962	1.903	1.200
MH 16 RM 1 1962	1.891	1.188
MH 16 RM 2 1962	1.815	1.112
3165 B 1985	1.899	1.196
MIAMI EL 15.491	4.804	4.101

U.S. DEPARTMENT OF COMMERCE

MLLW NGVD Calculation:

Bench Mark Stamping: MIAMI EL. 15.491
Per PID# AC2183,
stamping located at elevation of 4.636m NGVD (15.21' NGVD)

Bench Mark Stamping: MIAMI EL. 15.491 is located 4.804m above MLLW,
Therefore MLLW elevation = -0.168m NGVD (-0.551' NGVD) or
-0.27' MIAMI Datum

MHHW Calculation for Modeling:

MHHW= 0.723m above MLLW

MHHW= 0.555m NGVD = 1.82' NGVD = **2.10' MIAMI Datum**

MHHW Check:

NAVD 88 = 0.643m above MLLW
MHHW= 0.723m above MLLW
so
MHHW= 0.08m NAVD
convert to NGVD:
MHHW= 0.553m NGVD = 1.81' NGVD = **2.07' MIAMI Datum**

Highest Observed Water Level:

NAVD 88 = 0.643m above MLLW
HOWL= 1.103m above MLLW
so
HOWL= 0.46m NAVD
convert to NGVD:
MHHW= 0.933m NGVD = 3.06' NGVD= **3.32' MIAMI Datum**

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Service

Station ID: **8723165** **PUBLICATION DATE:** **05/07/2003**
Name: **MIAMI, BISCAYNE BAY**
FLORIDA
NOAA Chart: **11468** **Latitude:** **25° 46.7' N**
USGS Quad: **MIAMI** **Longitude:** **80° 11.1' W**

DEFINITIONS

Mean Sea Level (MSL) is a tidal datum determined over a 19-year National Tidal Datum Epoch. It pertains to local mean sea level and should not be confused with the fixed datums of North American Vertical Datum of 1988 (NAVD 88).

NGVD 29 is a fixed datum adopted as a national standard geodetic reference for heights but is now considered superseded. NGVD 29 is sometimes referred to as Sea Level Datum of 1929 or as Mean Sea Level on some early issues of Geological Survey Topographic Quads. NGVD 29 was originally derived from a general adjustment of the first-order leveling networks of the U.S. and Canada after holding mean sea level observed at 26 long term tide stations as fixed. Numerous local and wide-spread adjustments have been made since establishment in 1929. Bench mark elevations relative to NGVD 29 are available from the National Geodetic Survey (NGS) data base via the World Wide Web at National Geodetic Survey.

NAVD 88 is a fixed datum derived from a simultaneous, least squares, minimum constraint adjustment of Canadian/Mexican/United States leveling observations. Local mean sea level observed at Father Point/Rimouski, Canada was held fixed as the single initial constraint. NAVD 88 replaces NGVD 29 as the national standard geodetic reference for heights. Bench mark elevations relative to NAVD 88 are available from NGS through the World Wide Web at National Geodetic Survey.

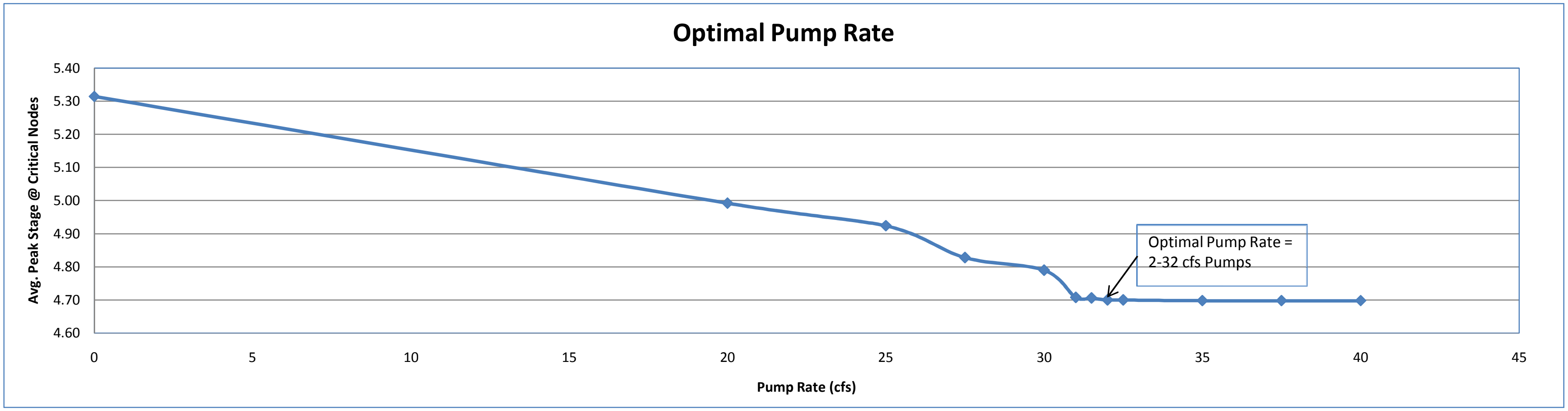
NGVD 29 and NAVD 88 are fixed geodetic datums whose elevation relationships to local MSL and other tidal datums may not be consistent from one location to another.

The Vertical Mark Number (VM#) and PID# shown on the bench mark sheet are unique identifiers for bench marks in the tidal and geodetic databases, respectively. Each bench mark in either database has a single, unique VM# and/or PID# assigned. Where both VM# and PID# are indicated, both tidal and geodetic elevations are available for the bench mark listed.

The NAVD 88 elevation is shown on the Elevations of Tidal Datums Table Referred to MLLW only when two or more of the bench marks listed have NAVD 88 elevations. The NAVD 88 elevation relationship shown in the table is derived from an average of several bench mark elevations relative to tide station datum. As a result of this averaging, NAVD 88 bench mark elevations computed indirectly from the tidal datums elevation table may differ slightly from NAVD 88 elevations listed for each bench mark in the NGS database.

Pump Size Optimization Calculations - Final Design

		10yr-24hr Peak Stage Elevation										
	Exist. Gravity	**Variable Pump Rate (cfs per pump, station will be duplex)**										
Critical Basins	**0**	**20**	**25**	**27.5**	**30**	**31**	**31.5**	**32**	**32.5**	**35**	**37.5**	**40**
B-10	5.45	5.04	4.97	4.87	4.83	4.75	4.74	4.74	4.74	4.74	4.74	4.74
B-11	5.47	5.05	4.98	4.89	4.85	4.77	4.77	4.76	4.76	4.76	4.76	4.76
B-12	5.57	5.11	5.04	4.95	4.92	4.84	4.85	4.85	4.85	4.84	4.84	4.84
B-20	5.04	4.88	4.81	4.71	4.67	4.58	4.58	4.57	4.57	4.57	4.57	4.57
B-21	5.04	4.88	4.82	4.72	4.68	4.60	4.59	4.58	4.58	4.58	4.58	4.58
Average Stage	**5.31**	**4.99**	**4.92**	**4.83**	**4.79**	**4.71**	**4.71**	**4.70**	**4.70**	**4.70**	**4.70**	**4.70**



Project No. 550717.00
Date: JUne 2009

BRICKELL 13th STREET STORM WATER PUMP STATION DESIGN

Prep. By: F. Alonso, P.E.
Check By: C. Gomez, P.E.

Flow Calculations

1. PUMP DESIGN FLOW (from AdICPR Model)

Total Flow (cfs)=	64.0 cfs
number of pumps	2
Pump Flow (cfs)=	32.0 cfs
Pump Flow(gpm) =	14362 gpm

Pump Cycle Calculations

	width	length
Wet Well Dimensions=	15.0 feet	25.0 feet

X-section Area of Wet Well + Storage Chamber = 375.00 s.f.

Wet Well Volume per foot of Storage = 2805 gallons/ft.

Pump Cycle Criteria: for preliminary calculations assume Q_{peak} = Pump Design Flow

1. Minimum Pump Run Time: 2.5 minutes (per pump manufacturer)
2. Cycle Time at Average Conditions: 15 cycles per hour per pump.

Required Storage to meet Criteria 1: Vol. = Q_{peak} x 2.5 minutes

Vol. = 35904 gallons

Required Storage to meet Criteria 2: Vol. = (60 min. / Cycle Rate) x Pump Flow / 2 pumps

Vol. = 28723 gallons

Computed storage depth (Pumps OFF to Lead Pump ON) =	12.80 feet
Computed storage volume (Pumps OFF to Lead Pump ON) =	35904 gallons

Force Main Data:

Discharge Pipe:	**24" DIP**	**Force Main:**	**48" DIP**	**Gravity Main:**	**60"x36" Box Culvert**
				(round equivalent)	
Nominal =	24 inch	Nominal =	48 inch	=	52 inch
				Inside Diameter	
Inside Diameter=	24.92 inches	side Diameter =	49.88 inches	(round equivalent) =	52.46 inches
Length =	45.0 feet	Length =	30.0 feet	Length =	975.0 feet
C =	120	C =	120	C =	100

Fittings	**Equiv. Length (20'**	**Fittings**	**Equiv. Length (48"**	**Fittings**	**Equiv. Length (41")**
2-90 deg. El.	124.0 feet	2-Enlarger	50.0 feet		
1-Gate Valve (open)	15.0 feet	1-Tee Run Flow	90.0 feet		
1-Enlarger	15.0 feet	1-45 deg. El.	60.0 feet		
1-Tee Branch Flow	140.0 feet				
1-Check Valve	160.0 feet				
Total =	454.0 feet	Total =	200.0 feet	Total =	0.0 feet
Total Length (20" equivalent) =	499 feet	(30" equivalent)=	230 feet	(41" equivalent) =	975 feet

Static Head	**Max. Head**	**Min. Head**
	13.80 feet	1.00 feet

CONTROL ELEVATIONS:

Top Wet Well Elevation =	**7.00 feet**
High Point On Force Main or Tailwater (higher) =	**2.60 feet**
Influent Invert Elev =	**-1.50 feet**
High Level Alarm Elev. =	**2.60 feet**
Lag Pump On Elev =	**2.10 feet**
Lead Pump On Elev.=	**1.60 feet**
Computed Pump Off Elev.=	**-11.20 feet**
Design Pump Off Elev.=	**-11.20 feet**
Fail Safe Pump Off Elev.=	**-11.70 feet**
Bottom Wet Well Elev. =	**-15.92 feet**

Head Loss Calculations (Based on Hazen-Williams Equation)

System Curves:

24" Discharge				48" Force Main			
Pump Flow gpm	**Friction Head**	**Velocity fps**	**Velocity Head**	**Total Flow gpm**	**Friction Head**	**Velocity fps**	**Velocity Head**
0	0.00	0.0	0.00	0	0.00	0.0	0.00
5000	0.84	3.3	0.17	10000	0.05	1.6	0.04
6000	1.17	3.9	0.24	12000	0.07	2.0	0.06
7000	1.56	4.6	0.33	14000	0.09	2.3	0.08
8000	2.00	5.3	0.43	16000	0.11	2.6	0.11
9000	2.48	5.9	0.54	18000	0.14	3.0	0.14
10000	3.02	6.6	0.67	20000	0.17	3.3	0.17
11000	3.60	7.2	0.81	22000	0.20	3.6	0.20
12342	4.46	8.1	1.02	24684	0.25	4.1	0.26
13000	4.91	8.6	1.14	26000	0.28	4.3	0.28
14568	6.06	9.6	1.43	29136	0.34	4.8	0.36
15000	6.39	9.9	1.51	30000	0.36	4.9	0.38
16000	7.21	10.5	1.72	32000	0.41	5.3	0.43
17000	8.06	11.2	1.94	34000	0.46	5.6	0.48
18000	8.96	11.8	2.18	36000	0.51	5.9	0.54
19000	9.91	12.5	2.43	38000	0.56	6.2	0.61
20000	10.89	13.2	2.69	40000	0.62	6.6	0.67

60"x36" (52" equiv. round) Gravity Main				Total Dynamic Head			
Total Flow gpm	**Friction Head**	**Velocity fps**	**Velocity Head**	**Pump Flow gpm**	**Max. T.D.H. feet**	**Min. T.D.H. feet**	**Avg. T.D.H. feet**
0	0.00	0.0	0.00	0	**13.8**	**1.0**	**7.4**
10000	0.22	1.5	0.03	5000	**15.1**	**2.3**	**8.7**
12000	0.31	1.8	0.05	6000	**15.7**	**2.9**	**9.3**
14000	0.41	2.1	0.07	7000	**16.3**	**3.5**	**9.9**
16000	0.53	2.4	0.09	8000	**17.1**	**4.3**	**10.7**
18000	0.66	2.7	0.11	9000	**17.9**	**5.1**	**11.5**
20000	0.80	3.0	0.14	10000	**18.8**	**6.0**	**12.4**
22000	0.95	3.3	0.17	11000	**19.7**	**6.9**	**13.3**
24684	1.18	3.7	0.21	12342	**21.2**	**8.4**	**14.8**
26000	1.30	3.9	0.23	13000	**21.9**	**9.1**	**15.5**
29136	1.60	4.3	0.29	14568	**23.9**	**11.1**	**17.5**
30000	1.69	4.5	0.31	15000	**24.4**	**11.6**	**18.0**
32000	1.91	4.8	0.35	16000	**25.8**	**13.0**	**19.4**
34000	2.13	5.1	0.40	17000	**27.3**	**14.5**	**20.9**
36000	2.37	5.3	0.44	18000	**28.8**	**16.0**	**22.4**
38000	2.62	5.6	0.49	19000	**30.4**	**17.6**	**24.0**
40000	2.88	5.9	0.55	20000	**32.1**	**19.3**	**25.7**

BRICKELL 13th STREET
STORM WATER PUMP
STATION DESIGN

	Operating Points		
	Maximum	**Minimum**	**Average**
Pump Rate, gpm	14361.6	14361.6	14361.6
T.D.H., feet	23.9	11.1	17.5

Basis of Design Pump Curve:

Based on Manufacturer Recommendations:

Peak Flow (1 pump): **9119 gpm**

FROM PUMP CURVE

TDH (both pumps on, max.): **27.2'**

Manufacturer:	Flygt
Model:	CP 3531/735
Curve No. :	C3531-63-1440
Motor:	43-44-14AA
Imp. Diameter:	615 mm
Discharge:	19.5
Motor Horsepower:	90
Motor Speed:	500 rpm
Voltage:	460
Cycle:	60 Hz
Phase:	3
Curve date:	2-12-2009

	Pump Curve	
Flow cfs	**Flow gpm**	**Total Head**
35.7	16000	0.0
29.9	13411	12.9
29.3	13142	14.0
28.7	12897	15.0
27.3	12264	17.5
25.8	11594	20.0
24.2	10867	22.5
22.5	10084	25.0
20.6	9226	27.5
18.5	8322	30.0
16.4	7382	32.5
14.3	6421	35.0
12.1	5451	37.5
10.0	4477	40.0
7.8	3497	42.5
5.6	2495	45.0
3.3	1459	47.5
0.8	380	50.0
0.0	0.0	51.2

Net Positive Suction Head Check

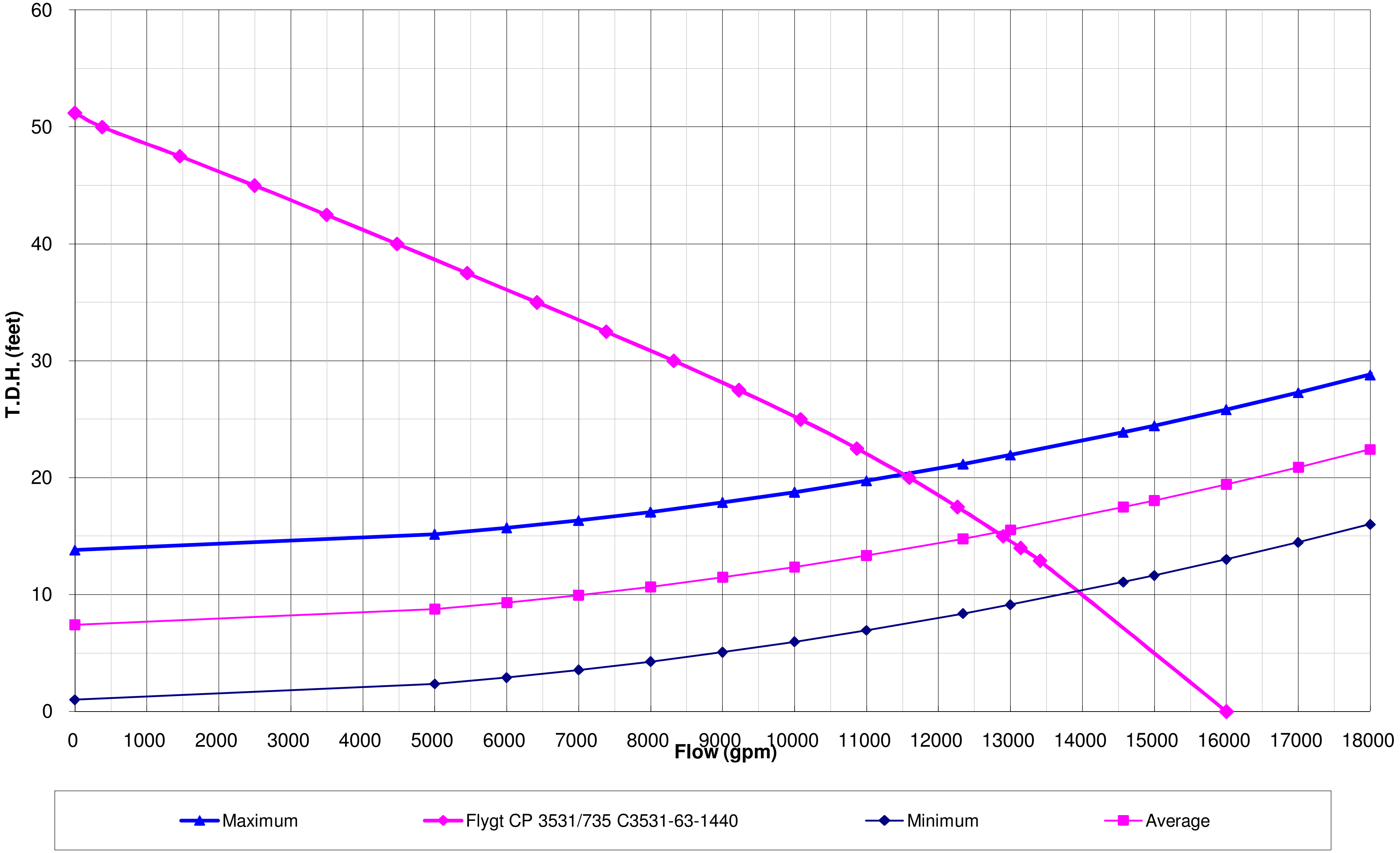
$NPSH_{available} = h_{atm} + h_{z(suction)} + h_{f(suction)} + h_{vp}$

h_{atm} (atmospheric pressure)	33.9'	
h_z (head on suction side)	2.0'	(distance from low water level to pump suction inlet)
h_f (friction loss on suction pipe)	0.0'	(no pipe on suction side)
h_{vp} (vapor pressure of water at 70 deg.F)	1.2'	

$NPSH_{required}$= (refer to manufacturer pump curce for $NPSH_{required}$)

$NPSH_{available}$= 37.07 **ok**

SYSTEM CURVES vs. PUMP PERFORMANCE CURVE



APPENDIX D – WATER QUALITY CALCULATIONS

- EXFILTRATION TRENCH CALCULATIONS
- WATER QUALITY TREATMENT CALCULATIONS FOR BMP

Prepared by: FA

CITY OF MIAMI CAPITAL IMPROVEMENTS PROGRAM
MARY BRICKELL VILLAGE DRAINAGE IMPROVEMENTS
WATER QUALITY CALCULATIONS
EXISTING BASIN B-16 and B-17

Volumetric Retention Treatment Required:

Impervious Area=	**0.93**	ac.
Pervious Area=	**0.00**	ac.
Total Area=	**0.93**	**ac.**

SFWMD CRITERIA:

a) First inch of runoff from the developed project:
(1 In x = D.A. Ac. x 1 Ft/12 In) = **0.078** **Ac.-Ft.**

b) 2.5 inches times the percentage of imperviousness:
Percent Impervious = **100%**
(2.5 In x % Impervious) = **2.50** in. to be treated
Volume required to be treated = (in. to be treated x D.A. Ac x 1 Ft/12 In) = **0.194** **Ac.-Ft.**

DERM CRITERIA:

$$t_{1"} = \frac{2940 \text{ x } F^{-0.11}}{308.5 \text{ x } C - 60.5 \text{ (} 0.5895 + F^{-0.67} \text{)}}$$

WHERE:

$t_{1"}$ = time to generate 1" of runoff, in minutes

F	=	**5**	Frequency in years, DCPW Manual, Part II, Section D4-Water Control, Table I
Cwtd	=	0.90	weighted runoff coefficient (from the rational formula)
Tc	=	**10**	time of concentration, in minutes

CONTRIBUTING AREA AND ROUGHNESS COEFFICIENT CRITERIA.

Pervious Areas = 0.00 Ac., C_{PERV} = 0.2

Imperv. Areas = 0.93 Ac., C_{IMP} = 0.9

$C = (A_{IMP} \text{ x } C_{IMP} + A_{PERV} \text{ x } C_{PERV})/A_T$ = **0.90**

$t_{1"}$ = **11.1** MIN.

TOTAL TIME OF CONCENTRATION (T_T) : $T_T = t_{1"} + T_C$ = **21.12** MIN.

STORM INTENSITY (Dade County Rainfall Intensity-Duration-Frequency Curves)

$$i = \frac{308.5}{48.6 \text{ x } F^{-0.11} + T_T \text{ (} 0.5895 + F^{-0.67} \text{)}} =$$ **5.11** IN/HR.

RUNOFF FLOW $Q_{1"}$ = C x I x A_T = **4.28** CFS FOR THE 1st INCH OF RUNOFF

TOTAL RUNOFF VOLUME TO BE TREATED $V_{1"}$ (FOR 1 INCH):

$V_{1"}$ = 60 $Q_{1"}$ T_T = 5,423 CF = 0.124 Ac.-Ft.

Volume Treatment Required= 0.194 ac-ft.

Volume Provided by exfiltraton trench System (following SFWMD Exfiltration Trench Equation Derivation):

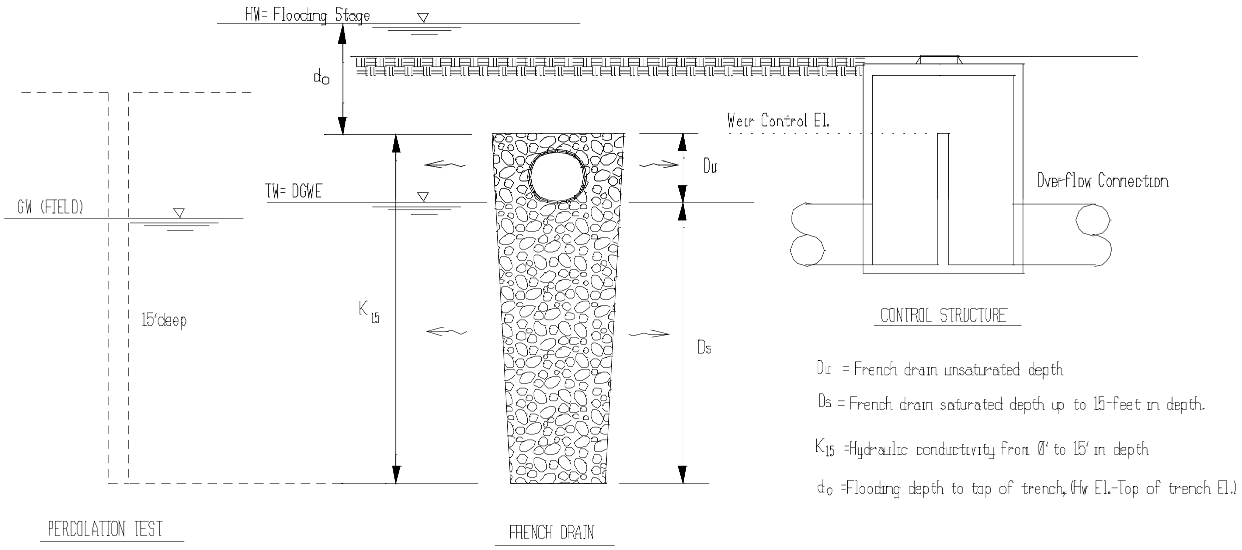
EXFILTRATION TRENCH BASIN

Volume Storage in Exfiltraton Trench:

WE=	8.00	(Lowest Ground Elev. or Control Weir Elev., ft., NGVD)	
GW=	2.00	(DERM October Average Groundwater Level, ft., NGVD)	
WDTH=	4	(Exfiltraton Trench width, ft.)	
TOP EL.=	6.50	(Exfiltraton Trench Top Elev., ft., NGVD)	
BOT. EL.=	-7.00	(Exfiltraton Trench Botom Elev., ft., NGVD)	
d=	2.00	(Exfiltraton Trench Pipe diameter, ft.)	
INV. EL.=	3.00	(Exfiltraton Trench Pipe Invert Elev., ft., NGVD)	
$d_{enc.}$=	-1.00	(pipe encroachment below GW, (GW-INV. EL), ft.)	
V_{pipe}=	3.14	ft^3/ft	
V_{trench}=	4.17	ft^3/ft	(assume 20% voids for 15 years in service)
$V_{dry}=V_{pipe}+V_{trench}$=	7.31	ft^3/ft	

Volume Exfiltrated through Exfiltraton Trench:

$V_{SIDE-EXF.}$ =	(KS1H1+KS2H2) 3600
$V_{SIDE-EXF\cdot}$=	Volume exfiltrated out a side in 1-hour (ft3/ft)
S_1=	Unsaturated trench surfaec (ft^2)
S_2=	Saturated trench surface (ft^2)
H_1=	Average head on unsaturated surface (ft. head)
H_2=	Head on saturated surface (ft. head)



$V_{SIDE-EXF.(2-sides)}$ =2*(K*S_1*H_1+K*S_2*H_2) 3600 = 2*(K_{15}*D_u*(D_u/2+D_s))*3600 = E*3600

$K_{15-avg\cdot}$=	5.00E-04 cfs/ft^2-ft	D_u=	4.5 ft.
		D_s=	9.00 ft.

E= 5.06E-02 cfs/ft (Using directly perc. test results and SFWMD F.D. Eq.)

E*3600= 182 ft^3/ft = $V_{exf\cdot}$

Treatment Unit Volume provided by Exfiltration Trench:

V_{dry}= 7.31 ft^3/ft

$V_{exf.}$= 182 ft^3/ft

$V_{FD\text{- Unit}} = V_{dry} + V_{side\text{-exf.}} =$ 190 ft^3/ft = 0.0044 ac-ft/ ft = 0.0522 ac-in/ft

Existing FD Length= 100 ft

Treatment Volume provided by Exfiltration Trench:

$V_{FD} = V_{FD\text{-Unit}} \times L_{FD} =$ **18,956** ft^3 = **0.435** ac-ft. = 5 ac-in

$V_{provided}$=	**0.435 ac-ft**
$V_{required}$=	**0.194 ac-ft**

Factor of Safety = 2.2 >>>>> Water Quality Criteria is met.

CITY OF MIAMI CAPITAL IMPROVEMENTS PROGRAM
MARY BRICKELL VILLAGE DRAINAGE IMPROVEMENTS
WATER QUALITY CALCULATIONS
EXISTING BASIN B-27 and B-28

Prepared by: FA

Volumetric Retention Treatment Required:

Impervious Area=	**1.38**	ac.
Pervious Area=	**0.00**	ac.
Total Area=	**1.38**	**ac.**

SFWMD CRITERIA:

a) First inch of runoff from the developed project:
(1 In x = D.A. Ac. x 1 Ft/12 In) = **0.115** **Ac.-Ft.**

b) 2.5 inches times the percentage of imperviousness:
Percent Impervious = **100%**
(2.5 In x % Impervious) = **2.50** in. to be treated
Volume required to be treated = (in. to be treated x D.A. Ac x 1 Ft/12 In) = **0.288** **Ac.-Ft.**

DERM CRITERIA:

$$t_{1"} = \frac{2940 \times F^{-0.11}}{308.5 \times C - 60.5\,(0.5895 + F^{-0.67})}$$

WHERE:
$t_{1"}$ = time to generate 1" of runoff, in minutes
F = **5** Frequency in years, DCPW Manual, Part II, Section D4-Water Control, Table I
Cwtd = 0.90 weighted runoff coefficient (from the rational formula)
Tc = **10** time of concentration, in minutes

CONTRIBUTING AREA AND ROUGHNESS COEFFICIENT CRITERIA.

Pervious Areas = 0.00 Ac., C_{PERV} = 0.2

Imperv. Areas = 1.38 Ac., C_{IMP} = 0.9

$C = (A_{IMP} \times C_{IMP} + A_{PERV} \times C_{PERV})/A_T$ = **0.90**

$t_{1"}$ = **11.1** MIN.

TOTAL TIME OF CONCENTRATION (T_T) : $T_T = t_{1"} + T_C$ = **21.12** MIN.

STORM INTENSITY (Dade County Rainfall Intensity-Duration-Frequency Curves)

$$i = \frac{308.5}{48.6 \times F^{-0.11} + T_T\,(0.5895 + F^{-0.67})} = \mathbf{5.11}\ \text{IN/HR.}$$

RUNOFF FLOW $Q_{1"} = C \times I \times A_T$ = **6.35** CFS FOR THE 1st INCH OF RUNOFF

TOTAL RUNOFF VOLUME TO BE TREATED $V_{1"}$ (FOR 1 INCH):

$V_{1"} = 60\ Q_{1"}\ T_T$ = 8,047 CF = 0.185 Ac.-Ft.

Volume Treatment Required= 0.288 ac-ft.

Volume Provided by exfiltraton trench System (following SFWMD Exfiltration Trench Equation Derivation):

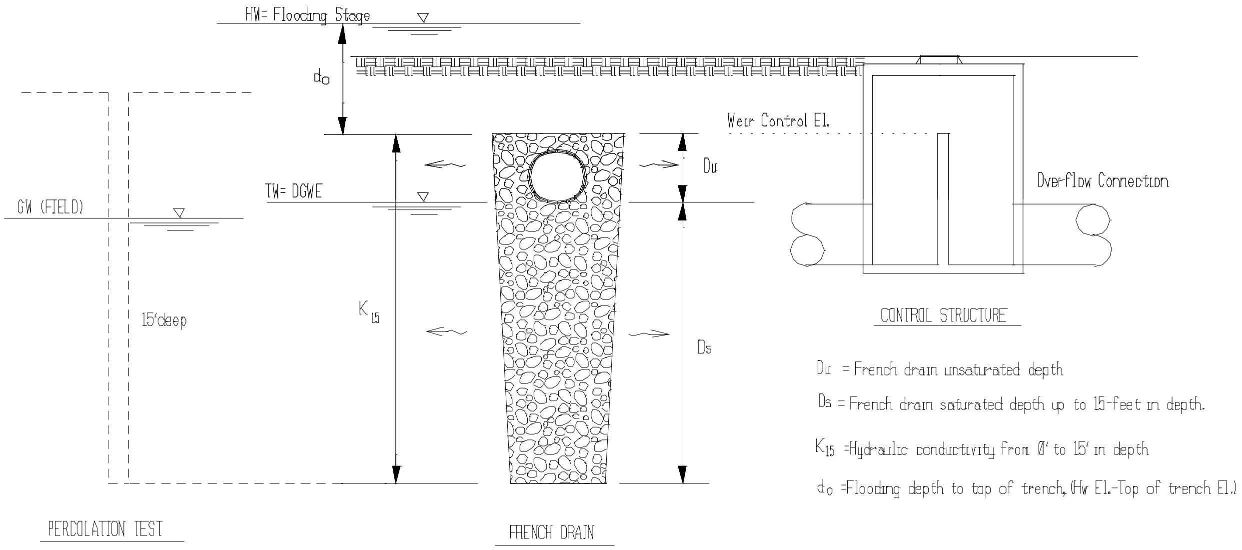
EXFILTRATION TRENCH BASIN

Volume Storage in Exfiltraton Trench:

WE=	7.00	(Lowest Ground Elev. or Control Weir Elev., ft., NGVD)	
GW=	2.00	(DERM October Average Groundwater Level, ft., NGVD)	
WDTH=	4	(Exfiltraton Trench width, ft.)	
TOP EL.=	5.50	(Exfiltraton Trench Top Elev., ft., NGVD)	
BOT. EL.=	-8.00	(Exfiltraton Trench Botom Elev., ft., NGVD)	
d=	2.00	(Exfiltraton Trench Pipe diameter, ft.)	
INV. EL.=	2.50	(Exfiltraton Trench Pipe Invert Elev., ft., NGVD)	
$d_{enc.}$=	-0.50	(pipe encroachment below GW, (GW-INV. EL), ft.)	
V_{pipe}=	3.14	ft^3/ft	
V_{trench}=	3.37	ft^3/ft	(assume 20% voids for 15 years in service)
$V_{dry}=V_{pipe}+V_{trench}$=	6.51	ft^3/ft	

Volume Exfiltrated through Exfiltraton Trench:

$V_{SIDE-EXF.}$ =	(KS1H1+KS2H2) 3600
$V_{SIDE-EXF}$.=	Volume exfiltrated out a side in 1-hour (ft3/ft)
S_1=	Unsaturated trench surfaec (ft^2)
S_2=	Saturated trench surface (ft^2)
H_1=	Average head on unsaturated surface (ft. head)
H_2=	Head on saturated surface (ft. head)



$V_{SIDE-EXF.(2-sides)}$ =2*(K*S_1*H_1+K*S_2*H_2) 3600 = 2*(K_{15}*D_u*(D_u/2+D_s))*3600 = E*3600

K_{15-avg}.=	5.00E-04 cfs/ft^2-ft	D_u=	3.5 ft.
		D_s=	10.00 ft.

E= 4.11E-02 cfs/ft (Using directly perc. test results and SFWMD F.D. Eq.)

E*3600= 148 ft^3/ft = V_{exf}.

Treatment Unit Volume provided by Exfiltration Trench:

V_{dry}= 6.51 ft^3/ft

$V_{exf.}$= 148 ft^3/ft

$V_{FD-\ Unit} = V_{dry} + V_{side\text{-}exf.}$ = 155 ft^3/ft = 0.0035 ac-ft/ ft = 0.0426 ac-in/ft

Existing FD Length= **200 ft**

Treatment Volume provided by Exfiltration Trench:

$V_{FD} = V_{FD\text{-}Unit} \times L_{FD}$ = **30,913** ft^3 = **0.710** ac-ft. = 9 ac-in

$V_{provided}$=	**0.710 ac-ft**
$V_{required}$=	**0.288 ac-ft**

Factor of Safety = **2.5** ***>>>>> Water Quality Criteria is met.***

Post-Development Drainage Conditions Prepared by: FA

Mary Brickell Village Drainage Improvements

WATER QUALITY CALCULATIONS

Volumetric Retention Treatment Required:

Impervious Area=	13.80	ac.
Pervious Area=	0.00	ac.
Total Area=	**13.80**	**ac.**

SFWMD CRITERIA:

a) First inch of runoff from the developed project:

(1 In x 9.95 Ac. x 1 Ft/12 In) = 1.15 Ac.-Ft.

b) 2.5 inches times the percentage of imperviousness:

Percent Impervious = 100%

(2.5 In x 1.00) = 2.50 in. to be treated

Volume required to be treated = (2.5 In x 9.95 Ac x 1 Ft/12 In) = 2.88 Ac.-Ft.

DERM CRITERIA:

$$t_{1"} = \frac{2940 \ \text{x} \ F^{-0.11}}{308.5 \text{ x } C - 60.5 \ (0.5895 + F^{-0.67})}$$

WHERE:

$t_{1"}$ = time to generate 1" of runoff, in minutes

F = 5 frequency in years, DCPW Manual, Part II, Section D4-Water Control, Table I

Cwtd = 0.90 weighted runoff coefficient (from the rational formula)

Tc = 166 time of concentration, in minutes

CONTRIBUTING AREA AND ROUGHNESS COEFFICIENT CRITERIA.

Pervious Areas = 0.00 Ac., C_{PERV} = 0.2

Imperv. Areas = 13.80 Ac., C_{IMP} = 0.9

$C = (A_{IMP} \text{ x } C_{IMP} + A_{PERV} \text{ x } C_{PERV})/A_T = 0.90$

$t_{1"}$ = 11.12 MIN.

TOTAL TIME OF CONCENTRATION (T_T) : $T_T = t_{1"} + T_C =$ 177.12 MIN.

STORM INTENSITY (Dade County Rainfall Intensity-Duration-Frequency Curves)

$$i = \frac{308.5}{48.6 \text{ x } F^{-0.11} + T_T \ (0.5895 + F^{-0.67})} = 1.50 \text{ IN/HR.}$$

RUNOFF FLOW $Q_{1"} = C \text{ x } I \text{ x } A_T =$ **18.66 CFS** **FOR THE 1st INCH OF RUNOFF**

TOTAL RUNOFF VOLUME TO BE TREATED $V_{1"}$ (FOR 1 INCH):

$V_{1"} = 60 \ Q_{1"} \ T_T =$ **198,265 CF = 4.55 Ac.-Ft.**

Volume Treatment Required= 4.55 ac-ft.

Post-Development Drainage Conditions Prepared by: FA

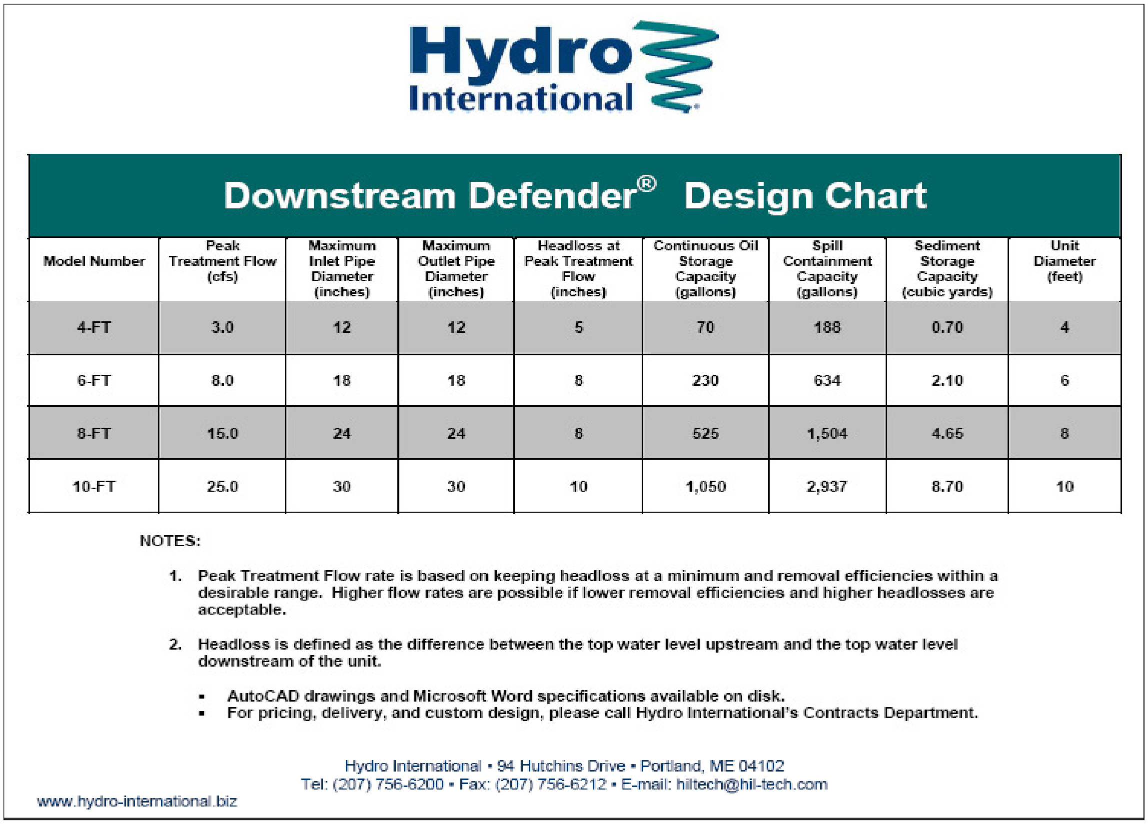
Mary Brickell Village Drainage Improvements

WATER QUALITY CALCULATIONS

Peak Treatment Flow: 18.66 CFS

Downstream Defender Size Required: 10 Feet, Dia.

(From Hydro International supplied design chart)



Hydro International

Downstream Defender® Design Chart

Model Number	Peak Treatment Flow (cfs)	Maximum Inlet Pipe Diameter (inches)	Maximum Outlet Pipe Diameter (inches)	Headloss at Peak Treatment Flow (inches)	Continuous Oil Storage Capacity (gallons)	Spill Containment Capacity (gallons)	Sediment Storage Capacity (cubic yards)	Unit Diameter (feet)
4-FT	3.0	12	12	5	70	188	0.70	4
6-FT	8.0	18	18	8	230	634	2.10	6
8-FT	15.0	24	24	8	525	1,504	4.65	8
10-FT	25.0	30	30	10	1,050	2,937	8.70	10

NOTES:

1. Peak Treatment Flow rate is based on keeping headloss at a minimum and removal efficiencies within a desirable range. Higher flow rates are possible if lower removal efficiencies and higher headlosses are acceptable.

2. Headloss is defined as the difference between the top water level upstream and the top water level downstream of the unit.

- AutoCAD drawings and Microsoft Word specifications available on disk.
- For pricing, delivery, and custom design, please call Hydro International's Contracts Department.

Hydro International • 94 Hutchins Drive • Portland, ME 04102
Tel: (207) 756-6200 • Fax: (207) 756-6212 • E-mail: hiltech@hil-tech.com

www.hydro-international.biz

Head Losses through Downstream Defender System

Head Loss Calculations (Based on Hazen-Williams Equation)

$$H_f = 0.002083 \times L(100/C)^{1.85}(Q^{1.85}/d^{4.8655})$$

C=0.453 english

Incoming Pipe Diameter(in.)=	30
In/Out Pipe Lengths(ft)=	10
Resistance Coef. (c)=	120
flow(gpm)=	8372.78
h_f(friction loss,ft)=	0.01748
h_{dd}(head loss through unit, from chart)	0.83330
h_{Total} through system	**0.85**
Influent Pipe Invert	-0.70
Weir Elevation	**2.65**

TR-55 Time of Concentration Calculations for Water Quality Calculations
Post-Development Drainage Conditions
Mary Brickell Village Drainage Project

Sheet Flow (flow length less than 100ft)

Segment ID	Surface Description (table 3-1)	Manning's Roughness Coefficient, n (table 3-1)	Flow Length, L (ft)	2-yr 24-hr rainfall, P_2 (in)	Furthest Point Elev. (ft.)	Discharge Point Elev. (ft.)	Slope, s (ft/ft)	$T_t = [0.007(nL)^{0.8}]/[P_2^{0.5}s^{0.4}]$
1	Smooth (asphalt)	0.011	100	6.00	8.50	7.50	0.0100	0.02
							Total Sheet Flow Time of Concentration:	0.02 hours

Shallow Concentrated Flow

Segment ID	Surface Description (paved or unpaved)	Flow Length, L (ft)	Furthest Point Elev. (ft.)	Discharge Point Elev. (ft.)	Watercourse Slope, s (ft/ft)	Average Velocity, V (ft/s) (figure 3-1)	$T_t = L / (3600V)$
1	paved	250	7.50	5.50	0.0080	2	0.03
						Total Shallow Concentrated Flow Time of Concentration:	0.03 hours

Channel/Pipe Flow

Segment ID	C.S. flow area, a	Wetted Perimeter, p_w	Hydraulic Radius, $r=a/p_w$	Channel Slope, s	Manning's Roughness Coefficient, n	$V(ft/s) = 1.49r^{2/3}s^{1/2} / n$	Channel Length, L	$T_t = L / (3600V)$
23"X14"	2.24	6.17	0.363	0.005	0.012	0.158	78	0.137
30"X19"	3.96	8.17	0.485	0.005	0.012	0.192	381	0.553
36"X24"	6.00	10.00	0.600	0.005	0.012	0.221	877	1.103
54"X30"	11.25	14.00	0.804	0.005	0.012	0.268	167	0.173
60"X36"	15.00	16.00	0.938	0.005	0.012	0.297	810	0.757
							Total Shallow Concentrated Flow Time of Concentration:	2.72 hours

Watershed Total Time of Concentration:	2.78 hours
Watershed Total Time of Concentration:	166.61 min

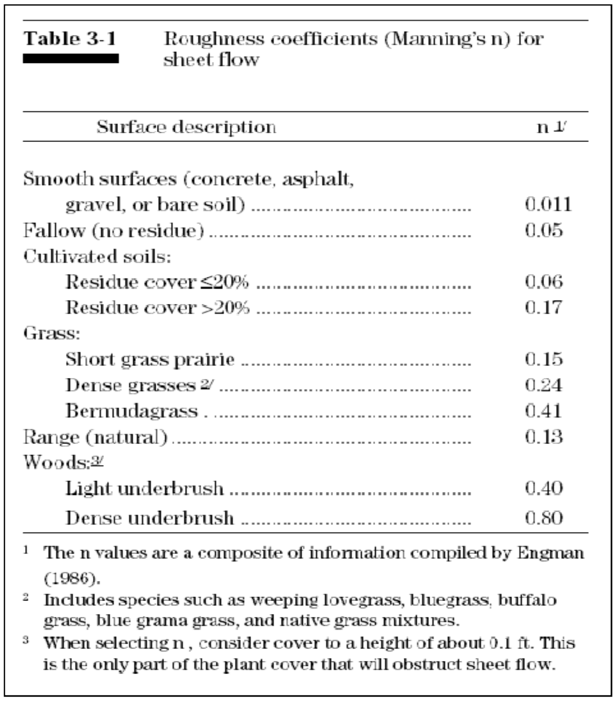


Table 3-1 Roughness coefficients (Manning's n) for sheet flow

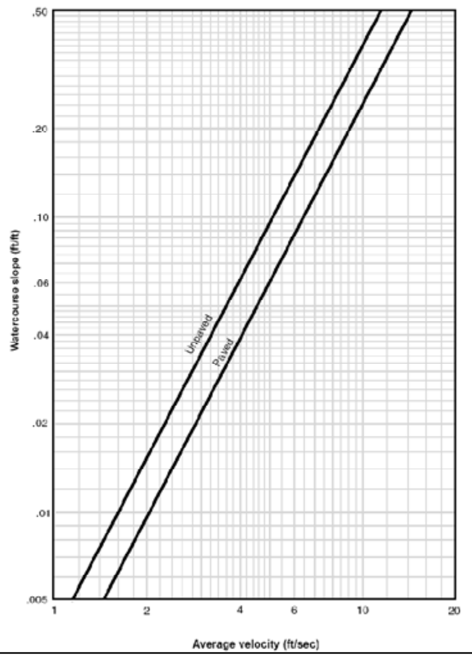
Surface description	n [1]
Smooth surfaces (concrete, asphalt, gravel, or bare soil)	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover ≤20%	0.06
Residue cover >20%	0.17
Grass:	
Short grass prairie	0.15
Dense grasses [2]	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:[3]	
Light underbrush	0.40
Dense underbrush	0.80

[1] The n values are a composite of information compiled by Engman (1986).

