NOT TO SCALE

NORTH

L2 - LANDSCAPE

L2 - LANDSCAPE

L3 - LANDSCAPE

L4 - LANDSCAPE

L5 - LANDSCAPE

L6 - LANDSCAPE

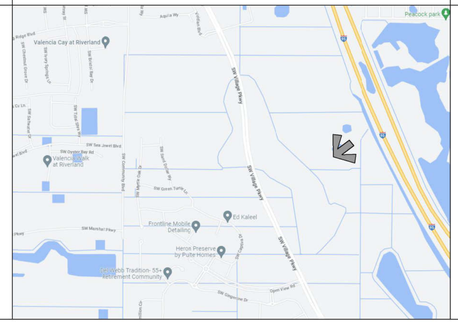
L7 - LANDSCAPE

PORT ST. LUCIE UTILITY SYSTEMS DEPARTMENT NOTES

1. NO LANDSCAPING SHALL BE PLANTED IN A MANNER THAT WOULD ADVERSELY AFFECT UTILITY EASEMENTS. LANDSCAPING SHALL BE IN COMPLIANCE WITH CHAPTER 154 OF THE CITY OF PORT ST. LUCIE CODE OF ORDINANCES, PSLUSD TECHNICAL SPECIFICATIONS AND POLICIES.
2. ALL LANDSCAPING WITHIN CITY UTILITY EASEMENTS SHALL COMPLY WITH PSLUSD TECHNICAL SPECIFICATIONS, POLICIES, AND CODES.
3. ALL LANDSCAPING SHALL MEET THE LATEST PSLUSD LANDSCAPE POLICY AND SHALL NOT BE PLACED IN A MANNER THAT WOULD CREATE CONFLICTS WITH THE INTENDED OPERATION AND MAINTENANCE OF ANY EXISTING UTILITY.
4. TREES SHALL NOT BE PLANTED WITHIN (10) FEET OF ANY PSLUSD UNDERGROUND INFRASTRUCTURE.
5. NO LANDSCAPING OTHER THAN SOD GRASSES SHALL BE LOCATED WITHIN 5' OF A PSLUSD APPURTENANCE SUCH AS A WATER METER ASSEMBLY, BACKFLOW DEVICE, FIRE HYDRANT OR SEWER CLEANOUT, ETC.

TABLE OF CONTENTS:

LOCATION MAP:



SITE DATA

HARDINESS ZONE:	10A
MEAN ANNUAL PRECIPITATION:	46" - 58"
MEAN ANNUAL AIR TEMP:	68° - 77°
FROST FREE PERIOD:	350 - 365 DAYS
SOIL TYPE:	RIVIERA AND SIM.
LANDFORM:	DEPRESSIONS ON MARINE TERRACES
SOIL PROFILE:	0"-22" SAND 22"-80" SANDY LOAM
SLOPE:	0% - 1%
DEPTH TO RESTRICTIVE FEATURE:	MORE THAN 80"
DRAINAGE CLASS:	VERY POORLY DRAINING
RUNOFF CLASS:	NEGLIGIBLE
DEPTH TO WATER TABLE:	ABOUT 0"
FREQUENCY FOR FLOODING:	NONE
HYDROLOGIC SOIL GROUP:	C/D

GROUP C: SOILS ARE SANDY CLAY LOAM. THEY HAVE LOW INFILTRATION RATES WHEN THOROUGHLY WETTED AND CONSIST CHIEFLY OF SOILS WITH A LAYER THAT IMPEDES DOWNWARD MOVEMENT OF WATER AND/ SOILS WITH MODERATELY FINE TO FINE STRUCTURE.

GROUP D: SOILS ARE CLAY LOAM, SILTY CLAY LOAM, SANDY CLAY, SILTY CLAY OR CLAY. THIS HSG HAS THE HIGHEST RUNOFF POTENTIAL. THEY HAVE VERY LOW INFILTRATION RATES WHEN THOROUGHLY WETTED AND CONSIST CHIEFLY OF CLAY SOILS WITH A HIGH SWELLING POTENTIAL, SOILS WITH A PERMANENT HIGH WATER TABLE, SOILS WITH A CLAYPAN OR CLAY LAYER AT OR NEAR THE SURFACE AND SHALLOW SOILS OVER NEARLY IMPERVIOUS MATERIAL.

HYDRIC SOIL RATING:	YES

100% PLANS

P24-010

Michael Flaugh
LANDSCAPE ARCHITECT
FL Reg #LA0001728
772.419.0024
Stuart
Houzz.com/pro/Michael-Flaugh www.MikeFlaughLA.com

Sheet L1
Title Sheet

Landscape Plan
TOM MACKIE BLVD. EXTENSION
Port St. Lucie, FL

Michael Flaugh
Digitally signed by Michael Flaugh
Date: 2024.04.29 14:45:46 -04'00'

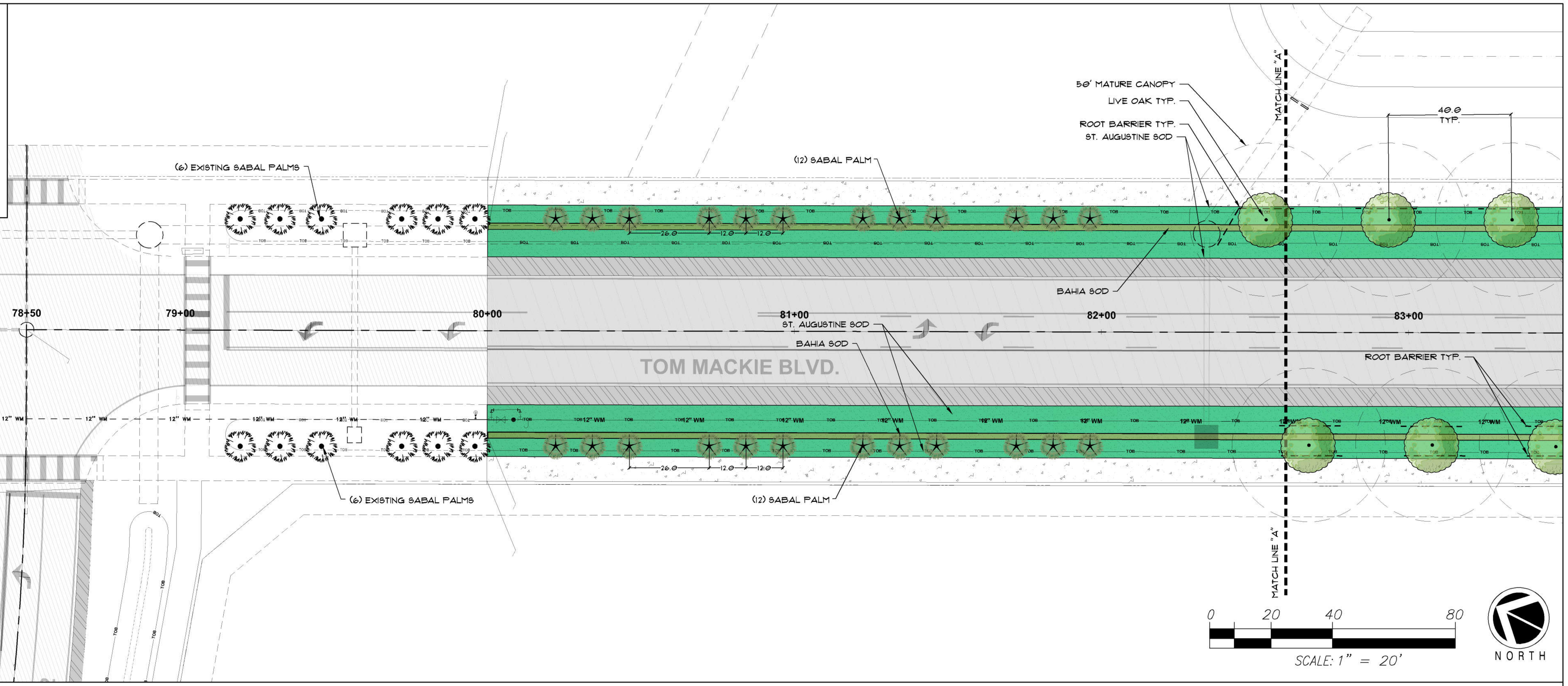
Please note: This landscape plan is a professional interpretation of existing and proposed site elements based on multiple sources of information. These sources may include: property surveys, architectural plans, google aerial imagery, site observations, photographs and site plans. At times, these supporting documents are inaccurate or approximate at best and on-site adjustments to the design during installation are necessary. **It is the contractors responsibility to verify all measurements and quantities prior to commencing work.**