[2] Includes species such as weeping lovegrass, bluegrass, buffalo grass, blue grama grass, and native grass mixtures.

[3] When selecting n , consider cover to a height of about 0.1 ft. This is the only part of the plant cover that will obstruct sheet flow.

Figure 3-1 Average velocities for estimating travel time for shallow concentrated flow



APPENDIX E – EXISTING FLOODING CONDITIONS DOCUMENTATION

- FIELD VISIT PICTURES

Field Visit April 15, 2009

Field Visit April 15, 2009

Field Visit April 15, 2009




Field Visit April 15, 2009

Field Visit April 15, 2009

Field Visit April 15, 2009

Field Visit April 15, 2009

Field Visit April 15, 2009

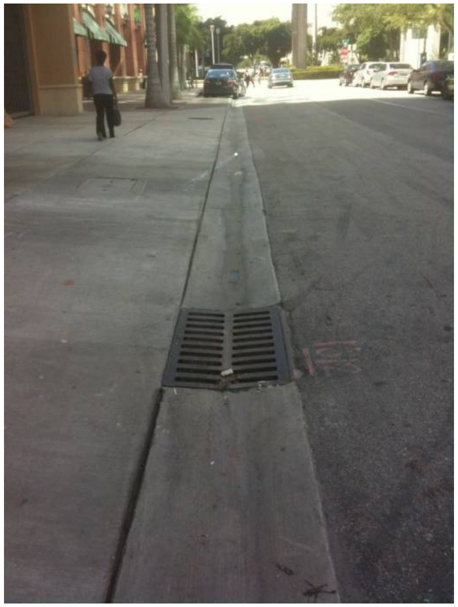
Field Visit April 15, 2009

Field Visit April 15, 2009

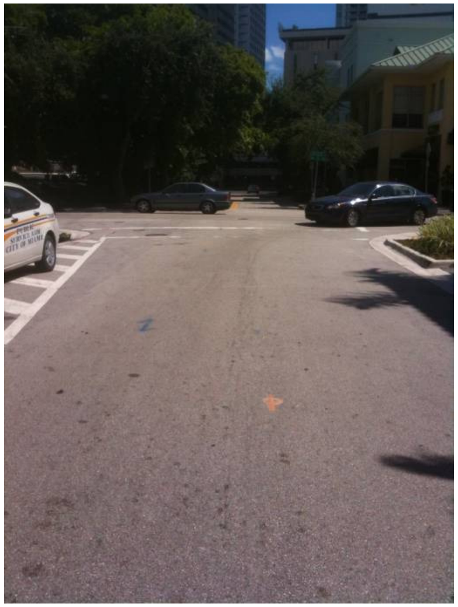
Field Visit December 17, 2009

Field Visit December 17, 2009

Field Visit December 17, 2009



Site Visit October 8, 2010



Site Visit October 8, 2010

Site Visit October 8, 2010

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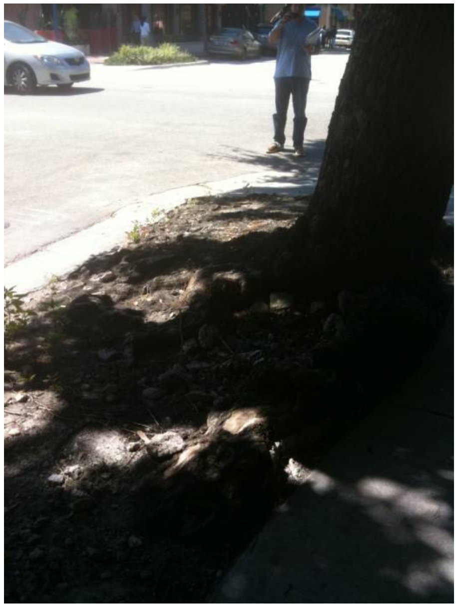

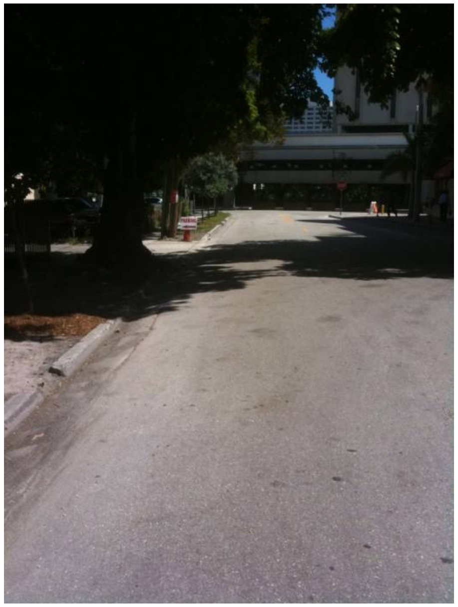

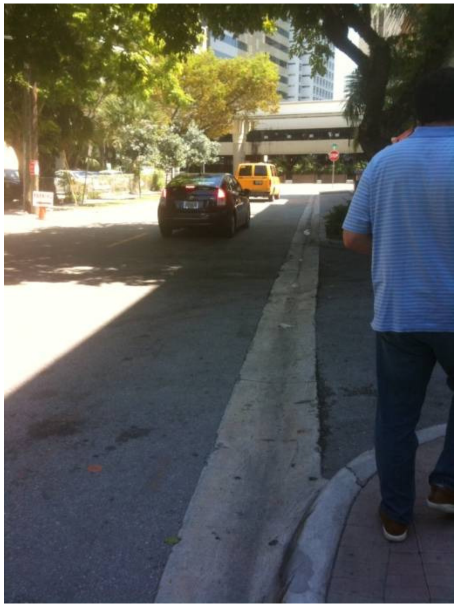

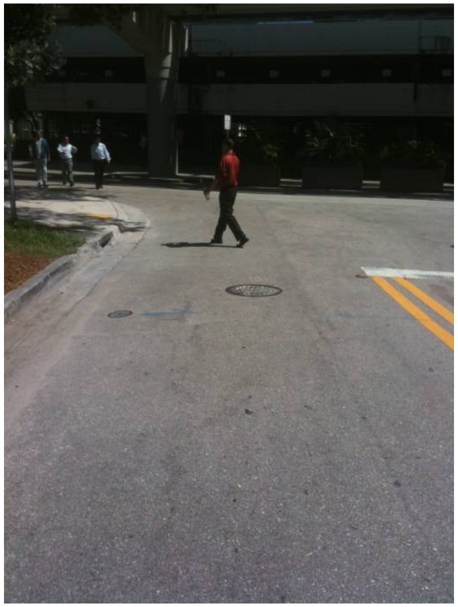

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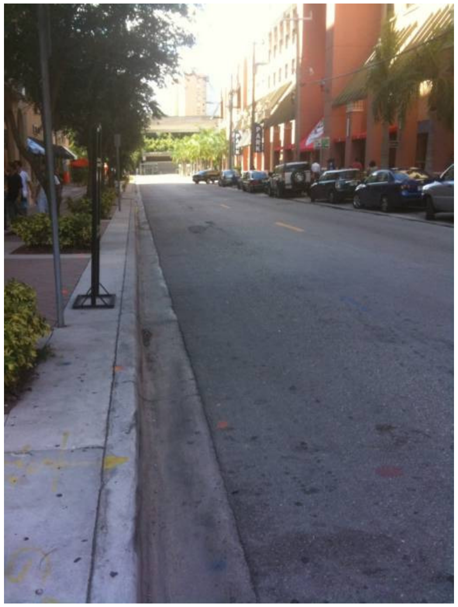

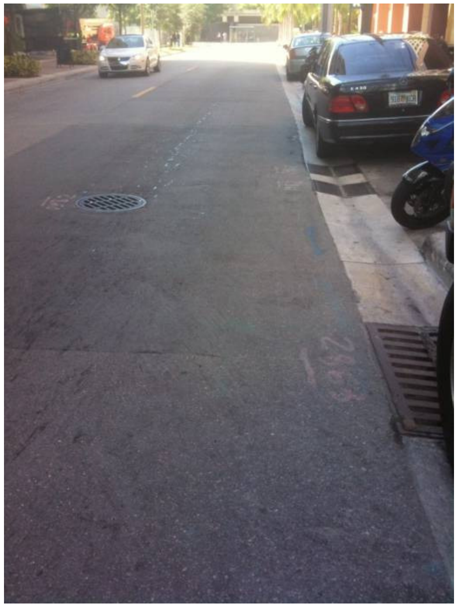

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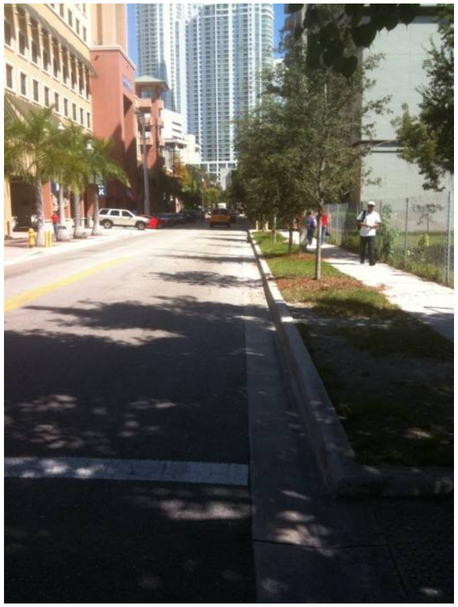

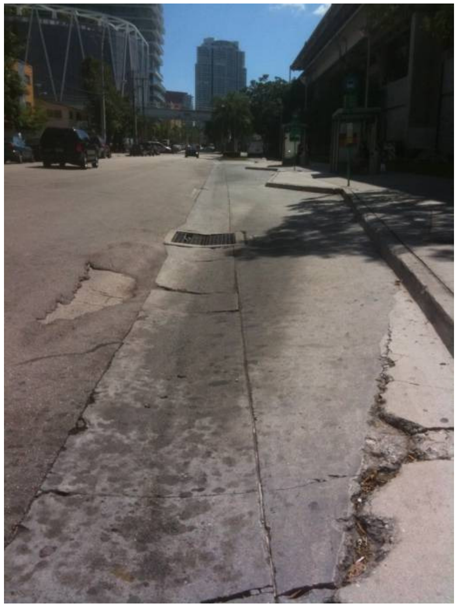

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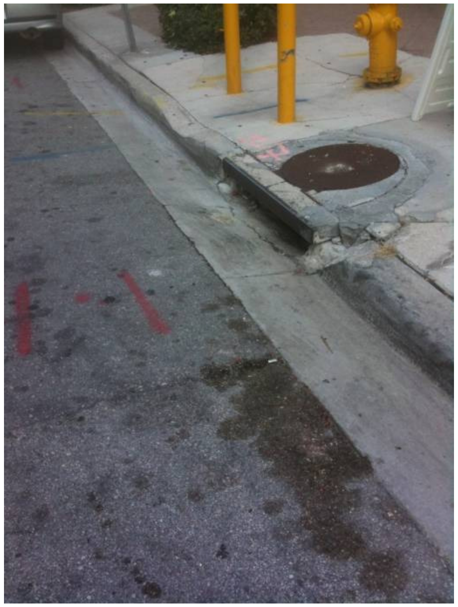

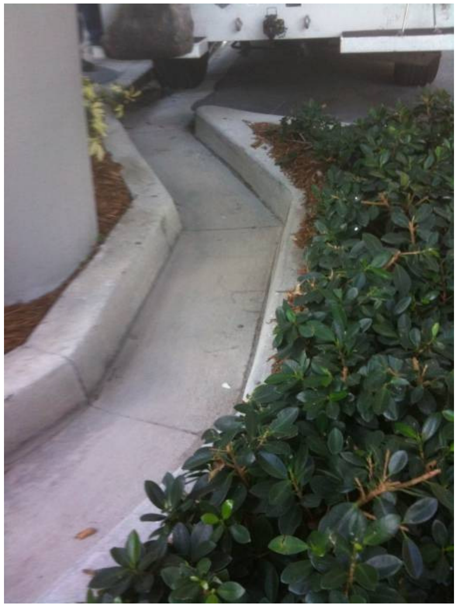

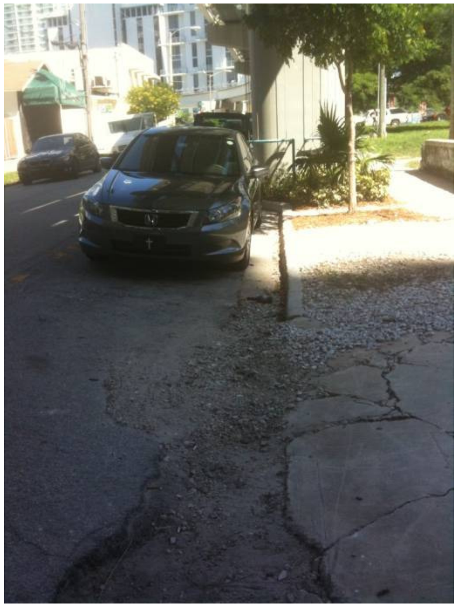

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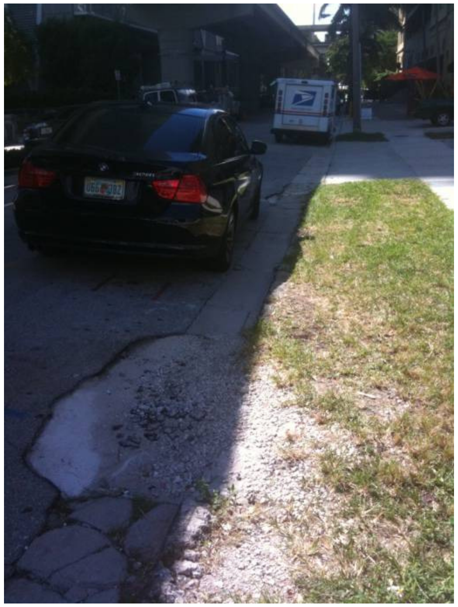

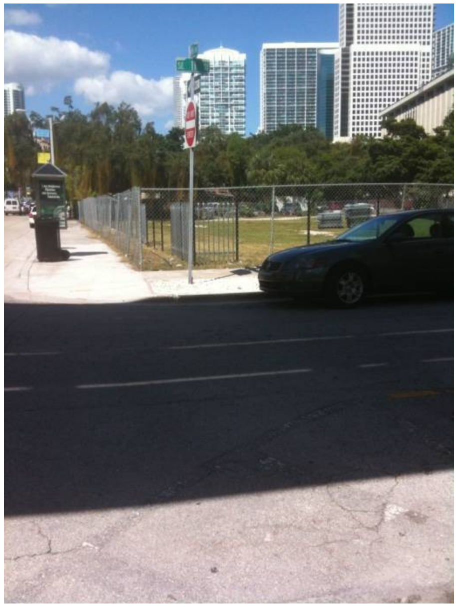

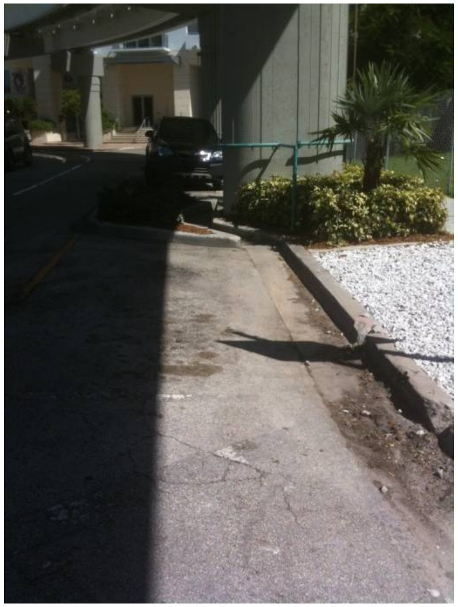

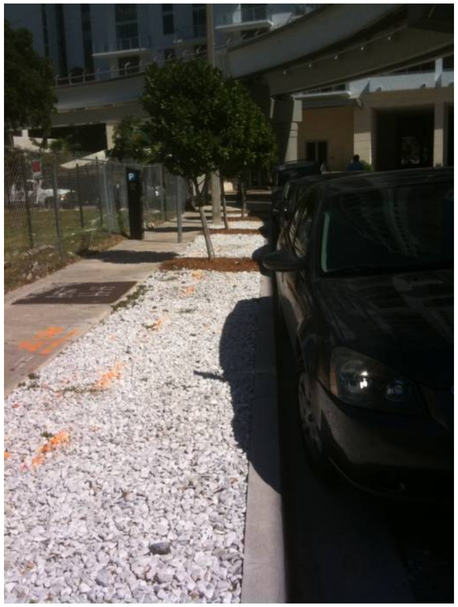

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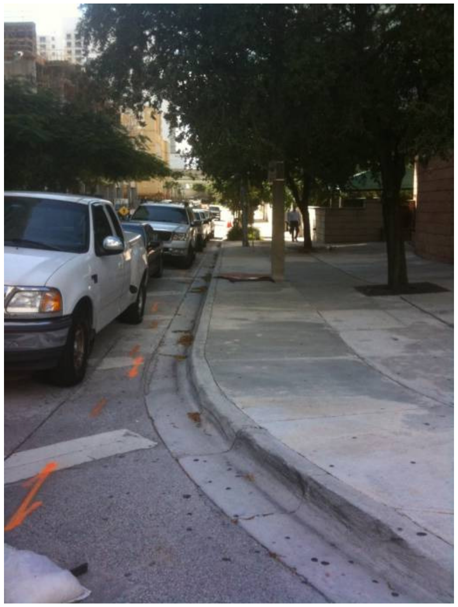

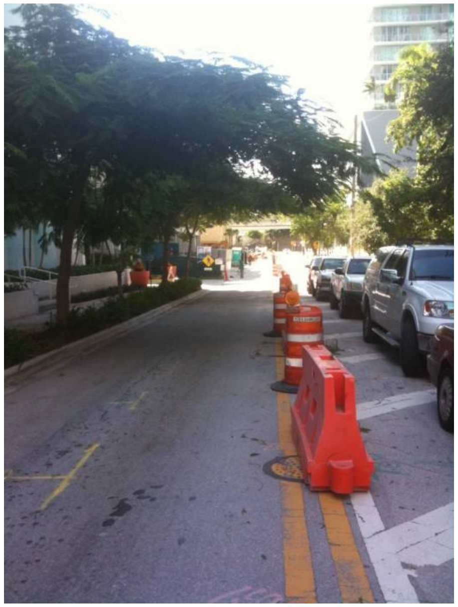

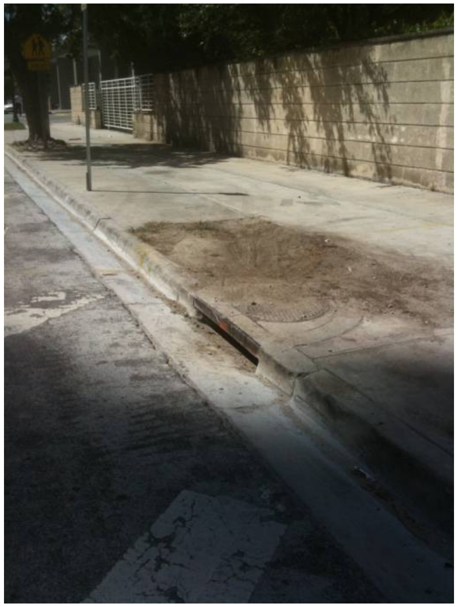

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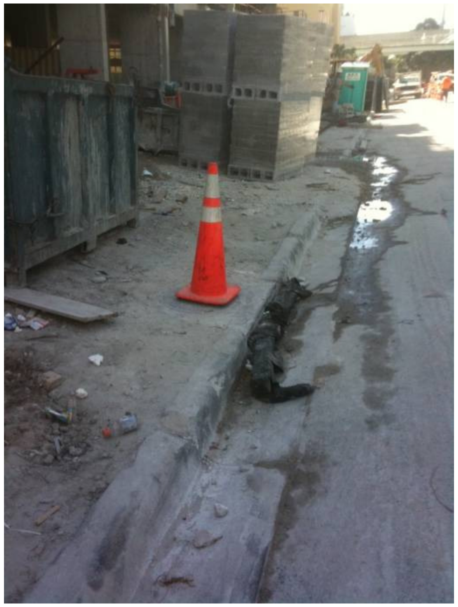

Site Visit October 8, 2010

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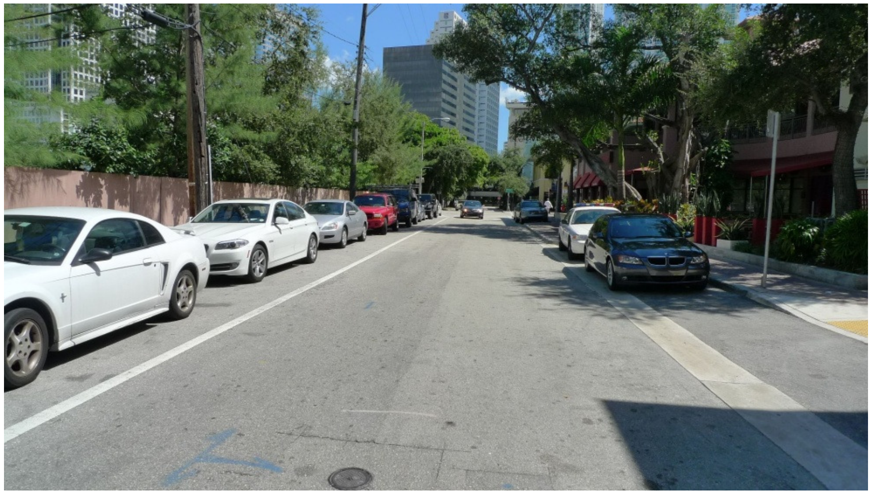

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Site Visit October 8, 2010

APPENDIX F – ICPR PRE-DEVELOPMENT MODEL

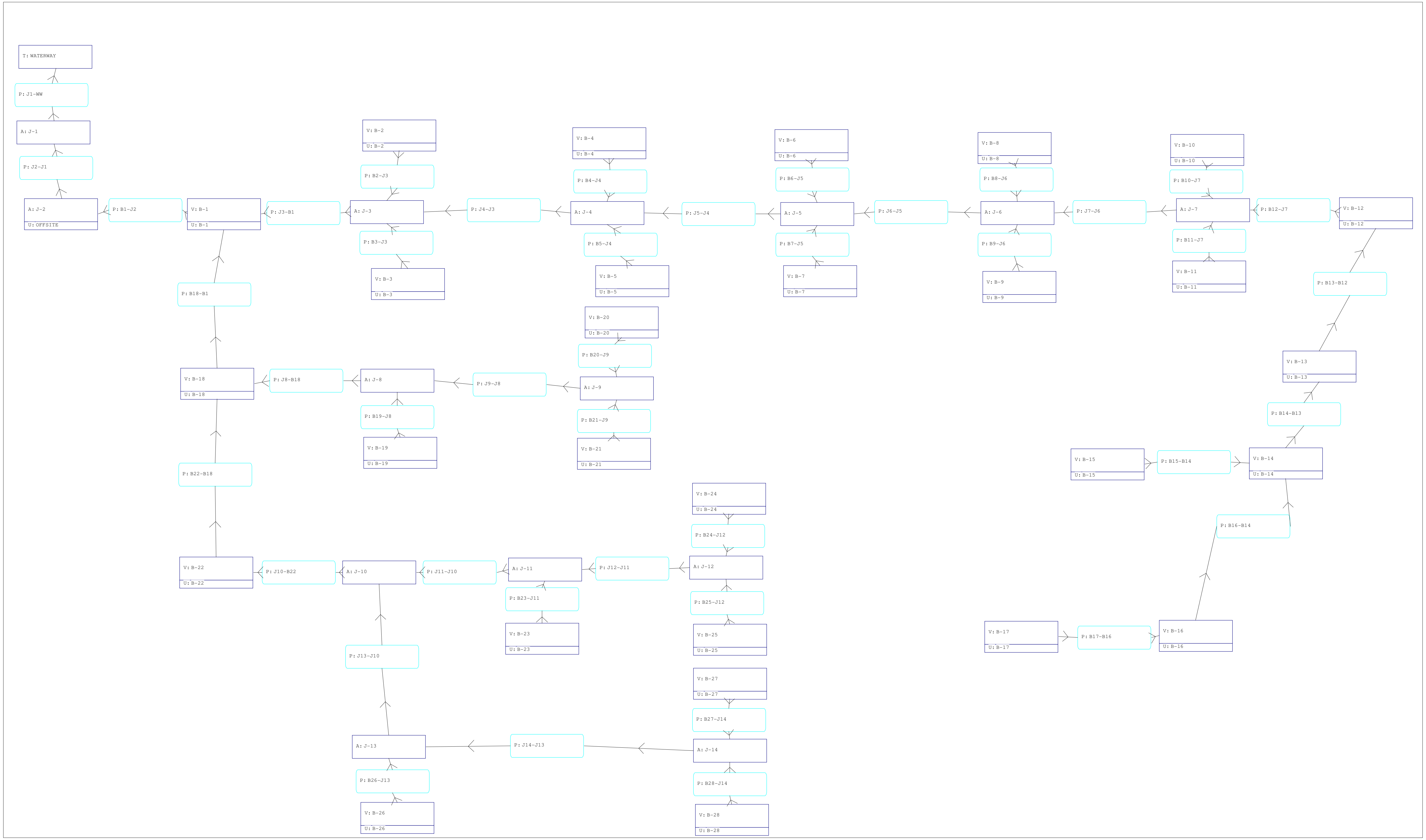
- NODE – LINK DIAGRAM
- COMPLETE INPUT REPORT
- NODE MAXIMUM CONDITIONS REPORT
- LINK MAXIMUM CONDITIONS REPORT

Mary Brickell Village Drainage Improvements
Node Link Diagram
Pre Mitigation Condition

Nodes
A Stage/Area
V Stage/Volume
T Time/Stage
M Manhole

Basins
O Overland Flow
U SCS Unit CN
S SBUH CN
Y SCS Unit GA
Z SBUH GA

Links
P Pipe
W Weir
C Channel
D Drop Structure
B Bridge
R Rating Curve
H Breach
E Percolation
F Filter
X Exfil Trench



```
==========================================================================================
==== Basins ==============================================================================
==========================================================================================

         Name: B-1                      Node: B-1                    Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 1.100                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00



----------------------------------------------------------------------------------------------------
         Name: B-10                     Node: B-10                   Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.740                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00



----------------------------------------------------------------------------------------------------
         Name: B-11                     Node: B-11                   Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.890                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00



----------------------------------------------------------------------------------------------------
         Name: B-12                     Node: B-12                   Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.970                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00



----------------------------------------------------------------------------------------------------
         Name: B-13                     Node: B-13                   Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.200                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00



----------------------------------------------------------------------------------------------------
         Name: B-14                     Node: B-14                   Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
```

```
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.650                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00



----------------------------------------------------------------------------------------------------
         Name: B-15                     Node: B-15                   Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.560                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00



----------------------------------------------------------------------------------------------------
         Name: B-16                     Node: B-16                   Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.490                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00



----------------------------------------------------------------------------------------------------
         Name: B-17                     Node: B-17                   Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.440                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00



----------------------------------------------------------------------------------------------------
         Name: B-18                     Node: B-18                   Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.600                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00



----------------------------------------------------------------------------------------------------
         Name: B-19                     Node: B-19                   Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.400                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00



----------------------------------------------------------------------------------------------------
         Name: B-2                      Node: b-2                    Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN
```

```
        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 1.250                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


----------------------------------------------------------------------------------------------------
         Name: B-20                     Node: B-20                   Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 1.130                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


----------------------------------------------------------------------------------------------------
         Name: B-21                     Node: B-21                   Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 1.120                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


----------------------------------------------------------------------------------------------------
         Name: B-22                     Node: B-22                   Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 1.090                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


----------------------------------------------------------------------------------------------------
         Name: B-23                     Node: B-23                   Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.390                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


----------------------------------------------------------------------------------------------------
         Name: B-24                     Node: B-24                   Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 1.060                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00
```

```
---------------------------------------------------------------------------------------------------
         Name: B-25                     Node: B-25                   Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 1.770                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00



---------------------------------------------------------------------------------------------------
         Name: B-26                     Node: B-26                   Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.360                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00



---------------------------------------------------------------------------------------------------
         Name: B-27                     Node: B-27                   Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 1.750                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00



---------------------------------------------------------------------------------------------------
         Name: B-28                     Node: B-28                   Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.950                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00



---------------------------------------------------------------------------------------------------
         Name: B-3                      Node: B-3                    Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.620                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00



---------------------------------------------------------------------------------------------------
         Name: B-4                      Node: B-4                    Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.710                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00
```

```
----------------------------------------------------------------------------------------------------
         Name: B-5                      Node: B-5                    Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.960                   Time Shift(hrs): 0.00
           Curve Number: 98.00          Max Allowable Q(cfs): 999999.000
               DCIA(%): 0.00


----------------------------------------------------------------------------------------------------
         Name: B-6                      Node: B-6                    Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.350                   Time Shift(hrs): 0.00
           Curve Number: 98.00          Max Allowable Q(cfs): 999999.000
               DCIA(%): 0.00


----------------------------------------------------------------------------------------------------
         Name: B-7                      Node: B-7                    Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.240                   Time Shift(hrs): 0.00
           Curve Number: 98.00          Max Allowable Q(cfs): 999999.000
               DCIA(%): 0.00


----------------------------------------------------------------------------------------------------
         Name: B-8                      Node: B-8                    Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.380                   Time Shift(hrs): 0.00
           Curve Number: 98.00          Max Allowable Q(cfs): 999999.000
               DCIA(%): 0.00


----------------------------------------------------------------------------------------------------
         Name: B-9                      Node: B-9                    Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.370                   Time Shift(hrs): 0.00
           Curve Number: 98.00          Max Allowable Q(cfs): 999999.000
               DCIA(%): 0.00


----------------------------------------------------------------------------------------------------
         Name: OFFSITE                  Node: J-2                    Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 21.00
```

```
              Area(ac): 2.960                  Time Shift(hrs): 0.00
          Curve Number: 98.00             Max Allowable Q(cfs): 999999.000
               DCIA(%): 0.00

For Tc calculation see Offisite basin Tc calculations spreadsheet.

==========================================================================================
==== Nodes ===============================================================================
==========================================================================================

      Name: B-1                Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                              Warn Stage(ft): 3.800
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          2.600          0.0000
          3.800          0.0013
          4.000          0.0031
          4.500          0.0387
          5.000          0.1734
          6.000          0.7710
          7.000          1.5717
          8.000          2.4696
          9.000          3.4703
         10.500          5.0287
         12.000          6.5871

------------------------------------------------------------------------------------------
      Name: B-10               Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                              Warn Stage(ft): 4.110
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          2.600          0.0000
          4.110          0.0014
          4.500          0.0050
          5.000          0.0546
          6.000          0.3749
          7.000          0.9191
          8.000          1.6202
          9.000          2.3451
         10.500          3.4326
         12.000          4.5200

------------------------------------------------------------------------------------------
      Name: B-11               Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                              Warn Stage(ft): 4.060
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          2.600          0.0000
          4.060          0.0014
          4.500          0.0084
          5.000          0.0546
          6.000          0.3151
          7.000          0.8961
          8.000          2.0271
          9.000          3.4190
         10.500          5.5068
         12.000          7.5946

------------------------------------------------------------------------------------------
      Name: B-12               Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                              Warn Stage(ft): 4.150
      Type: Stage/Volume
```

```
      Stage(ft)      Volume(af)
--------------- ---------------
          2.600          0.0000
          4.150          0.0015
          4.500          0.0039
          5.000          0.0304
          6.000          0.1711
          7.000          0.4770
          8.000          0.9524
          9.000          1.5624
         10.500          2.6467
         12.000          3.7310

------------------------------------------------------------------------------------------
      Name: B-13                Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                               Warn Stage(ft): 5.870
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          2.600          0.0000
          5.870          0.0025
          6.000          0.0026
          7.000          0.0224
          8.000          0.0686
          9.000          0.1424
         10.500          0.3642
         12.000          0.6021

------------------------------------------------------------------------------------------
      Name: B-14                Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                               Warn Stage(ft): 5.700
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          2.600          0.0000
          5.700          0.0024
          6.000          0.0032
          7.000          0.0515
          8.000          0.1856
          9.000          0.4534
         10.500          1.1248
         12.000          1.9320

------------------------------------------------------------------------------------------
      Name: B-15                Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                               Warn Stage(ft): 5.660
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          2.600          0.0000
          5.660          0.0023
          6.000          0.0033
          7.000          0.0798
          8.000          0.3051
          9.000          0.6773
         10.500          1.4554
         12.000          2.2945

------------------------------------------------------------------------------------------
      Name: B-16                Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                               Warn Stage(ft): 8.130
      Type: Stage/Volume
```

```
      Stage(ft)      Volume(af)
--------------- ---------------
          2.600          0.0000
          8.130          0.0037
          9.000          0.0740
         10.500          0.5881
         12.000          1.2283

==========================================================================================
      Name: B-17                Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                               Warn Stage(ft): 8.150
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          2.600          0.0000
          8.150          0.0038
          9.000          0.0596
         10.500          0.6260
         12.000          1.3156

==========================================================================================
      Name: B-18                Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                               Warn Stage(ft): 4.030
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          2.600          0.0000
          4.030          0.0014
          4.500          0.0064
          5.000          0.0359
          6.000          0.2829
          7.000          0.8156
          8.000          1.3831
          9.000          1.9506
         10.500          2.8019
         12.000          3.6532

==========================================================================================
      Name: B-19                Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                               Warn Stage(ft): 4.370
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          2.600          0.0000
          4.370          0.0016
          4.500          0.0017
          5.000          0.0073
          6.000          0.1121
          7.000          0.3848
          8.000          0.7395
          9.000          1.1411
         10.500          1.7434
         12.000          2.3458

==========================================================================================
      Name: B-2                 Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                               Warn Stage(ft): 3.960
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          2.600          0.0000
          3.960          0.0014
```

```
          4.500          0.0200
          5.000          0.0808
          6.000          0.2586
          7.000          0.5060
          8.000          0.7940
          9.000          1.1270
         10.500          1.6521
         12.000          2.1918

------------------------------------------------------------------------------------------
      Name: B-20                Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                               Warn Stage(ft): 3.670
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          2.600          0.0000
          3.670          0.0012
          4.000          0.0031
          4.500          0.0347
          5.000          0.1211
          6.000          0.4812
          7.000          1.0491
          8.000          1.8381
          9.000          2.6272
         10.500          3.8107
         12.000          4.9943

------------------------------------------------------------------------------------------
      Name: B-21                Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                               Warn Stage(ft): 3.830
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          2.600          0.0000
          3.830          0.0013
          4.000          0.0016
          4.500          0.0307
          5.000          0.1330
          6.000          0.4696
          7.000          0.9242
          8.000          1.4315
          9.000          2.1144
         10.500          3.1559
         12.000          4.1974

------------------------------------------------------------------------------------------
      Name: B-22                Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                               Warn Stage(ft): 5.310
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          2.600          0.0000
          5.310          0.0021
          6.000          0.0197
          7.000          0.1241
          8.000          0.3267
          9.000          0.6524
         10.500          1.3352
         12.000          2.2350

------------------------------------------------------------------------------------------
      Name: B-23                Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                               Warn Stage(ft): 5.340
      Type: Stage/Volume
```

```
      Stage(ft)      Volume(af)
--------------- ---------------
          2.600         0.0000
          5.340         0.0021
          6.000         0.0172
          7.000         0.0886
          8.000         0.2126
          9.000         0.3729
         10.500         0.7495
         12.000         1.2461

------------------------------------------------------------------------------------------
      Name: B-24                Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                               Warn Stage(ft): 4.200
      Type: Stage/Volume


      Stage(ft)      Volume(af)
--------------- ---------------
          2.600         0.0000
          4.200         0.0015
          4.500         0.0020
          5.000         0.0251
          6.000         0.2376
          7.000         0.5373
          8.000         0.8959
          9.000         1.3047
         10.500         1.9634
         12.000         2.8260

------------------------------------------------------------------------------------------
      Name: B-25                Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                               Warn Stage(ft): 4.200
      Type: Stage/Volume


      Stage(ft)      Volume(af)
--------------- ---------------
          2.600         0.0000
          4.200         0.0015
          4.500         0.0035
          5.000         0.0453
          6.000         0.3025
          7.000         0.6905
          8.000         1.2048
          9.000         1.7916
         10.500         2.7538
         12.000         3.8005

------------------------------------------------------------------------------------------
      Name: B-26                Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                               Warn Stage(ft): 9.940
      Type: Stage/Volume


      Stage(ft)      Volume(af)
--------------- ---------------
          2.600         0.0000
          9.940         0.0048
         10.500         0.0099
         12.000         0.0891

------------------------------------------------------------------------------------------
      Name: B-27                Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                               Warn Stage(ft): 5.900
      Type: Stage/Volume


      Stage(ft)      Volume(af)
--------------- ---------------
```

```
          2.600          0.0000
          5.900          0.0025
          6.000          0.0222
          7.000          0.1041
          8.000          0.3342
          9.000          0.7004
         10.500          1.4681
         12.000          2.3786

------------------------------------------------------------------------------------------
      Name: B-28                Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                               Warn Stage(ft): 5.800
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          2.600          0.0000
          5.800          0.0024
          6.000          0.0025
          7.000          0.0395
          8.000          0.1565
          9.000          0.3610
         10.500          0.8406
         12.000          1.4000

------------------------------------------------------------------------------------------
      Name: B-3                 Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                               Warn Stage(ft): 3.960
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          2.600          0.0000
          3.960          0.0013
          4.000          0.0014
          4.500          0.0278
          5.000          0.1191
          6.000          0.4511
          7.000          0.8571
          8.000          1.3610
          9.000          1.8650
         10.500          2.6209
         12.000          3.3768

------------------------------------------------------------------------------------------
      Name: B-4                 Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                               Warn Stage(ft): 3.120
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          2.600          0.0000
          3.120          0.0009
          3.500          0.0013
          4.000          0.0092
          4.500          0.0446
          5.000          0.1445
          6.000          0.5415
          7.000          0.9754
          8.000          1.4128
          9.000          1.8534
         10.500          2.5198
         12.000          3.1921

------------------------------------------------------------------------------------------
      Name: B-5                 Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                               Warn Stage(ft): 3.690
      Type: Stage/Volume
```

```
      Stage(ft)      Volume(af)
--------------- ---------------
          2.600          0.0000
          3.690          0.0012
          4.000          0.0030
          4.500          0.0429
          5.000          0.1588
          6.000          0.5515
          7.000          1.0384
          8.000          1.7077
          9.000          2.3797
         10.500          3.3877
         12.000          4.3958

-------------------------------------------------------------------------------------------
      Name: B-6               Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                             Warn Stage(ft): 4.870
      Type: Stage/Volume


      Stage(ft)      Volume(af)
--------------- ---------------
          2.600          0.0000
          4.870          0.0019
          5.000          0.0024
          6.000          0.0311
          7.000          0.1475
          8.000          0.3786
          9.000          0.6798
         10.500          1.2133
         12.000          1.7468

-------------------------------------------------------------------------------------------
      Name: B-7               Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                             Warn Stage(ft): 5.220
      Type: Stage/Volume


      Stage(ft)      Volume(af)
--------------- ---------------
          2.600          0.0000
          5.220          0.0012
          6.000          0.0403
          7.000          0.2176
          8.000          0.4601
          9.000          0.7026
         10.500          1.0663
         12.000          1.4301

-------------------------------------------------------------------------------------------
      Name: B-8               Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                             Warn Stage(ft): 4.900
      Type: Stage/Volume


      Stage(ft)      Volume(af)
--------------- ---------------
          2.600          0.0000
          4.900          0.0019
          5.000          0.0024
          6.000          0.0444
          7.000          0.2148
          8.000          0.5568
          9.000          0.9400
         10.500          1.5148
         12.000          2.0896

-------------------------------------------------------------------------------------------
      Name: B-9               Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                             Warn Stage(ft): 4.860
```

```
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          2.600          0.0000
          4.860          0.0019
          5.000          0.0020
          6.000          0.0762
          7.000          0.3260
          8.000          0.6753
          9.000          1.0444
         10.500          1.5980
         12.000          2.1516

-------------------------------------------------------------------------------------
      Name: J-1                Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                              Warn Stage(ft): 5.800
      Type: Stage/Area



      Stage(ft)        Area(ac)
--------------- ---------------
          2.600          0.0006
          5.800          0.0006

-------------------------------------------------------------------------------------
      Name: J-10               Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                              Warn Stage(ft): 5.860
      Type: Stage/Area



      Stage(ft)        Area(ac)
--------------- ---------------
          2.600          0.0006
          5.860          0.0006

-------------------------------------------------------------------------------------
      Name: J-11               Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                              Warn Stage(ft): 5.950
      Type: Stage/Area



      Stage(ft)        Area(ac)
--------------- ---------------
          2.600          0.0006
          5.950          0.0006

-------------------------------------------------------------------------------------
      Name: J-12               Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                              Warn Stage(ft): 4.650
      Type: Stage/Area



      Stage(ft)        Area(ac)
--------------- ---------------
          2.600          0.0006
          4.650          0.0006

-------------------------------------------------------------------------------------
      Name: J-13               Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                              Warn Stage(ft): 10.080
      Type: Stage/Area



      Stage(ft)        Area(ac)
--------------- ---------------
          2.600          0.0006
         10.080          0.0006
```

```
-------------------------------------------------------------------------------------------
      Name: J-14                Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                               Warn Stage(ft): 6.500
      Type: Stage/Area



      Stage(ft)        Area(ac)
--------------- ---------------
          2.600          0.0006
          6.500          0.0006

-------------------------------------------------------------------------------------------
      Name: J-2                 Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                               Warn Stage(ft): 5.000
      Type: Stage/Area



      Stage(ft)        Area(ac)
--------------- ---------------
          2.600          0.0006
          5.000          0.0006

-------------------------------------------------------------------------------------------
      Name: J-3                 Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                               Warn Stage(ft): 4.200
      Type: Stage/Area



      Stage(ft)        Area(ac)
--------------- ---------------
          2.600          0.0006
          4.200          0.0006

-------------------------------------------------------------------------------------------
      Name: J-4                 Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                               Warn Stage(ft): 4.600
      Type: Stage/Area



      Stage(ft)        Area(ac)
--------------- ---------------
          2.600          0.0006
          4.600          0.0006

-------------------------------------------------------------------------------------------
      Name: J-5                 Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                               Warn Stage(ft): 5.300
      Type: Stage/Area



      Stage(ft)        Area(ac)
--------------- ---------------
          2.600          0.0006
          5.300          0.0006

-------------------------------------------------------------------------------------------
      Name: J-6                 Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                               Warn Stage(ft): 5.200
      Type: Stage/Area



      Stage(ft)        Area(ac)
--------------- ---------------
          2.600          0.0006
          5.200          0.0006

-------------------------------------------------------------------------------------------
      Name: J-7                 Base Flow(cfs): 0.000          Init Stage(ft): 2.600
```

```
     Group: BASE                                               Warn Stage(ft): 4.400
      Type: Stage/Area



      Stage(ft)        Area(ac)
--------------- ---------------
          2.600          0.0006
          4.400          0.0006

------------------------------------------------------------------------------------------
      Name: J-8                 Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                               Warn Stage(ft): 4.860
      Type: Stage/Area



      Stage(ft)        Area(ac)
--------------- ---------------
          2.600          0.0006
          4.860          0.0006

------------------------------------------------------------------------------------------
      Name: J-9                 Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                               Warn Stage(ft): 4.000
      Type: Stage/Area



      Stage(ft)        Area(ac)
--------------- ---------------
          2.600          0.0006
          4.000          0.0006

------------------------------------------------------------------------------------------
      Name: WATERWAY            Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                               Warn Stage(ft): 2.600
      Type: Time/Stage

Outfall Discharge to Miami River,
Tidal Data at Miami Marina NOAA Station used to determine mean high-high water.
MHHW determined to be 2.6' City of Miami Datum

      Time(hrs)       Stage(ft)
--------------- ---------------
           0.00           2.600
         100.00           2.600

==========================================================================================
==== Pipes ===============================================================================
==========================================================================================

         Name: B1-J2               From Node: B-1                Length(ft): 119.00
        Group: BASE                  To Node: J-2                     Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Rectangular    Rectangular                              Flow: Both
     Span(in): 54.00          54.00                      Entrance Loss Coef: 0.50
     Rise(in): 30.00          30.00                          Exit Loss Coef: 0.00
   Invert(ft): 0.150          -0.250                         Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares


----------------------------------------------------------------------------------------------------
```

```
         Name: B10-J7              From Node: B-10               Length(ft): 11.00
        Group: BASE                  To Node: J-7                      Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 12.00          12.00                      Entrance Loss Coef: 0.50
     Rise(in): 12.00          12.00                          Exit Loss Coef: 0.00
   Invert(ft): 2.170          1.550                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



----------------------------------------------------------------------------------------------------
         Name: B11-J7              From Node: B-11               Length(ft): 19.00
        Group: BASE                  To Node: J-7                      Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 12.00          12.00                      Entrance Loss Coef: 0.50
     Rise(in): 12.00          12.00                          Exit Loss Coef: 0.00
   Invert(ft): 2.010          1.550                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



----------------------------------------------------------------------------------------------------
         Name: B12-J7              From Node: B-12               Length(ft): 61.00
        Group: BASE                  To Node: J-7                      Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Rectangular    Rectangular                              Flow: Both
     Span(in): 30.00          30.00                      Entrance Loss Coef: 0.50
     Rise(in): 19.00          19.00                          Exit Loss Coef: 0.00
   Invert(ft): 1.800          1.800                          Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares



----------------------------------------------------------------------------------------------------
         Name: B13-B12             From Node: B-13               Length(ft): 320.00
        Group: BASE                  To Node: B-12                     Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Rectangular    Rectangular                              Flow: Both
     Span(in): 30.00          30.00                      Entrance Loss Coef: 0.50
```

```
     Rise(in): 19.00         19.00                        Exit Loss Coef: 0.00
   Invert(ft): 1.320         0.360                        Bend Loss Coef: 0.70
  Manning's N: 0.012000      0.012000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000         0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000         0.000                     Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares



----------------------------------------------------------------------------------------------------
         Name: B14-B13           From Node: B-14              Length(ft): 78.00
        Group: BASE                To Node: B-13                   Count: 1
                                                       Friction Equation: Automatic
               UPSTREAM      DOWNSTREAM               Solution Algorithm: Most Restrictive
     Geometry: Rectangular   Rectangular                            Flow: Both
     Span(in): 23.00         23.00                    Entrance Loss Coef: 0.50
     Rise(in): 14.00         14.00                        Exit Loss Coef: 0.00
   Invert(ft): 1.750         1.770                        Bend Loss Coef: 0.00
  Manning's N: 0.012000      0.012000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000         0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000         0.000                     Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares



----------------------------------------------------------------------------------------------------
         Name: B15-B14           From Node: B-15              Length(ft): 22.00
        Group: BASE                To Node: B-14                   Count: 1
                                                       Friction Equation: Automatic
               UPSTREAM      DOWNSTREAM               Solution Algorithm: Most Restrictive
     Geometry: Circular      Circular                               Flow: Both
     Span(in): 12.00         12.00                    Entrance Loss Coef: 0.50
     Rise(in): 12.00         12.00                        Exit Loss Coef: 0.00
   Invert(ft): 1.950         1.770                        Bend Loss Coef: 0.55
  Manning's N: 0.012000      0.012000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000         0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000         0.000                     Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



----------------------------------------------------------------------------------------------------
         Name: B16-B14           From Node: B-16              Length(ft): 349.00
        Group: BASE                To Node: B-14                   Count: 1
                                                       Friction Equation: Automatic
               UPSTREAM      DOWNSTREAM               Solution Algorithm: Most Restrictive
     Geometry: Circular      Circular                               Flow: Both
     Span(in): 15.00         15.00                    Entrance Loss Coef: 0.50
     Rise(in): 15.00         15.00                        Exit Loss Coef: 0.00
   Invert(ft): 2.550         1.800                        Bend Loss Coef: 0.00
  Manning's N: 0.012000      0.012000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000         0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000         0.000                     Stabilizer Option: None
```

```
Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



----------------------------------------------------------------------------------------------------
         Name: B17-B16             From Node: B-17               Length(ft): 30.00
        Group: BASE                  To Node: B-16                    Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 12.00          12.00                      Entrance Loss Coef: 0.50
     Rise(in): 12.00          12.00                          Exit Loss Coef: 0.00
   Invert(ft): 2.800          2.480                          Bend Loss Coef: 0.55
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



----------------------------------------------------------------------------------------------------
         Name: B18-B1              From Node: B-18               Length(ft): 350.00
        Group: BASE                  To Node: B-1                     Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Rectangular    Rectangular                              Flow: Both
     Span(in): 42.00          42.00                      Entrance Loss Coef: 0.50
     Rise(in): 30.00          30.00                          Exit Loss Coef: 0.00
   Invert(ft): 0.590          0.150                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares



----------------------------------------------------------------------------------------------------
         Name: B19-J8              From Node: B-19               Length(ft): 32.00
        Group: BASE                  To Node: J-8                     Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 12.00          12.00                      Entrance Loss Coef: 0.50
     Rise(in): 12.00          12.00                          Exit Loss Coef: 0.00
   Invert(ft): 2.110          1.950                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
```

```
Circular Concrete: Square edge w/ headwall



----------------------------------------------------------------------------------------------------
         Name: B2-J3               From Node: B-2                Length(ft): 17.00
        Group: BASE                  To Node: J-3                     Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 12.00          12.00                      Entrance Loss Coef: 0.50
     Rise(in): 12.00          12.00                          Exit Loss Coef: 0.00
   Invert(ft): 0.510          0.270                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



----------------------------------------------------------------------------------------------------
         Name: B20-J9              From Node: B-20               Length(ft): 12.00
        Group: BASE                  To Node: J-9                     Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 18.00          18.00                      Entrance Loss Coef: 0.50
     Rise(in): 18.00          18.00                          Exit Loss Coef: 0.00
   Invert(ft): 1.800          1.800                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



----------------------------------------------------------------------------------------------------
         Name: B21-J9              From Node: B-21               Length(ft): 40.00
        Group: BASE                  To Node: J-9                     Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 18.00          18.00                      Entrance Loss Coef: 0.50
     Rise(in): 18.00          18.00                          Exit Loss Coef: 0.00
   Invert(ft): 1.500          1.500                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



----------------------------------------------------------------------------------------------------
         Name: B22-B18             From Node: B-22               Length(ft): 346.00
```

```
        Group: BASE                  To Node: B-18                    Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Rectangular    Rectangular                              Flow: Both
     Span(in): 36.00          36.00                      Entrance Loss Coef: 0.50
     Rise(in): 30.00          30.00                          Exit Loss Coef: 0.00
   Invert(ft): 1.110          0.590                          Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares



----------------------------------------------------------------------------------------------------
         Name: B23-J11             From Node: B-23               Length(ft): 31.00
        Group: BASE                  To Node: J-11                    Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 15.00          15.00                      Entrance Loss Coef: 0.50
     Rise(in): 15.00          15.00                          Exit Loss Coef: 0.00
   Invert(ft): 3.400          3.250                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



----------------------------------------------------------------------------------------------------
         Name: B24-J12             From Node: B-24               Length(ft): 13.00
        Group: BASE                  To Node: J-12                    Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 12.00          12.00                      Entrance Loss Coef: 0.50
     Rise(in): 12.00          12.00                          Exit Loss Coef: 0.00
   Invert(ft): 2.500          2.100                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



----------------------------------------------------------------------------------------------------
         Name: B25-J12             From Node: B-25               Length(ft): 21.00
        Group: BASE                  To Node: J-12                    Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 12.00          12.00                      Entrance Loss Coef: 0.50
     Rise(in): 12.00          12.00                          Exit Loss Coef: 0.00
```

```
   Invert(ft): 2.410          2.120                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall


----------------------------------------------------------------------------------------------------
         Name: B26-J13             From Node: B-26               Length(ft): 41.00
        Group: BASE                  To Node: J-13                    Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 12.00          12.00                      Entrance Loss Coef: 0.50
     Rise(in): 12.00          12.00                          Exit Loss Coef: 0.00
   Invert(ft): 5.110          4.440                          Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall


----------------------------------------------------------------------------------------------------
         Name: B27-J14             From Node: B-27               Length(ft): 9.00
        Group: BASE                  To Node: J-14                    Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 12.00          12.00                      Entrance Loss Coef: 0.50
     Rise(in): 12.00          12.00                          Exit Loss Coef: 0.00
   Invert(ft): 2.770          2.500                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall


----------------------------------------------------------------------------------------------------
         Name: B28-J14             From Node: B-28               Length(ft): 26.00
        Group: BASE                  To Node: J-14                    Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 12.00          12.00                      Entrance Loss Coef: 0.50
     Rise(in): 12.00          12.00                          Exit Loss Coef: 0.00
   Invert(ft): 2.800          2.500                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None
```

```
Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



----------------------------------------------------------------------------------------------------
         Name: B3-J3               From Node: B-3                Length(ft): 37.00
        Group: BASE                  To Node: J-3                     Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 12.00          12.00                      Entrance Loss Coef: 0.50
     Rise(in): 12.00          12.00                          Exit Loss Coef: 0.00
   Invert(ft): 0.870          1.350                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



----------------------------------------------------------------------------------------------------
         Name: B4-J4               From Node: B-4                Length(ft): 6.00
        Group: BASE                  To Node: J-4                     Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 12.00          12.00                      Entrance Loss Coef: 0.50
     Rise(in): 12.00          12.00                          Exit Loss Coef: 0.00
   Invert(ft): 1.370          1.000                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



----------------------------------------------------------------------------------------------------
         Name: B5-J4               From Node: B-5                Length(ft): 18.00
        Group: BASE                  To Node: J-4                     Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 12.00          12.00                      Entrance Loss Coef: 0.50
     Rise(in): 12.00          12.00                          Exit Loss Coef: 0.00
   Invert(ft): 1.640          1.000                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall
```

```
----------------------------------------------------------------------------------------------------
         Name: B6-J5               From Node: B-6                Length(ft): 9.00
        Group: BASE                  To Node: J-5                     Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 12.00          12.00                      Entrance Loss Coef: 0.50
     Rise(in): 12.00          12.00                          Exit Loss Coef: 0.00
   Invert(ft): 1.820          1.470                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



----------------------------------------------------------------------------------------------------
         Name: B7-J5               From Node: B-7                Length(ft): 33.00
        Group: BASE                  To Node: J-5                     Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 12.00          12.00                      Entrance Loss Coef: 0.50
     Rise(in): 12.00          12.00                          Exit Loss Coef: 0.00
   Invert(ft): 0.970          0.590                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



----------------------------------------------------------------------------------------------------
         Name: B8-J6               From Node: B-8                Length(ft): 20.00
        Group: BASE                  To Node: J-6                     Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 12.00          12.00                      Entrance Loss Coef: 0.50
     Rise(in): 12.00          12.00                          Exit Loss Coef: 0.00
   Invert(ft): 1.390          0.800                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



----------------------------------------------------------------------------------------------------
         Name: B9-J6               From Node: B-9                Length(ft): 32.00
        Group: BASE                  To Node: J-6                     Count: 1
```

```
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 12.00          12.00                      Entrance Loss Coef: 0.50
     Rise(in): 12.00          12.00                          Exit Loss Coef: 0.00
   Invert(ft): 1.460          0.450                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



----------------------------------------------------------------------------------------------------
         Name: J1-WW               From Node: J-1                Length(ft): 450.00
        Group: BASE                  To Node: WATERWAY                Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Rectangular    Rectangular                              Flow: Both
     Span(in): 60.00          60.00                      Entrance Loss Coef: 0.50
     Rise(in): 36.00          36.00                          Exit Loss Coef: 1.00
   Invert(ft): -0.680         -0.800                         Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares



----------------------------------------------------------------------------------------------------
         Name: J10-B22             From Node: J-10               Length(ft): 45.00
        Group: BASE                  To Node: B-22                    Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Rectangular    Rectangular                              Flow: Both
     Span(in): 36.00          36.00                      Entrance Loss Coef: 0.50
     Rise(in): 30.00          30.00                          Exit Loss Coef: 0.00
   Invert(ft): 1.200          1.110                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares



----------------------------------------------------------------------------------------------------
         Name: J11-J10             From Node: J-11               Length(ft): 22.00
        Group: BASE                  To Node: J-10                    Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Rectangular    Rectangular                              Flow: Both
     Span(in): 24.00          24.00                      Entrance Loss Coef: 0.50
     Rise(in): 15.00          15.00                          Exit Loss Coef: 0.00
   Invert(ft): 1.280          1.200                          Bend Loss Coef: 0.00
```

```
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares



---------------------------------------------------------------------------------------------------
         Name: J12-J11             From Node: J-12               Length(ft): 351.00
        Group: BASE                  To Node: J-11                    Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Rectangular    Rectangular                              Flow: Both
     Span(in): 24.00          24.00                      Entrance Loss Coef: 0.50
     Rise(in): 15.00          15.00                          Exit Loss Coef: 0.00
   Invert(ft): 1.950          1.280                          Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares



---------------------------------------------------------------------------------------------------
         Name: J13-J10             From Node: J-13               Length(ft): 348.00
        Group: BASE                  To Node: J-10                    Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 21.00          21.00                      Entrance Loss Coef: 0.50
     Rise(in): 21.00          21.00                          Exit Loss Coef: 0.00
   Invert(ft): 1.160          0.780                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



---------------------------------------------------------------------------------------------------
         Name: J14-J13             From Node: J-14               Length(ft): 392.00
        Group: BASE                  To Node: J-13                    Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 21.00          21.00                      Entrance Loss Coef: 0.50
     Rise(in): 21.00          21.00                          Exit Loss Coef: 0.00
   Invert(ft): 2.000          1.060                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None
```

```
Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



----------------------------------------------------------------------------------------------------
         Name: J2-J1               From Node: J-2               Length(ft): 360.00
        Group: BASE                  To Node: J-1                    Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Rectangular    Rectangular                              Flow: Both
     Span(in): 60.00          60.00                      Entrance Loss Coef: 0.50
     Rise(in): 36.00          36.00                          Exit Loss Coef: 0.00
   Invert(ft): -0.250         -0.680                         Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares



----------------------------------------------------------------------------------------------------
         Name: J3-B1               From Node: J-3               Length(ft): 48.00
        Group: BASE                  To Node: B-1                    Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Rectangular    Rectangular                              Flow: Both
     Span(in): 54.00          54.00                      Entrance Loss Coef: 0.50
     Rise(in): 30.00          30.00                          Exit Loss Coef: 0.00
   Invert(ft): 0.690          0.150                          Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares



----------------------------------------------------------------------------------------------------
         Name: J4-J3               From Node: J-4               Length(ft): 230.00
        Group: BASE                  To Node: J-3                    Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Rectangular    Rectangular                              Flow: Both
     Span(in): 36.00          36.00                      Entrance Loss Coef: 0.50
     Rise(in): 24.00          24.00                          Exit Loss Coef: 0.00
   Invert(ft): 0.750          0.690                          Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares
```

```
----------------------------------------------------------------------------------------------------
         Name: J5-J4              From Node: J-5               Length(ft): 383.00
        Group: BASE                 To Node: J-4                    Count: 1
                                                        Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM               Solution Algorithm: Most Restrictive
     Geometry: Rectangular    Rectangular                            Flow: Both
     Span(in): 36.00          36.00                    Entrance Loss Coef: 0.50
     Rise(in): 24.00          24.00                        Exit Loss Coef: 0.00
   Invert(ft): 1.160          0.750                        Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                     Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares


----------------------------------------------------------------------------------------------------
         Name: J6-J5              From Node: J-6               Length(ft): 50.00
        Group: BASE                 To Node: J-5                    Count: 1
                                                        Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM               Solution Algorithm: Most Restrictive
     Geometry: Rectangular    Rectangular                            Flow: Both
     Span(in): 36.00          36.00                    Entrance Loss Coef: 0.50
     Rise(in): 24.00          24.00                        Exit Loss Coef: 0.00
   Invert(ft): -1.050         -1.120                       Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                     Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares


----------------------------------------------------------------------------------------------------
         Name: J7-J6              From Node: J-7               Length(ft): 264.00
        Group: BASE                 To Node: J-6                    Count: 1
                                                        Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM               Solution Algorithm: Most Restrictive
     Geometry: Rectangular    Rectangular                            Flow: Both
     Span(in): 36.00          36.00                    Entrance Loss Coef: 0.50
     Rise(in): 24.00          24.00                        Exit Loss Coef: 0.00
   Invert(ft): 1.560          1.330                        Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                     Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares


----------------------------------------------------------------------------------------------------
         Name: J8-B18             From Node: J-8               Length(ft): 53.00
        Group: BASE                 To Node: B-18                   Count: 1
                                                        Friction Equation: Automatic
```

```
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Rectangular    Rectangular                              Flow: Both
     Span(in): 36.00          36.00                    Entrance Loss Coef: 0.50
     Rise(in): 30.00          30.00                        Exit Loss Coef: 0.00
   Invert(ft): 0.810          0.650                        Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                     Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares



----------------------------------------------------------------------------------------------------
         Name: J9-J8               From Node: J-9               Length(ft): 294.00
        Group: BASE                  To Node: J-8                    Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Rectangular    Rectangular                              Flow: Both
     Span(in): 24.00          24.00                    Entrance Loss Coef: 0.50
     Rise(in): 15.00          15.00                        Exit Loss Coef: 0.00
   Invert(ft): 1.300          0.740                        Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                     Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares



==========================================================================================
==== Hydrology Simulations ===============================================================
==========================================================================================

         Name: 100yr-72hr
     Filename: K:\Projects\550860.15_CM Mary Brickell Village\docs\drainage report\icpr\pre results\100yr-72hr.R

      Override Defaults: Yes
    Storm Duration(hrs): 72.00
          Rainfall File: Sfwmd72
    Rainfall Amount(in): 14.00

Time(hrs)       Print Inc(min)
--------------- ---------------
48.000          15.00
56.000          5.00
64.000          1.00
72.000          5.00
72.330          5.00

----------------------------------------------------------------------------------------------------
         Name: 10yr-24hr
     Filename: K:\Projects\550860.15_CM Mary Brickell Village\docs\drainage report\icpr\pre results\10yr-24hr.R3

      Override Defaults: Yes
    Storm Duration(hrs): 24.00
          Rainfall File: Flmod
    Rainfall Amount(in): 7.90

Time(hrs)       Print Inc(min)
--------------- ---------------
8.000           15.00
10.000          5.00
```

```
14.000          1.00
16.000          5.00
24.000          15.00
24.330          5.00

---------------------------------------------------------------------------------------------------
         Name: 1hr_calibrate
     Filename: K:\Projects\550860.15_CM Mary Brickell Village\docs\drainage report\icpr\pre results\1hr_calibrat

      Override Defaults: Yes
    Storm Duration(hrs): 1.00
          Rainfall File: Fdot-1
    Rainfall Amount(in): 2.00

Time(hrs)       Print Inc(min)
--------------- ---------------
1.000           1.00
1.330           1.00

---------------------------------------------------------------------------------------------------
         Name: 25yr-72hr
     Filename: K:\Projects\550860.15_CM Mary Brickell Village\docs\drainage report\icpr\pre results\25yr-72hr.R3

      Override Defaults: Yes
    Storm Duration(hrs): 72.00
          Rainfall File: Sfwmd72
    Rainfall Amount(in): 12.00

Time(hrs)       Print Inc(min)
--------------- ---------------
48.000          15.00
56.000          5.00
64.000          1.00
72.000          5.00
72.330          5.00

---------------------------------------------------------------------------------------------------
         Name: 5yr-24hr
     Filename: K:\Projects\550860.15_CM Mary Brickell Village\docs\drainage report\icpr\pre results\5yr-24hr.R32

      Override Defaults: Yes
    Storm Duration(hrs): 24.00
          Rainfall File: Flmod
    Rainfall Amount(in): 6.30

Time(hrs)       Print Inc(min)
--------------- ---------------
8.000           15.00
10.000          5.00
14.000          1.00
16.000          5.00
24.000          15.00
24.330          5.00

==========================================================================================
==== Routing Simulations =================================================================
==========================================================================================

         Name: 100yr-72hr          Hydrology Sim: 100yr-72hr
     Filename: K:\Projects\550860.15_CM Mary Brickell Village\docs\drainage report\icpr\pre results\100yr-72hr.I

      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.01000
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 96.00
     Min Calc Time(sec): 0.0500               Max Calc Time(sec): 60.0000
        Boundary Stages: 25/100yr River           Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
48.000          15.000
```

```
56.000          5.000
64.000          1.000
72.000          5.000
96.000          15.000

Group           Run
--------------- -----
BASE            Yes


----------------------------------------------------------------------------------------------------
         Name: 10yr-24hr           Hydrology Sim: 10yr-24hr
     Filename: K:\Projects\550860.15_CM Mary Brickell Village\docs\drainage report\icpr\pre results\10yr-24hr.I3

      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.01000
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 48.00
     Min Calc Time(sec): 0.0500               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
8.000           5.000
16.000          1.000
24.000          5.000
48.000          15.000

Group           Run
--------------- -----
BASE            Yes


----------------------------------------------------------------------------------------------------
         Name: 1hr_calibrate       Hydrology Sim: 1hr_calibrate
     Filename: K:\Projects\550860.15_CM Mary Brickell Village\docs\drainage report\icpr\pre results\1hr_calibrat

      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.01000
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 25.00
     Min Calc Time(sec): 0.0500               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
1.000           1.000
25.000          15.000

Group           Run
--------------- -----
BASE            Yes


----------------------------------------------------------------------------------------------------
         Name: 25yr-72hr           Hydrology Sim: 25yr-72hr
     Filename: K:\Projects\550860.15_CM Mary Brickell Village\docs\drainage report\icpr\pre results\25yr-72hr.I3

      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.01000
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 96.00
     Min Calc Time(sec): 0.0500               Max Calc Time(sec): 60.0000
        Boundary Stages: 25/100yr River           Boundary Flows:
```

```
Time(hrs)       Print Inc(min)
--------------- ---------------
48.000          15.000
56.000          5.000
64.000          1.000
72.000          5.000
96.000          15.000

Group           Run
--------------- -----
BASE            Yes


--------------------------------------------------------------------------------------------------------
         Name: 5yr-24hr            Hydrology Sim: 5yr-24hr
     Filename: K:\Projects\550860.15_CM Mary Brickell Village\docs\drainage report\icpr\pre results\5yr-24hr.I32

      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.01000
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 48.00
     Min Calc Time(sec): 0.0500             Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
8.000           5.000
16.000          1.000
24.000          5.000
48.000          15.000

Group           Run
--------------- -----
BASE            Yes


==========================================================================================
==== Boundary Conditions =================================================================
==========================================================================================

      Name: 25/100yr River        Node: WATERWAY              Type: Stage

      Time(hrs)       Stage(ft)
--------------- ---------------
          0.000           3.800
       1000.000           3.800
```

Mary Brickell Village Drainage Improvements
Node Maximum Comparison Report
Pre Mitigation Condition

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
B-1	BASE	100yr-72hr	60.50	5.171	3.800	0.0069	20917	60.54	37.752	60.82	38.658
B-1	BASE	10yr-24hr	12.34	4.419	3.800	0.0092	6548	12.32	44.042	12.53	44.565
B-1	BASE	1hr_calibrate	0.83	3.969	3.800	0.0086	1562	0.81	39.434	0.87	39.454
B-1	BASE	25yr-72hr	60.45	5.032	3.800	0.0069	19297	60.52	36.088	60.75	36.784
B-1	BASE	5yr-24hr	12.30	4.199	3.800	0.0098	4053	12.30	41.968	12.39	42.134
B-10	BASE	100yr-72hr	60.85	5.920	4.110	0.0033	18054	60.02	4.597	62.66	2.518
B-10	BASE	10yr-24hr	12.65	5.449	4.110	-0.0063	13491	12.03	3.493	13.55	3.545
B-10	BASE	1hr_calibrate	0.95	4.856	4.110	-0.0060	7185	0.65	2.194	1.26	2.893
B-10	BASE	25yr-72hr	60.75	5.747	4.110	0.0033	16376	60.02	3.939	62.22	2.392
B-10	BASE	5yr-24hr	12.52	5.178	4.110	-0.0066	10865	12.03	2.782	13.14	3.286
B-11	BASE	100yr-72hr	60.85	5.935	4.060	0.0033	17633	60.02	5.528	62.66	2.450
B-11	BASE	10yr-24hr	12.66	5.474	4.060	-0.0054	12730	12.03	4.201	13.44	3.366
B-11	BASE	1hr_calibrate	0.96	4.886	4.060	-0.0059	6468	0.65	2.639	1.28	2.889
B-11	BASE	25yr-72hr	60.75	5.762	4.060	0.0033	15797	60.02	4.738	62.13	2.316
B-11	BASE	5yr-24hr	12.53	5.207	4.060	-0.0048	9890	12.03	3.345	13.13	3.133
B-12	BASE	100yr-72hr	60.60	6.046	4.150	0.0031	10088	60.02	14.066	60.12	9.983
B-12	BASE	10yr-24hr	12.49	5.572	4.150	0.0045	7394	12.05	12.330	12.11	9.364
B-12	BASE	1hr_calibrate	0.87	4.934	4.150	0.0043	3856	0.67	9.104	0.74	7.621
B-12	BASE	25yr-72hr	60.56	5.857	4.150	0.0031	8963	60.02	12.958	60.10	9.486
B-12	BASE	5yr-24hr	12.38	5.279	4.150	0.0039	5779	12.05	10.915	12.15	8.638
B-13	BASE	100yr-72hr	60.44	6.287	5.870	0.0031	755	60.04	8.322	60.05	8.053
B-13	BASE	10yr-24hr	12.39	5.799	5.870	0.0044	137	12.04	7.833	12.05	7.754
B-13	BASE	1hr_calibrate	0.83	5.084	5.870	0.0046	137	0.68	6.339	0.68	6.263
B-13	BASE	25yr-72hr	60.35	6.075	5.870	0.0031	546	60.05	7.882	60.03	7.806
B-13	BASE	5yr-24hr	12.32	5.469	5.870	0.0042	137	12.05	7.352	12.06	7.273
B-14	BASE	100yr-72hr	60.30	6.690	5.700	0.0027	3100	60.03	8.487	60.12	7.143
B-14	BASE	10yr-24hr	12.33	6.161	5.700	0.0049	1587	12.07	7.431	12.05	6.890
B-14	BASE	1hr_calibrate	0.78	5.330	5.700	0.0051	128	0.67	5.836	0.68	5.756
B-14	BASE	25yr-72hr	60.25	6.448	5.700	0.0027	2408	60.02	7.825	60.10	6.879
B-14	BASE	5yr-24hr	12.23	5.776	5.700	0.0046	353	12.03	6.679	12.05	6.601
B-15	BASE	100yr-72hr	60.38	6.808	5.660	0.0032	5643	60.02	3.479	59.70	1.931
B-15	BASE	10yr-24hr	12.35	6.296	5.660	-0.0072	3164	12.03	2.644	11.90	1.945
B-15	BASE	1hr_calibrate	0.76	5.440	5.660	0.0054	114	0.65	1.660	0.68	1.570
B-15	BASE	25yr-72hr	60.30	6.568	5.660	0.0027	4482	60.02	2.981	59.73	1.895
B-15	BASE	5yr-24hr	12.20	5.915	5.660	0.0047	1319	12.03	2.105	11.99	1.885
B-16	BASE	100yr-72hr	60.22	7.754	8.130	0.0041	1549	60.03	4.616	60.18	3.530
B-16	BASE	10yr-24hr	12.29	6.954	8.130	0.0057	1044	12.05	3.644	12.23	3.048
B-16	BASE	1hr_calibrate	0.77	5.826	8.130	0.0060	332	0.67	2.553	0.75	2.397
B-16	BASE	25yr-72hr	60.19	7.367	8.130	0.0034	1305	60.03	4.077	60.16	3.272
B-16	BASE	5yr-24hr	12.20	6.411	8.130	0.0055	701	12.06	3.032	12.19	2.709
B-17	BASE	100yr-72hr	60.22	7.916	8.150	0.0043	1326	60.02	2.733	60.19	1.672
B-17	BASE	10yr-24hr	12.29	7.074	8.150	0.0059	897	12.03	2.077	12.24	1.444
B-17	BASE	1hr_calibrate	0.77	5.900	8.150	0.0062	298	0.65	1.305	0.76	1.134

Mary Brickell Village Drainage Improvements
Node Maximum Comparison Report
Pre Mitigation Condition

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
B-17	BASE	25yr-72hr	60.19	7.506	8.150	0.0036	1117	60.02	2.342	60.17	1.550
B-17	BASE	5yr-24hr	12.20	6.506	8.150	0.0057	607	12.03	1.654	12.20	1.282
B-18	BASE	100yr-72hr	60.51	5.453	4.030	0.0054	11401	60.00	25.088	60.51	19.269
B-18	BASE	10yr-24hr	12.34	4.774	4.030	-0.0073	4396	12.05	24.146	12.36	21.626
B-18	BASE	1hr_calibrate	0.84	4.243	4.030	0.0068	887	0.67	21.240	0.81	19.040
B-18	BASE	25yr-72hr	60.44	5.286	4.030	-0.0062	9679	60.01	24.115	60.38	18.328
B-18	BASE	5yr-24hr	12.30	4.513	4.030	-0.0078	1706	12.06	22.805	12.28	20.336
B-19	BASE	100yr-72hr	60.53	5.504	4.370	0.0055	5399	60.02	2.485	59.67	1.167
B-19	BASE	10yr-24hr	12.33	4.871	4.370	0.0032	1941	12.03	1.888	11.94	1.498
B-19	BASE	1hr_calibrate	0.81	4.307	4.370	0.0039	114	0.65	1.186	0.70	1.146
B-19	BASE	25yr-72hr	60.45	5.334	4.370	0.0055	4432	60.02	2.129	59.69	1.157
B-19	BASE	5yr-24hr	12.25	4.591	4.370	0.0034	676	12.03	1.504	12.01	1.428
B-2	BASE	100yr-72hr	60.41	5.732	3.960	0.0052	8528	60.02	7.765	60.31	3.248
B-2	BASE	10yr-24hr	12.38	5.038	3.960	-0.0029	6625	12.03	5.901	12.44	3.316
B-2	BASE	1hr_calibrate	0.85	4.412	3.960	-0.0035	2969	0.65	3.706	0.87	2.753
B-2	BASE	25yr-72hr	60.37	5.505	3.960	0.0052	7904	60.02	6.654	60.28	2.967
B-2	BASE	5yr-24hr	12.33	4.728	3.960	-0.0031	4824	12.03	4.699	12.36	3.033
B-20	BASE	100yr-72hr	60.69	5.618	3.670	0.0064	16927	60.02	7.019	62.05	2.271
B-20	BASE	10yr-24hr	12.54	5.037	3.670	-0.0059	11928	12.03	5.334	13.22	2.906
B-20	BASE	1hr_calibrate	0.91	4.493	3.670	-0.0088	5093	0.65	3.350	1.31	2.816
B-20	BASE	25yr-72hr	60.64	5.440	3.670	0.0064	15393	60.02	6.015	61.82	2.165
B-20	BASE	5yr-24hr	12.43	4.780	3.670	-0.0069	8765	12.03	4.248	12.87	2.649
B-21	BASE	100yr-72hr	60.68	5.624	3.830	0.0064	15189	60.02	6.957	62.69	2.255
B-21	BASE	10yr-24hr	12.54	5.044	3.830	-0.0089	12028	12.03	5.287	13.27	3.051
B-21	BASE	1hr_calibrate	0.92	4.499	3.830	-0.0079	5713	0.65	3.321	1.20	2.585
B-21	BASE	25yr-72hr	60.64	5.445	3.830	0.0064	14212	60.02	5.962	62.28	2.195
B-21	BASE	5yr-24hr	12.44	4.786	3.830	-0.0088	9199	12.03	4.210	12.96	2.844
B-22	BASE	100yr-72hr	60.37	5.679	5.310	0.0090	1807	60.05	17.540	60.06	16.944
B-22	BASE	10yr-24hr	12.32	5.024	5.310	0.0081	488	12.07	15.990	12.08	15.811
B-22	BASE	1hr_calibrate	0.82	4.429	5.310	0.0072	252	0.72	13.310	1.32	14.012
B-22	BASE	25yr-72hr	60.32	5.491	5.310	0.0096	1193	60.05	16.150	60.05	15.822
B-22	BASE	5yr-24hr	12.28	4.727	5.310	0.0068	370	12.07	14.562	12.08	14.439
B-23	BASE	100yr-72hr	60.33	5.873	5.340	-0.0019	1758	60.02	2.423	59.91	1.782
B-23	BASE	10yr-24hr	12.32	5.240	5.340	-0.0039	481	12.03	1.841	12.07	1.604
B-23	BASE	1hr_calibrate	0.83	4.595	5.340	0.0026	259	0.65	1.156	0.67	1.044
B-23	BASE	25yr-72hr	60.29	5.666	5.340	-0.0019	1275	60.02	2.076	59.95	1.657
B-23	BASE	5yr-24hr	12.29	4.919	5.340	0.0031	368	12.03	1.466	12.07	1.299
B-24	BASE	100yr-72hr	60.67	6.213	4.200	0.0049	11834	60.02	6.584	61.93	1.981
B-24	BASE	10yr-24hr	12.57	5.635	4.200	-0.0060	9143	12.03	5.004	13.66	2.627
B-24	BASE	1hr_calibrate	0.93	4.979	4.200	-0.0060	5439	0.65	3.143	1.21	2.160
B-24	BASE	25yr-72hr	60.62	5.982	4.200	0.0049	11057	60.02	5.643	61.66	1.890
B-24	BASE	5yr-24hr	12.48	5.310	4.200	-0.0057	7348	12.03	3.984	13.23	2.367

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B-25	BASE	100yr-72hr	60.69	6.426	4.200	0.0047	16439	60.02	10.995	62.74	2.889
B-25	BASE	10yr-24hr	12.62	5.863	4.200	-0.0081	13145	12.03	8.356	13.81	4.912
B-25	BASE	1hr_calibrate	0.97	5.149	4.200	-0.0099	8413	0.65	5.248	1.41	4.608
B-25	BASE	25yr-72hr	60.64	6.177	4.200	0.0047	15043	60.02	9.422	62.33	2.780
B-25	BASE	5yr-24hr	12.54	5.518	4.200	-0.0078	10858	12.03	6.653	13.36	4.719
B-26	BASE	100yr-72hr	60.09	6.746	9.940	0.0033	114	60.02	2.236	60.03	2.141
B-26	BASE	10yr-24hr	12.05	5.926	9.940	0.0018	130	12.03	1.699	12.05	1.697
B-26	BASE	1hr_calibrate	0.66	5.719	9.940	0.0062	133	0.65	1.067	0.65	1.065
B-26	BASE	25yr-72hr	60.10	6.414	9.940	0.0029	114	60.02	1.916	60.03	1.828
B-26	BASE	5yr-24hr	12.05	5.815	9.940	-0.0007	132	12.03	1.353	12.05	1.351
B-27	BASE	100yr-72hr	60.55	7.705	5.900	0.0052	11163	60.02	10.870	61.22	3.867
B-27	BASE	10yr-24hr	12.51	6.938	5.900	-0.0094	6751	12.03	8.261	13.01	4.545
B-27	BASE	1hr_calibrate	0.91	5.843	5.900	-0.0090	4160	0.65	5.189	1.16	3.793
B-27	BASE	25yr-72hr	60.49	7.355	5.900	0.0052	8994	60.02	9.316	61.41	3.751
B-27	BASE	5yr-24hr	12.43	6.379	5.900	-0.0099	6348	12.03	6.578	12.84	4.204
B-28	BASE	100yr-72hr	60.37	7.542	5.800	0.0049	5332	60.02	5.901	59.68	3.127
B-28	BASE	10yr-24hr	12.36	6.817	5.800	-0.0069	2892	12.03	4.485	11.87	3.103
B-28	BASE	1hr_calibrate	0.77	5.769	5.800	0.0065	114	0.65	2.817	0.67	2.703
B-28	BASE	25yr-72hr	60.30	7.215	5.800	0.0049	4139	60.02	5.057	59.71	3.060
B-28	BASE	5yr-24hr	12.26	6.299	5.800	0.0050	1576	12.03	3.571	11.95	3.038
B-3	BASE	100yr-72hr	60.65	5.282	3.960	0.0054	12579	60.02	3.851	61.91	1.530
B-3	BASE	10yr-24hr	12.43	4.627	3.960	-0.0085	6677	12.03	2.927	12.81	1.706
B-3	BASE	1hr_calibrate	0.86	4.151	3.960	-0.0086	2391	0.65	1.838	0.59	1.674
B-3	BASE	25yr-72hr	60.61	5.133	3.960	0.0054	11856	60.02	3.300	61.58	1.476
B-3	BASE	5yr-24hr	12.35	4.399	3.960	-0.0065	4332	12.03	2.331	11.87	1.647
B-4	BASE	100yr-72hr	60.76	5.479	3.120	0.0048	15439	60.02	4.410	62.63	2.070
B-4	BASE	10yr-24hr	12.56	4.879	3.120	0.0025	11275	12.03	3.352	13.23	2.645
B-4	BASE	1hr_calibrate	0.92	4.380	3.120	0.0030	4936	0.65	2.105	1.20	2.131
B-4	BASE	25yr-72hr	60.70	5.324	3.120	0.0048	14650	60.02	3.780	62.22	2.011
B-4	BASE	5yr-24hr	12.45	4.650	3.120	0.0025	8030	12.03	2.669	12.94	2.328
B-5	BASE	100yr-72hr	60.78	5.508	3.690	0.0046	16423	60.02	5.963	62.76	2.269
B-5	BASE	10yr-24hr	12.59	4.933	3.690	-0.0054	12690	12.03	4.532	13.31	2.948
B-5	BASE	1hr_calibrate	0.94	4.429	3.690	-0.0072	6088	0.65	2.846	1.27	2.543
B-5	BASE	25yr-72hr	60.72	5.350	3.690	0.0046	15549	60.02	5.110	62.35	2.209
B-5	BASE	5yr-24hr	12.49	4.703	3.690	-0.0060	9549	12.03	3.609	13.02	2.722
B-6	BASE	100yr-72hr	60.65	5.705	4.870	0.0037	2437	60.02	2.174	59.74	1.459
B-6	BASE	10yr-24hr	12.44	5.176	4.870	0.0033	1142	12.03	1.652	12.00	1.534
B-6	BASE	1hr_calibrate	0.86	4.626	4.870	0.0037	113	0.65	1.038	0.67	0.979
B-6	BASE	25yr-72hr	60.60	5.542	4.870	0.0037	2037	60.02	1.863	59.78	1.377
B-6	BASE	5yr-24hr	12.35	4.924	4.870	0.0033	354	12.03	1.316	12.05	1.257
B-7	BASE	100yr-72hr	60.68	5.699	5.220	0.0038	3469	60.02	1.491	59.93	0.814
B-7	BASE	10yr-24hr	12.47	5.166	5.220	0.0038	1058	12.03	1.133	12.09	0.736
B-7	BASE	1hr_calibrate	0.87	4.617	5.220	0.0037	605	0.65	0.712	0.89	0.497

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Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
B-7	BASE	25yr-72hr	60.62	5.536	5.220	0.0038	2665	60.02	1.278	60.00	0.760
B-7	BASE	5yr-24hr	12.37	4.914	5.220	0.0032	850	12.03	0.902	12.13	0.597
B-8	BASE	100yr-72hr	60.68	5.791	4.900	0.0035	3873	60.02	2.360	59.72	1.484
B-8	BASE	10yr-24hr	12.48	5.291	4.900	0.0035	2073	12.03	1.794	11.96	1.558
B-8	BASE	1hr_calibrate	0.85	4.726	4.900	0.0039	114	0.65	1.127	0.66	1.059
B-8	BASE	25yr-72hr	60.62	5.624	4.900	0.0035	3272	60.02	2.023	59.76	1.414
B-8	BASE	5yr-24hr	12.37	5.032	4.900	0.0035	1141	12.03	1.428	12.06	1.366
B-9	BASE	100yr-72hr	60.72	5.789	4.860	0.0035	5914	60.02	2.298	59.71	1.391
B-9	BASE	10yr-24hr	12.51	5.291	4.860	-0.0048	3209	12.03	1.747	11.95	1.475
B-9	BASE	1hr_calibrate	0.85	4.729	4.860	0.0039	114	0.65	1.097	0.66	1.029
B-9	BASE	25yr-72hr	60.65	5.623	4.860	0.0035	5012	60.02	1.970	59.75	1.332
B-9	BASE	5yr-24hr	12.39	5.034	4.860	0.0035	1814	12.03	1.391	12.05	1.332
J-1	BASE	100yr-72hr	60.27	4.337	5.800	0.0091	214	60.27	46.750	60.27	46.750
J-1	BASE	10yr-24hr	12.29	3.293	5.800	0.0077	214	12.29	53.104	12.29	53.103
J-1	BASE	1hr_calibrate	0.82	3.107	5.800	0.0074	214	0.82	45.433	0.82	45.433
J-1	BASE	25yr-72hr	60.26	4.279	5.800	0.0091	214	60.26	44.124	60.26	44.124
J-1	BASE	5yr-24hr	12.25	3.201	5.800	0.0077	214	12.25	49.446	12.25	49.446
J-10	BASE	100yr-72hr	60.38	5.747	5.860	-0.0083	133	60.53	11.719	60.54	11.725
J-10	BASE	10yr-24hr	12.32	5.094	5.860	-0.0088	133	12.66	12.187	12.71	12.224
J-10	BASE	1hr_calibrate	0.82	4.485	5.860	0.0072	133	0.92	10.659	1.32	11.125
J-10	BASE	25yr-72hr	60.33	5.553	5.860	0.0082	133	60.44	11.184	60.46	11.188
J-10	BASE	5yr-24hr	12.29	4.790	5.860	-0.0089	133	12.51	11.467	12.52	11.507
J-11	BASE	100yr-72hr	60.43	5.847	5.950	0.0051	133	62.81	5.573	61.93	5.122
J-11	BASE	10yr-24hr	12.34	5.210	5.950	0.0076	133	13.20	7.015	13.67	7.026
J-11	BASE	1hr_calibrate	0.83	4.586	5.950	0.0040	134	1.33	5.824	1.34	6.116
J-11	BASE	25yr-72hr	60.36	5.643	5.950	0.0051	133	62.33	5.432	62.41	4.984
J-11	BASE	5yr-24hr	12.30	4.898	5.950	0.0028	133	13.25	6.485	13.25	6.664
J-12	BASE	100yr-72hr	60.59	6.101	4.650	0.0047	131	62.43	4.836	62.47	4.861
J-12	BASE	10yr-24hr	12.47	5.486	4.650	-0.0053	131	13.69	6.569	13.69	6.674
J-12	BASE	1hr_calibrate	0.89	4.843	4.650	0.0035	131	1.31	5.313	1.34	5.522
J-12	BASE	25yr-72hr	60.56	5.877	4.650	0.0047	131	62.27	4.639	62.33	4.682
J-12	BASE	5yr-24hr	12.39	5.169	4.650	0.0048	131	13.25	6.074	13.26	6.232
J-13	BASE	100yr-72hr	60.26	6.539	10.080	0.0058	146	60.09	7.246	60.11	7.203
J-13	BASE	10yr-24hr	12.33	5.840	10.080	0.0038	150	12.33	6.863	12.37	6.868
J-13	BASE	1hr_calibrate	0.82	5.029	10.080	0.0047	164	0.78	5.871	0.81	5.860
J-13	BASE	25yr-72hr	60.25	6.279	10.080	0.0058	146	60.11	6.858	60.14	6.832
J-13	BASE	5yr-24hr	12.29	5.433	10.080	0.0037	153	12.28	6.374	12.32	6.375
J-14	BASE	100yr-72hr	60.42	7.161	6.500	0.0047	131	60.69	6.166	60.70	6.189
J-14	BASE	10yr-24hr	12.39	6.431	6.500	0.0044	131	12.63	6.067	12.65	6.106
J-14	BASE	1hr_calibrate	0.83	5.460	6.500	-0.0049	131	0.85	4.998	0.88	5.016
J-14	BASE	25yr-72hr	60.35	6.856	6.500	0.0047	131	60.53	5.874	60.61	5.892
J-14	BASE	5yr-24hr	12.33	5.949	6.500	0.0042	131	12.45	5.554	12.47	5.586