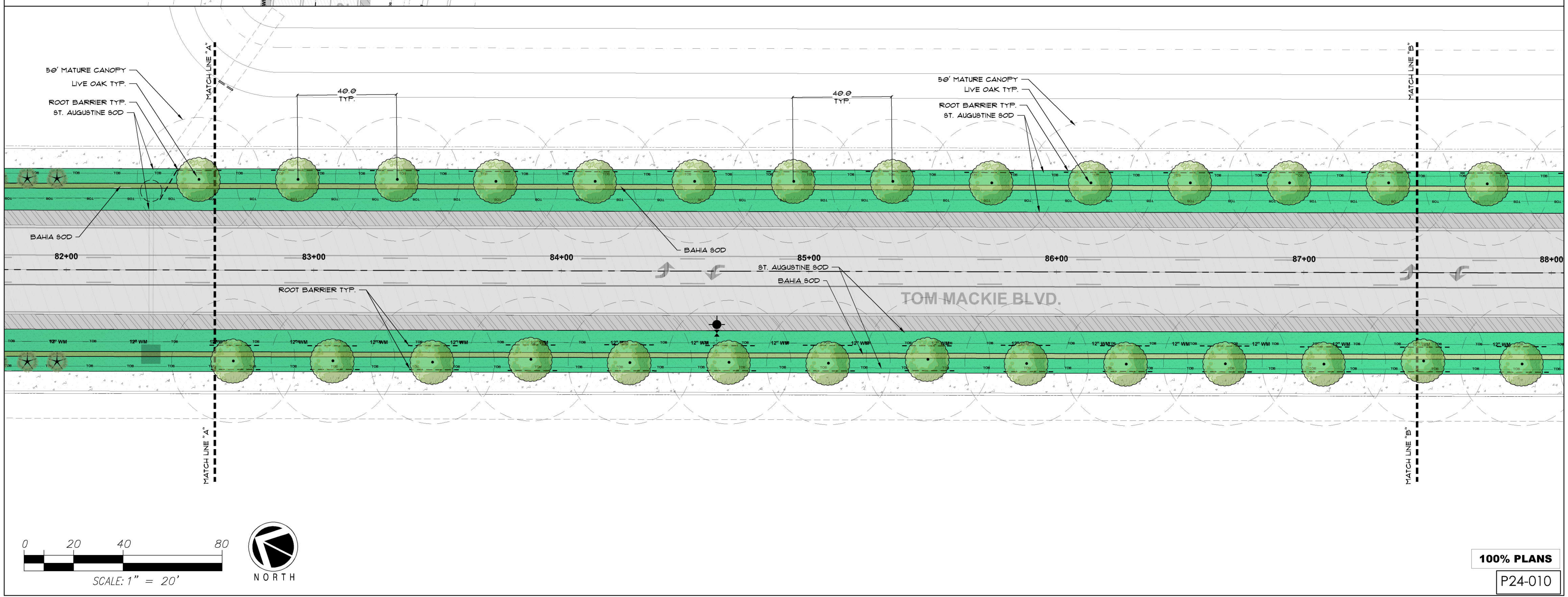
REGISTERED LANDSCAPE ARCHITECT MICHAEL FLAUGH LA 0001728 STATE OF FLORIDA

Date: 01/12/2024
Design by: PA, MF
Reviewed by: MF
Revised: 05/01/2024
100% PLANS:

PORT ST. LUCIE UTILITY SYSTEMS DEPARTMENT NOTES

1. NO LANDSCAPING SHALL BE PLANTED IN A MANNER THAT WOULD ADVERSELY AFFECT UTILITY EASEMENTS. LANDSCAPING SHALL BE IN COMPLIANCE WITH CHAPTER 154 OF THE CITY OF PORT ST. LUCIE CODE OF ORDINANCES, PSLUSD TECHNICAL SPECIFICATIONS AND POLICIES.
2. ALL LANDSCAPING WITHIN CITY UTILITY EASEMENTS SHALL COMPLY WITH PSLUSD TECHNICAL SPECIFICATIONS, POLICIES, AND CODES.
3. ALL LANDSCAPING SHALL MEET THE LATEST PSLUSD LANDSCAPE POLICY AND SHALL NOT BE PLACED IN A MANNER THAT WOULD CREATE CONFLICTS WITH THE INTENDED OPERATON AND MAINTENANCE OF ANY EXISTING UTILITY.
4. TREES SHALL NOT BE PLANTED WITHIN (10) FEET OF ANY PSLUSD UNDERGROUND INFRASTRUCTURE.
5. NO LANDSCAPING OTHER THAN SOD GRASSES SHALL BE LOCATED WITHIN 5' OF A PSLUSD APPURTENANCE SUCH AS A WATER METER ASSEMBLY, BACKFLOW DEVICE, FIRE HYDRANT OR SEWER CLEANOUT, ETC.