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J-2	BASE	100yr-72hr	60.27	4.812	5.000	0.0081	171	60.26	46.752	60.27	46.750
J-2	BASE	10yr-24hr	12.29	3.906	5.000	0.0097	171	12.28	53.105	12.29	53.104
J-2	BASE	1hr_calibrate	0.82	3.556	5.000	0.0089	171	0.82	45.433	0.82	45.433
J-2	BASE	25yr-72hr	60.26	4.702	5.000	0.0081	171	60.26	44.126	60.26	44.124
J-2	BASE	5yr-24hr	12.25	3.732	5.000	0.0100	171	12.25	49.446	12.25	49.446
J-3	BASE	100yr-72hr	60.54	5.228	4.200	-0.0090	137	61.13	17.360	61.13	17.372
J-3	BASE	10yr-24hr	12.36	4.499	4.200	0.0099	137	12.84	21.340	12.83	21.372
J-3	BASE	1hr_calibrate	0.84	4.039	4.200	-0.0099	137	1.01	18.746	1.35	19.881
J-3	BASE	25yr-72hr	60.49	5.083	4.200	-0.0088	137	60.98	16.604	60.98	16.616
J-3	BASE	5yr-24hr	12.32	4.276	4.200	-0.0098	137	12.63	20.067	12.62	20.101
J-4	BASE	100yr-72hr	60.65	5.453	4.600	0.0071	160	61.36	13.798	61.36	13.814
J-4	BASE	10yr-24hr	12.45	4.823	4.600	0.0026	160	12.91	16.700	12.92	16.741
J-4	BASE	1hr_calibrate	0.87	4.327	4.600	0.0032	160	1.09	14.980	1.09	15.048
J-4	BASE	25yr-72hr	60.61	5.300	4.600	0.0071	160	61.07	13.128	61.07	13.143
J-4	BASE	5yr-24hr	12.37	4.592	4.600	0.0026	160	12.87	15.801	12.87	15.896
J-5	BASE	100yr-72hr	60.63	5.693	5.300	-0.0097	147	60.07	11.141	60.08	11.086
J-5	BASE	10yr-24hr	12.48	5.149	5.300	0.0043	147	12.69	12.855	12.71	12.874
J-5	BASE	1hr_calibrate	0.87	4.602	5.300	0.0065	147	0.83	11.696	0.85	11.686
J-5	BASE	25yr-72hr	60.62	5.529	5.300	-0.0099	147	60.08	10.887	60.08	10.838
J-5	BASE	5yr-24hr	12.38	4.898	5.300	0.0042	147	12.44	12.322	12.45	12.331
J-6	BASE	100yr-72hr	60.69	5.775	5.200	0.0096	138	60.63	10.304	60.91	10.144
J-6	BASE	10yr-24hr	12.50	5.258	5.200	0.0037	138	12.76	11.843	12.76	11.865
J-6	BASE	1hr_calibrate	0.87	4.693	5.200	0.0038	138	0.90	10.462	0.91	10.476
J-6	BASE	25yr-72hr	60.63	5.608	5.200	-0.0099	138	60.52	9.898	60.74	9.828
J-6	BASE	5yr-24hr	12.39	4.998	5.200	0.0034	138	12.27	11.217	12.53	11.214
J-7	BASE	100yr-72hr	60.71	5.904	4.400	-0.0065	137	60.79	9.038	60.63	9.145
J-7	BASE	10yr-24hr	12.54	5.417	4.400	0.0085	137	12.73	10.272	12.74	10.292
J-7	BASE	1hr_calibrate	0.89	4.820	4.400	0.0086	137	0.99	9.219	1.00	9.264
J-7	BASE	25yr-72hr	60.63	5.730	4.400	0.0059	137	60.67	8.740	60.52	8.767
J-7	BASE	5yr-24hr	12.41	5.142	4.400	0.0075	137	12.67	9.804	12.67	9.853
J-8	BASE	100yr-72hr	60.51	5.460	4.860	-0.0100	132	61.81	5.156	62.05	6.861
J-8	BASE	10yr-24hr	12.35	4.785	4.860	0.0100	132	13.27	6.495	13.22	7.896
J-8	BASE	1hr_calibrate	0.83	4.253	4.860	-0.0099	132	1.21	5.634	0.46	8.189
J-8	BASE	25yr-72hr	60.47	5.294	4.860	0.0100	132	61.62	4.937	61.82	6.110
J-8	BASE	5yr-24hr	12.30	4.524	4.860	-0.0100	132	12.98	6.133	12.87	8.248
J-9	BASE	100yr-72hr	60.66	5.597	4.000	0.0060	130	62.53	4.472	62.30	4.544
J-9	BASE	10yr-24hr	12.50	4.999	4.000	-0.0058	130	13.22	5.941	13.25	6.015
J-9	BASE	1hr_calibrate	0.90	4.460	4.000	-0.0084	130	1.19	5.007	1.21	5.123
J-9	BASE	25yr-72hr	60.62	5.420	4.000	0.0060	130	62.23	4.328	61.85	4.377
J-9	BASE	5yr-24hr	12.40	4.743	4.000	-0.0072	130	12.93	5.466	12.93	5.573
WATERWAY	BASE	100yr-72hr	0.00	3.800	2.600	1.2000	56	60.27	46.750	0.00	0.000
WATERWAY	BASE	10yr-24hr	0.00	2.600	2.600	0.0000	56	12.29	53.103	0.00	0.000
WATERWAY	BASE	1hr_calibrate	0.00	2.600	2.600	0.0000	56	0.82	45.433	0.00	0.000

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Mary Brickell Village Drainage Improvements
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                                                         Max Time       Max   Warning Max Delta  Max Surf  Max Time        Max  Max Time        Max
              Name          Group      Simulation           Stage     Stage     Stage     Stage      Area    Inflow     Inflow   Outflow    Outflow
                                                              hrs        ft        ft        ft       ft2       hrs        cfs       hrs        cfs
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          WATERWAY           BASE      25yr-72hr             0.00     3.800     2.600    1.2000        56     60.26     44.124      0.00      0.000
          WATERWAY           BASE       5yr-24hr             0.00     2.600     2.600    0.0000        56     12.25     49.446      0.00      0.000
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Mary Brickell Village Drainage Improvements
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Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
B1-J2	BASE	100yr-72hr	60.82	38.658	8.122	60.50	5.171	60.27	4.812
B1-J2	BASE	10yr-24hr	12.53	44.565	9.656	12.34	4.419	12.29	3.906
B1-J2	BASE	1hr_calibrate	0.87	39.454	9.398	0.83	3.969	0.82	3.556
B1-J2	BASE	25yr-72hr	60.75	36.784	8.126	60.45	5.032	60.26	4.702
B1-J2	BASE	5yr-24hr	12.39	42.134	-11.522	12.30	4.199	12.25	3.732
B10-J7	BASE	100yr-72hr	62.66	2.518	0.551	60.85	5.920	60.71	5.904
B10-J7	BASE	10yr-24hr	13.55	3.545	1.103	12.65	5.449	12.54	5.417
B10-J7	BASE	1hr_calibrate	1.26	2.893	-1.077	0.95	4.856	0.89	4.820
B10-J7	BASE	25yr-72hr	62.22	2.392	0.389	60.75	5.747	60.63	5.730
B10-J7	BASE	5yr-24hr	13.14	3.286	1.103	12.52	5.178	12.41	5.142
B11-J7	BASE	100yr-72hr	62.66	2.450	0.445	60.85	5.935	60.71	5.904
B11-J7	BASE	10yr-24hr	13.44	3.366	-0.256	12.66	5.474	12.54	5.417
B11-J7	BASE	1hr_calibrate	1.28	2.889	-0.343	0.96	4.886	0.89	4.820
B11-J7	BASE	25yr-72hr	62.13	2.316	0.366	60.75	5.762	60.63	5.730
B11-J7	BASE	5yr-24hr	13.13	3.133	-0.427	12.53	5.207	12.41	5.142
B12-J7	BASE	100yr-72hr	60.12	9.983	2.789	60.60	6.046	60.71	5.904
B12-J7	BASE	10yr-24hr	12.11	9.364	0.540	12.49	5.572	12.54	5.417
B12-J7	BASE	1hr_calibrate	0.74	7.621	0.610	0.87	4.934	0.89	4.820
B12-J7	BASE	25yr-72hr	60.10	9.486	2.080	60.56	5.857	60.63	5.730
B12-J7	BASE	5yr-24hr	12.15	8.638	0.897	12.38	5.279	12.41	5.142
B13-B12	BASE	100yr-72hr	60.05	8.053	0.966	60.44	6.287	60.60	6.046
B13-B12	BASE	10yr-24hr	12.05	7.754	0.328	12.39	5.799	12.49	5.572
B13-B12	BASE	1hr_calibrate	0.68	6.263	-0.385	0.83	5.084	0.87	4.934
B13-B12	BASE	25yr-72hr	60.03	7.806	0.966	60.35	6.075	60.56	5.857
B13-B12	BASE	5yr-24hr	12.06	7.273	-0.855	12.32	5.469	12.38	5.279
B14-B13	BASE	100yr-72hr	60.12	7.143	0.428	60.30	6.690	60.44	6.287
B14-B13	BASE	10yr-24hr	12.05	6.890	-0.311	12.33	6.161	12.39	5.799
B14-B13	BASE	1hr_calibrate	0.68	5.756	0.237	0.78	5.330	0.83	5.084
B14-B13	BASE	25yr-72hr	60.10	6.879	0.428	60.25	6.448	60.35	6.075
B14-B13	BASE	5yr-24hr	12.05	6.601	-0.417	12.23	5.776	12.32	5.469
B15-B14	BASE	100yr-72hr	59.70	1.931	0.046	60.38	6.808	60.30	6.690
B15-B14	BASE	10yr-24hr	11.90	1.945	-0.113	12.35	6.296	12.33	6.161
B15-B14	BASE	1hr_calibrate	0.68	1.570	-0.153	0.76	5.440	0.78	5.330
B15-B14	BASE	25yr-72hr	59.73	1.895	0.046	60.30	6.568	60.25	6.448
B15-B14	BASE	5yr-24hr	11.99	1.885	-0.240	12.20	5.915	12.23	5.776
B16-B14	BASE	100yr-72hr	60.18	3.530	0.020	60.22	7.754	60.30	6.690
B16-B14	BASE	10yr-24hr	12.23	3.048	0.051	12.29	6.954	12.33	6.161
B16-B14	BASE	1hr_calibrate	0.75	2.397	-0.054	0.77	5.826	0.78	5.330
B16-B14	BASE	25yr-72hr	60.16	3.272	0.020	60.19	7.367	60.25	6.448
B16-B14	BASE	5yr-24hr	12.19	2.709	0.060	12.20	6.411	12.23	5.776
B17-B16	BASE	100yr-72hr	60.19	1.672	0.021	60.22	7.916	60.22	7.754
B17-B16	BASE	10yr-24hr	12.24	1.444	0.273	12.29	7.074	12.29	6.954
B17-B16	BASE	1hr_calibrate	0.76	1.134	0.277	0.77	5.900	0.77	5.826

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Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
B17-B16	BASE	25yr-72hr	60.17	1.550	0.021	60.19	7.506	60.19	7.367
B17-B16	BASE	5yr-24hr	12.20	1.282	0.277	12.20	6.506	12.20	6.411
B18-B1	BASE	100yr-72hr	60.51	19.269	4.049	60.51	5.453	60.50	5.171
B18-B1	BASE	10yr-24hr	12.36	21.626	5.510	12.34	4.774	12.34	4.419
B18-B1	BASE	1hr_calibrate	0.81	19.040	5.087	0.84	4.243	0.83	3.969
B18-B1	BASE	25yr-72hr	60.38	18.328	-4.023	60.44	5.286	60.45	5.032
B18-B1	BASE	5yr-24hr	12.28	20.336	5.444	12.30	4.513	12.30	4.199
B19-J8	BASE	100yr-72hr	59.67	1.167	0.609	60.53	5.504	60.51	5.460
B19-J8	BASE	10yr-24hr	11.94	1.498	0.591	12.33	4.871	12.35	4.785
B19-J8	BASE	1hr_calibrate	0.70	1.146	0.608	0.81	4.307	0.83	4.253
B19-J8	BASE	25yr-72hr	59.69	1.157	0.599	60.45	5.334	60.47	5.294
B19-J8	BASE	5yr-24hr	12.01	1.428	0.621	12.25	4.591	12.30	4.524
B2-J3	BASE	100yr-72hr	60.31	3.248	0.599	60.41	5.732	60.54	5.228
B2-J3	BASE	10yr-24hr	12.44	3.316	0.395	12.38	5.038	12.36	4.499
B2-J3	BASE	1hr_calibrate	0.87	2.753	0.625	0.85	4.412	0.84	4.039
B2-J3	BASE	25yr-72hr	60.28	2.967	0.594	60.37	5.505	60.49	5.083
B2-J3	BASE	5yr-24hr	12.36	3.033	0.394	12.33	4.728	12.32	4.276
B20-J9	BASE	100yr-72hr	62.05	2.271	-1.117	60.69	5.618	60.66	5.597
B20-J9	BASE	10yr-24hr	13.22	2.906	0.937	12.54	5.037	12.50	4.999
B20-J9	BASE	1hr_calibrate	1.31	2.816	-1.112	0.91	4.493	0.90	4.460
B20-J9	BASE	25yr-72hr	61.82	2.165	-1.117	60.64	5.440	60.62	5.420
B20-J9	BASE	5yr-24hr	12.87	2.649	0.879	12.43	4.780	12.40	4.743
B21-J9	BASE	100yr-72hr	62.69	2.255	-0.860	60.68	5.624	60.66	5.597
B21-J9	BASE	10yr-24hr	13.27	3.051	1.275	12.54	5.044	12.50	4.999
B21-J9	BASE	1hr_calibrate	1.20	2.585	-1.386	0.92	4.499	0.90	4.460
B21-J9	BASE	25yr-72hr	62.28	2.195	-0.860	60.64	5.445	60.62	5.420
B21-J9	BASE	5yr-24hr	12.96	2.844	1.083	12.44	4.786	12.40	4.743
B22-B18	BASE	100yr-72hr	60.06	16.944	4.639	60.37	5.679	60.51	5.453
B22-B18	BASE	10yr-24hr	12.08	15.811	2.859	12.32	5.024	12.34	4.774
B22-B18	BASE	1hr_calibrate	1.32	14.012	2.829	0.82	4.429	0.84	4.243
B22-B18	BASE	25yr-72hr	60.05	15.822	4.640	60.32	5.491	60.44	5.286
B22-B18	BASE	5yr-24hr	12.08	14.439	2.712	12.28	4.727	12.30	4.513
B23-J11	BASE	100yr-72hr	59.91	1.782	0.601	60.33	5.873	60.43	5.847
B23-J11	BASE	10yr-24hr	12.07	1.604	0.744	12.32	5.240	12.34	5.210
B23-J11	BASE	1hr_calibrate	0.67	1.044	-0.023	0.83	4.595	0.83	4.586
B23-J11	BASE	25yr-72hr	59.95	1.657	0.606	60.29	5.666	60.36	5.643
B23-J11	BASE	5yr-24hr	12.07	1.299	-0.242	12.29	4.919	12.30	4.898
B24-J12	BASE	100yr-72hr	61.93	1.981	0.109	60.67	6.213	60.59	6.101
B24-J12	BASE	10yr-24hr	13.66	2.627	-0.818	12.57	5.635	12.47	5.486
B24-J12	BASE	1hr_calibrate	1.21	2.160	-0.652	0.93	4.979	0.89	4.843
B24-J12	BASE	25yr-72hr	61.66	1.890	0.109	60.62	5.982	60.56	5.877
B24-J12	BASE	5yr-24hr	13.23	2.367	-0.816	12.48	5.310	12.39	5.169

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Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
B25-J12	BASE	100yr-72hr	62.74	2.889	0.104	60.69	6.426	60.59	6.101
B25-J12	BASE	10yr-24hr	13.81	4.912	-0.380	12.62	5.863	12.47	5.486
B25-J12	BASE	1hr_calibrate	1.41	4.608	-0.092	0.97	5.149	0.89	4.843
B25-J12	BASE	25yr-72hr	62.33	2.780	0.104	60.64	6.177	60.56	5.877
B25-J12	BASE	5yr-24hr	13.36	4.719	-0.381	12.54	5.518	12.39	5.169
B26-J13	BASE	100yr-72hr	60.03	2.141	-0.419	60.09	6.746	60.26	6.539
B26-J13	BASE	10yr-24hr	12.05	1.697	-0.136	12.05	5.926	12.33	5.840
B26-J13	BASE	1hr_calibrate	0.65	1.065	0.008	0.66	5.719	0.65	4.756
B26-J13	BASE	25yr-72hr	60.03	1.828	-0.384	60.10	6.414	60.25	6.279
B26-J13	BASE	5yr-24hr	12.05	1.351	-0.003	12.05	5.815	12.29	5.433
B27-J14	BASE	100yr-72hr	61.22	3.867	-0.086	60.55	7.705	60.42	7.161
B27-J14	BASE	10yr-24hr	13.01	4.545	-0.699	12.51	6.938	12.39	6.431
B27-J14	BASE	1hr_calibrate	1.16	3.793	-0.716	0.91	5.843	0.83	5.460
B27-J14	BASE	25yr-72hr	61.41	3.751	-0.069	60.49	7.355	60.35	6.856
B27-J14	BASE	5yr-24hr	12.84	4.204	-0.723	12.43	6.379	12.33	5.949
B28-J14	BASE	100yr-72hr	59.68	3.127	-0.063	60.37	7.542	60.42	7.161
B28-J14	BASE	10yr-24hr	11.87	3.103	-0.333	12.36	6.817	12.39	6.431
B28-J14	BASE	1hr_calibrate	0.67	2.703	-0.394	0.77	5.769	0.83	5.460
B28-J14	BASE	25yr-72hr	59.71	3.060	-0.063	60.30	7.215	60.35	6.856
B28-J14	BASE	5yr-24hr	11.95	3.038	-0.345	12.26	6.299	12.33	5.949
B3-J3	BASE	100yr-72hr	61.91	1.530	0.542	60.65	5.282	60.54	5.228
B3-J3	BASE	10yr-24hr	12.81	1.706	0.570	12.43	4.627	12.36	4.499
B3-J3	BASE	1hr_calibrate	0.59	1.674	0.554	0.86	4.151	0.84	4.039
B3-J3	BASE	25yr-72hr	61.58	1.476	0.537	60.61	5.133	60.49	5.083
B3-J3	BASE	5yr-24hr	11.87	1.647	0.576	12.35	4.399	12.32	4.276
B4-J4	BASE	100yr-72hr	62.63	2.070	0.418	60.76	5.479	60.65	5.453
B4-J4	BASE	10yr-24hr	13.23	2.645	0.281	12.56	4.879	12.45	4.823
B4-J4	BASE	1hr_calibrate	1.20	2.131	-0.346	0.92	4.380	0.87	4.327
B4-J4	BASE	25yr-72hr	62.22	2.011	0.417	60.70	5.324	60.61	5.300
B4-J4	BASE	5yr-24hr	12.94	2.328	-0.325	12.45	4.650	12.37	4.592
B5-J4	BASE	100yr-72hr	62.76	2.269	0.377	60.78	5.508	60.65	5.453
B5-J4	BASE	10yr-24hr	13.31	2.948	0.382	12.59	4.933	12.45	4.823
B5-J4	BASE	1hr_calibrate	1.27	2.543	-0.448	0.94	4.429	0.87	4.327
B5-J4	BASE	25yr-72hr	62.35	2.209	0.377	60.72	5.350	60.61	5.300
B5-J4	BASE	5yr-24hr	13.02	2.722	-0.483	12.49	4.703	12.37	4.592
B6-J5	BASE	100yr-72hr	59.74	1.459	0.603	60.65	5.705	60.63	5.693
B6-J5	BASE	10yr-24hr	12.00	1.534	0.145	12.44	5.176	12.48	5.149
B6-J5	BASE	1hr_calibrate	0.67	0.979	0.324	0.86	4.626	0.87	4.602
B6-J5	BASE	25yr-72hr	59.78	1.377	0.599	60.60	5.542	60.62	5.529
B6-J5	BASE	5yr-24hr	12.05	1.257	-0.392	12.35	4.924	12.38	4.898
B7-J5	BASE	100yr-72hr	59.93	0.814	0.482	60.68	5.699	60.63	5.693
B7-J5	BASE	10yr-24hr	12.09	0.736	0.156	12.47	5.166	12.48	5.149
B7-J5	BASE	1hr_calibrate	0.89	0.497	-0.345	0.87	4.617	0.87	4.602

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Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
B7-J5	BASE	25yr-72hr	60.00	0.760	0.483	60.62	5.536	60.62	5.529
B7-J5	BASE	5yr-24hr	12.13	0.597	-0.237	12.37	4.914	12.38	4.898
B8-J6	BASE	100yr-72hr	59.72	1.484	0.612	60.68	5.791	60.69	5.775
B8-J6	BASE	10yr-24hr	11.96	1.558	0.156	12.48	5.291	12.50	5.258
B8-J6	BASE	1hr_calibrate	0.66	1.059	0.168	0.85	4.726	0.87	4.693
B8-J6	BASE	25yr-72hr	59.76	1.414	0.605	60.62	5.624	60.63	5.608
B8-J6	BASE	5yr-24hr	12.06	1.366	0.189	12.37	5.032	12.39	4.998
B9-J6	BASE	100yr-72hr	59.71	1.391	0.563	60.72	5.789	60.69	5.775
B9-J6	BASE	10yr-24hr	11.95	1.475	0.144	12.51	5.291	12.50	5.258
B9-J6	BASE	1hr_calibrate	0.66	1.029	0.156	0.85	4.729	0.87	4.693
B9-J6	BASE	25yr-72hr	59.75	1.332	0.563	60.65	5.623	60.63	5.608
B9-J6	BASE	5yr-24hr	12.05	1.332	0.175	12.39	5.034	12.39	4.998
J1-WW	BASE	100yr-72hr	60.27	46.750	-69.873	60.27	4.337	0.00	3.800
J1-WW	BASE	10yr-24hr	12.29	53.103	7.754	12.29	3.293	0.00	2.600
J1-WW	BASE	1hr_calibrate	0.82	45.433	7.575	0.82	3.107	0.00	2.600
J1-WW	BASE	25yr-72hr	60.26	44.124	-69.873	60.26	4.279	0.00	3.800
J1-WW	BASE	5yr-24hr	12.25	49.446	7.755	12.25	3.201	0.00	2.600
J10-B22	BASE	100yr-72hr	60.54	11.725	7.706	60.38	5.747	60.37	5.679
J10-B22	BASE	10yr-24hr	12.71	12.224	4.995	12.32	5.094	12.32	5.024
J10-B22	BASE	1hr_calibrate	1.32	11.125	3.877	0.82	4.485	0.82	4.429
J10-B22	BASE	25yr-72hr	60.46	11.188	7.740	60.33	5.553	60.32	5.491
J10-B22	BASE	5yr-24hr	12.52	11.507	3.300	12.29	4.790	12.28	4.727
J11-J10	BASE	100yr-72hr	61.93	5.122	2.054	60.43	5.847	60.38	5.747
J11-J10	BASE	10yr-24hr	13.67	7.026	-2.169	12.34	5.210	12.32	5.094
J11-J10	BASE	1hr_calibrate	1.34	6.116	1.166	0.83	4.586	0.82	4.485
J11-J10	BASE	25yr-72hr	62.41	4.984	2.055	60.36	5.643	60.33	5.553
J11-J10	BASE	5yr-24hr	13.25	6.664	0.573	12.30	4.898	12.29	4.790
J12-J11	BASE	100yr-72hr	62.47	4.861	-0.354	60.59	6.101	60.43	5.847
J12-J11	BASE	10yr-24hr	13.69	6.674	0.793	12.47	5.486	12.34	5.210
J12-J11	BASE	1hr_calibrate	1.34	5.522	0.820	0.89	4.843	0.83	4.586
J12-J11	BASE	25yr-72hr	62.33	4.682	-0.354	60.56	5.877	60.36	5.643
J12-J11	BASE	5yr-24hr	13.26	6.232	0.759	12.39	5.169	12.30	4.898
J13-J10	BASE	100yr-72hr	60.11	7.203	0.749	60.26	6.539	60.38	5.747
J13-J10	BASE	10yr-24hr	12.37	6.868	-1.059	12.33	5.840	12.32	5.094
J13-J10	BASE	1hr_calibrate	0.81	5.860	0.614	0.82	5.029	0.82	4.485
J13-J10	BASE	25yr-72hr	60.14	6.832	0.752	60.25	6.279	60.33	5.553
J13-J10	BASE	5yr-24hr	12.32	6.375	0.389	12.29	5.433	12.29	4.790
J14-J13	BASE	100yr-72hr	60.70	6.189	-0.296	60.42	7.161	60.26	6.539
J14-J13	BASE	10yr-24hr	12.65	6.106	-0.275	12.39	6.431	12.33	5.840
J14-J13	BASE	1hr_calibrate	0.88	5.016	-0.308	0.83	5.460	0.82	5.029
J14-J13	BASE	25yr-72hr	60.61	5.892	-0.296	60.35	6.856	60.25	6.279
J14-J13	BASE	5yr-24hr	12.47	5.586	-0.286	12.33	5.949	12.29	5.433

Mary Brickell Village Drainage Improvements
Link Maximum Comparison Report
Pre Mitigation Condition

Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
J2-J1	BASE	100yr-72hr	60.27	46.750	-9.877	60.27	4.812	60.27	4.337
J2-J1	BASE	10yr-24hr	12.29	53.104	12.299	12.29	3.906	12.29	3.293
J2-J1	BASE	1hr_calibrate	0.82	45.433	12.046	0.82	3.556	0.82	3.107
J2-J1	BASE	25yr-72hr	60.26	44.124	-9.877	60.26	4.702	60.26	4.279
J2-J1	BASE	5yr-24hr	12.25	49.446	12.297	12.25	3.732	12.25	3.201
J3-B1	BASE	100yr-72hr	61.13	17.372	8.605	60.54	5.228	60.50	5.171
J3-B1	BASE	10yr-24hr	12.83	21.372	14.822	12.36	4.499	12.34	4.419
J3-B1	BASE	1hr_calibrate	1.35	19.881	-15.855	0.84	4.039	0.83	3.969
J3-B1	BASE	25yr-72hr	60.98	16.616	8.496	60.49	5.083	60.45	5.032
J3-B1	BASE	5yr-24hr	12.62	20.101	13.787	12.32	4.276	12.30	4.199
J4-J3	BASE	100yr-72hr	61.36	13.814	4.064	60.65	5.453	60.54	5.228
J4-J3	BASE	10yr-24hr	12.92	16.741	2.984	12.45	4.823	12.36	4.499
J4-J3	BASE	1hr_calibrate	1.09	15.048	2.934	0.87	4.327	0.84	4.039
J4-J3	BASE	25yr-72hr	61.07	13.143	4.001	60.61	5.300	60.49	5.083
J4-J3	BASE	5yr-24hr	12.87	15.896	-3.835	12.37	4.592	12.32	4.276
J5-J4	BASE	100yr-72hr	60.08	11.086	2.869	60.63	5.693	60.65	5.453
J5-J4	BASE	10yr-24hr	12.71	12.874	1.424	12.48	5.149	12.45	4.823
J5-J4	BASE	1hr_calibrate	0.85	11.686	1.688	0.87	4.602	0.87	4.327
J5-J4	BASE	25yr-72hr	60.08	10.838	2.866	60.62	5.529	60.61	5.300
J5-J4	BASE	5yr-24hr	12.45	12.331	1.512	12.38	4.898	12.37	4.592
J6-J5	BASE	100yr-72hr	60.91	10.144	6.090	60.69	5.775	60.63	5.693
J6-J5	BASE	10yr-24hr	12.76	11.865	1.901	12.50	5.258	12.48	5.149
J6-J5	BASE	1hr_calibrate	0.91	10.476	0.884	0.87	4.693	0.87	4.602
J6-J5	BASE	25yr-72hr	60.74	9.828	4.164	60.63	5.608	60.62	5.529
J6-J5	BASE	5yr-24hr	12.53	11.214	1.903	12.39	4.998	12.38	4.898
J7-J6	BASE	100yr-72hr	60.63	9.145	3.133	60.71	5.904	60.69	5.775
J7-J6	BASE	10yr-24hr	12.74	10.292	1.440	12.54	5.417	12.50	5.258
J7-J6	BASE	1hr_calibrate	1.00	9.264	1.511	0.89	4.820	0.87	4.693
J7-J6	BASE	25yr-72hr	60.52	8.767	4.385	60.63	5.730	60.63	5.608
J7-J6	BASE	5yr-24hr	12.67	9.853	1.573	12.41	5.142	12.39	4.998
J8-B18	BASE	100yr-72hr	62.05	6.861	-7.968	60.51	5.460	60.51	5.453
J8-B18	BASE	10yr-24hr	13.22	7.896	7.935	12.35	4.785	12.34	4.774
J8-B18	BASE	1hr_calibrate	0.46	8.189	6.108	0.83	4.253	0.84	4.243
J8-B18	BASE	25yr-72hr	61.82	6.110	-7.968	60.47	5.294	60.44	5.286
J8-B18	BASE	5yr-24hr	12.87	8.248	8.183	12.30	4.524	12.30	4.513
J9-J8	BASE	100yr-72hr	62.30	4.544	1.306	60.66	5.597	60.51	5.460
J9-J8	BASE	10yr-24hr	13.25	6.015	-1.305	12.50	4.999	12.35	4.785
J9-J8	BASE	1hr_calibrate	1.21	5.123	-0.877	0.90	4.460	0.83	4.253
J9-J8	BASE	25yr-72hr	61.85	4.377	1.303	60.62	5.420	60.47	5.294
J9-J8	BASE	5yr-24hr	12.93	5.573	1.172	12.40	4.743	12.30	4.524

APPENDIX G – ICPR POST-DEVELOPMENT MODEL

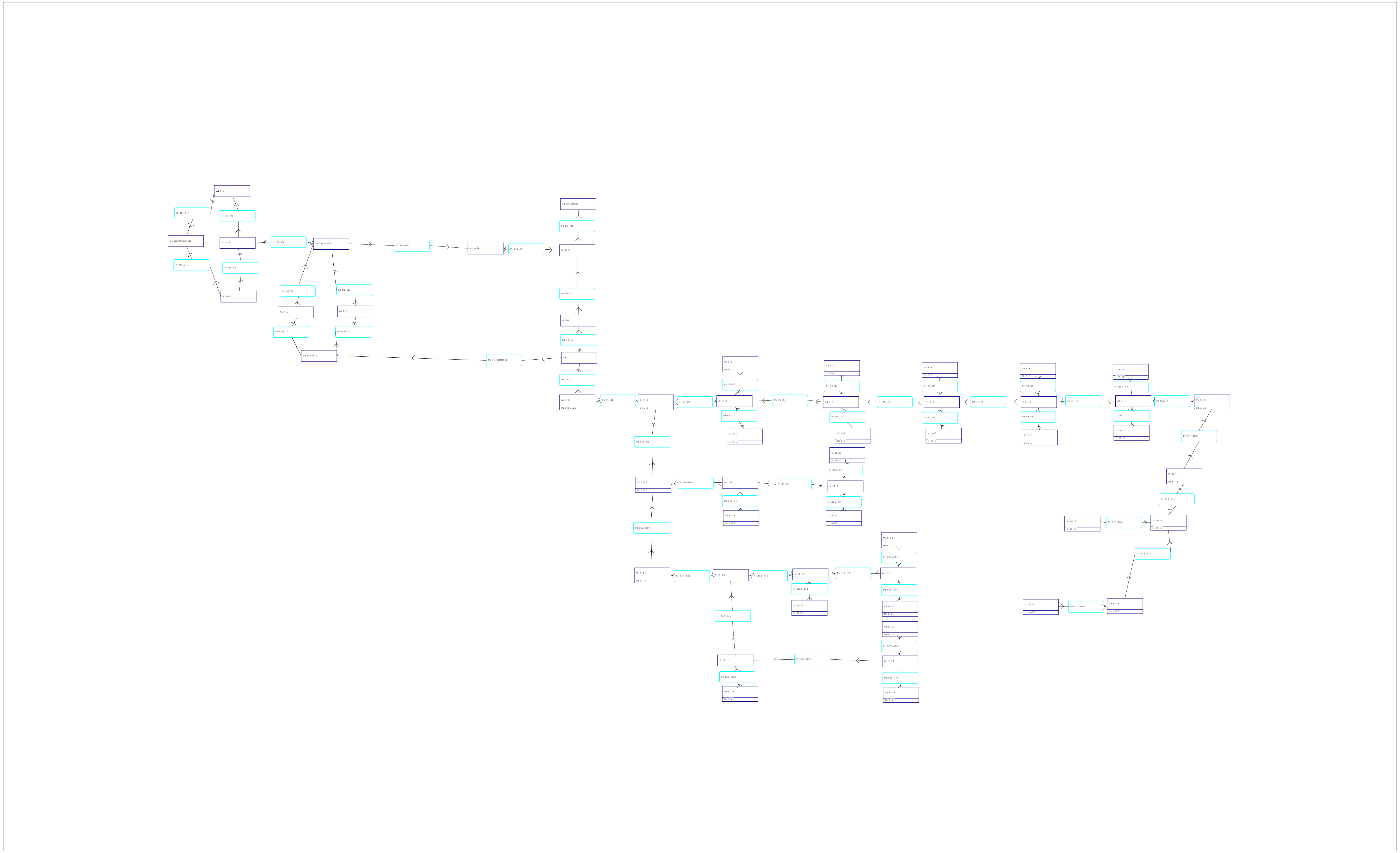
- NODE-LINK DIAGRAM
- COMPLETE INPUT REPORT
- NODE MAXIMUM CONDITIONS REPORT
- LINK MAXIMUM CONDITIONS REPORT