100% PLANS

P24-010

Michael Flaugh
LANDSCAPE ARCHITECT
FL Reg. #LA0001728
772.419.0024
Stuart
Houzz.com/pro/Michael-Flaugh www.MikeFlaughLA.com

Sheet L2

Planting Plan

Landscape Plan
TOM MACKIE BLVD. EXTENSION

Port St. Lucie, FL

Please note:
This landscape plan is a professional interpretation of existing and proposed site elements based on multiple sources of information. These sources may include: property surveys, architectural plans, google aerial imagery, site observations, photographs and site plans. At times, these supporting documents are inaccurate or approximate at best and on-site adjustments to the design during installation are necessary. ***It is the contractors' responsibility to verify all measurements and quantities prior to commencing work.***

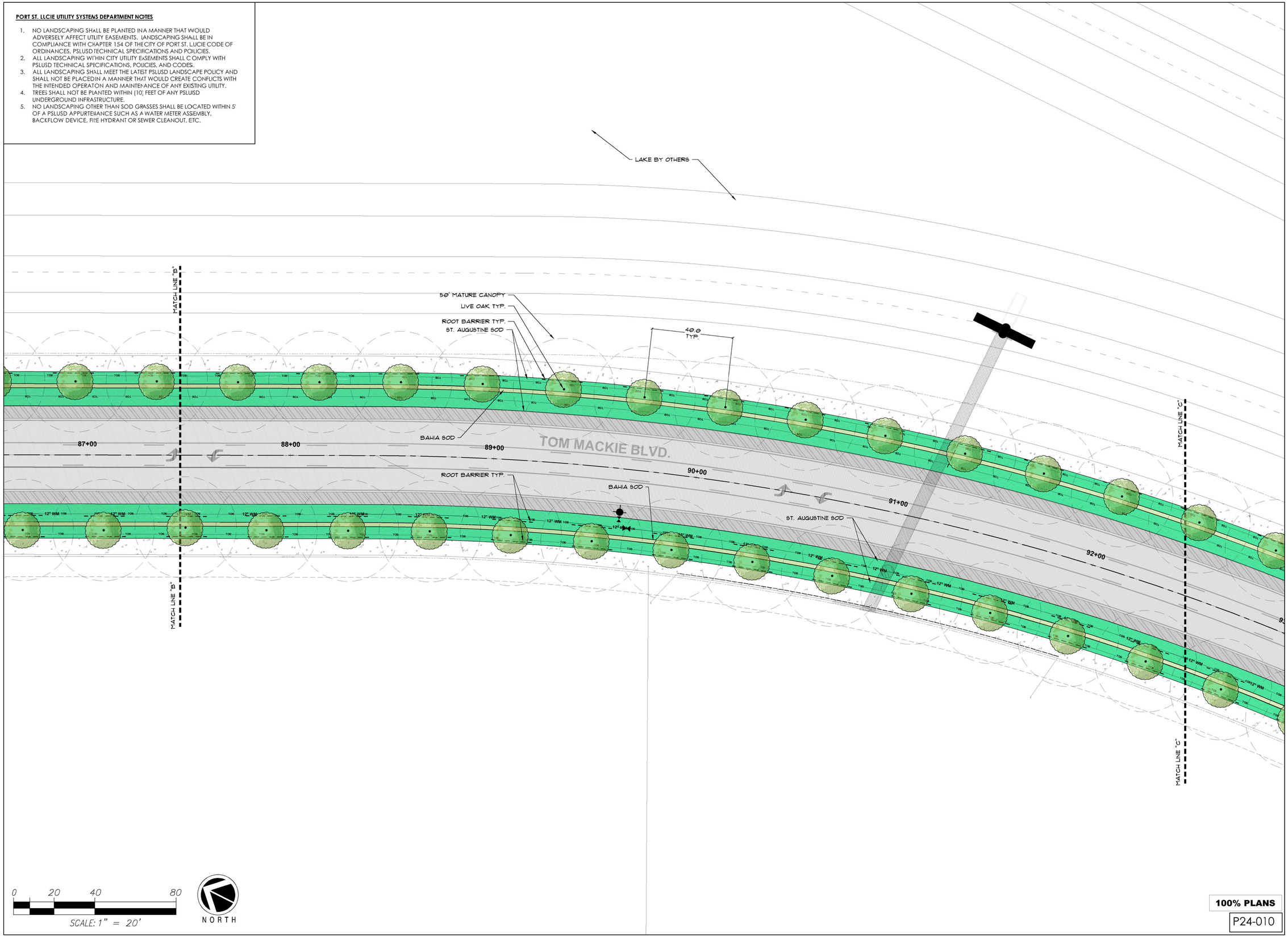
Michael Flaugh
Digitally signed by Michael Flaugh
Date: 2024.04.29 14:46:09 -04'00'

REGISTERED LANDSCAPE ARCHITECT
MICHAEL FLAUGH
LA 1728
STATE OF FLORIDA

Date: 01/12/2024
Design by: PA, MF
Reviewed by: MF
Revised:
100% PLANS: 05/01/2024

PORT ST. LUCIE UTILITY SYSTENS DEPARTMENT NOTES

1. NO LANDSCAPING SHALL BE PLANTED IN A MANNER THAT WOULD ADVERSELY AFFECT UTILITY EASEMENTS. LANDSCAPING SHALL BE IN COMPLIANCE WITH CHAPTER 154 OF THE CITY OF PORT ST. LUCIE CODE OF ORDINANCES, PSLUSD TECHNICAL SPECIFICATIONS AND POLICIES.
2. ALL LANDSCAPING WITHIN CITY UTILITY EASEMENTS SHALL COMPLY WITH PSLUSD TECHNICAL SPECIFICATIONS, POLICIES, AND CODES.
3. ALL LANDSCAPING SHALL MEET THE LATEST PSLUSD LANDSCAPE POLICY AND SHALL NOT BE PLACED IN A MANNER THAT WOULD CREATE CONFLICTS WITH THE INTENDED OPERATON AND MAINTENANCE OF ANY EXISTING UTILITY.
4. TREES SHALL NOT BE PLANTED WITHIN (10) FEET OF ANY PSLUSD UNDERGROUND INFRASTRUCTURE.
5. NO LANDSCAPING OTHER THAN SOD GRASSES SHALL BE LOCATED WITHIN 5' OF A PSLUSD APPURTENANCE SUCH AS A WATER METER ASSEMBLY, BACKFLOW DEVICE, FIRE HYDRANT OR SEWER CLEANOUT, ETC.



0 20 40 80

SCALE: 1" = 20'

NORTH

100% PLANS

P24-010

Michael Flaugh LANDSCAPE ARCHITECT
FL Reg. #LA0001728
772.419.0024
Stuart
Houzz.com/pro/MichaelFlaugh www.MikeFlaughLA.com

Sheet L3
Planting Plan

Landscape Plan
TOM MACKIE BLVD. EXTENSION
Port St. Lucie, FL

Michael Flaugh
Digitally signed by Michael Flaugh
Date: 2024.04.29 15:42:53 -04'00'

Please note:
This landscape plan is a professional interpretation of existing and proposed site elements based on multiple sources of information. These sources may include: property surveys, architectural plans, google earth imagery, site observations, photographs and site plans. At times, these supporting documents are inaccurate or approximate at best and private adjustments to the design during installation are necessary. ***It is the contractors responsibility to verify all measurements and quantities prior to commencing work.***

REGISTERED LANDSCAPE ARCHITECT MICHAEL FLAUGH LA 0001728 STATE OF FLORIDA

Date: 01/12/2024
Design by: PA, MF
Reviewed by: MF
Revised:
100% PLANS: 05/01/2024