Mary Brickell Village Drainage Improvements
Final Design
Node-Link Diagram

Nodes
A Stage/Area
V Stage/Volume
T Time/Stage
M Manhole

Basins
O Overland Flow
U SCS Unit CN
S SBUH CN
Y SCS Unit GA
Z SBUH GA

Links
P Pipe
W Weir
C Channel
D Drop Structure
B Bridge
R Rating Curve
H Breach
E Percolation
F Filter
X Exfil Trench



```
==========================================================================================
==== Basins ==============================================================================
==========================================================================================

         Name: B-1                      Node: B-1                    Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 1.100                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


----------------------------------------------------------------------------------------------------
         Name: B-10                     Node: B-10                   Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.740                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


----------------------------------------------------------------------------------------------------
         Name: B-11                     Node: B-11                   Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.890                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


----------------------------------------------------------------------------------------------------
         Name: B-12                     Node: B-12                   Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.970                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


----------------------------------------------------------------------------------------------------
         Name: B-13                     Node: B-13                   Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.200                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


----------------------------------------------------------------------------------------------------
         Name: B-14                     Node: B-14                   Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.650                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


----------------------------------------------------------------------------------------------------
         Name: B-15                     Node: B-15                   Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
```

```
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.560                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00



----------------------------------------------------------------------------------------------------
         Name: B-16                     Node: B-16                   Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.490                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00



----------------------------------------------------------------------------------------------------
         Name: B-17                     Node: B-17                   Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.440                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00



----------------------------------------------------------------------------------------------------
         Name: B-18                     Node: B-18                   Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.600                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00



----------------------------------------------------------------------------------------------------
         Name: B-19                     Node: B-19                   Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.400                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00



----------------------------------------------------------------------------------------------------
         Name: B-2                      Node: b-2                    Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 1.250                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00



----------------------------------------------------------------------------------------------------
         Name: B-20                     Node: B-20                   Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 1.130                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00



----------------------------------------------------------------------------------------------------
```

```
         Name: B-21                     Node: B-21                    Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 1.120                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00



----------------------------------------------------------------------------------------------------
         Name: B-22                     Node: B-22                    Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 1.090                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00



----------------------------------------------------------------------------------------------------
         Name: B-23                     Node: B-23                    Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.390                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00



----------------------------------------------------------------------------------------------------
         Name: B-24                     Node: B-24                    Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 1.060                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00



----------------------------------------------------------------------------------------------------
         Name: B-25                     Node: B-25                    Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 1.770                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00



----------------------------------------------------------------------------------------------------
         Name: B-26                     Node: B-26                    Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.360                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00



----------------------------------------------------------------------------------------------------
         Name: B-27                     Node: B-27                    Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 1.750                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00
```

```
----------------------------------------------------------------------------------------------------
         Name: B-28                     Node: B-28                    Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.950                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


----------------------------------------------------------------------------------------------------
         Name: B-3                      Node: B-3                     Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.620                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


----------------------------------------------------------------------------------------------------
         Name: B-4                      Node: B-4                     Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.710                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


----------------------------------------------------------------------------------------------------
         Name: B-5                      Node: B-5                     Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.960                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


----------------------------------------------------------------------------------------------------
         Name: B-6                      Node: B-6                     Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.350                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


----------------------------------------------------------------------------------------------------
         Name: B-7                      Node: B-7                     Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.240                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


----------------------------------------------------------------------------------------------------
         Name: B-8                      Node: B-8                     Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
```

```
    Rainfall Amount(in): 0.000                Time of Conc(min): 10.00
               Area(ac): 0.380                  Time Shift(hrs): 0.00
           Curve Number: 98.00             Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00



----------------------------------------------------------------------------------------------------
         Name: B-9                      Node: B-9                      Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
               Area(ac): 0.370                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00



----------------------------------------------------------------------------------------------------
         Name: OFFSITE                  Node: J-2                      Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File:                     Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 21.00
               Area(ac): 2.960                   Time Shift(hrs): 0.00
           Curve Number: 98.00              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00

For Tc calculation see Offisite basin Tc calculations spreadsheet.

==========================================================================================
==== Nodes ===============================================================================
==========================================================================================

      Name: B-1                 Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                               Warn Stage(ft): 3.800
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          0.000          0.0000
          3.800          0.0013
          4.000          0.0031
          4.500          0.0387
          5.000          0.1734
          6.000          0.7710
          7.000          1.5717
          8.000          2.4696
          9.000          3.4703
         10.500          5.0287
         12.000          6.5871

------------------------------------------------------------------------------------------
      Name: B-10                Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                               Warn Stage(ft): 4.110
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          0.000          0.0000
          4.110          0.0014
          4.500          0.0050
          5.000          0.0546
          6.000          0.3749
          7.000          0.9191
          8.000          1.6202
          9.000          2.3451
         10.500          3.4326
         12.000          4.5200

------------------------------------------------------------------------------------------
      Name: B-11                Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                               Warn Stage(ft): 4.060
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          0.000          0.0000
```

```
          4.060          0.0014
          4.500          0.0084
          5.000          0.0546
          6.000          0.3151
          7.000          0.8961
          8.000          2.0271
          9.000          3.4190
         10.500          5.5068
         12.000          7.5946

------------------------------------------------------------------------------------------
      Name: B-12               Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                              Warn Stage(ft): 4.150
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          0.000          0.0000
          4.150          0.0015
          4.500          0.0039
          5.000          0.0304
          6.000          0.1711
          7.000          0.4770
          8.000          0.9524
          9.000          1.5624
         10.500          2.6467
         12.000          3.7310

------------------------------------------------------------------------------------------
      Name: B-13               Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                              Warn Stage(ft): 5.870
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          0.000          0.0000
          5.870          0.0025
          6.000          0.0026
          7.000          0.0224
          8.000          0.0686
          9.000          0.1424
         10.500          0.3642
         12.000          0.6021

------------------------------------------------------------------------------------------
      Name: B-14               Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                              Warn Stage(ft): 5.700
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          0.000          0.0000
          5.700          0.0024
          6.000          0.0032
          7.000          0.0515
          8.000          0.1856
          9.000          0.4534
         10.500          1.1248
         12.000          1.9320

------------------------------------------------------------------------------------------
      Name: B-15               Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                              Warn Stage(ft): 5.660
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          0.000          0.0000
          5.660          0.0023
          6.000          0.0033
          7.000          0.0798
          8.000          0.3051
          9.000          0.6773
         10.500          1.4554
         12.000          2.2945

------------------------------------------------------------------------------------------
      Name: B-16               Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                              Warn Stage(ft): 8.130
```

```
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          0.000          0.0000
          8.130          0.0037
          9.000          0.0740
         10.500          0.5881
         12.000          1.2283

------------------------------------------------------------------------------------------
      Name: B-17                Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                               Warn Stage(ft): 8.150
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          0.000          0.0000
          8.150          0.0038
          9.000          0.0596
         10.500          0.6260
         12.000          1.3156

------------------------------------------------------------------------------------------
      Name: B-18                Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                               Warn Stage(ft): 4.030
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          0.000          0.0000
          4.030          0.0014
          4.500          0.0064
          5.000          0.0359
          6.000          0.2829
          7.000          0.8156
          8.000          1.3831
          9.000          1.9506
         10.500          2.8019
         12.000          3.6532

------------------------------------------------------------------------------------------
      Name: B-19                Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                               Warn Stage(ft): 4.370
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          0.000          0.0000
          4.370          0.0016
          4.500          0.0017
          5.000          0.0073
          6.000          0.1121
          7.000          0.3848
          8.000          0.7395
          9.000          1.1411
         10.500          1.7434
         12.000          2.3458

------------------------------------------------------------------------------------------
      Name: B-2                 Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                               Warn Stage(ft): 3.960
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          0.000          0.0000
          3.960          0.0014
          4.500          0.0200
          5.000          0.0808
          6.000          0.2586
          7.000          0.5060
          8.000          0.7940
          9.000          1.1270
         10.500          1.6521
         12.000          2.1918
```

```
-------------------------------------------------------------------------------------------
      Name: B-20               Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                              Warn Stage(ft): 3.670
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          0.000          0.0000
          3.670          0.0012
          4.000          0.0031
          4.500          0.0347
          5.000          0.1211
          6.000          0.4812
          7.000          1.0491
          8.000          1.8381
          9.000          2.6272
         10.500          3.8107
         12.000          4.9943

-------------------------------------------------------------------------------------------
      Name: B-21               Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                              Warn Stage(ft): 3.830
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          0.000          0.0000
          3.830          0.0013
          4.000          0.0016
          4.500          0.0307
          5.000          0.1330
          6.000          0.4696
          7.000          0.9242
          8.000          1.4315
          9.000          2.1144
         10.500          3.1559
         12.000          4.1974

-------------------------------------------------------------------------------------------
      Name: B-22               Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                              Warn Stage(ft): 5.310
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          0.000          0.0000
          5.310          0.0021
          6.000          0.0197
          7.000          0.1241
          8.000          0.3267
          9.000          0.6524
         10.500          1.3352
         12.000          2.2350

-------------------------------------------------------------------------------------------
      Name: B-23               Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                              Warn Stage(ft): 5.340
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          0.000          0.0000
          5.340          0.0021
          6.000          0.0172
          7.000          0.0886
          8.000          0.2126
          9.000          0.3729
         10.500          0.7495
         12.000          1.2461

-------------------------------------------------------------------------------------------
      Name: B-24               Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                              Warn Stage(ft): 4.200
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
```

```
          0.000          0.0000
          4.200          0.0015
          4.500          0.0020
          5.000          0.0251
          6.000          0.2376
          7.000          0.5373
          8.000          0.8959
          9.000          1.3047
         10.500          1.9634
         12.000          2.8260

-------------------------------------------------------------------------------------
      Name: B-25              Base Flow(cfs): 0.000         Init Stage(ft): 0.000
     Group: BASE                                            Warn Stage(ft): 4.200
      Type: Stage/Volume


      Stage(ft)      Volume(af)
--------------- ---------------
          0.000          0.0000
          4.200          0.0015
          4.500          0.0035
          5.000          0.0453
          6.000          0.3025
          7.000          0.6905
          8.000          1.2048
          9.000          1.7916
         10.500          2.7538
         12.000          3.8005

-------------------------------------------------------------------------------------
      Name: B-26              Base Flow(cfs): 0.000         Init Stage(ft): 0.000
     Group: BASE                                            Warn Stage(ft): 9.940
      Type: Stage/Volume


      Stage(ft)      Volume(af)
--------------- ---------------
          0.000          0.0000
          9.940          0.0048
         10.500          0.0099
         12.000          0.0891

-------------------------------------------------------------------------------------
      Name: B-27              Base Flow(cfs): 0.000         Init Stage(ft): 0.000
     Group: BASE                                            Warn Stage(ft): 5.900
      Type: Stage/Volume


      Stage(ft)      Volume(af)
--------------- ---------------
          0.000          0.0000
          5.900          0.0025
          6.000          0.0222
          7.000          0.1041
          8.000          0.3342
          9.000          0.7004
         10.500          1.4681
         12.000          2.3786

-------------------------------------------------------------------------------------
      Name: B-28              Base Flow(cfs): 0.000         Init Stage(ft): 0.000
     Group: BASE                                            Warn Stage(ft): 5.800
      Type: Stage/Volume


      Stage(ft)      Volume(af)
--------------- ---------------
          0.000          0.0000
          5.800          0.0024
          6.000          0.0025
          7.000          0.0395
          8.000          0.1565
          9.000          0.3610
         10.500          0.8406
         12.000          1.4000

-------------------------------------------------------------------------------------
      Name: B-3               Base Flow(cfs): 0.000         Init Stage(ft): 0.000
     Group: BASE                                            Warn Stage(ft): 3.960
      Type: Stage/Volume
```

```
      Stage(ft)      Volume(af)
--------------- ---------------
          0.000          0.0000
          3.960          0.0013
          4.000          0.0014
          4.500          0.0278
          5.000          0.1191
          6.000          0.4511
          7.000          0.8571
          8.000          1.3610
          9.000          1.8650
         10.500          2.6209
         12.000          3.3768

------------------------------------------------------------------------------------------
      Name: B-4                 Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                               Warn Stage(ft): 3.120
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          0.000          0.0000
          3.120          0.0009
          3.500          0.0013
          4.000          0.0092
          4.500          0.0446
          5.000          0.1445
          6.000          0.5415
          7.000          0.9754
          8.000          1.4128
          9.000          1.8534
         10.500          2.5198
         12.000          3.1921

------------------------------------------------------------------------------------------
      Name: B-5                 Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                               Warn Stage(ft): 3.690
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          0.000          0.0000
          3.690          0.0012
          4.000          0.0030
          4.500          0.0429
          5.000          0.1588
          6.000          0.5515
          7.000          1.0384
          8.000          1.7077
          9.000          2.3797
         10.500          3.3877
         12.000          4.3958

------------------------------------------------------------------------------------------
      Name: B-6                 Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                               Warn Stage(ft): 4.870
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          0.000          0.0000
          4.870          0.0019
          5.000          0.0024
          6.000          0.0311
          7.000          0.1475
          8.000          0.3786
          9.000          0.6798
         10.500          1.2133
         12.000          1.7468

------------------------------------------------------------------------------------------
      Name: B-7                 Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                               Warn Stage(ft): 5.220
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          0.000          0.0000
```

```
          5.220          0.0012
          6.000          0.0403
          7.000          0.2176
          8.000          0.4601
          9.000          0.7026
         10.500          1.0663
         12.000          1.4301

------------------------------------------------------------------------------------------
      Name: B-8                 Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                               Warn Stage(ft): 4.900
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          0.000          0.0000
          4.900          0.0019
          5.000          0.0024
          6.000          0.0444
          7.000          0.2148
          8.000          0.5568
          9.000          0.9400
         10.500          1.5148
         12.000          2.0896

------------------------------------------------------------------------------------------
      Name: B-9                 Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                               Warn Stage(ft): 4.860
      Type: Stage/Volume



      Stage(ft)      Volume(af)
--------------- ---------------
          0.000          0.0000
          4.860          0.0019
          5.000          0.0020
          6.000          0.0762
          7.000          0.3260
          8.000          0.6753
          9.000          1.0444
         10.500          1.5980
         12.000          2.1516

------------------------------------------------------------------------------------------
      Name: D-1                 Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                               Warn Stage(ft): 6.500
      Type: Stage/Area

EMERGENCY OVERFLOW CONTROL STRUCTURE W/ GATE VALVE, DOWNSTREAM LINK MODELED AS POSITIVE TO SIMULATE A CHECK VALVE ON THE DOWNSTR

      Stage(ft)        Area(ac)
--------------- ---------------
          0.000          0.0006
          6.500          0.0006

------------------------------------------------------------------------------------------
      Name: D-2                 Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                               Warn Stage(ft): 6.500
      Type: Stage/Area

FORCE MAIN RETURN STRUCTURE INSTALLED ALONG EXISTING CULVERT

      Stage(ft)        Area(ac)
--------------- ---------------
          0.000          0.0006
          6.500          0.0006

------------------------------------------------------------------------------------------
      Name: D-3                 Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                               Warn Stage(ft): 6.500
      Type: Stage/Area

JUNCTURE BOX TO MODEL  DIVERSION TEE ALONG FORCE MAIN TO DIVERT FLOWS TO WELLS

      Stage(ft)        Area(ac)
--------------- ---------------
          0.000          0.0001
          6.500          0.0001

------------------------------------------------------------------------------------------
      Name: D-3A                Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                               Warn Stage(ft): 6.500
      Type: Stage/Area
```

```
DUMMY NODE TO MODEL REDUCER

      Stage(ft)        Area(ac)
--------------- ---------------
          0.000          0.0001
          6.500          0.0001

-----------------------------------------------------------------------------------------------
      Name: GROUNDWATER         Base Flow(cfs): 0.000          Init Stage(ft): 2.250
     Group: BASE                                               Warn Stage(ft): 0.000
      Type: Time/Stage

This node represents the downstream discharge of the Well or the Goundwater table which was determined to be approximately 2.00'

      Time(hrs)       Stage(ft)
--------------- ---------------
           0.00           2.250
         200.00           2.250

-----------------------------------------------------------------------------------------------
      Name: J-1                 Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                               Warn Stage(ft): 5.800
      Type: Stage/Area

DIVERSION STRUCTURE INSTALLED ALONG EXISTING CULVERT

      Stage(ft)        Area(ac)
--------------- ---------------
          0.000          0.0006
          5.800          0.0006

-----------------------------------------------------------------------------------------------
      Name: J-10                Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                               Warn Stage(ft): 5.860
      Type: Stage/Area



      Stage(ft)        Area(ac)
--------------- ---------------
          0.000          0.0006
          5.860          0.0006

-----------------------------------------------------------------------------------------------
      Name: J-11                Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                               Warn Stage(ft): 5.950
      Type: Stage/Area



      Stage(ft)        Area(ac)
--------------- ---------------
          0.000          0.0006
          5.950          0.0006

-----------------------------------------------------------------------------------------------
      Name: J-12                Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                               Warn Stage(ft): 4.650
      Type: Stage/Area



      Stage(ft)        Area(ac)
--------------- ---------------
          0.000          0.0006
          4.650          0.0006

-----------------------------------------------------------------------------------------------
      Name: J-13                Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                               Warn Stage(ft): 10.080
      Type: Stage/Area



      Stage(ft)        Area(ac)
--------------- ---------------
          0.000          0.0006
         10.080          0.0006

-----------------------------------------------------------------------------------------------
      Name: J-14                Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                               Warn Stage(ft): 6.500
      Type: Stage/Area



      Stage(ft)        Area(ac)
```

```
--------------- ---------------
          0.000          0.0006
          6.500          0.0006

-----------------------------------------------------------------------------------------
      Name: J-2                Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                              Warn Stage(ft): 5.000
      Type: Stage/Area



      Stage(ft)        Area(ac)
--------------- ---------------
          0.000          0.0006
          5.000          0.0006

-----------------------------------------------------------------------------------------
      Name: J-3                Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                              Warn Stage(ft): 4.200
      Type: Stage/Area



      Stage(ft)        Area(ac)
--------------- ---------------
          0.000          0.0006
          4.200          0.0006

-----------------------------------------------------------------------------------------
      Name: J-4                Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                              Warn Stage(ft): 4.600
      Type: Stage/Area



      Stage(ft)        Area(ac)
--------------- ---------------
          0.000          0.0006
          4.600          0.0006

-----------------------------------------------------------------------------------------
      Name: J-5                Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                              Warn Stage(ft): 5.300
      Type: Stage/Area



      Stage(ft)        Area(ac)
--------------- ---------------
          0.000          0.0006
          5.300          0.0006

-----------------------------------------------------------------------------------------
      Name: J-6                Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                              Warn Stage(ft): 5.200
      Type: Stage/Area



      Stage(ft)        Area(ac)
--------------- ---------------
          0.000          0.0006
          5.200          0.0006

-----------------------------------------------------------------------------------------
      Name: J-7                Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                              Warn Stage(ft): 4.400
      Type: Stage/Area



      Stage(ft)        Area(ac)
--------------- ---------------
          0.000          0.0006
          4.400          0.0006

-----------------------------------------------------------------------------------------
      Name: J-8                Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                              Warn Stage(ft): 4.860
      Type: Stage/Area



      Stage(ft)        Area(ac)
--------------- ---------------
          0.000          0.0006
          4.860          0.0006
```

```
------------------------------------------------------------------------------------------
      Name: J-9                Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                              Warn Stage(ft): 4.000
      Type: Stage/Area



      Stage(ft)        Area(ac)
--------------- ---------------
          0.000          0.0006
          4.000          0.0006

------------------------------------------------------------------------------------------
      Name: P-1                Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                              Warn Stage(ft): 6.500
      Type: Stage/Area



      Stage(ft)        Area(ac)
--------------- ---------------
          2.600          0.0001
          6.500          0.0001

------------------------------------------------------------------------------------------
      Name: P-2                Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                              Warn Stage(ft): 6.500
      Type: Stage/Area



      Stage(ft)        Area(ac)
--------------- ---------------
          2.600          0.0001
          6.500          0.0001

------------------------------------------------------------------------------------------
      Name: VALVEBOX           Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                              Warn Stage(ft): 6.500
      Type: Stage/Area



      Stage(ft)        Area(ac)
--------------- ---------------
          2.600          0.0001
          6.500          0.0001

------------------------------------------------------------------------------------------
      Name: W-1                Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                              Warn Stage(ft): 8.000
      Type: Stage/Area

JUNCTURE BOX TO MODEL WELL STRUCTURE

      Stage(ft)        Area(ac)
--------------- ---------------
          0.000          0.0001
          6.500          0.0001

------------------------------------------------------------------------------------------
      Name: W-2                Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                              Warn Stage(ft): 8.000
      Type: Stage/Area

JUNCTURE BOX TO MODEL WELL STRUCTURE

      Stage(ft)        Area(ac)
--------------- ---------------
          0.000          0.0001
          6.500          0.0001

------------------------------------------------------------------------------------------
      Name: WATERWAY           Base Flow(cfs): 0.000          Init Stage(ft): 2.600
     Group: BASE                                              Warn Stage(ft): 2.600
      Type: Time/Stage

Outfall Discharge to Miami River,
Tidal Data at Miami Marina NOAA Station used to determine mean high-high water.
MHHW determined to be 2.6' City of Miami Datum

      Time(hrs)       Stage(ft)
--------------- ---------------
           0.00           2.600
         100.00           2.600
```

```
------------------------------------------------------------------------------------------
      Name: WETWELL             Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                               Warn Stage(ft): 6.500
      Type: Stage/Area

15'x25' wetwell

      Stage(ft)        Area(ac)
--------------- ---------------
        -15.000          0.0090
          6.500          0.0090

==========================================================================================
==== Operating Tables ====================================================================
==========================================================================================

      Name: pump                 Group: BASE
      Type: Rating Curve
  Function: Head vs. Discharge



       Head(ft)  Discharge(cfs)
--------------- ---------------
        -100.00           32.00
           0.00           32.00

------------------------------------------------------------------------------------------
      Name: well                 Group: BASE
      Type: Rating Curve
  Function: US Stage vs. Discharge

well estimation is 600gpm/ft of head
2.25' is the October High Groundwater Elev.
3.75' is 1.5 feet above the water table which is the head required to overcome salinity mounding.
8.25' is the maximum elevation permitted by FDEP upstream of a well (8.00 NGVD).
20.00' is a fictitious elevation to extend rating curve

   US Stage(ft)  Discharge(cfs)
--------------- ---------------
          2.250            0.00
          3.750            0.00
          8.250            6.01
         20.000           21.72

==========================================================================================
==== Pipes ===============================================================================
==========================================================================================

         Name: B1-J2               From Node: B-1               Length(ft): 119.00
        Group: BASE                  To Node: J-2                    Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Rectangular    Rectangular                              Flow: Both
     Span(in): 54.00          54.00                      Entrance Loss Coef: 0.50
     Rise(in): 30.00          30.00                          Exit Loss Coef: 0.00
   Invert(ft): 0.150          -0.250                         Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares



----------------------------------------------------------------------------------------------------
         Name: B10-J7              From Node: B-10              Length(ft): 11.00
        Group: BASE                  To Node: J-7                    Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 18.00          18.00                      Entrance Loss Coef: 0.50
     Rise(in): 18.00          18.00                          Exit Loss Coef: 0.00
   Invert(ft): 2.170          1.550                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
```

```
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Cross Drain size increased to 18"

----------------------------------------------------------------------------------------------------
         Name: B11-J7             From Node: B-11               Length(ft): 19.00
        Group: BASE                 To Node: J-7                     Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 18.00          18.00                      Entrance Loss Coef: 0.50
     Rise(in): 18.00          18.00                          Exit Loss Coef: 0.00
   Invert(ft): 2.010          1.550                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Cross Drain size increased to 18"

----------------------------------------------------------------------------------------------------
         Name: B12-J7             From Node: B-12               Length(ft): 61.00
        Group: BASE                 To Node: J-7                     Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Rectangular    Rectangular                              Flow: Both
     Span(in): 30.00          30.00                      Entrance Loss Coef: 0.50
     Rise(in): 19.00          19.00                          Exit Loss Coef: 0.00
   Invert(ft): 1.800          1.800                          Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares



----------------------------------------------------------------------------------------------------
         Name: B13-B12            From Node: B-13               Length(ft): 320.00
        Group: BASE                 To Node: B-12                    Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Rectangular    Rectangular                              Flow: Both
     Span(in): 30.00          30.00                      Entrance Loss Coef: 0.50
     Rise(in): 19.00          19.00                          Exit Loss Coef: 0.00
   Invert(ft): 1.320          0.360                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares



----------------------------------------------------------------------------------------------------
         Name: B14-B13            From Node: B-14               Length(ft): 78.00
        Group: BASE                 To Node: B-13                    Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Rectangular    Rectangular                              Flow: Both
     Span(in): 23.00          23.00                      Entrance Loss Coef: 0.50
     Rise(in): 14.00          14.00                          Exit Loss Coef: 0.00
   Invert(ft): 1.750          1.770                          Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
```

```
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares



----------------------------------------------------------------------------------------------------
         Name: B15-B14             From Node: B-15               Length(ft): 22.00
        Group: BASE                  To Node: B-14                    Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 12.00          12.00                      Entrance Loss Coef: 0.50
     Rise(in): 12.00          12.00                          Exit Loss Coef: 0.00
   Invert(ft): 1.950          1.770                          Bend Loss Coef: 0.55
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



----------------------------------------------------------------------------------------------------
         Name: B16-B14             From Node: B-16               Length(ft): 349.00
        Group: BASE                  To Node: B-14                    Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: None
     Span(in): 15.00          15.00                      Entrance Loss Coef: 0.50
     Rise(in): 15.00          15.00                          Exit Loss Coef: 0.00
   Invert(ft): 2.550          1.800                          Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



----------------------------------------------------------------------------------------------------
         Name: B17-B16             From Node: B-17               Length(ft): 30.00
        Group: BASE                  To Node: B-16                    Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 12.00          12.00                      Entrance Loss Coef: 0.50
     Rise(in): 12.00          12.00                          Exit Loss Coef: 0.00
   Invert(ft): 2.800          2.480                          Bend Loss Coef: 0.55
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



----------------------------------------------------------------------------------------------------
         Name: B18-B1              From Node: B-18               Length(ft): 350.00
        Group: BASE                  To Node: B-1                     Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Rectangular    Rectangular                              Flow: Both
```

```
     Span(in): 42.00          42.00                      Entrance Loss Coef: 0.50
     Rise(in): 30.00          30.00                          Exit Loss Coef: 0.00
   Invert(ft): 0.590          0.150                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares



----------------------------------------------------------------------------------------------------
         Name: B19-J8              From Node: B-19               Length(ft): 32.00
        Group: BASE                  To Node: J-8                     Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 18.00          18.00                      Entrance Loss Coef: 0.50
     Rise(in): 18.00          18.00                          Exit Loss Coef: 0.00
   Invert(ft): 2.110          1.950                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



----------------------------------------------------------------------------------------------------
         Name: B2-J3               From Node: B-2                Length(ft): 17.00
        Group: BASE                  To Node: J-3                     Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 18.00          18.00                      Entrance Loss Coef: 0.50
     Rise(in): 18.00          18.00                          Exit Loss Coef: 0.00
   Invert(ft): 0.510          0.270                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Cross Drain size increased to 18"

----------------------------------------------------------------------------------------------------
         Name: B20-J9              From Node: B-20               Length(ft): 12.00
        Group: BASE                  To Node: J-9                     Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 18.00          18.00                      Entrance Loss Coef: 0.50
     Rise(in): 18.00          18.00                          Exit Loss Coef: 0.00
   Invert(ft): 1.800          1.800                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Cross Drain size increased to 18"

----------------------------------------------------------------------------------------------------
```

```
         Name: B21-J9              From Node: B-21               Length(ft): 40.00
        Group: BASE                  To Node: J-9                     Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 18.00          18.00                      Entrance Loss Coef: 0.50
     Rise(in): 18.00          18.00                          Exit Loss Coef: 0.00
   Invert(ft): 1.500          1.500                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Cross Drain size increased to 18"

----------------------------------------------------------------------------------------------------
         Name: B22-B18             From Node: B-22               Length(ft): 346.00
        Group: BASE                  To Node: B-18                    Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Rectangular    Rectangular                              Flow: Both
     Span(in): 36.00          36.00                      Entrance Loss Coef: 0.50
     Rise(in): 30.00          30.00                          Exit Loss Coef: 0.00
   Invert(ft): 1.110          0.590                          Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares



----------------------------------------------------------------------------------------------------
         Name: B23-J11             From Node: B-23               Length(ft): 31.00
        Group: BASE                  To Node: J-11                    Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 15.00          15.00                      Entrance Loss Coef: 0.50
     Rise(in): 15.00          15.00                          Exit Loss Coef: 0.00
   Invert(ft): 3.400          3.250                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



----------------------------------------------------------------------------------------------------
         Name: B24-J12             From Node: B-24               Length(ft): 13.00
        Group: BASE                  To Node: J-12                    Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 18.00          18.00                      Entrance Loss Coef: 0.50
     Rise(in): 18.00          18.00                          Exit Loss Coef: 0.00
   Invert(ft): 2.500          2.100                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
```

```
Circular Concrete: Square edge w/ headwall

Cross Drain size increased to 18"

----------------------------------------------------------------------------------------------------
         Name: B25-J12            From Node: B-25             Length(ft): 21.00
        Group: BASE                 To Node: J-12                  Count: 1
                                                      Friction Equation: Automatic
              UPSTREAM       DOWNSTREAM              Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                              Flow: Both
     Span(in): 18.00          18.00                  Entrance Loss Coef: 0.50
     Rise(in): 18.00          18.00                      Exit Loss Coef: 0.00
   Invert(ft): 2.410          2.120                      Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                 Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                     Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                   Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Cross Drain size increased to 18"

----------------------------------------------------------------------------------------------------
         Name: B26-J13            From Node: B-26             Length(ft): 41.00
        Group: BASE                 To Node: J-13                  Count: 1
                                                      Friction Equation: Automatic
              UPSTREAM       DOWNSTREAM              Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                              Flow: Both
     Span(in): 12.00          12.00                  Entrance Loss Coef: 0.50
     Rise(in): 12.00          12.00                      Exit Loss Coef: 0.00
   Invert(ft): 5.110          4.440                      Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                 Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                     Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                   Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



----------------------------------------------------------------------------------------------------
         Name: B27-J14            From Node: B-27             Length(ft): 9.00
        Group: BASE                 To Node: J-14                  Count: 1
                                                      Friction Equation: Automatic
              UPSTREAM       DOWNSTREAM              Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                              Flow: Both
     Span(in): 18.00          18.00                  Entrance Loss Coef: 0.50
     Rise(in): 18.00          18.00                      Exit Loss Coef: 0.00
   Invert(ft): 2.770          2.500                      Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                 Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                     Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                   Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Cross Drain size increased to 18"

----------------------------------------------------------------------------------------------------
         Name: B28-J14            From Node: B-28             Length(ft): 26.00
        Group: BASE                 To Node: J-14                  Count: 1
                                                      Friction Equation: Automatic
              UPSTREAM       DOWNSTREAM              Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                              Flow: Both
     Span(in): 18.00          18.00                  Entrance Loss Coef: 0.50
     Rise(in): 18.00          18.00                      Exit Loss Coef: 0.00
   Invert(ft): 2.800          2.500                      Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                 Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                     Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                   Stabilizer Option: None
```

```
Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Cross Drain size increased to 18"

----------------------------------------------------------------------------------------------------
         Name: B3-J3               From Node: B-3                Length(ft): 37.00
        Group: BASE                  To Node: J-3                     Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 18.00          18.00                      Entrance Loss Coef: 0.50
     Rise(in): 18.00          18.00                          Exit Loss Coef: 0.00
   Invert(ft): 0.870          1.350                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Cross Drain size increased to 18"

----------------------------------------------------------------------------------------------------
         Name: B4-J4               From Node: B-4                Length(ft): 6.00
        Group: BASE                  To Node: J-4                     Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 24.00          24.00                      Entrance Loss Coef: 0.50
     Rise(in): 24.00          24.00                          Exit Loss Coef: 0.00
   Invert(ft): 1.370          1.000                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Cross Drain size increased to 24"

----------------------------------------------------------------------------------------------------
         Name: B5-J4               From Node: B-5                Length(ft): 18.00
        Group: BASE                  To Node: J-4                     Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 18.00          18.00                      Entrance Loss Coef: 0.50
     Rise(in): 18.00          18.00                          Exit Loss Coef: 0.00
   Invert(ft): 1.640          1.000                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Cross Drain size increased to 18"

----------------------------------------------------------------------------------------------------
         Name: B6-J5               From Node: B-6                Length(ft): 9.00
        Group: BASE                  To Node: J-5                     Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 12.00          12.00                      Entrance Loss Coef: 0.50
     Rise(in): 12.00          12.00                          Exit Loss Coef: 0.00
   Invert(ft): 1.820          1.470                          Bend Loss Coef: 0.70
```

```
  Manning's N: 0.012000       0.012000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                     Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



----------------------------------------------------------------------------------------------------
         Name: B7-J5              From Node: B-7                Length(ft): 33.00
        Group: BASE                 To Node: J-5                     Count: 1
                                                        Friction Equation: Automatic
              UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                               Flow: Both
     Span(in): 12.00          12.00                    Entrance Loss Coef: 0.50
     Rise(in): 12.00          12.00                        Exit Loss Coef: 0.00
   Invert(ft): 0.970          0.590                        Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                     Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



----------------------------------------------------------------------------------------------------
         Name: B8-J6              From Node: B-8                Length(ft): 20.00
        Group: BASE                 To Node: J-6                     Count: 1
                                                        Friction Equation: Automatic
              UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                               Flow: Both
     Span(in): 12.00          12.00                    Entrance Loss Coef: 0.50
     Rise(in): 12.00          12.00                        Exit Loss Coef: 0.00
   Invert(ft): 1.390          0.800                        Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                     Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



----------------------------------------------------------------------------------------------------
         Name: B9-J6              From Node: B-9                Length(ft): 32.00
        Group: BASE                 To Node: J-6                     Count: 1
                                                        Friction Equation: Automatic
              UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                               Flow: Both
     Span(in): 12.00          12.00                    Entrance Loss Coef: 0.50
     Rise(in): 12.00          12.00                        Exit Loss Coef: 0.00
   Invert(ft): 1.460          0.450                        Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                     Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



----------------------------------------------------------------------------------------------------
         Name: D1-D2              From Node: D-1                Length(ft): 50.00
        Group: BASE                 To Node: D-2                     Count: 1
                                                        Friction Equation: Automatic
```

```
               UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Rectangular    Rectangular                             Flow: Positive
     Span(in): 60.00          60.00                     Entrance Loss Coef: 0.50
     Rise(in): 36.00          36.00                         Exit Loss Coef: 0.00
   Invert(ft): -0.750         -0.750                        Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                    Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                        Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                      Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

FLOW IS POSITIVE TO SIMULATE A CHECK VALVE ON THE DOWNSTREAM STRUCTURE TO NOT ALLOW FOR RECIRCULATION OF THE PUMPED WATERS.

----------------------------------------------------------------------------------------------------
         Name: D2-WW               From Node: D-2                Length(ft): 975.00
        Group: BASE                  To Node: WATERWAY                Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Rectangular    Rectangular                             Flow: Both
     Span(in): 60.00          60.00                     Entrance Loss Coef: 0.50
     Rise(in): 36.00          36.00                         Exit Loss Coef: 1.00
   Invert(ft): -0.750         -0.800                        Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                    Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                        Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                      Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares



----------------------------------------------------------------------------------------------------
         Name: D3-W1               From Node: D-3                Length(ft): 50.00
        Group: BASE                  To Node: W-1                     Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                Flow: Both
     Span(in): 24.86          24.86                     Entrance Loss Coef: 0.00
     Rise(in): 24.86          24.86                         Exit Loss Coef: 1.00
   Invert(ft): 0.500          0.500                         Bend Loss Coef: 0.50
  Manning's N: 0.012000       0.012000                    Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                        Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                      Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

This pipe represents the force main stub-out to well 1

----------------------------------------------------------------------------------------------------
         Name: D3-W2               From Node: D-3                Length(ft): 50.00
        Group: BASE                  To Node: W-2                     Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                Flow: Both
     Span(in): 24.86          24.86                     Entrance Loss Coef: 0.00
     Rise(in): 24.86          24.86                         Exit Loss Coef: 1.00
   Invert(ft): 0.500          0.500                         Bend Loss Coef: 0.50
  Manning's N: 0.012000       0.012000                    Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                        Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                      Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

This pipe represents the force main stub-out to well 2
```

```
----------------------------------------------------------------------------------------------------
         Name: D3A-D3              From Node: D-3A               Length(ft): 0.50
        Group: BASE                  To Node: D-2                     Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 43.00          32.40                      Entrance Loss Coef: 0.00
     Rise(in): 43.00          32.40                          Exit Loss Coef: 1.00
   Invert(ft): 0.000          0.000                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

PIPE REPRESENTS 32.4" CONTROL ORIFACE INSTALLED IN PIPE FLANGE CONNECTOR

----------------------------------------------------------------------------------------------------
         Name: J1-D1               From Node: J-1                Length(ft): 25.00
        Group: BASE                  To Node: D-1                     Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Rectangular    Rectangular                              Flow: Both
     Span(in): 60.00          60.00                      Entrance Loss Coef: 0.50
     Rise(in): 36.00          36.00                          Exit Loss Coef: 0.00
   Invert(ft): -0.680         -0.750                         Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares


----------------------------------------------------------------------------------------------------
         Name: J1-WETWELL          From Node: J-1                Length(ft): 30.00
        Group: BASE                  To Node: WETWELL                 Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 84.00          84.00                      Entrance Loss Coef: 0.50
     Rise(in): 84.00          84.00                          Exit Loss Coef: 1.00
   Invert(ft): -1.000         -1.000                         Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall


----------------------------------------------------------------------------------------------------
         Name: J10-B22             From Node: J-10               Length(ft): 45.00
        Group: BASE                  To Node: B-22                    Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Rectangular    Rectangular                              Flow: Both
     Span(in): 36.00          36.00                      Entrance Loss Coef: 0.50
     Rise(in): 30.00          30.00                          Exit Loss Coef: 0.00
   Invert(ft): 1.200          1.110                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares
```

```
Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares



----------------------------------------------------------------------------------------------------
         Name: J11-J10            From Node: J-11              Length(ft): 22.00
        Group: BASE                 To Node: J-10                   Count: 1
                                                        Friction Equation: Automatic
              UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                               Flow: Both
     Span(in): 30.00          30.00                    Entrance Loss Coef: 0.50
     Rise(in): 30.00          30.00                        Exit Loss Coef: 0.00
   Invert(ft): 1.280          1.200                        Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                      Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Pipe run size increased to 30" circular

----------------------------------------------------------------------------------------------------
         Name: J12-J11            From Node: J-12              Length(ft): 351.00
        Group: BASE                 To Node: J-11                   Count: 1
                                                        Friction Equation: Automatic
              UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                               Flow: Both
     Span(in): 30.00          30.00                    Entrance Loss Coef: 0.50
     Rise(in): 30.00          30.00                        Exit Loss Coef: 0.00
   Invert(ft): 1.950          1.280                        Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                      Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Pipe run size increased to 30" circular

----------------------------------------------------------------------------------------------------
         Name: J13-J10            From Node: J-13              Length(ft): 348.00
        Group: BASE                 To Node: J-10                   Count: 1
                                                        Friction Equation: Automatic
              UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                               Flow: Both
     Span(in): 21.00          21.00                    Entrance Loss Coef: 0.50
     Rise(in): 21.00          21.00                        Exit Loss Coef: 0.00
   Invert(ft): 1.160          0.780                        Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                      Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



----------------------------------------------------------------------------------------------------
         Name: J14-J13            From Node: J-14              Length(ft): 392.00
        Group: BASE                 To Node: J-13                   Count: 1
                                                        Friction Equation: Automatic
              UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                               Flow: None
     Span(in): 21.00          21.00                    Entrance Loss Coef: 0.50
     Rise(in): 21.00          21.00                        Exit Loss Coef: 0.00
   Invert(ft): 2.000          1.060                        Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                      Stabilizer Option: None
```

```
Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



----------------------------------------------------------------------------------------------------
         Name: J2-J1               From Node: J-2                Length(ft): 50.00
        Group: BASE                  To Node: J-1                     Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Rectangular    Rectangular                              Flow: Both
     Span(in): 60.00          60.00                      Entrance Loss Coef: 0.50
     Rise(in): 36.00          36.00                          Exit Loss Coef: 0.00
   Invert(ft): -0.250         -0.680                         Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares



----------------------------------------------------------------------------------------------------
         Name: J3-B1               From Node: J-3                Length(ft): 48.00
        Group: BASE                  To Node: B-1                     Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 48.00          48.00                      Entrance Loss Coef: 0.50
     Rise(in): 48.00          48.00                          Exit Loss Coef: 0.00
   Invert(ft): 0.250          0.000                          Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Pipe run modified to 48" circular

----------------------------------------------------------------------------------------------------
         Name: J4-J3               From Node: J-4                Length(ft): 230.00
        Group: BASE                  To Node: J-3                     Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 48.00          48.00                      Entrance Loss Coef: 0.50
     Rise(in): 48.00          48.00                          Exit Loss Coef: 0.00
   Invert(ft): 0.500          0.500                          Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Pipe run modified to 48"Circular

----------------------------------------------------------------------------------------------------
         Name: J5-J4               From Node: J-5                Length(ft): 383.00
        Group: BASE                  To Node: J-4                     Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 36.00          42.00                      Entrance Loss Coef: 0.50
```

```
     Rise(in): 36.00          42.00                          Exit Loss Coef: 0.00
   Invert(ft): 1.000          0.500                          Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Upsize to 42" circular pipe at downstream side.  Intermediate manhole will be added with 36" upstream pipe

----------------------------------------------------------------------------------------------------
         Name: J6-J5               From Node: J-6                Length(ft): 50.00
        Group: BASE                  To Node: J-5                     Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Rectangular    Rectangular                              Flow: Both
     Span(in): 36.00          36.00                      Entrance Loss Coef: 0.50
     Rise(in): 24.00          24.00                          Exit Loss Coef: 0.00
   Invert(ft): -1.050         -1.120                         Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares



----------------------------------------------------------------------------------------------------
         Name: J7-J6               From Node: J-7                Length(ft): 264.00
        Group: BASE                  To Node: J-6                     Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Rectangular    Rectangular                              Flow: Both
     Span(in): 36.00          36.00                      Entrance Loss Coef: 0.50
     Rise(in): 24.00          24.00                          Exit Loss Coef: 0.00
   Invert(ft): 1.560          1.330                          Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares



----------------------------------------------------------------------------------------------------
         Name: J8-B18              From Node: J-8                Length(ft): 53.00
        Group: BASE                  To Node: B-18                    Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Rectangular    Rectangular                              Flow: Both
     Span(in): 36.00          36.00                      Entrance Loss Coef: 0.50
     Rise(in): 30.00          30.00                          Exit Loss Coef: 0.00
   Invert(ft): 0.810          0.650                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares

Downstream FHWA Inlet Edge Description:
Rectangular Box: 30° to 75° wingwall flares



----------------------------------------------------------------------------------------------------
         Name: J9-J8               From Node: J-9                Length(ft): 294.00
```

```
        Group: BASE                   To Node: J-8                   Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 30.00          30.00                      Entrance Loss Coef: 0.50
     Rise(in): 30.00          30.00                          Exit Loss Coef: 0.00
   Invert(ft): 0.500          0.500                          Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Pipe run size increased to 30" circular

----------------------------------------------------------------------------------------------------
         Name: P1-VB               From Node: P-1            Length(ft): 454.00
        Group: BASE                   To Node: VALVEBOX              Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Positive
     Span(in): 24.92          24.92                      Entrance Loss Coef: 0.00
     Rise(in): 24.92          24.92                          Exit Loss Coef: 0.00
   Invert(ft): 0.500          0.500                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

This pipe represents the run between the pump outlet, through the valve box fixtures and out to the force main connection.
Length is a hydraulic equivalent length including pipes, fittings, and bends.
This pipe is shown with only positive flow in order to model a one-way check valve installed in the discharge pipe to avoid reci

----------------------------------------------------------------------------------------------------
         Name: P2-VB               From Node: P-2            Length(ft): 454.00
        Group: BASE                   To Node: VALVEBOX              Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Positive
     Span(in): 24.92          24.92                      Entrance Loss Coef: 0.00
     Rise(in): 24.92          24.92                          Exit Loss Coef: 0.00
   Invert(ft): 0.500          0.500                          Bend Loss Coef: 0.70
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

This pipe represents the run between the pump outlet, through the valve box fixtures and out to the force main connection.
Length is a hydraulic equivalent length including pipes, fittings, and bends.
This pipe is shown with only positive flow in order to model a one-way check valve installed in the discharge pipe to avoid reci

----------------------------------------------------------------------------------------------------
         Name: VB-D3               From Node: VALVEBOX       Length(ft): 5.00
        Group: BASE                   To Node: d-3                   Count: 1
                                                          Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 43.00          43.00                      Entrance Loss Coef: 0.00
     Rise(in): 43.00          43.00                          Exit Loss Coef: 0.70
   Invert(ft): 0.000          0.000                          Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
```

```
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



----------------------------------------------------------------------------------------------------
         Name: VB-D3A             From Node: VALVEBOX          Length(ft): 250.00
        Group: BASE                 To Node: d-3A                   Count: 1
                                                         Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                Flow: Both
     Span(in): 43.00          43.00                     Entrance Loss Coef: 0.00
     Rise(in): 43.00          43.00                         Exit Loss Coef: 0.50
   Invert(ft): 0.000          0.000                         Bend Loss Coef: 0.00
  Manning's N: 0.012000       0.012000                    Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                        Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                      Stabilizer Option: None



Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

This pipe represents the force main connecting back to the bypassed gravity outfall, included equivalent lengths for fittings (i

==========================================================================================
==== Channels ============================================================================
==========================================================================================

          Name:                     From Node:                    Length(ft): 0.00
         Group: BASE                  To Node:                         Count: 1

                UPSTREAM       DOWNSTREAM                  Friction Equation: Automatic
      Geometry: Trapezoidal    Trapezoidal                Solution Algorithm: Automatic
    Invert(ft): 0.000          0.000                                    Flow: Both
 TClpInitZ(ft): 9999.000       9999.000                     Contraction Coef: 0.100
   Manning's N: 0.000000       0.000000                       Expansion Coef: 0.300
  Top Clip(ft): 0.000          0.000                      Entrance Loss Coef: 0.000
  Bot Clip(ft): 0.000          0.000                          Exit Loss Coef: 0.000
     Main XSec:                                             Outlet Ctrl Spec: Use dc or tw
  AuxElev1(ft):                                              Inlet Ctrl Spec: Use dc
     Aux XSec1:                                            Stabilizer Option: None
  AuxElev2(ft):
     Aux XSec2:
 Top Width(ft):
     Depth(ft):
 Bot Width(ft): 0.000          0.000
  LtSdSlp(h/v): 0.00           0.00
  RtSdSlp(h/v): 0.00           0.00



==========================================================================================
==== Drop Structures =====================================================================
==========================================================================================

         Name:                     From Node:                    Length(ft): 0.00
        Group: BASE                  To Node:                         Count: 1

               UPSTREAM       DOWNSTREAM                  Friction Equation: Automatic
     Geometry: Circular       Circular                   Solution Algorithm: Most Restrictive
     Span(in): 0.00           0.00                                     Flow: Both
     Rise(in): 0.00           0.00                       Entrance Loss Coef: 0.000
   Invert(ft): 0.000          0.000                          Exit Loss Coef: 1.000
  Manning's N: 0.000000       0.000000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                           Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



==========================================================================================
==== Bridges =============================================================================
==========================================================================================

         Name:                     From Node:                          Flow: Both
```

```
        Group: BASE                  To Node:                     Run WSPRO: No

      XSEC TYPE            NAME         INV(ft)        STAT(ft)       SKEW(deg)           EXPAN          CONTRAC
           Exit                           0.000           0.00           0.000           0.500           0.000
    Full Valley                           0.000           0.00           0.000           0.500           0.000
       Approach                           0.000           0.00           0.000           0.500           0.000
        Roadway                           0.000           0.00           0.000

            Road Surface Material: Paved
    Road Embankment Top Width(ft): 0.00
     Road Unsubmerged Weir Q Coef: 0.000


RATING CURVE CONTROL
         TW(ft)       QMin(cfs)       QMax(cfs)       QInc(cfs)
--------------- --------------- --------------- ---------------
          0.000           0.000           0.000           0.000


==========================================================================================
==== Rating Curves =======================================================================
==========================================================================================

         Name: PUMP 1              From Node: WETWELL                 Count: 1
        Group: BASE                  To Node: P-1                      Flow: Both

               TABLE           ELEV ON(ft)     ELEV OFF(ft)
           #1: pump            1.600           -8.000
           #2:                 0.000           0.000
           #3:                 0.000           0.000
           #4:                 0.000           0.000



----------------------------------------------------------------------------------------------------
         Name: PUMP 2              From Node: WETWELL                 Count: 1
        Group: BASE                  To Node: P-2                      Flow: Both

               TABLE           ELEV ON(ft)     ELEV OFF(ft)
           #1: pump            2.100           -8.000
           #2:                 0.000           0.000
           #3:                 0.000           0.000
           #4:                 0.000           0.000



----------------------------------------------------------------------------------------------------
         Name: Well 1              From Node: W-1                     Count: 1
        Group: BASE                  To Node: GROUNDWATER              Flow: Both

               TABLE           ELEV ON(ft)     ELEV OFF(ft)
           #1: well            2.250           2.250
           #2:                 0.000           0.000
           #3:                 0.000           0.000
           #4:                 0.000           0.000

Dischrage to Well

----------------------------------------------------------------------------------------------------
         Name: Well 2              From Node: W-2                     Count: 1
        Group: BASE                  To Node: GROUNDWATER              Flow: Both

               TABLE           ELEV ON(ft)     ELEV OFF(ft)
           #1: well            2.250           2.250
           #2:                 0.000           0.000
           #3:                 0.000           0.000
           #4:                 0.000           0.000

Dischrage to Well

==========================================================================================
==== Exfiltration Trenches ===============================================================
==========================================================================================

         Name:                     From Node:                          Flow: Both
        Group: BASE                  To Node:                         Count: 1

       Aquifer Base Elev(ft): 0.000                     Trench Bot Elev(ft): 0.000
        Water Table Elev(ft): 0.000                        Trench Width(ft): 0.000
 *****************************0.000                       Trench Length(ft): 0.000
  Horiz Conductivity(ft/day): 0.000                       Trench Height(ft): 0.000
   Vert Conductivity(ft/day): 0.000                    Gravel Porosity(dec): 0.000
     Effective Porosity(dec): 0.000                       Pipe Diameter(in): 0.000
            Suction Head(in): 0.000                    Pipe Invert Elev(ft): 0.000
                                                              End Treatment: Exclude
                                                           Cell Spacing(ft): 0.000
```

```
                                                                          Num Cells: 0



=========================================================================================
==== Hydrology Simulations ==============================================================
=========================================================================================

         Name: 100yr-72hr
     Filename: K:\Projects\550860.15_CM Mary Brickell Village\docs\drainage report\icpr\post results final design\100yr-72hr.R32

      Override Defaults: Yes
    Storm Duration(hrs): 72.00
          Rainfall File: Sfwmd72
    Rainfall Amount(in): 14.00

Time(hrs)       Print Inc(min)
--------------- ---------------
48.000          15.00
56.000          5.00
64.000          1.00
72.000          5.00
72.330          5.00

---------------------------------------------------------------------------------------------------
         Name: 10yr-24hr
     Filename: K:\Projects\550860.15_CM Mary Brickell Village\docs\drainage report\icpr\post results final design\10yr-24hr.R32

      Override Defaults: Yes
    Storm Duration(hrs): 24.00
          Rainfall File: Flmod
    Rainfall Amount(in): 7.90

Time(hrs)       Print Inc(min)
--------------- ---------------
8.000           15.00
10.000          5.00
14.000          1.00
16.000          5.00
24.000          15.00
24.330          5.00

---------------------------------------------------------------------------------------------------
         Name: 25yr-72hr
     Filename: K:\Projects\550860.15_CM Mary Brickell Village\docs\drainage report\icpr\post results final design\25yr-72hr.R32

      Override Defaults: Yes
    Storm Duration(hrs): 72.00
          Rainfall File: Sfwmd72
    Rainfall Amount(in): 12.00

Time(hrs)       Print Inc(min)
--------------- ---------------
48.000          15.00
56.000          5.00
64.000          1.00
72.000          5.00
72.330          5.00

---------------------------------------------------------------------------------------------------
         Name: 5yr-24hr
     Filename: K:\Projects\550860.15_CM Mary Brickell Village\docs\drainage report\icpr\post results final design\5yr-24hr.R32

      Override Defaults: Yes
    Storm Duration(hrs): 24.00
          Rainfall File: Flmod
    Rainfall Amount(in): 6.30

Time(hrs)       Print Inc(min)
--------------- ---------------
8.000           15.00
10.000          5.00
14.000          1.00
16.000          5.00
24.000          15.00
24.330          5.00

=========================================================================================
==== Routing Simulations ================================================================
=========================================================================================

         Name: 100yr-72hr          Hydrology Sim: 100yr-72hr
     Filename: K:\Projects\550860.15_CM Mary Brickell Village\docs\drainage report\icpr\post results final design\100yr-72hr.I32

      Execute: Yes         Restart: No            Patch: No
  Alternative: No
```

```
        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.01000
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 96.00
     Min Calc Time(sec): 0.0500               Max Calc Time(sec): 60.0000
        Boundary Stages: 25/100yr Tailwa          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
48.000          15.000
56.000          5.000
64.000          1.000
72.000          5.000
96.000          15.000

Group           Run
--------------- -----
BASE            Yes


----------------------------------------------------------------------------------------------------
         Name: 10yr-24hr           Hydrology Sim: 10yr-24hr
     Filename: K:\Projects\550860.15_CM Mary Brickell Village\docs\drainage report\icpr\post results final design\10yr-24hr.I32

      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.01000
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 48.00
     Min Calc Time(sec): 0.0500               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
8.000           5.000
16.000          1.000
24.000          5.000
48.000          15.000

Group           Run
--------------- -----
BASE            Yes


----------------------------------------------------------------------------------------------------
         Name: 25yr-72hr           Hydrology Sim: 25yr-72hr
     Filename: K:\Projects\550860.15_CM Mary Brickell Village\docs\drainage report\icpr\post results final design\25yr-72hr.I32

      Execute: No          Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.01000
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 96.00
     Min Calc Time(sec): 0.0500               Max Calc Time(sec): 60.0000
        Boundary Stages: 25/100yr Tailwa          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
48.000          15.000
56.000          5.000
64.000          1.000
72.000          5.000
96.000          15.000

Group           Run
--------------- -----
BASE            Yes


----------------------------------------------------------------------------------------------------
         Name: 5yr-24hr            Hydrology Sim: 5yr-24hr
     Filename: K:\Projects\550860.15_CM Mary Brickell Village\docs\drainage report\icpr\post results final design\5yr-24hr.I32

      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.01000
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 48.00
```

```
     Min Calc Time(sec): 0.0500               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:



Time(hrs)       Print Inc(min)
--------------- ---------------
8.000           5.000
16.000          1.000
24.000          5.000
48.000          15.000

Group           Run
--------------- -----
BASE            Yes


==========================================================================================
==== Boundary Conditions =================================================================
==========================================================================================

      Name: 25/100yr Tailwa       Node: WATERWAY              Type: Stage

      Time(hrs)       Stage(ft)
--------------- ---------------
          0.000           3.800
       1000.000           3.800
```

Mary Brickell Village Drainage Improvements
Final Design
Node Maximum Conditions Report