PORT ST. LUCIE UTILITY SYSTEMS DEPARTMENT NOTES

1. NO LANDSCAPING SHALL BE PLANTED IN A MANNER THAT WOULD ADVERSELY AFFECT UTILITY EASEMENTS. LANDSCAPING SHALL BE IN COMPLIANCE WITH CHAPTER 154 OF THE CITY OF PORT ST. LUCIE CODE OF ORDINANCES, PSLUSD TECHNICAL SPECIFICATIONS AND POLICIES.
2. ALL LANDSCAPING WITHIN CITY UTILITY EASEMENTS SHALL COMPLY WITH PSLUSD TECHNICAL SPECIFICATIONS, POLICIES, AND CODES.
3. ALL LANDSCAPING SHALL MEET THE LATEST PSLUSD LANDSCAPE POLICY AND SHALL NOT BE PLACED IN A MANNER THAT WOULD CREATE CONFLICTS WITH THE INTENDED OPERATION AND MAINTENANCE OF ANY EXISTING UTILITY.
4. TREES SHALL NOT BE PLANTED WITHIN (10) FEET OF ANY PSLUSD UNDERGROUND INFRASTRUCTURE.
5. NO LANDSCAPING OTHER THAN SOD GRASSES SHALL BE LOCATED WITHIN 5' OF A PSLUSD APPURTENANCE SUCH AS A WATER METER ASSEMBLY, BACKFLOW DEVICE, FIRE HYDRANT OR SEWER CLEANOUT, ETC.

LAKE BY OTHERS

MATCH LINE "C"

MATCH LINE "C"

40.0 TYP.

92+00

93+00

94+00

95+00

96+00

97+00

98+00

TOM MACKIE BLVD.

BAHIA SOD

ST. AUGUSTINE SOD

(18) SABAL PALM

ST. AUGUSTINE SOD

BAHIA SOD

(18) SABAL PALM

MATCH LINE "D"

MATCH LINE "D"

0 20 40 80

SCALE: 1" = 20'

NORTH

100% PLANS

P24-010

Michael Flaugh
LANDSCAPE ARCHITECT
FL Reg #LA0001728
772.419.0024
Stuart
Houzz.com/pro/Michael-Flaugh www.MikeFlaughLA.com

Sheet
L4
Planting Plan

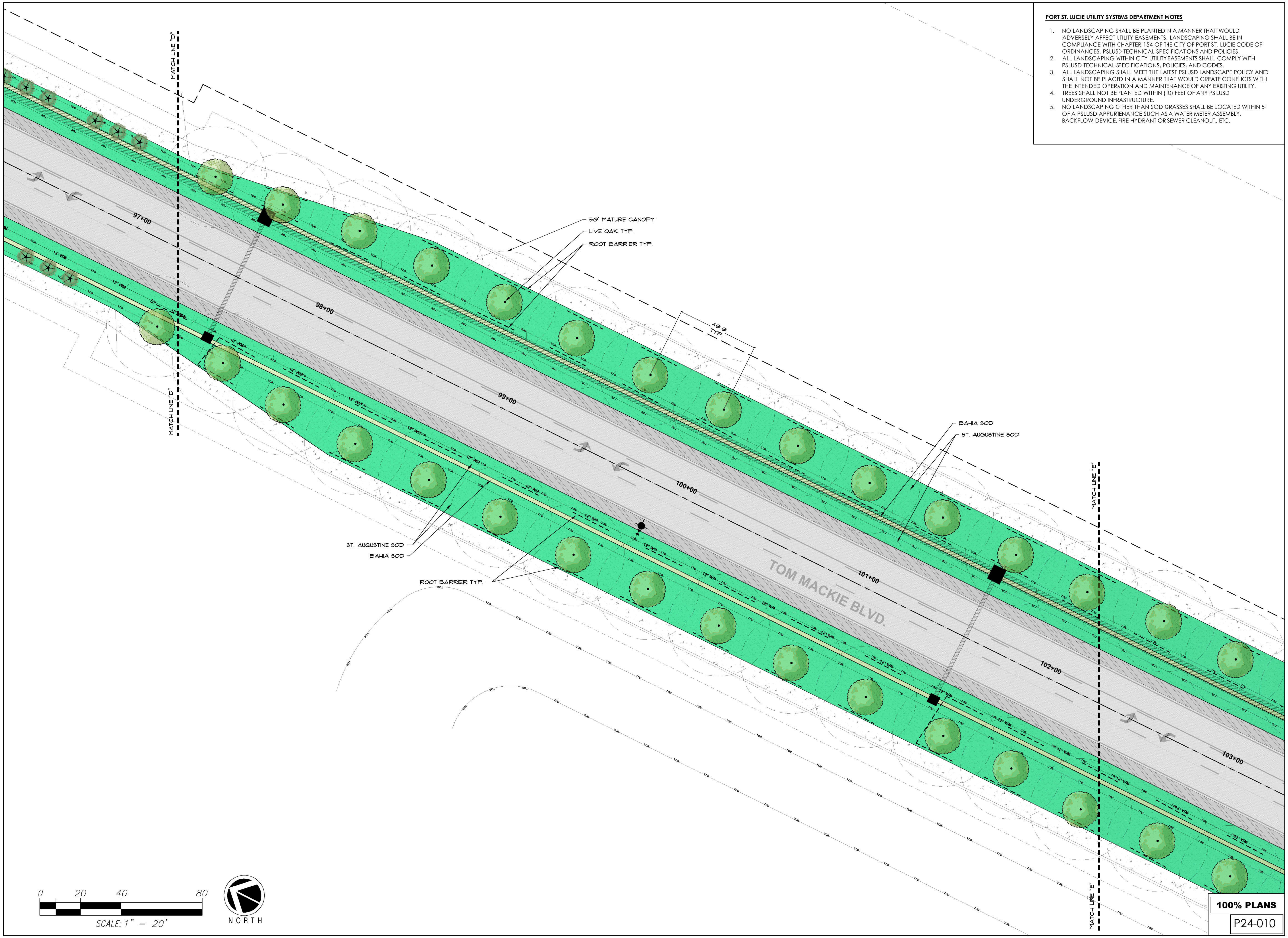
Landscape Plan
TOM MACKIE BLVD. EXTENSION
Port St. Lucie, FL