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
B-1	BASE	100yr-72hr	60.26	4.529	3.800	0.0026	8137	60.76	62.015	59.96	61.361
B-1	BASE	10yr-24hr	12.28	4.038	3.800	0.0055	2238	12.00	58.020	12.00	57.618
B-1	BASE	25yr-72hr	60.22	4.242	3.800	0.0047	4535	60.08	61.443	60.08	61.842
B-1	BASE	5yr-24hr	12.15	3.357	3.800	0.0053	276	12.14	56.016	12.14	55.991
B-10	BASE	100yr-72hr	60.41	5.295	4.110	-0.0045	11997	60.02	4.597	61.00	6.124
B-10	BASE	10yr-24hr	12.33	4.779	4.110	0.0026	6146	12.03	3.493	11.85	4.255
B-10	BASE	25yr-72hr	60.29	5.014	4.110	0.0033	9269	60.02	3.939	60.68	4.893
B-10	BASE	5yr-24hr	12.15	4.177	4.110	0.0026	581	12.03	2.782	11.92	4.248
B-11	BASE	100yr-72hr	60.41	5.311	4.060	-0.0034	11001	60.02	5.528	60.99	5.611
B-11	BASE	10yr-24hr	12.33	4.802	4.060	0.0018	5582	12.03	4.201	12.63	4.318
B-11	BASE	25yr-72hr	60.28	5.034	4.060	-0.0021	8051	60.02	4.738	60.73	4.984
B-11	BASE	5yr-24hr	12.15	4.202	4.060	-0.0020	1000	12.03	3.345	11.88	3.837
B-12	BASE	100yr-72hr	60.28	5.424	4.150	-0.0020	6580	60.00	13.414	60.05	10.187
B-12	BASE	10yr-24hr	12.28	4.876	4.150	0.0016	3520	12.05	10.844	12.03	9.024
B-12	BASE	25yr-72hr	60.20	5.146	4.150	0.0014	5047	60.02	12.064	60.06	9.668
B-12	BASE	5yr-24hr	12.14	4.261	4.150	0.0016	544	12.07	8.290	12.07	8.056
B-13	BASE	100yr-72hr	60.17	5.601	5.870	-0.0021	137	59.98	7.505	59.99	7.411
B-13	BASE	10yr-24hr	12.20	4.997	5.870	0.0011	137	12.06	6.406	12.07	6.292
B-13	BASE	25yr-72hr	60.13	5.318	5.870	0.0015	137	60.00	6.991	60.01	6.902
B-13	BASE	5yr-24hr	12.13	4.369	5.870	0.0012	137	12.08	4.889	12.10	4.784
B-14	BASE	100yr-72hr	60.11	5.882	5.700	0.0022	704	60.02	6.408	59.98	6.279
B-14	BASE	10yr-24hr	12.13	5.198	5.700	0.0011	117	12.05	5.577	12.06	5.469
B-14	BASE	25yr-72hr	60.09	5.581	5.700	0.0015	117	59.94	6.024	60.00	5.929
B-14	BASE	5yr-24hr	12.13	4.509	5.700	0.0010	117	12.07	4.320	12.09	4.166
B-15	BASE	100yr-72hr	60.15	6.218	5.660	-0.0021	2786	60.02	3.479	59.85	2.804
B-15	BASE	10yr-24hr	12.10	5.509	5.660	0.0011	114	12.03	2.644	12.07	2.525
B-15	BASE	25yr-72hr	60.10	5.924	5.660	0.0016	1359	60.02	2.981	59.94	2.700
B-15	BASE	5yr-24hr	12.12	4.697	5.660	0.0010	114	12.03	2.105	12.09	1.922
B-16	BASE	100yr-72hr	72.33	10.166	8.130	0.0001	15083	60.02	2.803	0.00	0.000
B-16	BASE	10yr-24hr	24.33	9.414	8.130	0.0003	11308	12.03	2.193	0.00	0.000
B-16	BASE	25yr-72hr	72.33	9.943	8.130	0.0001	13961	60.02	2.407	0.00	0.000
B-16	BASE	5yr-24hr	24.33	9.170	8.130	0.0002	10077	12.03	1.800	0.00	0.000
B-17	BASE	100yr-72hr	72.33	10.166	8.150	0.0001	16326	60.02	2.733	7.16	0.038
B-17	BASE	10yr-24hr	24.33	9.414	8.150	0.0003	12026	12.03	2.077	11.70	0.090
B-17	BASE	25yr-72hr	72.33	9.943	8.150	0.0001	15049	60.02	2.342	8.15	0.024
B-17	BASE	5yr-24hr	24.33	9.170	8.150	0.0002	10625	12.03	1.654	11.92	0.123
B-18	BASE	100yr-72hr	60.27	4.912	4.030	0.0042	5820	61.10	31.929	61.13	29.299
B-18	BASE	10yr-24hr	12.29	4.423	4.030	0.0041	1367	12.72	30.400	12.73	27.604
B-18	BASE	25yr-72hr	60.21	4.634	4.030	0.0039	2952	60.80	31.160	60.81	28.803
B-18	BASE	5yr-24hr	12.16	3.792	4.030	0.0039	273	12.36	25.898	12.42	24.635
B-19	BASE	100yr-72hr	60.28	4.950	4.370	0.0024	2301	60.02	2.485	59.89	2.175
B-19	BASE	10yr-24hr	12.29	4.465	4.370	-0.0019	198	12.03	1.888	12.06	1.769
B-19	BASE	25yr-72hr	60.21	4.675	4.370	0.0021	1055	60.02	2.129	59.97	2.005
B-19	BASE	5yr-24hr	12.16	3.840	4.370	0.0020	114	12.03	1.504	12.32	1.538
B-2	BASE	100yr-72hr	60.24	4.820	3.960	0.0026	5396	60.02	7.765	59.96	5.554
B-2	BASE	10yr-24hr	12.26	4.250	3.960	0.0019	2178	12.03	5.901	12.03	4.811
B-2	BASE	25yr-72hr	60.20	4.493	3.960	0.0013	3363	60.02	6.654	60.08	5.403
B-2	BASE	5yr-24hr	12.14	3.560	3.960	0.0018	609	12.03	4.699	12.12	4.100

```
                                              Max Time       Max   Warning Max Delta  Max Surf  Max Time       Max  Max Time       Max
          Name         Group      Simulation     Stage     Stage     Stage     Stage      Area    Inflow    Inflow   Outflow   Outflow
                                                   hrs        ft        ft        ft       ft2       hrs       cfs       hrs       cfs
------------------------------------------------------------------------------------------------------------------------------------------------------------------------

          B-20          BASE     100yr-72hr      60.40     5.070     3.670   -0.0056     12211     60.02     7.019     61.03     5.796
          B-20          BASE      10yr-24hr      12.36     4.615     3.670   -0.0051      6627     12.03     5.334     12.68     4.926
          B-20          BASE      25yr-72hr      60.29     4.812     3.670   -0.0057      9179     60.02     6.015     60.76     5.347
          B-20          BASE       5yr-24hr      12.18     4.033     3.670    0.0016      1740     12.03     4.248     12.03     3.874

          B-21          BASE     100yr-72hr      60.42     5.081     3.830   -0.0045     12228     60.02     6.957     61.12     6.910
          B-21          BASE      10yr-24hr      12.37     4.626     3.830   -0.0082      7252     12.03     5.287     12.70     5.324
          B-21          BASE      25yr-72hr      60.31     4.822     3.830   -0.0091      9633     60.02     5.962     60.80     5.901
          B-21          BASE       5yr-24hr      12.18     4.055     3.830    0.0012      1794     12.03     4.210     12.04     4.060

          B-22          BASE     100yr-72hr      60.20     5.137     5.310    0.0034       558     59.73    16.964     61.10    18.610
          B-22          BASE      10yr-24hr      12.29     4.622     5.310   -0.0021       452     12.72    15.901     12.72    19.000
          B-22          BASE      25yr-72hr      60.17     4.850     5.310    0.0030       499     60.80    16.626     60.83    19.268
          B-22          BASE       5yr-24hr      12.16     4.009     5.310    0.0024       326     12.35    15.836     12.36    17.709

          B-23          BASE     100yr-72hr      60.16     5.336     5.340   -0.0009       507     60.02     2.423     60.05     2.095
          B-23          BASE      10yr-24hr      12.29     4.792     5.340   -0.0008       407     12.03     1.841     11.97     1.660
          B-23          BASE      25yr-72hr      60.15     5.036     5.340   -0.0009       452     60.02     2.076     60.05     1.817
          B-23          BASE       5yr-24hr      12.17     4.189     5.340   -0.0004       314     12.03     1.466     12.06     1.457

          B-24          BASE     100yr-72hr      60.33     5.529     4.200    0.0036      8553     60.02     6.584     59.74     4.727
          B-24          BASE      10yr-24hr      12.35     4.995     4.200   -0.0037      5593     12.03     5.004     11.85     4.485
          B-24          BASE      25yr-72hr      60.27     5.230     4.200   -0.0034      6906     60.02     5.643     60.76     4.570
          B-24          BASE       5yr-24hr      12.17     4.397     4.200    0.0054       700     12.03     3.984     11.93     4.476

          B-25          BASE     100yr-72hr      60.35     5.675     4.200   -0.0098     11898     60.02    10.995     61.10     8.992
          B-25          BASE      10yr-24hr      12.37     5.129     4.200   -0.0085      8281     12.03     8.356     12.72     8.301
          B-25          BASE      25yr-72hr      60.28     5.370     4.200   -0.0095      9876     60.02     9.422     60.81     8.929
          B-25          BASE       5yr-24hr      12.19     4.553     4.200   -0.0037      2549     12.03     6.653     12.02     6.580

          B-26          BASE     100yr-72hr      60.02     6.096     9.940    0.0003       122     60.02     2.236     60.02     2.232
          B-26          BASE      10yr-24hr      12.05     5.926     9.940    0.0002       130     12.03     1.699     12.05     1.697
          B-26          BASE      25yr-72hr      60.02     5.995     9.940    0.0003       128     60.02     1.916     60.02     1.913
          B-26          BASE       5yr-24hr      12.05     5.815     9.940    0.0002       132     12.03     1.353     12.05     1.351

          B-27          BASE     100yr-72hr      72.33    11.091     5.900   -0.0002     26001     60.02    10.870      4.77     1.495
          B-27          BASE      10yr-24hr      24.33     9.530     5.900    0.0009     20977     12.03     8.261      3.04     1.185
          B-27          BASE      25yr-72hr      72.33    10.614     5.900   -0.0002     24684     60.02     9.316      5.52     1.209
          B-27          BASE       5yr-24hr      24.33     9.047     5.900    0.0008     19286     12.03     6.578      3.66     1.106

          B-28          BASE     100yr-72hr      72.49    11.091     5.800    0.0003     16000     60.02     5.901      7.16     0.381
          B-28          BASE      10yr-24hr      48.00     9.530     5.800    0.0010     12715     12.03     4.485      4.29     0.564
          B-28          BASE      25yr-72hr      72.49    10.614     5.800    0.0002     15264     60.02     5.057      8.16     0.343
          B-28          BASE       5yr-24hr      48.00     9.047     5.800    0.0009     11533     12.03     3.571      5.10     0.554

           B-3          BASE     100yr-72hr      60.33     4.678     3.960   -0.0029      7289     60.02     3.851     60.76     3.289
           B-3          BASE      10yr-24hr      12.29     4.134     3.960    0.0014      2258     12.03     2.927     12.07     2.783
           B-3          BASE      25yr-72hr      60.25     4.370     3.960   -0.0013      4107     60.02     3.300     59.92     2.998
           B-3          BASE       5yr-24hr      12.15     3.458     3.960    0.0013       114     12.03     2.331     12.00     2.234

           B-4          BASE     100yr-72hr      60.32     4.730     3.120   -0.0092      9158     60.02     4.410     59.69     6.388
           B-4          BASE      10yr-24hr      12.29     4.173     3.120   -0.0063      3272     12.03     3.352     11.81     5.981
           B-4          BASE      25yr-72hr      60.24     4.408     3.120   -0.0039      5153     60.02     3.780     59.71     6.306
           B-4          BASE       5yr-24hr      12.15     3.533     3.120   -0.0063       468     12.03     2.669     11.89     6.038

           B-5          BASE     100yr-72hr      60.37     4.775     3.690    0.0034     10540     60.02     5.963     60.90     5.029
           B-5          BASE      10yr-24hr      12.30     4.241     3.690    0.0037      4242     12.03     4.532     11.82     4.273
           B-5          BASE      25yr-72hr      60.27     4.460     3.690    0.0040      6394     60.02     5.110     59.72     4.608
           B-5          BASE       5yr-24hr      12.14     3.605     3.690    0.0033       129     12.03     3.609     11.91     4.335
```

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
B-6	BASE	100yr-72hr	60.24	4.946	4.870	0.0019	454	60.02	2.174	60.02	2.091
B-6	BASE	10yr-24hr	12.26	4.376	4.870	-0.0011	113	12.03	1.652	12.04	1.549
B-6	BASE	25yr-72hr	60.18	4.633	4.870	0.0008	113	60.02	1.863	60.02	1.793
B-6	BASE	5yr-24hr	12.15	3.723	4.870	-0.0012	113	12.03	1.316	11.82	1.426
B-7	BASE	100yr-72hr	60.29	4.920	5.220	0.0012	973	60.02	1.491	60.89	1.053
B-7	BASE	10yr-24hr	12.29	4.353	5.220	-0.0007	737	12.03	1.133	12.66	1.174
B-7	BASE	25yr-72hr	60.23	4.607	5.220	-0.0009	843	60.02	1.278	60.75	1.109
B-7	BASE	5yr-24hr	12.16	3.702	5.220	0.0004	465	12.03	0.902	12.28	0.881
B-8	BASE	100yr-72hr	60.25	5.133	4.900	0.0014	1504	60.02	2.360	59.97	2.220
B-8	BASE	10yr-24hr	12.26	4.581	4.900	-0.0008	114	12.03	1.794	12.04	1.676
B-8	BASE	25yr-72hr	60.15	4.843	4.900	0.0009	115	60.02	2.023	60.02	1.953
B-8	BASE	5yr-24hr	12.14	3.940	4.900	-0.0008	114	12.03	1.428	12.01	1.310
B-9	BASE	100yr-72hr	60.29	5.133	4.860	0.0014	2355	60.02	2.298	59.95	2.115
B-9	BASE	10yr-24hr	12.25	4.590	4.860	-0.0007	114	12.03	1.747	12.04	1.626
B-9	BASE	25yr-72hr	60.14	4.855	4.860	0.0009	114	60.02	1.970	60.03	1.899
B-9	BASE	5yr-24hr	12.14	3.948	4.860	0.0005	114	12.03	1.391	12.01	1.265
D-1	BASE	100yr-72hr	60.20	3.333	6.500	0.0070	122	59.76	14.398	0.00	0.000
D-1	BASE	10yr-24hr	12.26	2.766	6.500	-0.0063	122	11.99	12.837	0.00	0.000
D-1	BASE	25yr-72hr	60.19	3.006	6.500	0.0058	122	59.80	14.286	0.00	0.000
D-1	BASE	5yr-24hr	12.09	2.396	6.500	-0.0042	122	12.02	14.031	0.00	0.000
D-2	BASE	100yr-72hr	60.96	4.941	6.500	0.0097	360	60.96	52.648	60.96	52.648
D-2	BASE	10yr-24hr	12.77	3.837	6.500	0.0024	360	12.77	54.813	12.77	54.813
D-2	BASE	25yr-72hr	60.84	4.941	6.500	0.0097	360	60.84	52.648	60.84	52.648
D-2	BASE	5yr-24hr	12.46	3.837	6.500	0.0023	360	12.46	54.812	12.46	54.812
D-3	BASE	100yr-72hr	60.96	8.066	6.500	-0.0099	119	59.72	11.717	60.94	11.352
D-3	BASE	10yr-24hr	12.77	7.233	6.500	-0.0082	119	11.51	10.078	12.77	9.187
D-3	BASE	25yr-72hr	60.84	8.066	6.500	-0.0100	119	59.74	11.694	60.82	11.352
D-3	BASE	5yr-24hr	12.46	7.233	6.500	-0.0078	119	11.70	10.078	12.46	9.187
D-3A	BASE	100yr-72hr	60.96	7.148	6.500	0.0057	135	60.95	52.648	60.96	52.648
D-3A	BASE	10yr-24hr	12.77	6.229	6.500	-0.0035	135	12.77	54.813	12.77	54.813
D-3A	BASE	25yr-72hr	60.84	7.148	6.500	0.0057	135	60.84	52.648	60.84	52.648
D-3A	BASE	5yr-24hr	12.46	6.229	6.500	-0.0034	135	12.46	54.812	12.46	54.812
GROUNDWATER	BASE	100yr-72hr	0.00	2.250	0.000	0.0000	0	60.96	11.352	0.00	0.000
GROUNDWATER	BASE	10yr-24hr	0.00	2.250	0.000	0.0000	0	12.77	9.187	0.00	0.000
GROUNDWATER	BASE	25yr-72hr	0.00	2.250	0.000	0.0000	0	60.84	11.352	0.00	0.000
GROUNDWATER	BASE	5yr-24hr	0.00	2.250	0.000	0.0000	0	12.46	9.187	0.00	0.000
J-1	BASE	100yr-72hr	60.20	3.325	5.800	0.0070	225	59.95	74.277	59.83	77.056
J-1	BASE	10yr-24hr	12.26	2.759	5.800	0.0100	227	12.61	71.947	11.99	77.581
J-1	BASE	25yr-72hr	60.19	2.999	5.800	0.0069	226	60.07	74.242	59.89	77.034
J-1	BASE	5yr-24hr	12.09	2.396	5.800	-0.0062	257	12.16	64.417	12.06	72.668
J-10	BASE	100yr-72hr	60.21	5.192	5.860	-0.0029	133	61.06	13.655	61.09	14.794
J-10	BASE	10yr-24hr	12.29	4.672	5.860	-0.0028	133	12.74	13.537	12.72	14.573
J-10	BASE	25yr-72hr	60.17	4.903	5.860	-0.0037	133	60.83	13.988	60.80	15.576
J-10	BASE	5yr-24hr	12.16	4.067	5.860	0.0026	133	12.35	12.098	12.35	13.346
J-11	BASE	100yr-72hr	60.23	5.279	5.950	0.0019	137	61.05	14.025	61.06	13.184
J-11	BASE	10yr-24hr	12.30	4.757	5.950	-0.0017	137	12.66	12.884	12.74	12.648
J-11	BASE	25yr-72hr	60.18	4.988	5.950	0.0018	137	60.75	13.742	60.78	13.232
J-11	BASE	5yr-24hr	12.17	4.167	5.950	0.0012	199	11.97	10.968	12.35	11.012

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
J-12	BASE	100yr-72hr	60.30	5.447	4.650	-0.0029	136	59.74	12.578	61.05	13.252
J-12	BASE	10yr-24hr	12.33	4.918	4.650	-0.0024	136	11.93	11.156	12.66	11.981
J-12	BASE	25yr-72hr	60.24	5.151	4.650	-0.0026	136	60.76	11.825	60.75	12.914
J-12	BASE	5yr-24hr	12.17	4.306	4.650	-0.0017	273	11.95	10.357	11.97	9.640
J-13	BASE	100yr-72hr	60.15	5.231	10.080	0.0017	147	60.02	2.232	60.04	2.139
J-13	BASE	10yr-24hr	12.28	4.695	10.080	-0.0012	148	12.05	1.697	12.10	1.567
J-13	BASE	25yr-72hr	60.14	4.936	10.080	0.0014	148	60.02	1.913	60.04	1.830
J-13	BASE	5yr-24hr	12.16	4.088	10.080	0.0010	148	12.05	1.351	12.36	1.246
J-14	BASE	100yr-72hr	72.49	11.091	6.500	0.0009	114	4.77	1.570	0.00	0.000
J-14	BASE	10yr-24hr	48.00	9.530	6.500	0.0025	114	3.04	1.407	0.00	0.000
J-14	BASE	25yr-72hr	72.49	10.614	6.500	0.0010	114	5.52	1.302	0.00	0.000
J-14	BASE	5yr-24hr	48.00	9.046	6.500	0.0024	114	3.66	1.315	0.00	0.000
J-2	BASE	100yr-72hr	60.20	3.817	5.000	0.0097	133	59.96	73.823	59.95	74.277
J-2	BASE	10yr-24hr	12.26	3.251	5.000	0.0099	133	12.00	66.433	12.61	71.947
J-2	BASE	25yr-72hr	60.19	3.490	5.000	-0.0100	133	60.08	73.608	60.07	74.242
J-2	BASE	5yr-24hr	12.09	2.554	5.000	-0.0053	222	12.14	64.143	12.16	64.417
J-3	BASE	100yr-72hr	60.29	4.644	4.200	-0.0044	143	60.76	32.730	60.76	37.396
J-3	BASE	10yr-24hr	12.28	4.092	4.200	0.0017	417	12.00	29.715	12.49	29.381
J-3	BASE	25yr-72hr	60.23	4.336	4.200	-0.0042	293	60.08	31.736	60.38	35.626
J-3	BASE	5yr-24hr	12.15	3.417	4.200	0.0016	597	12.13	28.613	12.14	28.549
J-4	BASE	100yr-72hr	60.31	4.719	4.600	0.0017	169	60.88	27.534	60.89	27.031
J-4	BASE	10yr-24hr	12.29	4.160	4.600	0.0009	408	12.48	24.947	12.52	24.396
J-4	BASE	25yr-72hr	60.23	4.396	4.600	-0.0011	301	60.58	26.114	60.60	25.414
J-4	BASE	5yr-24hr	12.15	3.521	4.600	0.0009	949	12.13	22.626	12.15	22.538
J-5	BASE	100yr-72hr	60.30	4.884	5.300	-0.0022	148	60.98	18.603	60.92	19.446
J-5	BASE	10yr-24hr	12.28	4.316	5.300	0.0017	148	12.01	17.978	12.54	18.688
J-5	BASE	25yr-72hr	60.23	4.572	5.300	-0.0017	148	60.08	18.171	60.63	19.002
J-5	BASE	5yr-24hr	12.15	3.668	5.300	0.0005	503	12.13	17.240	12.15	17.211
J-6	BASE	100yr-72hr	60.32	5.049	5.200	-0.0016	138	59.78	17.037	60.98	17.128
J-6	BASE	10yr-24hr	12.29	4.498	5.200	-0.0025	138	11.97	16.435	11.97	16.180
J-6	BASE	25yr-72hr	60.22	4.748	5.200	-0.0016	138	59.82	16.624	60.63	16.342
J-6	BASE	5yr-24hr	12.15	3.863	5.200	-0.0028	138	12.07	15.646	12.08	15.488
J-7	BASE	100yr-72hr	60.35	5.270	4.400	0.0050	138	60.98	15.697	60.99	15.902
J-7	BASE	10yr-24hr	12.31	4.742	4.400	0.0054	138	11.96	14.008	12.53	14.081
J-7	BASE	25yr-72hr	60.24	4.986	4.400	0.0044	138	59.73	14.906	60.63	14.907
J-7	BASE	5yr-24hr	12.15	4.130	4.400	0.0049	138	11.92	13.797	12.07	13.156
J-8	BASE	100yr-72hr	60.29	4.933	4.860	0.0051	137	61.07	12.612	61.12	15.320
J-8	BASE	10yr-24hr	12.30	4.448	4.860	0.0033	137	12.69	11.260	12.69	11.282
J-8	BASE	25yr-72hr	60.22	4.657	4.860	-0.0038	137	60.77	11.962	60.82	12.747
J-8	BASE	5yr-24hr	12.16	3.825	4.860	-0.0035	137	12.04	8.987	12.04	9.002
J-9	BASE	100yr-72hr	60.34	5.000	4.000	-0.0024	133	61.05	11.929	61.05	12.081
J-9	BASE	10yr-24hr	12.33	4.532	4.000	-0.0029	133	12.69	10.192	12.69	10.381
J-9	BASE	25yr-72hr	60.25	4.735	4.000	-0.0028	133	60.76	11.074	60.76	11.244
J-9	BASE	5yr-24hr	12.17	3.935	4.000	0.0013	133	12.03	7.760	12.04	7.502
P-1	BASE	100yr-72hr	60.96	15.807	6.500	0.0117	137	7.05	32.000	60.96	32.000
P-1	BASE	10yr-24hr	12.77	14.967	6.500	-0.0117	137	4.29	32.000	12.77	32.000
P-1	BASE	25yr-72hr	60.84	15.807	6.500	0.0117	137	8.16	32.000	60.84	32.000
P-1	BASE	5yr-24hr	12.46	14.967	6.500	-0.0117	137	5.10	32.000	11.92	32.003

Mary Brickell Village Drainage Improvements
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Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
P-2	BASE	100yr-72hr	60.96	15.807	6.500	0.0117	137	59.70	32.000	60.96	32.000
P-2	BASE	10yr-24hr	12.77	14.967	6.500	0.0117	137	11.82	32.000	12.77	32.000
P-2	BASE	25yr-72hr	60.84	15.807	6.500	0.0117	137	59.72	32.000	60.84	32.000
P-2	BASE	5yr-24hr	12.46	14.967	6.500	0.0117	137	11.92	32.000	12.46	32.000
VALVEBOX	BASE	100yr-72hr	60.96	8.086	6.500	-0.0077	183	60.96	64.000	60.95	64.000
VALVEBOX	BASE	10yr-24hr	12.77	7.246	6.500	-0.0039	183	12.77	64.000	12.77	64.000
VALVEBOX	BASE	25yr-72hr	60.84	8.086	6.500	-0.0073	183	60.84	64.000	60.84	64.000
VALVEBOX	BASE	5yr-24hr	12.46	7.246	6.500	-0.0039	183	12.46	63.999	12.46	63.999
W-1	BASE	100yr-72hr	60.96	8.000	8.000	-0.0038	116	60.94	5.676	60.96	5.676
W-1	BASE	10yr-24hr	12.77	7.190	8.000	-0.0039	116	12.77	4.594	12.77	4.594
W-1	BASE	25yr-72hr	60.84	8.000	8.000	-0.0038	116	60.82	5.676	60.84	5.676
W-1	BASE	5yr-24hr	12.46	7.189	8.000	-0.0039	116	12.46	4.594	12.46	4.594
W-2	BASE	100yr-72hr	60.96	8.000	8.000	-0.0038	116	60.94	5.676	60.96	5.676
W-2	BASE	10yr-24hr	12.77	7.190	8.000	-0.0039	116	12.77	4.594	12.77	4.594
W-2	BASE	25yr-72hr	60.84	8.000	8.000	-0.0038	116	60.82	5.676	60.84	5.676
W-2	BASE	5yr-24hr	12.46	7.189	8.000	-0.0039	116	12.46	4.594	12.46	4.594
WATERWAY	BASE	100yr-72hr	0.00	3.800	2.600	1.2000	122	60.96	52.648	0.00	0.000
WATERWAY	BASE	10yr-24hr	0.00	2.600	2.600	0.0000	122	12.77	54.813	0.00	0.000
WATERWAY	BASE	25yr-72hr	0.00	3.800	2.600	1.2000	122	60.84	52.648	0.00	0.000
WATERWAY	BASE	5yr-24hr	0.00	2.600	2.600	0.0000	122	12.46	54.812	0.00	0.000
WETWELL	BASE	100yr-72hr	60.20	3.147	6.500	-0.0100	495	59.96	75.036	59.70	64.000
WETWELL	BASE	10yr-24hr	12.26	2.473	6.500	-0.0092	497	12.00	65.672	11.82	64.000
WETWELL	BASE	25yr-72hr	60.19	2.770	6.500	-0.0100	497	60.08	75.034	59.72	64.000
WETWELL	BASE	5yr-24hr	12.08	2.101	6.500	-0.0100	497	12.08	66.853	11.92	64.000

Mary Brickell Village Drainage Improvements
Final Design
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Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
B1-J2	BASE	100yr-72hr	59.96	61.361	9.526	60.26	4.529	60.20	3.817
B1-J2	BASE	10yr-24hr	12.00	57.618	9.526	12.28	4.038	12.26	3.251
B1-J2	BASE	25yr-72hr	60.08	61.842	9.525	60.22	4.242	60.19	3.490
B1-J2	BASE	5yr-24hr	12.14	55.991	9.525	12.15	3.357	12.09	2.554
B10-J7	BASE	100yr-72hr	61.00	6.124	-3.224	60.41	5.295	60.35	5.270
B10-J7	BASE	10yr-24hr	11.85	4.255	1.992	12.33	4.779	12.31	4.742
B10-J7	BASE	25yr-72hr	60.68	4.893	3.580	60.29	5.014	60.24	4.986
B10-J7	BASE	5yr-24hr	11.92	4.248	-3.025	12.15	4.177	12.15	4.130
B11-J7	BASE	100yr-72hr	60.99	5.611	-1.938	60.41	5.311	60.35	5.270
B11-J7	BASE	10yr-24hr	12.63	4.318	-1.939	12.33	4.802	12.31	4.742
B11-J7	BASE	25yr-72hr	60.73	4.984	-1.936	60.28	5.034	60.24	4.986
B11-J7	BASE	5yr-24hr	11.88	3.837	-1.981	12.15	4.202	12.15	4.130
B12-J7	BASE	100yr-72hr	60.05	10.187	-0.630	60.28	5.424	60.35	5.270
B12-J7	BASE	10yr-24hr	12.03	9.024	-0.530	12.28	4.876	12.31	4.742
B12-J7	BASE	25yr-72hr	60.06	9.668	-0.603	60.20	5.146	60.24	4.986
B12-J7	BASE	5yr-24hr	12.07	8.056	-0.556	12.14	4.261	12.15	4.130
B13-B12	BASE	100yr-72hr	59.99	7.411	-0.549	60.17	5.601	60.28	5.424
B13-B12	BASE	10yr-24hr	12.07	6.292	-0.540	12.20	4.997	12.28	4.876
B13-B12	BASE	25yr-72hr	60.01	6.902	-0.544	60.13	5.318	60.20	5.146
B13-B12	BASE	5yr-24hr	12.10	4.784	0.541	12.13	4.369	12.14	4.261
B14-B13	BASE	100yr-72hr	59.98	6.279	-0.286	60.11	5.882	60.17	5.601
B14-B13	BASE	10yr-24hr	12.06	5.469	-0.244	12.13	5.198	12.20	4.997
B14-B13	BASE	25yr-72hr	60.00	5.929	-0.278	60.09	5.581	60.13	5.318
B14-B13	BASE	5yr-24hr	12.09	4.166	-0.255	12.13	4.509	12.13	4.369
B15-B14	BASE	100yr-72hr	59.85	2.804	-0.408	60.15	6.218	60.11	5.882
B15-B14	BASE	10yr-24hr	12.07	2.525	-0.363	12.10	5.509	12.13	5.198
B15-B14	BASE	25yr-72hr	59.94	2.700	-0.405	60.10	5.924	60.09	5.581
B15-B14	BASE	5yr-24hr	12.09	1.922	-0.362	12.12	4.697	12.13	4.509
B16-B14	BASE	100yr-72hr	0.00	0.000	0.000	0.00	0.000	0.00	0.000
B16-B14	BASE	10yr-24hr	0.00	0.000	0.000	0.00	0.000	0.00	0.000
B16-B14	BASE	25yr-72hr	0.00	0.000	0.000	0.00	0.000	0.00	0.000
B16-B14	BASE	5yr-24hr	0.00	0.000	0.000	0.00	0.000	0.00	0.000
B17-B16	BASE	100yr-72hr	7.16	0.038	-0.037	72.33	10.166	72.33	10.166
B17-B16	BASE	10yr-24hr	11.70	0.090	0.037	24.33	9.414	24.33	9.414
B17-B16	BASE	25yr-72hr	8.15	0.024	0.028	72.33	9.943	72.33	9.943
B17-B16	BASE	5yr-24hr	11.92	0.123	0.035	24.33	9.170	24.33	9.170
B18-B1	BASE	100yr-72hr	61.13	29.299	-4.179	60.27	4.912	60.26	4.529
B18-B1	BASE	10yr-24hr	12.73	27.604	-4.160	12.29	4.423	12.28	4.038
B18-B1	BASE	25yr-72hr	60.81	28.803	-4.272	60.21	4.634	60.22	4.242
B18-B1	BASE	5yr-24hr	12.42	24.635	-4.273	12.16	3.792	12.15	3.357
B19-J8	BASE	100yr-72hr	59.89	2.175	0.439	60.28	4.950	60.29	4.933
B19-J8	BASE	10yr-24hr	12.06	1.769	-0.390	12.29	4.465	12.30	4.448
B19-J8	BASE	25yr-72hr	59.97	2.005	-0.387	60.21	4.675	60.22	4.657
B19-J8	BASE	5yr-24hr	12.32	1.538	0.448	12.16	3.840	12.16	3.825
B2-J3	BASE	100yr-72hr	59.96	5.554	-1.240	60.24	4.820	60.29	4.644
B2-J3	BASE	10yr-24hr	12.03	4.811	-0.975	12.26	4.250	12.28	4.092
B2-J3	BASE	25yr-72hr	60.08	5.403	-1.204	60.20	4.493	60.23	4.336
B2-J3	BASE	5yr-24hr	12.12	4.100	-0.925	12.14	3.560	12.15	3.417

Mary Brickell Village Drainage Improvements
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Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
B20-J9	BASE	100yr-72hr	61.03	5.796	-0.065	60.40	5.070	60.34	5.000
B20-J9	BASE	10yr-24hr	12.68	4.926	-0.041	12.36	4.615	12.33	4.532
B20-J9	BASE	25yr-72hr	60.76	5.347	-0.067	60.29	4.812	60.25	4.735
B20-J9	BASE	5yr-24hr	12.03	3.874	-0.017	12.18	4.033	12.17	3.935
B21-J9	BASE	100yr-72hr	61.12	6.910	-0.021	60.42	5.081	60.34	5.000
B21-J9	BASE	10yr-24hr	12.70	5.324	-0.073	12.37	4.626	12.33	4.532
B21-J9	BASE	25yr-72hr	60.80	5.901	-0.062	60.31	4.822	60.25	4.735
B21-J9	BASE	5yr-24hr	12.04	4.060	-0.007	12.18	4.055	12.17	3.935
B22-B18	BASE	100yr-72hr	61.10	18.610	3.742	60.20	5.137	60.27	4.912
B22-B18	BASE	10yr-24hr	12.72	19.000	3.823	12.29	4.622	12.29	4.423
B22-B18	BASE	25yr-72hr	60.83	19.268	3.716	60.17	4.850	60.21	4.634
B22-B18	BASE	5yr-24hr	12.36	17.709	3.505	12.16	4.009	12.16	3.792
B23-J11	BASE	100yr-72hr	60.05	2.095	-0.443	60.16	5.336	60.23	5.279
B23-J11	BASE	10yr-24hr	11.97	1.660	-0.401	12.29	4.792	12.30	4.757
B23-J11	BASE	25yr-72hr	60.05	1.817	-0.422	60.15	5.036	60.18	4.988
B23-J11	BASE	5yr-24hr	12.06	1.457	-0.001	12.17	4.189	12.17	4.167
B24-J12	BASE	100yr-72hr	59.74	4.727	1.669	60.33	5.529	60.30	5.447
B24-J12	BASE	10yr-24hr	11.85	4.485	-1.536	12.35	4.995	12.33	4.918
B24-J12	BASE	25yr-72hr	60.76	4.570	-1.485	60.27	5.230	60.24	5.151
B24-J12	BASE	5yr-24hr	11.93	4.476	1.467	12.17	4.397	12.17	4.306
B25-J12	BASE	100yr-72hr	61.10	8.992	-0.926	60.35	5.675	60.30	5.447
B25-J12	BASE	10yr-24hr	12.72	8.301	-0.983	12.37	5.129	12.33	4.918
B25-J12	BASE	25yr-72hr	60.81	8.929	-0.962	60.28	5.370	60.24	5.151
B25-J12	BASE	5yr-24hr	12.02	6.580	1.881	12.19	4.553	12.17	4.306
B26-J13	BASE	100yr-72hr	60.02	2.232	0.001	60.02	6.096	60.02	4.912
B26-J13	BASE	10yr-24hr	12.05	1.697	-0.001	12.05	5.926	12.05	4.844
B26-J13	BASE	25yr-72hr	60.02	1.913	0.001	60.02	5.995	60.02	4.872
B26-J13	BASE	5yr-24hr	12.05	1.351	0.001	12.05	5.815	12.05	4.798
B27-J14	BASE	100yr-72hr	4.77	1.495	-1.686	72.33	11.091	72.49	11.091
B27-J14	BASE	10yr-24hr	3.04	1.185	-1.411	24.33	9.530	48.00	9.530
B27-J14	BASE	25yr-72hr	5.52	1.209	-1.380	72.33	10.614	72.49	10.614
B27-J14	BASE	5yr-24hr	3.66	1.106	-1.322	24.33	9.047	48.00	9.046
B28-J14	BASE	100yr-72hr	7.16	0.381	0.599	72.49	11.091	72.49	11.091
B28-J14	BASE	10yr-24hr	4.29	0.564	0.449	48.00	9.530	48.00	9.530
B28-J14	BASE	25yr-72hr	8.16	0.343	0.339	72.49	10.614	72.49	10.614
B28-J14	BASE	5yr-24hr	5.10	0.554	0.480	48.00	9.047	48.00	9.046
B3-J3	BASE	100yr-72hr	60.76	3.289	-0.126	60.33	4.678	60.29	4.644
B3-J3	BASE	10yr-24hr	12.07	2.783	-0.034	12.29	4.134	12.28	4.092
B3-J3	BASE	25yr-72hr	59.92	2.998	-0.125	60.25	4.370	60.23	4.336
B3-J3	BASE	5yr-24hr	12.00	2.234	-0.036	12.15	3.458	12.15	3.417
B4-J4	BASE	100yr-72hr	59.69	6.388	-4.902	60.32	4.730	60.31	4.719
B4-J4	BASE	10yr-24hr	11.81	5.981	4.197	12.29	4.173	12.29	4.160
B4-J4	BASE	25yr-72hr	59.71	6.306	-4.891	60.24	4.408	60.23	4.396
B4-J4	BASE	5yr-24hr	11.89	6.038	4.782	12.15	3.533	12.15	3.521
B5-J4	BASE	100yr-72hr	60.90	5.029	-2.666	60.37	4.775	60.31	4.719
B5-J4	BASE	10yr-24hr	11.82	4.273	-1.894	12.30	4.241	12.29	4.160
B5-J4	BASE	25yr-72hr	59.72	4.608	2.757	60.27	4.460	60.23	4.396
B5-J4	BASE	5yr-24hr	11.91	4.335	-2.720	12.14	3.605	12.15	3.521

Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
B6-J5	BASE	100yr-72hr	60.02	2.091	-0.936	60.24	4.946	60.30	4.884
B6-J5	BASE	10yr-24hr	12.04	1.549	-0.935	12.26	4.376	12.28	4.316
B6-J5	BASE	25yr-72hr	60.02	1.793	-0.935	60.18	4.633	60.23	4.572
B6-J5	BASE	5yr-24hr	11.82	1.426	-0.934	12.15	3.723	12.15	3.668
B7-J5	BASE	100yr-72hr	60.89	1.053	0.063	60.29	4.920	60.30	4.884
B7-J5	BASE	10yr-24hr	12.66	1.174	0.066	12.29	4.353	12.28	4.316
B7-J5	BASE	25yr-72hr	60.75	1.109	-0.069	60.23	4.607	60.23	4.572
B7-J5	BASE	5yr-24hr	12.28	0.881	-0.066	12.16	3.702	12.15	3.668
B8-J6	BASE	100yr-72hr	59.97	2.220	0.598	60.25	5.133	60.32	5.049
B8-J6	BASE	10yr-24hr	12.04	1.676	0.589	12.26	4.581	12.29	4.498
B8-J6	BASE	25yr-72hr	60.02	1.953	0.600	60.15	4.843	60.22	4.748
B8-J6	BASE	5yr-24hr	12.01	1.310	0.582	12.14	3.940	12.15	3.863
B9-J6	BASE	100yr-72hr	59.95	2.115	-0.206	60.29	5.133	60.32	5.049
B9-J6	BASE	10yr-24hr	12.04	1.626	-0.175	12.25	4.590	12.29	4.498
B9-J6	BASE	25yr-72hr	60.03	1.899	-0.201	60.14	4.855	60.22	4.748
B9-J6	BASE	5yr-24hr	12.01	1.265	-0.170	12.14	3.948	12.15	3.863
D1-D2	BASE	100yr-72hr	0.00	0.000	0.000	60.20	3.333	60.20	3.333
D1-D2	BASE	10yr-24hr	0.00	0.000	0.000	12.26	2.766	12.26	2.766
D1-D2	BASE	25yr-72hr	0.00	0.000	0.000	60.19	3.006	60.19	3.006
D1-D2	BASE	5yr-24hr	0.00	0.000	0.000	12.09	2.396	12.09	2.396
D2-WW	BASE	100yr-72hr	60.96	52.648	-53.993	60.96	4.941	0.00	3.800
D2-WW	BASE	10yr-24hr	12.77	54.813	3.120	12.77	3.837	0.00	2.600
D2-WW	BASE	25yr-72hr	60.84	52.648	-53.993	60.84	4.941	0.00	3.800
D2-WW	BASE	5yr-24hr	12.46	54.812	3.117	12.46	3.837	0.00	2.600
D3-W1	BASE	100yr-72hr	60.94	5.676	3.336	60.96	8.066	60.96	8.000
D3-W1	BASE	10yr-24hr	12.77	4.594	-2.806	12.77	7.233	12.77	7.190
D3-W1	BASE	25yr-72hr	60.82	5.676	3.342	60.84	8.066	60.84	8.000
D3-W1	BASE	5yr-24hr	12.46	4.594	-2.741	12.46	7.233	12.46	7.189
D3-W2	BASE	100yr-72hr	60.94	5.676	3.336	60.96	8.066	60.96	8.000
D3-W2	BASE	10yr-24hr	12.77	4.594	-2.806	12.77	7.233	12.77	7.190
D3-W2	BASE	25yr-72hr	60.82	5.676	3.342	60.84	8.066	60.84	8.000
D3-W2	BASE	5yr-24hr	12.46	4.594	-2.741	12.46	7.233	12.46	7.189
D3A-D3	BASE	100yr-72hr	60.96	52.648	22.164	60.96	7.148	60.96	4.941
D3A-D3	BASE	10yr-24hr	12.77	54.813	6.398	12.77	6.229	12.77	3.837
D3A-D3	BASE	25yr-72hr	60.84	52.648	22.164	60.84	7.148	60.84	4.941
D3A-D3	BASE	5yr-24hr	12.46	54.812	6.397	12.46	6.229	12.46	3.837
J1-D1	BASE	100yr-72hr	59.76	14.398	18.616	60.20	3.325	60.20	3.333
J1-D1	BASE	10yr-24hr	11.99	12.837	-11.056	12.26	2.759	12.26	2.766
J1-D1	BASE	25yr-72hr	59.80	14.286	18.764	60.19	2.999	60.19	3.006
J1-D1	BASE	5yr-24hr	12.02	14.031	-10.720	12.09	2.396	12.09	2.396
J1-WETWELL	BASE	100yr-72hr	59.96	75.036	8.329	60.20	3.325	60.20	3.147
J1-WETWELL	BASE	10yr-24hr	12.00	65.672	9.142	12.26	2.759	12.26	2.473
J1-WETWELL	BASE	25yr-72hr	60.08	75.034	8.328	60.19	2.999	60.19	2.770
J1-WETWELL	BASE	5yr-24hr	12.08	66.853	9.260	12.09	2.396	12.08	2.101
J10-B22	BASE	100yr-72hr	61.09	14.794	1.270	60.21	5.192	60.20	5.137
J10-B22	BASE	10yr-24hr	12.72	14.573	-1.545	12.29	4.672	12.29	4.622
J10-B22	BASE	25yr-72hr	60.80	15.576	1.782	60.17	4.903	60.17	4.850
J10-B22	BASE	5yr-24hr	12.35	13.346	1.850	12.16	4.067	12.16	4.009

Mary Brickell Village Drainage Improvements
Final Design
Link Maximum Conditions Report

Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
J11-J10	BASE	100yr-72hr	61.06	13.184	-0.999	60.23	5.279	60.21	5.192
J11-J10	BASE	10yr-24hr	12.74	12.648	-1.000	12.30	4.757	12.29	4.672
J11-J10	BASE	25yr-72hr	60.78	13.232	-0.995	60.18	4.988	60.17	4.903
J11-J10	BASE	5yr-24hr	12.35	11.012	-0.864	12.17	4.167	12.16	4.067
J12-J11	BASE	100yr-72hr	61.05	13.252	1.663	60.30	5.447	60.23	5.279
J12-J11	BASE	10yr-24hr	12.66	11.981	1.476	12.33	4.918	12.30	4.757
J12-J11	BASE	25yr-72hr	60.75	12.914	1.596	60.24	5.151	60.18	4.988
J12-J11	BASE	5yr-24hr	11.97	9.640	-0.032	12.17	4.306	12.17	4.167
J13-J10	BASE	100yr-72hr	60.04	2.139	0.094	60.15	5.231	60.21	5.192
J13-J10	BASE	10yr-24hr	12.10	1.567	-0.082	12.28	4.695	12.29	4.672
J13-J10	BASE	25yr-72hr	60.04	1.830	0.111	60.14	4.936	60.17	4.903
J13-J10	BASE	5yr-24hr	12.36	1.246	-0.081	12.16	4.088	12.16	4.067
J14-J13	BASE	100yr-72hr	0.00	0.000	0.000	0.00	0.000	0.00	0.000
J14-J13	BASE	10yr-24hr	0.00	0.000	0.000	0.00	0.000	0.00	0.000
J14-J13	BASE	25yr-72hr	0.00	0.000	0.000	0.00	0.000	0.00	0.000
J14-J13	BASE	5yr-24hr	0.00	0.000	0.000	0.00	0.000	0.00	0.000
J2-J1	BASE	100yr-72hr	59.95	74.277	-20.477	60.20	3.817	60.20	3.325
J2-J1	BASE	10yr-24hr	12.61	71.947	-20.955	12.26	3.251	12.26	2.759
J2-J1	BASE	25yr-72hr	60.07	74.242	-20.844	60.19	3.490	60.19	2.999
J2-J1	BASE	5yr-24hr	12.16	64.417	-7.441	12.09	2.554	12.09	2.396
J3-B1	BASE	100yr-72hr	60.76	37.396	6.795	60.29	4.644	60.26	4.529
J3-B1	BASE	10yr-24hr	12.49	29.381	0.803	12.28	4.092	12.28	4.038
J3-B1	BASE	25yr-72hr	60.38	35.626	6.736	60.23	4.336	60.22	4.242
J3-B1	BASE	5yr-24hr	12.14	28.549	0.795	12.15	3.417	12.15	3.357
J4-J3	BASE	100yr-72hr	60.89	27.031	-0.581	60.31	4.719	60.29	4.644
J4-J3	BASE	10yr-24hr	12.52	24.396	0.187	12.29	4.160	12.28	4.092
J4-J3	BASE	25yr-72hr	60.60	25.414	0.581	60.23	4.396	60.23	4.336
J4-J3	BASE	5yr-24hr	12.15	22.538	-0.069	12.15	3.521	12.15	3.417
J5-J4	BASE	100yr-72hr	60.92	19.446	-1.755	60.30	4.884	60.31	4.719
J5-J4	BASE	10yr-24hr	12.54	18.688	-1.641	12.28	4.316	12.29	4.160
J5-J4	BASE	25yr-72hr	60.63	19.002	-1.688	60.23	4.572	60.23	4.396
J5-J4	BASE	5yr-24hr	12.15	17.211	-0.025	12.15	3.668	12.15	3.521
J6-J5	BASE	100yr-72hr	60.98	17.128	0.366	60.32	5.049	60.30	4.884
J6-J5	BASE	10yr-24hr	11.97	16.180	0.436	12.29	4.498	12.28	4.316
J6-J5	BASE	25yr-72hr	60.63	16.342	-0.222	60.22	4.748	60.23	4.572
J6-J5	BASE	5yr-24hr	12.08	15.488	0.502	12.15	3.863	12.15	3.668
J7-J6	BASE	100yr-72hr	60.99	15.902	1.756	60.35	5.270	60.32	5.049
J7-J6	BASE	10yr-24hr	12.53	14.081	-1.746	12.31	4.742	12.29	4.498
J7-J6	BASE	25yr-72hr	60.63	14.907	1.723	60.24	4.986	60.22	4.748
J7-J6	BASE	5yr-24hr	12.07	13.156	-1.761	12.15	4.130	12.15	3.863
J8-B18	BASE	100yr-72hr	61.12	15.320	3.249	60.29	4.933	60.27	4.912
J8-B18	BASE	10yr-24hr	12.69	11.282	1.639	12.30	4.448	12.29	4.423
J8-B18	BASE	25yr-72hr	60.82	12.747	2.920	60.22	4.657	60.21	4.634
J8-B18	BASE	5yr-24hr	12.04	9.002	2.243	12.16	3.825	12.16	3.792
J9-J8	BASE	100yr-72hr	61.05	12.081	-0.086	60.34	5.000	60.29	4.933
J9-J8	BASE	10yr-24hr	12.69	10.381	-0.056	12.33	4.532	12.30	4.448
J9-J8	BASE	25yr-72hr	60.76	11.244	-0.054	60.25	4.735	60.22	4.657
J9-J8	BASE	5yr-24hr	12.04	7.502	0.104	12.17	3.935	12.16	3.825

Mary Brickell Village Drainage Improvements
Final Design
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Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
P1-VB	BASE	100yr-72hr	60.96	32.000	1.089	60.96	15.807	60.96	8.086
P1-VB	BASE	10yr-24hr	12.77	32.000	1.291	12.77	14.967	12.77	7.246
P1-VB	BASE	25yr-72hr	60.84	32.000	1.089	60.84	15.807	60.84	8.086
P1-VB	BASE	5yr-24hr	11.92	32.003	1.289	12.46	14.967	12.46	7.246
P2-VB	BASE	100yr-72hr	60.96	32.000	0.994	60.96	15.807	60.96	8.086
P2-VB	BASE	10yr-24hr	12.77	32.000	1.225	12.77	14.967	12.77	7.246
P2-VB	BASE	25yr-72hr	60.84	32.000	1.050	60.84	15.807	60.84	8.086
P2-VB	BASE	5yr-24hr	12.46	32.000	1.136	12.46	14.967	12.46	7.246
PUMP 1	BASE	100yr-72hr	7.05	32.000	32.000	60.20	3.147	60.96	15.807
PUMP 1	BASE	10yr-24hr	4.29	32.000	32.000	12.26	2.473	12.77	14.967
PUMP 1	BASE	25yr-72hr	8.16	32.000	32.000	60.19	2.770	60.84	15.807
PUMP 1	BASE	5yr-24hr	5.10	32.000	32.000	12.08	2.101	12.46	14.967
PUMP 2	BASE	100yr-72hr	59.70	32.000	32.000	60.20	3.147	60.96	15.807
PUMP 2	BASE	10yr-24hr	11.82	32.000	32.000	12.26	2.473	12.77	14.967
PUMP 2	BASE	25yr-72hr	59.72	32.000	32.000	60.19	2.770	60.84	15.807
PUMP 2	BASE	5yr-24hr	11.92	32.000	32.000	12.08	2.101	12.46	14.967
VB-D3	BASE	100yr-72hr	59.72	11.717	-10.621	60.96	8.086	60.96	8.066
VB-D3	BASE	10yr-24hr	11.51	10.078	-6.452	12.77	7.246	12.77	7.233
VB-D3	BASE	25yr-72hr	59.74	11.694	-10.641	60.84	8.086	60.84	8.066
VB-D3	BASE	5yr-24hr	11.70	10.078	-6.452	12.46	7.246	12.46	7.233
VB-D3A	BASE	100yr-72hr	60.95	52.648	-6.993	60.96	8.086	60.96	7.148
VB-D3A	BASE	10yr-24hr	12.77	54.813	1.947	12.77	7.246	12.77	6.229
VB-D3A	BASE	25yr-72hr	60.84	52.648	-6.993	60.84	8.086	60.84	7.148
VB-D3A	BASE	5yr-24hr	12.46	54.812	2.142	12.46	7.246	12.46	6.229
Well 1	BASE	100yr-72hr	60.96	5.676	-0.005	60.96	8.000	0.00	2.250
Well 1	BASE	10yr-24hr	12.77	4.594	-0.004	12.77	7.190	0.00	2.250
Well 1	BASE	25yr-72hr	60.84	5.676	-0.005	60.84	8.000	0.00	2.250
Well 1	BASE	5yr-24hr	12.46	4.594	0.004	12.46	7.189	0.00	2.250
Well 2	BASE	100yr-72hr	60.96	5.676	-0.005	60.96	8.000	0.00	2.250
Well 2	BASE	10yr-24hr	12.77	4.594	-0.004	12.77	7.190	0.00	2.250
Well 2	BASE	25yr-72hr	60.84	5.676	-0.005	60.84	8.000	0.00	2.250
Well 2	BASE	5yr-24hr	12.46	4.594	0.004	12.46	7.189	0.00	2.250

APPENDIX H – GEOTECHNICAL ENGINEERING REPORTS

PREPARED BY:

MACTEC ENGINEERING AND CONSULTING, INC.

REPORT OF GEOTECHNICAL SUBSURFACE EXPLORATION – PAVEMENT CORING

MARY BRICKELL VILLAGE

SW 8TH ST TO SW 12TH ST BETWEEN SW 2ND AVE AND SE 1ST AVE
CITY OF MIAMI, MIAMI-DADE COUNTY, FL

-PREPARED FOR-

T.Y. LINN INTERNATIONAL
201 ALHAMBRA CIRCLE, SUITE 900
CORAL GABLES, FLORIDA 33134

-PREPARED BY-
AMEC ENVIRONMENT & INFRASTRUCTURE, INC. (AMEC)
5845 NW 158TH STREET
MIAMI LAKES, FLORIDA 33014

AMEC PROJECT NO. 6785-10-2160 TASK 01

OCTOBER 12, 2011

amec

October 12, 2011

Mr. Francisco J. Alonso
T.Y. Linn International
201 Alhambra Circle
Coral Gables, Florida 33134

Subject: **Report of Geotechnical Exploration**
Mary Brickell Village
SW 8th St to SW 12th St between SW 2nd Ave and SE 1st Ave
Miami, Florida
AMEC Project Number 6785-10-2160 T-01

Dear Mr. Alonso:

AMEC Environment & Infrastructure, Inc. (AMEC), formally MACTEC, has completed the geotechnical services for the above referenced project. Our services were provided in accordance with the scope of services contained in our Proposal Number Prop09Miam T-70a and 70b, dated December 16, 2009 and December 15, 2011. The authorization to proceed with the geotechnical services was granted by you on May 18, 2011.

The attached report presents our findings based on the results of the field services conducted for the subject project. Pavement cores will be stored for three months and then discarded unless other arrangements are made.

We have enjoyed assisting you and look forward to serving as your geotechnical consultant on the remainder of this project and on future projects. If you have any questions, please contact us at your earliest convenience.

Sincerely,

AMEC ENVIRONMENTAL & INFRASTRUCTURE, INC.
FORMALLY MACTEC ENGINEERING AND CONSULTING, INC.
Florida Board of Professional Engineers Authorization No. 6090

GEORGE T. McDANIEL
No. 26158
10/12/11

Oscar Rodriguez
Project Engineer

G. Thomas McDaniel, P.E.
Principal Geotechnical Engineer
Florida Registration 26158

Distribution: Addressee (2)
File (1)

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Environment & Infrastructure
5845 NW 158th Street • Miami Lakes, FL 33014 USA
Tel: 305.826.5588 • Fax 305.826.1799

TABLE OF CONTENTS

1.0 INTRODUCTION

The purpose of this geotechnical exploration and pavement coring was to develop information concerning the site and subsurface conditions in order for T.Y. Linn International to evaluate site preparation requirements and paving alternatives for the planned repaving and reconstruction of the subject site. This report briefly describes the field activities and presents the findings.

The purpose of this investigation was:

- To investigate the general subsurface conditions at the site.
- To provide information on the thickness of asphaltic and base course material of the pavement cores extracted.
- To provide results for two soil boring test and two percolation test.

The soil test borings (B-1 and B-2) were drilled to a depth of 30 and 40 feet respectively, below site pavement grade. The borings locations can be seen in the field exploration plan in the appendix. The general surface elevations at the soil borings were not provided. This report represents an evaluation of site conditions based on traditional geotechnical procedures for site characterization. The recovered soil samples were not examined, either visually or analytically for environmental hazards.

Our exploration program involved various geotechnical studies and collection of subsurface data. Your office proposed and we conducted two soil test boring tests in the westbound lane of SW 10th street and at the pump station location on SW 2nd Ave. Also, we have extracted a total of 8 core samples of the planned 13 pavement core locations, from the existing pavement at the locations indicated in the attached field exploration plan. Five asphalt core locations, C-2, C-3, C-5, C-6, and C-8 could not be cored due to utility conflicts. Two pavement cores were taken at each block, except at SE 11th Street, which due to the block length only one was taken and were designated as C-1 though C-13. Thickness of asphaltic layer and base material are measured for each of these cores extracted.

AMEC also performed two South Florida Water Management District Constant Head Percolation test at location chosen by T.Y. Linn International, see attached Field Exploration Plan for locations. The results of the testing are presented in the appendix.

2.0 PROJECT INFORMATION

Project information has been provided by Mr. Francisco J. Alonso of T.Y. Linn Interantional. AMEC understands the project consists of design, and reconstruction of the subject site. The main purpose of the pavement cores is primarily to understand the existing pavement depth and pavement structure condition in order to determine where to mill and resurface, or to replace the full depth pavement. The percolation tests were performed to redesign the road to address drainage issues. We understand that the following information IS NOT required:

- Cross slope
- Crack Information
- Rut depth
- Pavement Condition

3.0 FIELD SERVICES AND PAVEMENT INFORMATION

Six-inch diameter pavement core samples (approximately), were drilled at 8 locations at the subject site. Each pavement core were drilled to a depth of approximately 14 inches below existing ground surface or to the end of the base layer. Please refer to the Boring Location Plan presented in the Appendix of this report for specific coring locations.

The locations of the pavement cores are shown on the attached Field Exploration Plan. The lengths of asphalt cores and the thicknesses of the underlying base and sub base layers are summarized in the table below:

SUMMARY OF PAVEMENT CORING

Core	Asphalt (inches)	Base (inches)	Lane Location
C-1*	1.875	12.125	Westbound Lane
C-2	-	-	Utility Conflict
C-3	-	-	Utility Conflict
C-4*	1	13	Westbound Lane
C-5	-	-	Utility Conflict
C-6	-	-	Utility Conflict
C-7	2.25	5	Westbound Lane
C-8	-	-	Utility Conflict
C-9*	2.5	12	Westbound Lane
C-10	2.75	5.75	Westbound Lane
C-11	2.5		Westbound Lane
C-12	2	7.125	Westbound Lane
C-13	3.5	7.5	Chevron Area North of Eastbound Lane

*Base material termination not encountered.

The scope of the field services included performing Maintenance of Traffic (M.O.T.) to facilitate the safe operation of pavement coring and drilling equipment and personnel within the travel lanes and right of way. The underlying soil samples were measured and recorded on our field logs. At the completion of core and soil boring, each core/boring location was backfilled with drill cuttings and tamped and then patched with asphaltic concrete cold patch and tamped.

3.1 SAMPLE STORAGE

The pavement cores, soil and rock samples retrieved during this exploration will be kept at our office for a period of three months from the date of this report. The samples are then discarded unless you request otherwise.

APPENDIX

Site location Map
Field Exploration Location Plan
Test boring records
Key classification and symbols
Percolation Test Results
Field Procedures

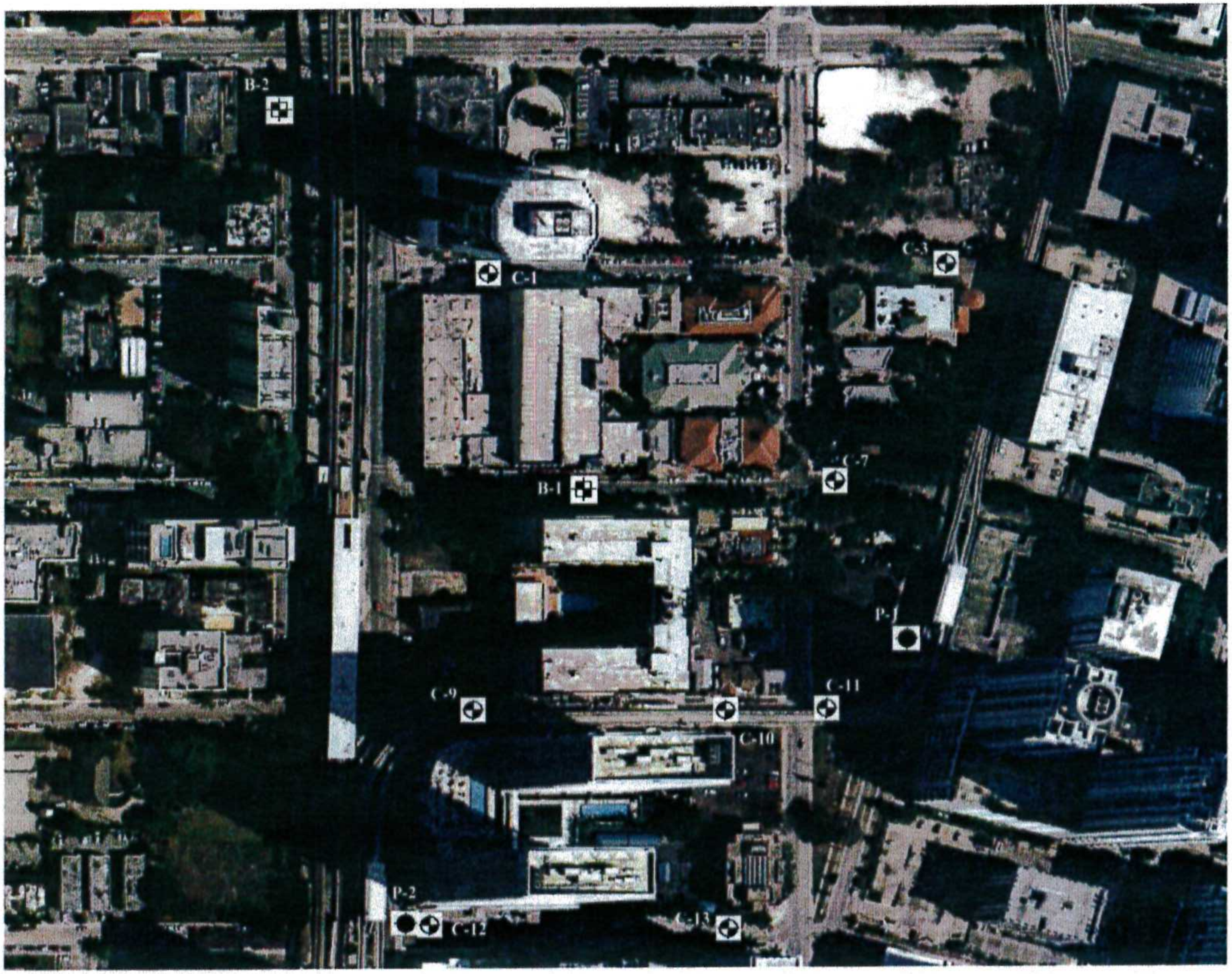
MACTEC Project No. 6785-10-2160 T-01

Mary Brickell Village
SW 8th to 12th St, b/w SW 2st and SE 1st Ave
Miami, Florida

amec

SITE LOCATION MAP

DRAWN BY: O.R..
CHECKED BY:
DATE: 10/12/2011
SCALE: NTS



LEGEND

● **P-1** Approximate percolation test boring location and designation

⊕ **C-1** Approximate asphalt coring location and designation

⊞ **B-1** Approximate soil boring test location and designation

MACTEC Project No. 6785-10-2160 T-01

N

Mary Brickell Village
SW 8th to 12th St, b/w SW 2nd and SE 1st Ave
Miami, Florida

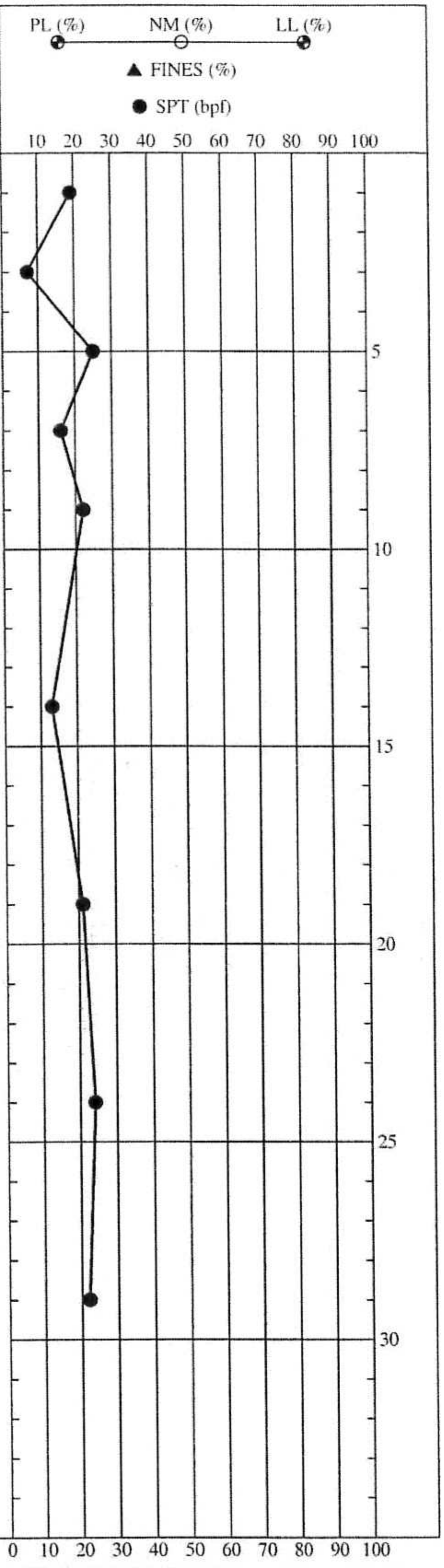
amec

FIELD EXPLORATION LOCATION PLAN

DRAWN BY: O.R.
CHECKED BY:
DATE: 10/12/2011
SCALE: NTS

DEPTH (ft)	SOIL CLASSIFICATION AND REMARKS SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW.	LEGEND	ELEV (ft)
0	ASPHALT (1.5 inch thick)		
	Tan, crushed LIMESTONE, with few fine sand, very soft, moist, FILL (LS) ▽		
	Brown, fine SAND, with few silt and limestone fragments, loose, wet (SP-SM)		
	Light brown, LIMESTONE, with few fine sand and silt, very soft, wet (LS)		
5	Light tan, LIMESTONE, with trace fine sand, soft, wet (LS)		
	- very soft		
	- soft		
10			
	- with few fine sand and silt, very soft		
15			
	- with trace fine sand and silt, soft		
20			
25			
30	Boring terminated at 30 feet		
35			

SAMPLES N-COUNT (1st 6" 2nd 6" 3rd 6")	N-VALUE
46-10-9	19
6-4-3	7
4-11-14	25
6-8-8	16
9-14-8	22
7-6-7	13
12-12-9	21
7-10-14	24
5-5-17	22



DRILLER: Helbert Avellanedo
EQUIPMENT: BK 66
METHOD: Standard Penetration Test
HOLE DIA.: 6-in
REMARKS:
ROTARY DRILLING:
GROUND WATER LEVEL: 1.67 feet
Checked By: TL Date: 10/12/11

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BEWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

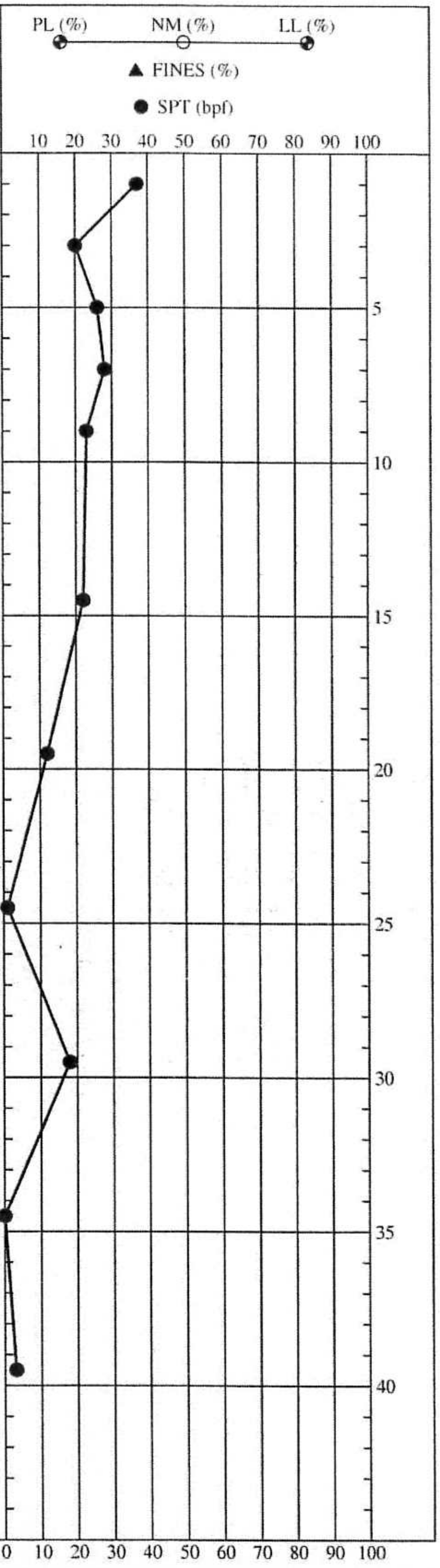
PROJECT NAME: Mary Brickell Village
PROJECT LOC.: Miami, Florida
PROJECT No.: 6785-10-2160
DRILLED: 9/15/2011
BORING No.: B-1

PAGE 1 OF 1

MACTEC

SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW.

SOIL CLASSIFICATION AND REMARKS	N-COUNT (1st 6" - 2nd 6" - 3rd 6")	N-VALUE
ASPHALT		
Dark gray fine SAND, with little limestone fragments, dense, moist (SP)	0-16-21	37
Tan LIMESTONE, with few fine sand, and trace of silt, very soft, wet (LS) ∇	8-9-11	20
- calcareous LIMESTONE, soft	15-14-12	26
	11-12-16	28
	13-11-12	23
- with trace fine sand	7-12-10	22
- very soft	9-7-5	12
No Recovery	1-0-1	1
Light gray fine SAND, with little limestene fragments, medium dense, wet (SP)	11-13-5	18
No Recovery	1-0-0	0
Brown fine SAND, with few silt, loose, wet (SP-SM)	2-1-2	3
Boring terminated at 40 feet		



DRILLER: Robert Carrasco
EQUIPMENT: CME 55 Automatic Hammer
METHOD: Standard Penetration Test
HOLE DIA.: 6-in
REMARKS:
ROTARY DRILLING:
GROUND WATER LEVEL: 3.5 feet
Checked By: ______ Date: 10/12/11

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BEWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

PROJECT NAME: Mary Brickell Village
PROJECT LOC.: Miami, Florida
PROJECT No.: 6785-10-2160
DRILLED: 7/5/2011
BORING No.: B-2

PAGE 1 OF 1

MACTEC

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES
COARSE GRAINED SOILS (More than 50% of material is LARGER than No. 200 sieve size)	GRAVELS (More than 50% of coarse fraction is LARGER than the No. 4 sieve size)	CLEAN GRAVELS (Little or no fines)	GW	Well graded gravels, gravel - sand mixtures, little or no fines.
			GP	Poorly graded gravels or gravel - sand mixtures, little or no fines.
		GRAVELS WITH FINES (Appreciable amount of fines)	GM	Silty gravels, gravel - sand - silt mixtures.
			GC	Clayey gravels, gravel - sand - clay mixtures.
	SANDS (More than 50% of coarse fraction is SMALLER than the No. 4 Sieve Size)	CLEAN SANDS (Little or no fines)	SW	Well graded sands, gravelly sands, little or no fines.
			SP	Poorly graded sands or gravelly sands, little or no fines.
		SANDS WITH FINES (Appreciable amount of fines)	SM	Silty sands, sand - silt mixtures
			SC	Clayey sands, sand - clay mixtures.
FINE GRAINED SOILS (More than 50% of material is SMALLER than No. 200 sieve size)	SILTS AND CLAYS (Liquid limit LESS than 50)		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts and with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS (Liquid limit GREATER than 50)		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			PT	Peat and other highly organic soils.

BOUNDARY CLASSIFICATIONS: Soils possessing characteristics of two groups are designated by combinations of group symbols.

SILT OR CLAY	SAND			GRAVEL		Cobbles	Boulders
	Fine	Medium	Coarse	Fine	Coarse		

No.200 No.40 No.10 No.4 3/4" 3" 12"

U.S. STANDARD SIEVE SIZE

Reference: The Unified Soil Classification System, Corps of Engineers, U.S. Army Technical Memorandum No. 3-357, Vol. 1, March, 1953 (Revised April, 1960)

amec

KEY TO SYMBOLS AND DESCRIPTIONS

▮ Undisturbed Sample (UD)	▮ Auger Cuttings
☒ Split Spoon Sample (SS)	≋ Bulk Sample
▥ Rock Core (RC)	
∇ Water Table at time of drilling	▼ Water Table after 24 hours
WOH - Weight of Hammer	◀100% - Percent Loss of Drilling Fluid
WOR - Weight of Drill Rods	c - cohesion estimated from pocket penetrometer
SCP - Static Cone Penetrometer Tip Resistance (kg/sq. cm)	qu - unconfined compressive strength estimated from pocket penetrometer

Correlation of Penetration Resistance (N) with Relative Density and Consistency

SAND & GRAVEL		SILT & CLAY	
No. of Blows	Relative Density	No. of Blows	Consistency
0 - 4	Very Loose	0 - 2	Very Soft
5 - 10	Loose	3 - 4	Soft
11 - 20	Firm	5 - 8	Firm
21 - 30	Very Firm	9 - 15	Stiff
31 - 50	Dense	16 - 30	Very Stiff
Over 50	Very Dense	31- 50	Hard
		Over 50	Very Hard

Modifiers

These Modifiers Provide Our Estimate of The Amount of Fines (Silt or Clay Size Particles) in The Soil Sample

APPROX. FINES CONTENT	MODIFIERS	UNIFIED SOIL CLASSIFICATION SYMBOL
5% TO 12%	WITH SILT OR WITH CLAY	SP-SM OR SP-SC
12% TO 30%	SILTY OR CLAYEY	SM OR SC
30% TO 50%	VERY SILTY OR VERY CLAYEY	SM OR SC

These Modifiers Provide Our Estimate of Shell, Rock Fragments, or Roots in The Soil Sample

APPROXIMATE CONTENT, BY WEIGHT	MODIFIERS
1% to 5%	TRACE
5% to 12%	FEW
12% to 30%	SOME
30% to 50%	MANY

These Modifiers Provide Our Estimate of Organic Content in The Soil Sample

ORGANIC CONTENT	MODIFIERS
1% TO 3%	TRACE
3% TO 5%	SLIGHTLY ORGANIC
5% TO 30%	ORGANIC
> 30%	PEAT

KEY CLASSIFICATION AND SYMBOLS

CORRELATION OF PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY

GRANULAR MATERIAL	SPT N VALUE (BLOWS/FOOT)		SILTS AND CLAYS	SPT N VALUE (BLOWS/FOOT)	
RELATIVE DENSITY	SAFETY HAMMER	AUTOMATIC HAMMER	CONSISTENCY	SAFETY HAMMER	AUTOMATIC HAMMER
VERY LOOSE	0 - 4	0 - 3	VERY SOFT	0 - 2	0 - 1
LOOSE	5 - 10	4 - 8	SOFT	3 - 4	2 - 3
MEDIUM DENSE	11 - 30	9 - 24	FIRM	5 - 8	4 - 6
DENSE	31 - 50	25 - 40	STIFF	9 - 15	7 - 12
VERY DENSE	> 50	> 40	VERY STIFF	16 - 30	13 - 24
			HARD	> 30	> 24

ROCK HARDNESS DESCRIPTION

VERY SOFT	Rock core crumbles when handled **N < 20**
SOFT	Can break core easily with hands **N = 21-30**
MEDIUM HARD	Can break core with hands **N = 31-45**
MODERATELY HARD	Thin edges of rock can be broken with fingers **N = 46-60**
HARD	Thin edges of rock cannot be broken with fingers **N = 61-100**
VERY HARD	Rock core rings when struck with a hammer (cherts) **N > 50/2"**

MODIFIERS

APPROXIMATE PERCENTAGE	MODIFIERS
0 to 5%	Trace
5% to 10%	Few
15% to 25%	Little
30% to 45%	Some

The modifiers provide our estimate of the percentages of gravel, sand, and fines (silt or clay size particles).

SYMBOLS	DESCRIPTION
UD	Undisturbed sample (UD) recovered.
100/2"	N, Number of blows (100) to drive the support spoon or cone a number of inches (2").
NX, 4", 6"	Corel Barrel sizes which obtain cores 2-1/8", 3-7/8", and 5-7/8" diameter respectively.
65%	Percentage (65) of rock core and soil sample recovered
RQD	Rock Quality Design - Percent of rock core 4 or more inches long
▼	Water table at least 24 hours after drilling
△	Water table one hour or less after drilling
◀	Loss of drilling fluid

SFWMD/DERM PERCOLATION TEST – CONSTANT HEAD

Percolation Test No. P-1

Date: 9/02/2011	Project Name: Mary Brickell Village
Project No. 6785-10-2160	Task No. 1
Crew: B. Carrasco	

BOREHOLE GEOMETRY

Borehole Diameter: 10.0 (inches)	Solid Casing Depth: from NA (feet) to NA (feet)
Casing Diameter: 4.5 (inches)	Perforated Casing Depth: 0 (feet) to 15 (feet)
Borehole Depth: 15 (feet)	Groundwater Depth Measured from Ground Surface 5'6" (feet-inches)

PERCOLATION TEST DATA

Flushing Period: 15 minutes	Groundwater Depth during testing: 0 (feet-inches) (measured from ground surface)

TEST RESULTS

Time (minutes)	**Meter Reading**		**Time** (minutes)	**Meter Reading**	
	Meter ** (Gallons)	Accumulated (Gallons)		Meter ** (Gallons)	Accumulated (Gallons)
Initial Reading	0	0	8	0.22	1.43
1	0.22	0.22	9	0.11	1.54
2	0.22	0.44	10	0.11	1.65
3	0.22	0.66	11	0.11	1.76
4	0.22	0.88	12	0.22	1.98
5	0.11	0.99	13	0.22	2.2
6	0.11	1.1	14	0.22	2.42
7	0.11	1.21	15	0.22	2.64

** MEASURE WITH KNOWN VOLUME

BORING INFORMATION

Sample No.	**Depth** (feet)		Soil/Rock Description
	From	To	
1	0	0.1	ASPHALT
2	0.1	1.5	Light gray, fine to coarse SAND with few limestone fragments.
3	1.5	5	Light tan, calcarious LIMESTONE.
4	5	15	Light tan to white, calcarious LIMESTONE with little fine sand and silt.

P:\Projects\Geo Projects\Projects 2010\10-2160 Mary Brickel Village\Percolation Tests\P-1.doc

SFWMD/DERM PERCOLATION TEST – CONSTANT HEAD

Percolation Test No. P-2

Date: 9/16/2011	Project Name: Mary Brickell Village
Project No. 6785-10-2160	Task No. 1
Crew: H. Avellaneda	

BOREHOLE GEOMETRY

Borehole Diameter: 6.0 (inches)	Solid Casing Depth: from NA (feet) to NA (feet)
Casing Diameter: 4.0 (inches)	Perforated Casing Depth: 0 (feet) to 15 (feet)
Borehole Depth: 15 (feet)	Groundwater Depth Measured from Ground Surface 5' (feet-inches)

PERCOLATION TEST DATA

Flushing Period: 15 minutes	Groundwater Depth during testing: 0 (feet-inches) (measured from ground surface)

TEST RESULTS

Time (minutes)	**Meter Reading**		**Time** (minutes)	**Meter Reading**	
	Meter (Gallons)	Accumulated (Gallons)		Meter ** (Gallons)	Accumulated (Gallons)
Initial Reading	0	0	8	32.14	32.14
1	4.38	4.38	9	35.68	35.68
2	8.99	8.99	10	39.04	39.04
3	13.42	13.42	11		
4	17.47	17.47	12		
5	21.34	21.34	13		
6	25.03	25.03	14		
7	28.69	28.69	15		

BORING INFORMATION

Sample No.	**Depth** (feet)		Soil/Rock Description
	From	To	
1	0	0.1	ASPHALT
2	0.1	2	Light brown, LIMESTONE FILL
3	2	15	Light brown, LIMESTONE with few fine sand.

SUMMARY OF PERCOLATION TEST RESULTS
USUAL CONDITION TEST CONSTANT HEAD

Project Name: Mary Brickell Village
Prepared by/Date:OR 09/19/2011 Checked by/Date: BMM 9/19/11
MACTEC PROJECT NO. 6785-10-2160 Task 01 Date Performed P-1 9/2/2011 & P-2 9/16/11

Test No.	Depth to Grd. Water (ft)	Depth to Water during testing (ft)	(H2) (ft)	Borehole Depth (ft)	Borehole Diameter (inches)	Rate of Flow		k, Hydraulic Conductivity (cfs/ft^2-ft. Head):
						(gpm)	(cfs)	
P-1	5.5	0.0	5.5	15	10.0	0.18	0.00039	**2.2E-06**
P-2	5.0	0.0	5.0	15	6.0	3.90	0.00869	**8.8E-05**

Note: Screen depth -
from 0.0 ft
to 15.0 ft below existing ground surface.

H 3= Depth of water during testing
Dc = depth of perforations = 5 ft
H2 = depth of water table

FIELD PROCEDURES

Test Borings - The test borings were made in general accordance with ASTM-D-1586, "Penetration Test and Split-Barrel Sampling of Soils." The borings were advanced using a 3-inch ID casing (or a 6-inch ID casing in borings with rock coring) and a rotary drilling process. Water or bentonite drilling fluid was circulated in the boreholes to flush the cuttings. At regular intervals, the drilling tools were removed and soil samples were obtained with a standard 1.4-inch I.D., 2.0 inch O.D., split-tube sampler. The sampler was first seated six inches and then driven an additional foot with blows of a 140-pound hammer falling 30 inches. The number of hammer blows required to drive the sampler the final foot is designated the "Penetration Resistance". The penetration resistance, when properly interpreted, is an index to the soil strength and density.

Representative portions of the soil samples, obtained from the sampler, were placed in glass jars and transported to our laboratory. The samples were then examined by an engineer in order to confirm the field classifications.

Percolation Testing - The percolation test was performed in order to estimate the hydraulic conductivity of the materials encountered. The Constant Head method was used. The general procedures outlined in the South Florida Water Management District Permit Information Manual (Volume IV) were followed. Test was performed in a 5.5-inch diameter perforated PVC pipe installed in a 6.25-inch diameter hole pre-drilled to a depth of 15 feet below the existing ground surface, using a rock coring casing. The borehole was then filled with water and the water level maintained at the surface. Once the inflow stabilized or came into equilibrium with the outflow rate or seepage, the amount of water added for a period of 10 minutes was recorded and the percolation rate calculated and reported in units of CFS/FT^2-FT of head.

APPENDIX I – COST ESTIMATES

City of Miami Project B-30637
Mary Brickell Drainage and Roadway Improvements Project - Phase I
Engineer's Opinion of Probable Construction Cost

PAY ITEM	PAY ITEM DESCRIPTION	UNIT	UNIT PRICE	PLAN QTY	FINAL QTY	COST	
101-1	Mobilization	LS	$27,786.46	1		$27,786.46	5%
102-1	Maintenance of Traffic	LS	$27,786.46	1		$27,786.46	5%
110-1-1	Clearing and Grubbing	LS	$27,786.46	1		$27,786.46	5%
285-706	Optional Base Group 06 (8" Limerock LBR 100)	SY	$15.00	43		$645.00	
285-711	Optional Base Group 11 (12" Limerock LBR 100)	SY	$20.00	2460		$49,200.00	
327-70-19	Milling Existing Asphalt Pavement (1" Average)	SY	$3.00	10744		$32,231.12	
334-1-13	Superpave Asphaltic Concrete, Traffic C (110lbs/sy-in., 1" min., includes roadway and parking lanes)	TN	$100.00	726		$72,620.38	
400-3-1	Concrete Class III, Culverts (36"x48" box culvert)	CY	$500.00	11		$5,500.00	
415-1-6	Reinforcing Steel - Miscellaneous (36"x48" box culvert)	LB	$1.00	700		$700.00	
425-1-351	Inlet, Curb Type P-5 , <10'	EA	$3,500.00	2		$7,000.00	
425-1-361	Inlet, Curb Type P-6 , <10'	EA	$4,000.00	2		$8,000.00	
425-1-521	Inlet, Ditch Bottom Type C , <10'	EA	$3,000.00	1		$3,000.00	
425-1-905	Inlet Special, Partial (replace City of Miami Type F-3 curb inlet tops)	EA	$1,500.00	3		$4,500.00	
425-2-61	Manholes, P-8, <10'	EA	$3,500.00	9		$31,500.00	
425-2-71	Manholes, J-7, <10' (refer to plans for dimensions)	EA	$6,000.00	6		$36,000.00	
430-175-112	Pipe Culvert, Optional Material, Round Shape 12" S/CD	LF	$40.00	12		$480.00	
430-175-118	Pipe Culvert, Optional Material, Round Shape 18" S/CD	LF	$50.00	77		$3,850.00	
430-175-124	Pipe Culvert, Optional Material, Round Shape 24" S/CD	LF	$75.00	52		$3,900.00	
430-175-130	Pipe Culvert, Optional Material, Round Shape 30" S/CD	LF	$90.00	625		$56,250.00	
430-175-136	Pipe Culvert, Optional Material, Round Shape 36" S/CD	LF	$100.00	378		$37,800.00	
430-175-148	Pipe Culvert, Optional Material, Round Shape 48" S/CD	LF	$150.00	215		$32,250.00	
430-94-1	Desilt Pipe	LF	$4.00	3700		$14,800.00	
443-70-3	French Drain, 18" HDPE	LF	$100.00	86		$8,600.00	
443-70-4	French Drain, 24" HDPE	LF	$110.00	297		$32,670.00	
520-1-10	Concrete Curb Type "F"	LF	$30.00	1440		$43,200.00	
522-1	Sidewalk Concrete, 4" Thick	SY	$45.00	1264		$56,880.00	
527-1	Detectable Warning on Existing Walking Surface, Retrofit	EA	$500.00	1		$500.00	
580-1-2	Landscaping Complete	LS	$10,000.00	1		$10,000.00	
706-3	Retro-Reflective Pavement Markers	EA	$5.00	75		$375.00	
711-11-121	Traffic Pavement Marking Thermoplastic, Solid, White, 6"	LF	$0.50	3503		$1,751.50	
711-11-123	Traffic Pavement Marking Thermoplastic, Solid, White, 12"	LF	$1.00	425		$425.00	
711-11-124	Traffic Pavement Marking Thermoplastic, Solid, White, 18"	LF	$1.50	275		$412.50	
711-11-125	Traffic Pavement Marking Thermoplastic, Solid, White, 24"	LF	$2.00	118		$236.00	
711-11-131	Traffic Pavement Marking Thermoplastic, Skip 10/30, White, 6"	GM	$2,640.00	0.02		$52.80	
711-11-170	Traffic Pavement Marking Thermoplastic, Solid, White, Arrows	EA	$50.00	8		$400.00	
711-11-221	Traffic Pavement Marking Thermoplastic, Solid, Yellow, 6"	LF	$0.50	592		$296.00	
711-11-231	Traffic Pavement Marking Thermoplastic, Skip 10/30, Yellow, 6"	GM	$2,640.00	0.21		$554.40	
	Contingency (Do Not Bid)	LS	$80,000.00	1		$70,000.00	
					TOTAL:	**$709,939.09**	

City of Miami Project B-30637
Mary Brickell Drainage and Roadway Improvements Project - Phase II Pump Station
Engineer's Opinion of Probable Construction Cost

PAY ITEM	PAY ITEM DESCRIPTION	UNIT	UNIT PRICE	PLAN QTY	FINAL QTY	COST	
101-1	Mobilization	LS	$59,070.35	1		$59,070.35	5%
102-1	Maintenance of Traffic	LS	$35,442.21	1		$35,442.21	3%
110-1-1	Clearing and Grubbing	LS	$35,442.21	1		$35,442.21	3%
285-711	Optional Base Group 11 (12" Limerock LBR 100)	SY	$20.00	64		$1,280.00	
327-70-19	Milling Existing Asphalt Pavement (1" Average)	SY	$3.00	920		$2,760.00	
334-1-13	Superpave Asphaltic Concrete, Traffic C (110lbs/sy-in., 1" min., includes roadway and parking lanes)	TN	$100.00	54		$5,412.00	
400-3-1	Concrete Class III, Culverts (36"x60" box culvert)	CY	$500.00	8		$4,000.00	
415-1-6	Reinforcing Steel - Miscellaneous (36"x60" box culvert)	LB	$1.00	550		$550.00	
425-2-71	Manholes, J-7, <10' (refer to plans for dimensions)	EA	$6,000.00	4		$24,000.00	
425-2-101	Manholes, Special <10' (includes structures S-1 and S-4)	EA	$10,000.00	2		$20,000.00	
425-2-102	Manholes, Special >10' (includes BMP structure)	EA	$50,000.00	1		$50,000.00	
430-175-124	Pipe Culvert, Optional Material, Round Shape 24" S/CD (D.I.P. for forcemain, includes fittings)	LF	$150.00	103		$15,450.00	
430-175-130	Pipe Culvert, Optional Material, Round Shape 30" S/CD	LF	$90.00	17		$1,530.00	
430-175-142	Pipe Culvert, Optional Material, Round Shape 42" S/CD (D.I.P. for forcemain, includes fittings)	LF	$250.00	28		$7,000.00	
430-175-148	Pipe Culvert, Optional Material, Round Shape 48" S/CD	LF	$150.00	30		$4,500.00	
444-70-11	Deep Well - Open Hole, 24"	LF	$150.00	30		$4,500.00	
444-71-11	Deep Well - Casing, 24"	LF	$200.00	160		$32,000.00	
448-73	Pumping Station	LS	$1,000,000.00	1		$1,000,000.00	
520-1-10	Concrete Curb Type "F"	LF	$20.00	130		$2,600.00	
522-1	Sidewalk Concrete, 4" Thick	SY	$45.00	85		$3,825.00	
580-1-2	Landscaping Complete	LS	$2,000.00	1		$2,000.00	
	Contingency (Do Not Bid)	LS	$100,000.00	1		$100,000.00	
					TOTAL:	**$1,411,361.77**	

APPENDIX J – CORRESPONDENCE

File

CITY OF MIAMI, FLORIDA

INTER-OFFICE MEMORANDUM

TO: Ola O.Aluko, Director,
Capital Improvement Program

DATE: September 16, 2008

FILE:

SUBJECT: SW 10th Street Inadequate Drainage System Request for Improvement

FROM: Francis
Francis Mitchell, Assistant Director
Public Works Department

REFERENCES:

ENCLOSURES:

The Public Works Department either thru the services of hired contractors or the capacity of its operations division has exhausted all options in dealing with the drainage deficiencies inherent to the SW 10th Street Drainage System. At high tide and during heavy storm events SW 10th Street gets flooded because the existing drainage system does not have enough capacity to adequately drain the storm generated runoff.

The problem facing this low lying area is compounded by the fact that private wells or drainage systems adjacent to this street are deficient and draining in the public right of way.

Therefore, in dealing with established 311 reporting procedure, our department is forwarding this memo to ur attention for reference in the event a funded or unfunded project will be created to remediate at this problem.

cc: Stephanie N. Grindell, Director, Public Works Department
Bill Anido, Assistant City Manager, City Manager's Office
Vanessa Morales Balthazar, Special Projects Coordinator, CitiStat

City of Miami

PEDRO G. HERNANDEZ, P.E.
City Manager

June 16, 2009

Ms. Esther Calas
Public Works Department
Miami-Dade County
111 NW 1 Street, Suite 1610
Miami, FL 33128-1970

RE: **Inadequate Drainage System along SW 2nd Avenue and south Miami Avenue from SW 15th Road to SW 7th Street.**

The City is currently experiencing serious flooding along SW 10th Street from South Miami Avenue to SW 1st Avenue. We have extensively analyzed the gravity drainage system servicing this area and are planning some improvement to remediate at this situation. A mini pump station is currently under study.

We have conducted multiple field observation of this site and have observed that the flooding along SW 10th Street is also related to the upland areas drainage systems located along SW 2nd Avenue and South Miami Avenue. These systems are deficient and quickly overflow toward the low lying areas of SW 10 ST and SW 9 ST.

We have identified these intersections as trouble areas contributing to the increased runoff on SW 10 ST.

SW 2nd Avenue intersections (refer to attachments)

- SW 9th ST
- SW 10th ST
- SW 11th ST

CoM DPW Note

South Miami Avenue Intersections (refer to attachments)

- SE 10th ST
- SE 11th ST
- SE 12th ST

Why is CoM asking MD to fix these?

Our Department will initiate an emergency storm sewer construction project at the SW 2nd Avenue intersections. However, in order to maximize the reduction of upland runoff toward SW 10 Street we are hoping that your Department could initiate similar remedial action along the South Miami Avenue intersections.

I am transmitting some of the archived information that we have on file to help in further explaining the problem. Please advise our office of your decision.

Sincerely,

Francis Mitchell,
Assistant Director

FM/cdt

cc: Stephanie N. Grindell, Director, Public Works
Leonard Helmers, Professional Engineer IV, Public Works
Pedro Lopez, Engineer I, Public Works
Ricardo Castro, Project Manager, CIP

DEPARTMENT OF PUBLIC WORKS
444 S.W. 2nd Avenue / Miami, Florida 33130 / (305) 416-1200 / Fax: (305) 416-1278
Mailing Address: P.O. Box 330708 Miami, FL 33233-0708

TYLININTERNATIONAL | HJ ROSS
201 Alhambra Circle, Suite 900 Coral Gables, Florida 33134 - 3163
Tel. (305) 567-1888 Fax. (305) 567-1771 EMAIL: hjross@hjross.com

Meeting Memorandum

PROJECT: City of Miami – Mary Brickell Village Drainage and Street Improvements

TO: **Ricardo Castro, PE**
444 S.W. 2nd Avenue
Miami, FL 33130

Phone: 305.416.1051

FROM: David Reynolds, P.E.

DATE: Wednesday, April 8, 2009, 2:00 PM

A meeting was held on this date at City of Miami Capital Improvements office to discuss the overview of the project. The following were in attendance:

Individual	Title	Company
Ricardo Castro	Project Manager	City of Miami, CIP
Francis Mitchell	Assistant Director	City of Miami, CIP
David Reynolds	Project Engineer	TY Lin International
Claudia Diaz	Project Engineer	TY Lin International

Project Overview –

There are drainage, pavement, and roadside deficiencies along 9th and 10th Streets in the vicinity of Mary Brickell Village that need improvement plans to address. Project issues were discussed and a walk of project site was done to check the possible causes of drainage problems and to evaluate the condition of pavement on the subject streets.

1. **Drainage** – Minor recurring flooding/ponding is reported on SW 10th Street between 1st Ave. and S. Miami Ave. and at the intersection of SW 10th Street at S. Miami Ave. Ponding has appeared to be for only very brief periods of time during and following storm events. There is also reported ponding at the intersection of SW 9th Street and Brickell Plaza although this has not been confirmed. The existing drainage line along 10th St is a concrete trench (24" span, 18" rise). The existing drainage line along 1st Court is a concrete trench (60" span, 36" rise). The City has recently cleaned out the storm sewer systems in these areas. The City is considering installation of a small storm water pump station to completely drain the contributing storm sewers at these problem areas. Additionally, the existing storm sewer outfall at SW 1st Court at the Miami River has collapsed and requires a stable permanent headwall as well as a manatee barrier. This location is within the city Right-of-Way.

2. **Pavement Deterioration** – The road section of SW 9th and SW 10th Streets generally has adequate crown and cross slope and some segments have relatively new pavement from recent site development around Mary Brickell Village. However, significant pavement failures including map cracking, longitudinal cracking, and pot holes were evident in other segments. See the attached aerial map with pavement notations. Milling and resurfacing versus full-depth pavement reconstruction will depend on pavement core results for asphalt and base thickness.

3. **Sidewalk and Curb & Gutter** – Existing sidewalk and curb and gutters on the north side of SW 9th St from about 200ft east of SW 1st Ave to Brickell Plaza need reconstruction.

Design Considerations – Drainage design will be limited to Rational Method hydrology and the design of new inlet locations, storm sewer sizing, and pump station design. No adICPR hydraulic modeling of the storm network will be required. Drainage design will be based on the 5-year, 1-hour storm event (FDOT curves).

Project Scope – This project will require topographic survey within Right of Way, geotechnical investigations for pavement and base thickness and subsurface conditions at the storm drain outfall at the Miami River. Ricardo will obtain and forward copies of City utility atlas sheets and City DPW reports of flooding.

Francisco Alonso

From:	Francisco Alonso
Sent:	Tuesday, October 20, 2009 2:38 PM
To:	fmitchell@miamigov.com
Cc:	Jose Lago (jlago@miamigov.com); Jorge Garcia (jagarcia@miamigov.com); Claudia Diaz; Javier Gonzalez
Subject:	City of Miami Mary Brickell Village
Attachments:	PROJECT LAYOUT 3.PDF

Francis,

It seems we missed each other last Friday, I just wanted to follow up with you to finalize the scope for the subject project.

The following is my understanding of the scope the City wishes to pursue:

The Project limits are:

- SW 9th Street from SW 1st Avenue to SE 1st Avenue (Brickell Plaza Drive),
- SW 10th Street from SW 1st Avenue to SE 1st Avenue(Brickell Plaza Drive), and

The Project will involve:

a. Construction of storm sewer improvements to alleviate recurring minor flooding/ponding. The City plans to utilize a small retrofit storm water pump station at the SW 10th Street / SW 1st Avenue intersection. Additional drainage improvements will include a new storm sewer connection for the isolated drainage system at SW 10th Street and S. Miami Avenue.
b. Pavement milling and resurfacing and pavement marking. Generally, pavement work will be limited to the travel lanes, however, specific shoulder areas along the north side of SW 9th Street will be improved to address on-street parking. Milling/resurfacing versus full-depth pavement reconstruction will depend on pavement coring results for asphalt and base thickness.
c. Reconstruction of existing sidewalk and curb and gutter along the north side of SW 9th Street as necessary to provide a uniform, closed-section roadway. Also include curb and gutter and sidewalk improvements on along 10th Street from S. Miami Avenue to SE 1st Avenue.
d. Reconstruction of specific existing curb ramps to comply with ADA requirements.

It is also my understanding that the original proposal included the reconstruction of the existing concrete culvert outfall on SW 1st Court at the Miami River and to provide an end wall structure and manatee barrier. This portion of the scope is no longer included, as you had mentioned to me that the County was to perform improvements along that area in the future. I have also provided a sketch with the areas of the proposed improvements. Please respond to this email to concur with the presented scope items or to clarify any of the above items which may be incorrect. As soon as you can respond, we will provide Capital Improvements with the finalized proposal and get started asap on this project. Thank you for the opportunity.

Francisco J. Alonso, P.E.
T.Y.Lin **International | H.J. Ross**
201 Alhambra Circle
Coral Gables, FL 33134
(305)567-1888 ext. 267

From: Lago, Jose [JLago@miamigov.com]
Sent: Friday, December 04, 2009 11:10 AM
To: Garcia, Jorge
Cc: Francisco Alonso; Mitchell, Francis
Subject: RE: Mary Brickell Sketch

Please arrange mtg with TYLIN. Time is of essence on this project (more then the norm).

Please insure that you understand the scope of work required. I have my notes. It may take the walking the site again. March 2010 is the design deadline. I believe it will require a DERM permit (Class II). Thx.

From: Francisco Alonso [Francisco.Alonso@tylin.com]
Sent: Friday, December 04, 2009 9:13 AM
To: Garcia, Jorge
Cc: Lago, Jose
Subject: RE: Mary Brickell Sketch

Gentlemen,

Before we proceed with the final proposal I need more specifics on the added scope. You are adding two more blocks of which I am not clear what the proposed improvements are, in addition I do not have any surveying planned for that area. I am requesting a meeting asap to go over the proposed plan in detail before finalizing the proposal. Please let me know

hank you.

Francisco J. Alonso, P.E.
T.Y.Lin International | H.J. Ross
201 Alhambra Circle
Coral Gables, FL 33134
(305)567-1888 ext. 267

From: Garcia, Jorge [mailto:jagarcia@miamigov.com]
Sent: Thursday, December 03, 2009 4:06 PM
To: Francisco Alonso
Cc: Lago, Jose
Subject: RE: Mary Brickell Sketch

Frank:

As we told you, the boundaries of the project changed, being now from the 9th Street to the 12th Street and between SE 1st Avenue and SW 1st Avenue. The storm water drainage should be analyzed inside those boundaries.
An important issue that you should consider is that S. Miami Avenue is a MDC street and is located inside the boundaries before mentioned, meaning that you have to coordinate with them the impact on that road due to this project.
Basically the scope of work is the same, but adding some aspects like the construction of bulb-outs, increases the sidewalk width all the way, some landscaping like small trees and nally if the cost estimate allows, considering to install pedestrian lightings.
he time is very important and the City needs to finish the design, including permitting and cost estimate on March, 2010, in order to start the construction on April, 2010, what I mean is that we should have your reviewed cost proposal not later than this Monday.

If you have any question, please do not hesitate to call me.

Thanks

Jorge Garcia
Project Manager
Department of Capital Improvements
444 S.W. 2nd Avenue, 8th Floor
Miami, FL 33130
Office Phone: (305) 416-1219
Fax: (305) 416-2153
Cell: (786) 376-4391

From: Francisco Alonso [mailto:Francisco.Alonso@tylin.com]
Sent: Wednesday, December 02, 2009 11:38 AM
To: Garcia, Jorge
Subject: Mary Brickell Sketch

Jorge,

Attached is the sketch for the Mary Brickell project scope. Let me know if this is adequate.

Thank you,

Francisco J. Alonso, P.E.
T.Y.Lin International | H.J. Ross
201 Alhambra Circle
Coral Gables, FL 33134
(305)567-1888 ext. 267

TYLININTERNATIONAL | HJ ROSS
201 Alhambra Circle, Suite 900 Coral Gables, Florida 33134 - 3163
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Meeting Memorandum

PROJECT: Mary Brickell Village Drainage and Street Improvements B-30637

TO: **Jorge Garcia** Phone: 305.416.1219
444 S.W. 2nd Avenue
Miami, FL 33130

FROM: Francisco J. Alonso, P.E.

DATE: Wednesday, September 16, 2010, 1:15 PM

A meeting was held on this date at City of Miami Department of Capital Improvements office to discuss the subject Project. The following were in attendance:

Individual	Title	Company
Alice N. Bravo, P.E.	CIP Director	City of Miami, CIP
Albert Sosa, P.E.	CIP Assistant Director	City of Miami, CIP
Jose Lago, P.E.	CIP	City of Miami, CIP
Jorge Garcia	Project Manager, CIP	City of Miami, CIP
Francisco J. Alonso, P.E.	Project Manager	TY Lin International

The purpose of this meeting was to discuss concerns T.Y. Lin had over the current scope of the project, the following bullet points address the specific topics discussed:

- The meeting began with a brief history of the project and an explanation of the drainage problems currently experience throughout the various depressions in the site. A brief history of how the current scope was arrived at was also detailed.
- Mr. Alonso explained that the current scope calls for a small pump station within the pavement just east of the intersection of S.W. 10th Street and 1st Avenue. The concerns expressed with current location included the following:
    - The project area is very difficult to construct due to existing utilizes along the street. In addition there is no apparent location for the placement of a control panel and emergency generator.
    - It will also be problematic for maintenance crews to access the pump station once it is operational and will require road closures to do so.
    - This scope would not address the other major flood problem at the intersection of 9th Street and SE 1st Avenue.
- Mr. Alonso went on to present an alternative solution placing the pump station in a small city owned park at the intersection of 10th Street and SE 1st Avenue. This location would allow for both major flood areas to be addressed. The pump station at this location would be significantly larger than the one originally proposed due to the greater size of the contributing basin. Also this requires construction of a new section of gravity collection system to the station and a new force main.
- Mr. Sosa suggested a third alternative to construct a larger bypass pump station at the downstream end of the entire system near the outfall at NW 1st Avenue and the Miami River. Mr. Alonso concurred that this solution was really the "end all" solution to the flooding problems as it would address the entire area, but did involve a significantly larger station and cost. It was

mentioned that the costs of the larger station may be offset by not having to construction a new collection system and force main.

- It was also discussed that using CIPP (cured in place pipe) could be utilized to line the existing trunk lines further reducing restoration costs and construction time.
- It was finally agreed to model and study the three proposed scenarios: current scope, pump station at 10th Street Park, and pump station at outfall.
- T.Y. Lin would model and study the three scenarios as part of the ongoing technical memorandum to determine their effectiveness and feasibility as well as cost estimates for each in order to provide a basis for CIP to decide on a course of action for design.
- The remainder of the scope including milling and resurfacing, curb and gutter, and sidewalk improvements would remain the same. However T.Y. Lin would include estimates for bid options including milling and resurfacing of the remaining sections of roadway encompassed by the overall project area but not currently in the scope.
- T.Y. Lin requested and was granted 2 additional weeks to complete the study. T.Y. Lin agreed to provide an update in 2 weeks and deliver the technical memorandum on October 18, 2010.
- Mr. Garcia was to follow-up with the parks department to determine the feasibility of constructing the 10th Street park option and provide a response from PD.
- It was discussed that a meeting should be arranged with Lyn Helmers to determine the status of the agreements between the City and the private owners regarding decorative sidewalk treatments within the project limits.

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Tel. (305) 567-1888 Fax. (305) 567-1771 EMAIL: hjross@hjross.com

Memorandum

PROJECT: Mary Brickell Village Drainage and Street Improvements B-30637

TO: **Jorge Garcia**
444 S.W. 2nd Avenue
Miami, FL 33130

Phone: 305.416.1219

FROM: Francisco J. Alonso, P.E.

DATE: September 27, 2010

The purpose of this memo is to provide an update to the department of Capital Improvements Program on the subject project. The following is an outline of what has been completed to date. The technical memorandum presenting the drainage and roadway improvement options will be submitted October 18, 2010.

Preliminary Engineering Services:

- Full Topographical Survey and GPR survey were completed as of September 15, 2010. Final signed and sealed copies were submitted to the City on September 22, 2010
- Geotechnical testing and report are currently being completed. There has been delay due to delays in the permitting of the field work, but we anticipate completion of the reporting prior to the Technical Memorandum submittal.
- Utility Coordination was initiated on August 12, 2010. The Sunshine state design ticket number is 224003469. Packages depicting preliminary surveys were mailed to all the utility companies listed on the design ticket on August 13, 2010. To date 5 of 14 of the utilities companies have responded in some form. Contact with all the utility companies is anticipated to be completed by the time of the Technical Memorandum submittal. Our Utility coordination matrix will be included with this memo.
- MD-WASD as-builts were acquired.
- City of Miami underground records were acquired from public works and incorporated into the project plans.

Technical Memorandum:

- GIS maps of the project area are being developed to determine land use and soil types.
- FEMA Firm maps have acquired for the project area.
- The ICPR drainage model has been fully developed for the existing conditions including:

    - All basins and sub-basins (28) have been identified and incorporated into the model based on the topographic survey and as-built information.
    - All junction nodes, pipes, and culverts have been identified and incorporated into the model including sizes and inverts based on survey and as-built data.
    - Utilizing this information, a node-link diagram was developed.
    - “Stage vs. Storage” curves have been developed using the topographic survey and AutoCAD Civil 3D to create 3D surfaces to calculate below and above ground storage. This information was incorporated into the ICPR node information and is critical to determining accurate flood levels.
    - Boundary condition information has been identified based on available NOAA tidal data in the area. Said condition will serve as the project tail water elevation.

  - Curve numbers based on percent impervious and existing soils have been estimated and incorporated into the model.
  - Times of concentration have been calculated and incorporated into the model.
  - Rainfall data for the area has been compiled and incorporated into the model.
  - All standard design storms have been modeled for the existing conditions per FDOT drainage design standards.
  - Levels of existing flooding have been identified and calibrated, and we now have a baseline from which to compare proposed improvement solutions.

- The ICPR drainage model for the proposed drainage alternatives is currently being developed. This model will be compared to the results of the existing conditions to determine the impact of the proposed improvements and serve as a basis for the final design.
- The technical memorandum write-up outline has been prepared.
- Field visits have been held to determine the extent of roadway improvements and to develop the typical sections that will be presented as part of the technical memorandum.

Attachments:

- ICPR node-link diagram for the existing system
- ICPR input report
- ICPR existing conditions node maximum results report
- Utility coordination Matrix

Pre Construction Conference Agenda

Miami Dade County
Public Works Department
September 1; 10:00 AM

Project Title: ***Drainage Improvement Project for: Brickell Area.***

Project No: ***201000406***

1. Introduction.

Introduction of attendees and opening comments by DCPW Head Construction Contract Management Section, Mr. Duane Kopp, P.E.

- Dade County Public Works Department
- Rock Power Paving Inc.
- Department of Business Development

2. Project Description

Total Contract Time : 240 Calendar Days
Contract Amount : $ 400,092.62

3. Delineation of lines of Authority

Dade County Public Works Department
  Esther Calas, P.E., Director.
  Antonio Cotarelo, P.E., Assistant Director.
  Bassam Moubayed, CFM, Chief Construction Division.
  Duane Kopp, P.E., Head Construction Contract Management Section.
  Otto Rojas P.E., Construction Coordinator.
  Ruben Arencibia, Project Manager.

Rock Power Paving Inc.
  Robert Delgado, President

All correspondence will be addressed to the project manager Ruben Arencibia who will coordinate the response.
Names and emergency telephone numbers for the contractor, deparment and others should be provided before starting construction.

4. Goals of the Project

- Timely completion of project
- Maintain project within contractual budget.
- Complete project with no reportable accidents

5. Department of Business Development

Explanation by a representative

6. Location of work.

The location of work to be performed shall be: South Miami Avenue from 10th Street to 14th Street and SW 2nd Avenue from SW 9th Street to 11 Street, Miami-Dade County, Florida. The exact location and limits of construction are shown in the Plans that accompanying the Contract.

7. Scope of Work.

The work under the Contract includes furnishing of all supervision, labor, materials, tools, equipment, and performing all operations necessary for this project.
Work includes but is not limited to the construction and installation of drainage structures, French Drains, miscellaneous drainage improvements, grading, sodding, and miscellaneous roadway restoration including construction of concrete curb and gutters, and sidewalks where needed in accordance with the construction plans and specifications contained in the contract.

8. SPECIAL PROVISIONS

The following items of discussion are the most relevant, but not the only aspects that will be enforced following the wording of the contract documents.

8.1. GENERAL.

STANDARD REFERENCES. (SP-page 6, 2.02)
The **Building Code** as set forth in **Charter 8** of the Code **of Miami Dade County, the Public Works Manual of Metropolitan Dade County,** and the **2008 Edition of FDOT Design Standards** (with July 1, 2009 modifications), Construction, Maintenance and Utility Operations on the State Highway System, as amended by the Contract Documents; all are incorporate by reference.
Unless otherwise specifically noted, the **2007 FDOT Standard Specification for Road and Bridge Construction**, as amended by the Contract Documents, is hereby incorporate by reference.
Miami-Dade County's Traffic Control Equipment Specifications and Standards for Metro Traffic Control System Miami Dade County with its supplements or addenda is incorporated herein by reference.

8.2 PLANS (SP-page 12, 3.03)

Engineering Drawings Plans are included in the Contract. Additional standards details are available in the Miami Dade Public Works Manual and FDOT's Standards for Design, Construction, Maintenance and Utility Operations on the State Highway System.
The County shall have the right to modify the details and /or sketches, to supplement the sketches with additional information as work proceeds.

8.3 TIME FOR COMPLETION (SP-page 13, 3.05)

The terms of the Contract shall expire **240 calendar days** from the effective date of the "**Notice to proceed**", or until such time as the Contract amount has been expended, whichever occurs first.
The effective date of the "**Notice to Proceed**" will be established today .The effective date shall be as or later than 30 calendar days after the date of execution of the Contract Documents, unless a later date acceptable to both parties is agreed upon writing.

8.4 PERMITS AND LICENSES (SP- page 13, 3.06)

- The Contractor must obtain **all permits required** for the Project prior to commencing the work. This includes Permits required by other Municipalities and agencies, Permits to work in the Right-of-Way, and those required for tree removals and/or relocation.
- Permit to perform work within the County's Right-of-Way are issue by Public Work Department's Construction Division
- The Contractor shall give due and adequate notices to those in control of all properties that may be affected by the construction activities.
- The actual amount paid for the permits, will be reimbursed to the Contractor from a dedicated allowance established by the County. Original receipts must be presented to the Engineer.
- The Contractor shall give all notices, pay all fees and comply with all laws, rules and regulations applicable to the Work at no additional cost.

8.4 USE OF PUBLIC STREETS (SP-page 13 -14, 3.07)

The use of Public Street and Alleys shall be such as providing a minimum inconvenience to the public and to other traffic. The Contractor shall so conduct his operations that he shall not close any thoroughfare nor interfere in any way with traffic on railway, highways, or on water, without the written consent of the proper authorities.
The Contractor shall immediately remove any earth or other excavated material spilled from trucks and clean the streets to the satisfaction of the governing authority.

General requirements are that the transport vehicles must be the type(s) approved for this application by the political jurisdiction involved. The vehicles have watertight bodies that they are properly equipped and fitted with seals and covers to prohibit material spillage or draining on roadways, and that they are cleaned as often as is necessary to prevent deposit of material on roadways.

The County does not provide staging areas.

8.5 RIGTH OF WAY VERIFICATION (SP-page 14, 3.09)

All works and improvements shall be performed, constructed and installed within the limits of the existing Right-of Way pursuant to the contract. The Contractor is responsible for obtaining all necessary documentation for verifying right-of way and property lines. The contractor shall retain a Florida Registered Surveyor and Mapper to obtain right-of way and property lines. The Contractor's surveyor will layout the required alignments, grades and is responsible for their accuracy.

8.6 PRESERVATION OF PROPERTY (SP-page 14-15, 3.09)

Property, public or private, if damage during construction or removed for convenience of work, shall be repaired or replaced at Contractor's expense in a manner acceptable to the Engineer, prior to final acceptance of the work. This includes, but is not limited to signalization equipment and miscellaneous hardware removed from the construction site, signs, driveways landscaping, walkways, walls, fences, footing or underground utilities.

All street signs shall remain in place during time of construction except those required to be relocated due to interference with actual construction. All signs relocated or damaged by the Contractor during the course of the work shall be re-installed or replaced at the proper location, as soon as possible at the Contractor's expense.

Prior to removal of any traffic control sign that interfere with the construction, the Contractor shall provide temporary signing or other provisions to assure a continuous flow of traffic under at least the same conditions of previously existed.

8.7 UTILITIES. (SP-page 15, 3.10)

The Contractor shall make all necessary arrangements with the utility companies concerned for maintenance of their lines during the construction period.

The County will not be liable for any delay or added expense the Contractor experiences due to the activities of the utility companies, nor shall the County be held responsible for damage to any utilities due to any actions by the Contractor.

Contractor shall contact **Sunshine State One Call of Florida, Inc. 1-800-432-4770 no less than forty-eight (48) hours prior to commencing any trenching or excavation on this project.**

8.8 PROJECT TIME SCHEDULE (SP-page 18-19, 3.14)

Work Progress Schedule.

The Schedule had to be submitting before this conference where show the various activities of the work, demonstrating a reasonable and workable plan to complete the Project within the Contract Duration.

Progress of the Work. The Contractor shall commence the Work within 5 calendar days from the date of "Notice to Proceed" and continue all work in an expeditious manner to a conclusion acceptable to the Engineer prior to the expiration Contract Duration.
The Contractor shall supply sufficient work force, materials and equipment to perform the work listed under "Scope of Work" in accordance with the schedule approved by the Engineer and the requirements stipulated in the Contract.
Progress of the work shall be judged based on a proportion of the amount of the work completed and accepted, to the number of calendar days that remain on the Contract Duration.
Contract work completed shall not fall behind by more than ten (10) percentage points, according to the total number of days past on the Contract since the issuance of the "Notice to Proceed"

8.9 PERFORMANCE OF WORK. (SP-page 20, 3.17)

The Contractor shall submit for approval by the Engineer a description of the type of materials and equipment to be used; and the method of procedure to be in the performance of the work.

Dust Control and Saw Cutting:
Dust control measurements are required as necessary to prevent the surface and air transport of dust from any construction activity performed under the Contract. This may include but is not limited to: pre-watering deeply before excavation, scheduling thorough and consistent watering that does not run off the site; applying best management practices in the loading, offloading, and transport of soils and miscellaneous materials; covering or otherwise stabilizing piles when necessary ;and schedule so control measures are available throughout the project.

Open Excavations:
At the close of each workday, the Contractor shall refill all open excavations, or cover open excavation with steel plates capable of supporting vehicular traffic.

Florida Trench Safety Act:
The propose and intention of the State of Florida "Trench Safety Act' is to provide for increased worker safety by requiring compliance with sufficient standards for trench safety and proving additional specific requirements when the excavation is in excess of 5 feet deep.

8.10 RESTORATION OF PROPERTY. (SP-page 22, 3.18)

The Contractor is advice to take preconstruction videos/picture of the entire work zone and adjacent areas and to take reasonable care in the protection of the property, vegetation and utilities.
Contractor shall restore the right-of-way as well as any affected adjacent private property within 45 days of completion of construction or damage to the affected property or area, whichever occurs first.

8.11 AS-BUILT DRAWINGS (SP-PAGE 23, 3.19)

Three (3) sets of complete "**As Built**" drawings signed and sealed by either a Florida Register Surveyor and Mapper or a Florida Registered Professional Engineer, shall be accurately recorded by the Contractor and submitted to the Engineer prior to final acceptance of the work. All locations and elevations shall be taken by a Florida Registered Surveyor and Mapper and be shown on the As-Built drawings. No separate payment will be made for the As-Built drawings.

8.12 LIQUIDATED DAMAGES. (SP-PAGE 24, 3.21)

The Contractor, or in case of his default the surety, shall pay to the County, not as a penalty but as liquidated damages, the amount of **$ 715.00** daily per calendar day should the Contractor fail to complete all works specified within the time stipulated in the contract including extra time granted in writing by the County.

8.13 MAINTENANCE OF TRAFFIC, SECTION 102. (SP-page 26 4.03)

A State of Florida MOT-Advanced Certified Technician is required for layout and maintenance of approved MOT plans.

Traffic may be detoured only upon approval of the Director of Public Works Department. Contractor must submit an MOT plan to closure of roads for review and approval by Public Work Department. No work shall commence on this project or any portion thereof without implementation of an approved MOT plan.

8.15 PREVENTION, CONTROL, AND ABATEMENT OF EROSION AND WATER POLLUTION. SECTION 104. (SP-page 28, 4.04)

The Contractor's Erosion Control Plan (ECP) must be approved by the Engineer in writing before any construction activities.

At the Preconstruction Conference (Today), submit to the Engineer for review and approval an ECP according with our Contract.

8.16 CLEARING AND GRUBING (SP-page 35 & 36, 4.05)

The contract unit price awarded shall be full compensation for all work required for clearing and grubbing; including, but not limited to, removal asphalt pavement, concrete curb and gutters, concrete sidewalk, vegetation, trees, trash, debris, tree trimming, mailboxes and other work related to clearing and grubbing including removal and disposal of stumps roots any others protruding object which are necessary for the proper construction project. Also included in this section shall be grading and final dressing required to provide the necessary terrain configuration to facilitate an effective drainage rum-off.

8.17 ROCK BASE (SP-page 36 4.07)

The **rock base** shall be constructed on a sub grade prepared in accordance with FDOT Section 120-9.4.

Within the entire limits of the proposed **subgrade**, the minimum density acceptable at any location shall be ninety five (95) percent for Non-roadway areas and ninety eight **(98)** percent for Primary and Secondary Roads, of maximum density.

It shall be the Contractor's responsibility to maintain the required density until the base is placed on the subgrade.

Base or **Limerock Base** shall have an overall compacted thickness as specified and noted in the plans. Minimum density shall be nine eight **(98)** percent of such maximum density. Minimum percent of calcium and magnesium in the limerock material will be fifty (50). Upon Engineer's approval, the lime rock base shall be primed. The prime coat should have a minimum curing period of 48 hours.

8.18 BITUMINOUS TREATMENTS SURFACE COURSES AND CONCRETE PAVEMENT. (SP-page 38, 5)

A prime coat is required for all limerock base construction and the cost will be included in the price utilizing the limerock base per square yard.

A tack coat shall be applied to previously primed and newly constructed bases, existing wearing surfaces, milled surfaces and previously applied leveling courses.

Payment for all bituminous material, including tack coat, shall be included in the payment for Asphaltic Concrete.

8.19 INLETS, MANHOLES AND JUNTION BOXES. (SP-page 41, 6.01)

Select material shall be used for backfill adjacent to catch basin and riser inlets, as detailed in the plans.

Upon completion of the work, and prior to acceptance and final payment, all such structures will be inspected by the Engineer to ensure that they are free of all debris and thoroughly cleaned.

8.20 PIPE CULVERTS. (SP-page 43, 6.03)

Obtain pipe culver from a producer currently on the FDOT's list of Producers with Accepted Quality Control Programs.

If Aluminum pipe is utilized, the Contractor shall exercise sufficient care in handling and backfilling to avoid damage to the pipe.

Corrugated Polyethylene Pipe Class I, and Polyvinyl Chloride (PVC) Pipe materials not be used on arterial roads. Corrugated Polyethylene Pipe Class II may be used on arterial roads pursuant to the requirements of this section.

8.21 FRECH DRAIN. (SP-page 36, 6.04)

Payments shall be made under: French Drain of 18" diam.perforated pipe, trench depth 15 ft BLS (Below Land Surface) in LF.

8.22 CONCRETE GUTTER, CURB ELEMENTS, AND TRAFFIC SEPARATOR. (SP-page 38, 7.02) AND CONCRETE SIDEWALK. (SP-page39, 7.03)

Class I Concrete shall have a minimum compressive strength of **3,000 P.S.I at 28 days**.

9. NOTICE TO PROCEED.

Upon receipt of a **Notice to Proceed**, the Contractor shall notify the Department two working days in advance of his intent to commence work. The Contractor shall commence the work in accordance with the Contract Documents including the Schedule, schedule of values, shop drawings submittals and process, etc

10. <u>Discuss Miscellaneous Issues/Questions and Answers.</u>

- Schedule.
- Propose starting day.

MEETING
SIGN IN SHEET

PROJECT NAME: BRICKELL AREAS.
PROJECT NO. : #2010406

NAME	SIGNATURE	COMPANY	PHONE No.	FAX No.
YULY HERNANDEZ		PWD	3/375.4084	3/375.4989
Elva R. Reyes		PWD	305 375 1889	305 375 2931
Robert Delgado		Rock Power	305 752-7742	305 752-7728
DUANE KOPP		PWD	305 375 1306	—
Edilia Nogueira		MDWASD	786-268-5250	786-268-[illegible]
Marien Fleitas		PWD	(305)375-3786	(305)375-5909
Alberto Marí		PWD	(305)375-3786	305 375 5909
ALEX ROCHE		TECO	954-453-0811	954-453-0804
Francisco Alonso		T.Y.Lin (City of Miami consultant)	(305)567-1988	(305)567-1771
RUBEN ANUNCIBIA		PWD	(305)375-2111	(305)375-2547
Otto Rojas		PWD	305 375·2111	305 375 2547
Urbano Baz		PWD	305 375 2111	305 375 2547

DATE: 9/1/10
LOCATION: 14TH FLOOR CONFERENCE ROOM

T·Y·LIN INTERNATIONAL | HJ ROSS
201 Alhambra Circle, Suite 900 Coral Gables, Florida 33134 - 3163
Tel. (305) 567-1888 Fax. (305) 567-1771 EMAIL: hjross@hjross.com

Meeting Memorandum

PROJECT: Mary Brickell Village Drainage and Street Improvements B-30637

TO: **Jorge Garcia**
444 S.W. 2nd Avenue
Miami, FL 33130

Phone: 305.416.1219

FROM: Francisco J. Alonso, P.E.

DATE: Wednesday, September 16, 2010, 1:15 PM

A meeting was held on this date at City of Miami Department of Capital Improvements office to discuss the subject Project. The following were in attendance:

Individual	Title	Company
Alice N. Bravo, P.E.	CIP Director	City of Miami, CIP
Albert Sosa, P.E.	CIP Assistant Director	City of Miami, CIP
Jose Lago, P.E.	CIP	City of Miami, CIP
Jorge Garcia	Project Manager, CIP	City of Miami, CIP
Francisco J. Alonso, P.E.	Project Manager	TY Lin International

The purpose of this meeting was to discuss concerns T.Y. Lin had over the current scope of the project, the following bullet points address the specific topics discussed:

- The meeting began with a brief history of the project and an explanation of the drainage problems currently experience throughout the various depressions in the site. A brief history of how the current scope was arrived at was also detailed.
- Mr. Alonso explained that the current scope calls for a small pump station within the pavement just east of the intersection of S.W. 10th Street and 1st Avenue. The concerns expressed with current location included the following:
    - The project area is very difficult to construct due to existing utilizes along the street. In addition there is no apparent location for the placement of a control panel and emergency generator.
    - It will also be problematic for maintenance crews to access the pump station once it is operational and will require road closures to do so.
    - This scope would not address the other major flood problem at the intersection of 9th Street and SE 1st Avenue.
- Mr. Alonso went on to present an alternative solution placing the pump station in a small city owned park at the intersection of 10th Street and SE 1st Avenue. This location would allow for both major flood areas to be addressed. The pump station at this location would be significantly larger than the one originally proposed due to the greater size of the contributing basin. Also this requires construction of a new section of gravity collection system to the station and a new force main.
- Mr. Sosa suggested a third alternative to construct a larger bypass pump station at the downstream end of the entire system near the outfall at NW 1st Avenue and the Miami River. Mr. Alonso concurred that this solution was really the “end all” solution to the flooding problems as it would address the entire area, but did involve a significantly larger station and cost. It was

mentioned that the costs of the larger station may be offset by not having to construction a new collection system and force main.

- It was also discussed that using CIPP (cured in place pipe) could be utilized to line the existing trunk lines further reducing restoration costs and construction time.
- It was finally agreed to model and study the three proposed scenarios: current scope, pump station at 10th Street Park, and pump station at outfall.
- T.Y. Lin would model and study the three scenarios as part of the ongoing technical memorandum to determine their effectiveness and feasibility as well as cost estimates for each in order to provide a basis for CIP to decide on a course of action for design.
- The remainder of the scope including milling and resurfacing, curb and gutter, and sidewalk improvements would remain the same. However T.Y. Lin would include estimates for bid options including milling and resurfacing of the remaining sections of roadway encompassed by the overall project area but not currently in the scope.
- T.Y. Lin requested and was granted 2 additional weeks to complete the study. T.Y. Lin agreed to provide an update in 2 weeks and deliver the technical memorandum on October 18, 2010.
- Mr. Garcia was to follow-up with the parks department to determine the feasibility of constructing the 10th Street park option and provide a response from PD.
- It was discussed that a meeting should be arranged with Lyn Helmers to determine the status of the agreements between the City and the private owners regarding decorative sidewalk treatments within the project limits.

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Meeting Memorandum

PROJECT: Mary Brickell Village Drainage and Street Improvements B-30637

TO: **Jorge Garcia**
444 S.W. 2nd Avenue
Miami, FL 33130

Phone: 305.416.1219

FROM: Francisco J. Alonso, P.E.

DATE: Friday, December 10, 2010

A meeting was held on this date at the project site to discuss the subject Project. The following were in attendance:

Individual	Title	Company
Albert Sosa, P.E.	CIP Assistant Director	City of Miami, CIP
Jose Lago, P.E.	CIP	City of Miami, CIP
Jorge Garcia	Project Manager, CIP	City of Miami, CIP
Francisco J. Alonso, P.E.	Project Manager	TY Lin International (TYLI)

The purpose of this meeting was to walk the project site along SW 1st Avenue west of the MDT corridor in order to identify possible locations for the proposed pump station, for discussion in an upcoming meeting with MDT. Originally TYLI was attempting to position the pump station within the MDT right-of-way under or near the guide-way. In a preliminary discussion with MDT and Orlando Misas (CIP), TYLI determined that the approval process for such a proposal would be long and possibly not successful. Upon reviewing the site with Utility Records in hand, it was determined that installing the pump station within the City right-of-way, possibly in a parking lane, would be possible. Specifically, a site just north of SW 9th Street along the parking lane was identified to have sufficient utility clearance to accommodate the pump station wet well/valve box. From current records, it seems only a small water main relocation would be required. TYLI was to investigate the site and clear it of utility conflicts to proceed with the Phase II design (pump station site plan). TYLI was to get a quote from its surveyor to perform a GPR analysis of the area and identify all underground facilities.

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Meeting Memorandum

PROJECT: Mary Brickell Village Drainage and Street Improvements B-30637

TO: **Jorge Garcia**
444 S.W. 2nd Avenue
Miami, FL 33130

Phone: 305.416.1219

FROM: Francisco J. Alonso, P.E.

DATE: Monday, December 20, 2010

A meeting was held on this date at the MDT offices to discuss the subject Project, specifically the location of the pump station with relation to the MDT right-of-way. The following were in attendance:

Individual	Title	Company
Eric J. Muntan	MDT Chief, Office of Safety and Security	Miami-Dade County MDT
Steven Chayt	Chief of Facilities Maintenance	Miami-Dade County MDT
Albert Sosa, P.E.	CIP Assistant Director	City of Miami, CIP
Jose Lago, P.E.	CIP	City of Miami, CIP
Jorge Garcia	Project Manager, CIP	City of Miami, CIP
Francisco J. Alonso, P.E.	Project Manager	TY Lin International (TYLI)

Note: There were two other representatives present from MDT but we do not have their contact information.

The purpose of this meeting was to determine the possibility and process by which the Mary Brickell Village pump stations or portions of it could be constructed within the MDT right-of-way. The main concerns posed by the MDT staff were as follows:

- Work could not be performed near the footings of the guide-way columns as they are typically spread footings which cover a significant area.
- If any work was agreed to be performed within the right-of-way there would need to be significant coordination with the MDT safety and security staff due to OSHA regulations, personal safety issues, as well as homeland security issues.

Mr. Sosa expressed that using the MDT right-of-way as the pump station site would be the last resort if no other location could be found within the City's right-of-way, and that we were currently evaluating different locations for utility clearance. MDT expressed that the process for approving any work within the MDT right-of-way was long and tedious and as an example mentioned the current City project just north of our site (B-30130 Greenway Project).

The last topic of discussion in the meeting was regarding the Overtown Greenway project (B30624). It was agreed to set up a field meeting with MDT staff to walk the site and identify possible issues.

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Meeting Memorandum

PROJECT: Mary Brickell Village Drainage and Street Improvements B-30637

TO: **Jorge Garcia**
444 S.W. 2nd Avenue
Miami, FL 33130

Phone: 305.416.1219

FROM: Francisco J. Alonso, P.E.

DATE: Friday, January 14, 2011 @ 11AM

A meeting was held on this date at the DERM Water Control offices to discuss the subject Project, specifically the permitting requirements with regard to drainage. The following were in attendance:

Individual	Title	Company
Camilo Ignacio	Engineer III	Miami Dade DERM
Marie Hall	Engineer II	Miami Dade DERM
Jorge Garcia	Project Manager, CIP	City of Miami, CIP
Francisco J. Alonso, P.E.	Project Manager	TY Lin International (TYLI)
Claudia Diaz	Project Engineer	TY Lin International (TYLI)

The purpose of this meeting was to determine the permitting requirements for Phase I and Phase II of the Mary Brickell Village Project.

Mr. Alonso began the meeting by describing the project location, existing conditions, and existing drainage concerns. The existing system was also thoroughly described as a large gravity outfall serving the entire neighborhood. The scope of the proposed improvements was also described including the conveyance improvements under Phase I and the pump station under Phase II. Proposed water quality features were also described.

Mr. Ignacio expressed that in general the project will require a Class II permit from them. He was not certain if an ERP would be required because we were not physically modifying the outfall pipe just installing a bypass pump station. He did express concern that because of the possible increase in discharge, we should present the project to the SFWMD to determine if an ERP will be required, as they are the agency with jurisdiction in this case. In addition he mentioned if drainage wells will be used (Mr. Alonso confirmed that) they would also require an environmental review by their office prior to submitting to FDEP for the well permits. Ms. Hall was designated as the contact for issues pertaining to drainage wells.

Mr. Alonso went on to describe that due to the recent changes in the project scope it was decided to bid it out in two phases, and the question was posed whether or not we need to submit two separate permit applications to allow for construction of Phase I. Mr. Ignacio confirmed that we would need to submit a separate Class II permit for Phase I, and that the conditions of the permit would state that water quality would be addressed as part of the pump station project in Phase II. An ERP would not required during Phase I as no improvements to the outfall are being made and the system would function as existing with only Phase I constructed.

Finally, it was decided to submit the 60% plans and technical memorandum along with a class II permit application to begin review next week. Mr. Ignacio mentioned that the review process would take approximately 3 weeks and that we could have an approved application in approximately 6-9 weeks.

Meeting adjourned at 11:35AM

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Meeting Memorandum

PROJECT: Mary Brickell Village Drainage and Street Improvements B-30637

TO: **Jorge Garcia**
444 S.W. 2nd Avenue
Miami, FL 33130

Phone: 305.416.1219

FROM: Francisco J. Alonso, P.E.

DATE: Thursday, February 10, 2011 @ 10:00AM

A meeting was held on this date at Leonard Helmers office to discuss the subject Project, specifically the existing local covenants. The following were in attendance:

Individual	Title	Company
Leonard Helmers	Asst. Director	City of Miami Public Works
Jorge Garcia	Project Manager, CIP	City of Miami, CIP
Francisco J. Alonso, P.E.	Project Manager	TY Lin International (TYLI)

The purpose of this meeting was to determine the actions required when encountering work within areas where there are existing covenants for non-standard improvements by private developers (i.e. Pavers)

Mr. Helmers explained that in the area of this project there were currently a few covenants executed between the City and neighboring land owners (copies of covenants had been provided to all parties). Mr. Helmers went on to explain that the purpose of the covenants were to allow for the installation of non-standards upgrades such as pavers or specialty landscaping by the private land developers within the City Right-of-Way. As part of the covenants the City would have no responsibility to maintain or repair these non-standard improvements. The practical meaning of these covenants for this project is that if any construction is performed within the areas that disturb the non-standard features described in the covenants, the property owner is responsible for their repair. The City's responsibility would be to notify the property owners about the proposed work that will impact their properties with sufficient time that they can make arrangements to make the repairs following construction. If the property owners are non-responsive or do not wish to make the repairs, the City will simply replace the damages areas with standard right-of-way features such as concrete sidewalks or standard asphalt pavement.

Mr. Alonso asked about a specific location shown on the plans to be repaired about 50' west of South Miami Avenue along SW 10th Street. This area has large concrete paver tiles and is currently in need of repair. Mr. Helmers confirmed that Public Works is aware of this area and they have already notified the property owner to repair the area per the covenant.

Action Items:

- T.Y. Lin to remove from the plans the area along SW 10th Street that was proposed to be repaired, as PW has already notified the owner that the repairs must be made.
- T.Y. Lin will identify the property owners that will have covenant areas impacted by construction and CIP will notify them as we approach the letting date of the project.

Meeting adjourned at 10:30AM

201103161448 0265

MIAMI-DADE
COUNTY
Carlos Alvarez, Mayor

Department of Environmental Resources Management
Natural Resources Regulation and Restoration Division
701 NW 1st Court, 6th Floor
Miami, Florida 33136-3912
T 305-372-6567 F 305-372-6407

miamidade.gov

March 16, 2011

Francisco J Alonso
T.Y. Lin International
201 Alhambra Circle Suite 900
Coral Gables, FL 33134

RE: Request for Additional information for Mary Brickell Village Drainage - Phase I, Class II Permit Application 20110006 for the proposed referenced project located at MIAMI, FL 33130- .

Dear Alonso:

Departmental staff has reviewed the items submitted on February 17, 2011 for the application referenced above. The Department is providing comments and requesting the following items to process the application:

1. Submit a substantiating letter from the City of MIAMI Zoning Department stating that the proposed usage of the property upon which the proposed work would occur does not violate any zoning law applicable to the area of the proposed work.

2. Provide a stormwater pollution prevention plan to address the short term water quality impacts from the proposed construction of the proposed development. The plan should identify the appropriate erosion and sedimentation controls and stormwater best management practices to reduce erosion, sedimentation, and stormwater pollution.

3. In order to minimize danger of entrapment to manatees, outfalls which are greater than 7 inches and less than 60 inches in diameter shall be covered with grates or screens with spaces less than 7 inches wide; these shall be maintained to prevent upland flooding.

4. Submit signed and sealed percolation tests performed within the project site. Also, the exfiltration trench must be installed to the same depth that the percolation test was performed.

Please note that based on new information or future submittals, this Department may require additional information or items prior to the issuance of the Class II Permit. Once all the indicated items have been returned, this office shall process the permit application. Please submit the required information within 30 days to prevent your application from becoming dormant.

Be advised that a review of second resubmittal items originally disapproved may be subject to an additional 50% of the original permit fee.

Permits from the Florida Department of Environmental Protection (561-681-6600), and the South Florida Water Management District (1-800-432-2045) may be required for this project. It is the responsibility of you, as the applicant, to contact these agencies.

If you have any questions, please contact me at 305-372-6681.

Sincerely,

City of Miami

TONY E. CRAPP, JR.
City Manager

April 19, 2011

Ms. Yaimara Perez
Engineer 3
Miami Dade County
Department of Environmental Resources Management (DERM)
Water Control Section
701 NW 1st Court, 6th Floor
Miami, Florida 33136-3912

Re: Mary Brickell Village Drainage Improvements, Phase 1, B-30637

Dear Ms. Perez:

This letter serves to inform you that the Office of Zoning has reviewed your request for the project entitled "Mary Brickell Village Improvement, Phase I, B-30637" with a DERM Class II Permit Application No. 20110006. The area of the proposed work is located within public right of way and bounded by SW/SE 9th Street (to the north) SW/SE 12th Street (to the south), SW 1st Avenue (to the west) and SE 1st Avenue (to the east). The Office of Zoning has no objection to the proposed work to be performed since it does not violate any applicable portions of the City of Miami Zoning Code and is in compliance with same.

Should you have any questions, please feel free to contact me at 305-416-1491 or via email at bmin@miamigov.com.

Sincerely,

Barnaby L. Min
Zoning Administrator

BM/mt
c: Zoning File

DEPARTMENT BUILDING & ZONING
444 S.W. 2nd Avenue, 4th Floor, Miami, FL 33130 / (305) 416-2168 Fax: (305) 416-1100
Mailing Address: P.O. Box 330708 Miami, Florida 33233-0708