Michael Flaugh
Digitally signed by Michael Flaugh
Date: 2024.04.29 15:43:39 -04'00'

Please note:
*This landscape plan is a professional interpretation of existing and proposed site elements based on multiple sources of information. These sources may include: property surveys, architectural plans, google earth imagery, site observations, photographs and site plans. At times, these supporting documents are inaccurate or approximate at best and private easements to the design during installation are necessary. **It is the contractors responsibility to verify all measurements and quantities prior to commencing work.***

REGISTERED LANDSCAPE ARCHITECT
MICHAEL FLAUGH
LA 0001728
STATE OF FLORIDA

Date: 01/12/2024
Design by: PA, MF
Reviewed by: MF
Revised:
100% PLANS 05/01/2024



PORT ST. LUCIE UTILITY SYSTEMS DEPARTMENT NOTES

1. NO LANDSCAPING SHALL BE PLANTED IN A MANNER THAT WOULD ADVERSELY AFFECT UTILITY EASEMENTS. LANDSCAPING SHALL BE IN COMPLIANCE WITH CHAPTER 154 OF THE CITY OF PORT ST. LUCIE CODE OF ORDINANCES, PSLUSD TECHNICAL SPECIFICATIONS AND POLICIES.
2. ALL LANDSCAPING WITHIN CITY UTILITY EASEMENTS SHALL COMPLY WITH PSLUSD TECHNICAL SPECIFICATIONS, POLICIES, AND CODES.
3. ALL LANDSCAPING SHALL MEET THE LATEST PSLUSD LANDSCAPE POLICY AND SHALL NOT BE PLACED IN A MANNER THAT WOULD CREATE CONFLICTS WITH THE INTENDED OPERATION AND MAINTENANCE OF ANY EXISTING UTILITY.
4. TREES SHALL NOT BE PLANTED WITHIN (10) FEET OF ANY PS LUSD UNDERGROUND INFRASTRUCTURE.
5. NO LANDSCAPING OTHER THAN SOD GRASSES SHALL BE LOCATED WITHIN 5' OF A PSLUSD APPURTENANCE SUCH AS A WATER METER ASSEMBLY, BACKFLOW DEVICE, FIRE HYDRANT OR SEWER CLEANOUT, ETC.

Michael Flaugh
LANDSCAPE ARCHITECT
FL Reg. #LA0001728
772.419.0024
Stuart
Houzz.com/pro/Michael-Flaugh www.MikeFlaughLA.com

Sheet
L5
Planting Plan

Landscape Plan
TOM MACKIE BLVD. EXTENSION
Port St. Lucie, FL

Please note:
This landscape plan is a professional interpretation of existing and proposed site elements based on multiple sources of information. These sources may include: property surveys, architectural plans, google aerial imagery, site observations, photographs and site plans. At times, these supporting documents are inaccurate or approximate at best and on-site adjustments to the design during installation are necessary. ***It is the contractors' responsibility to verify all measurements and quantities prior to commencing work.***

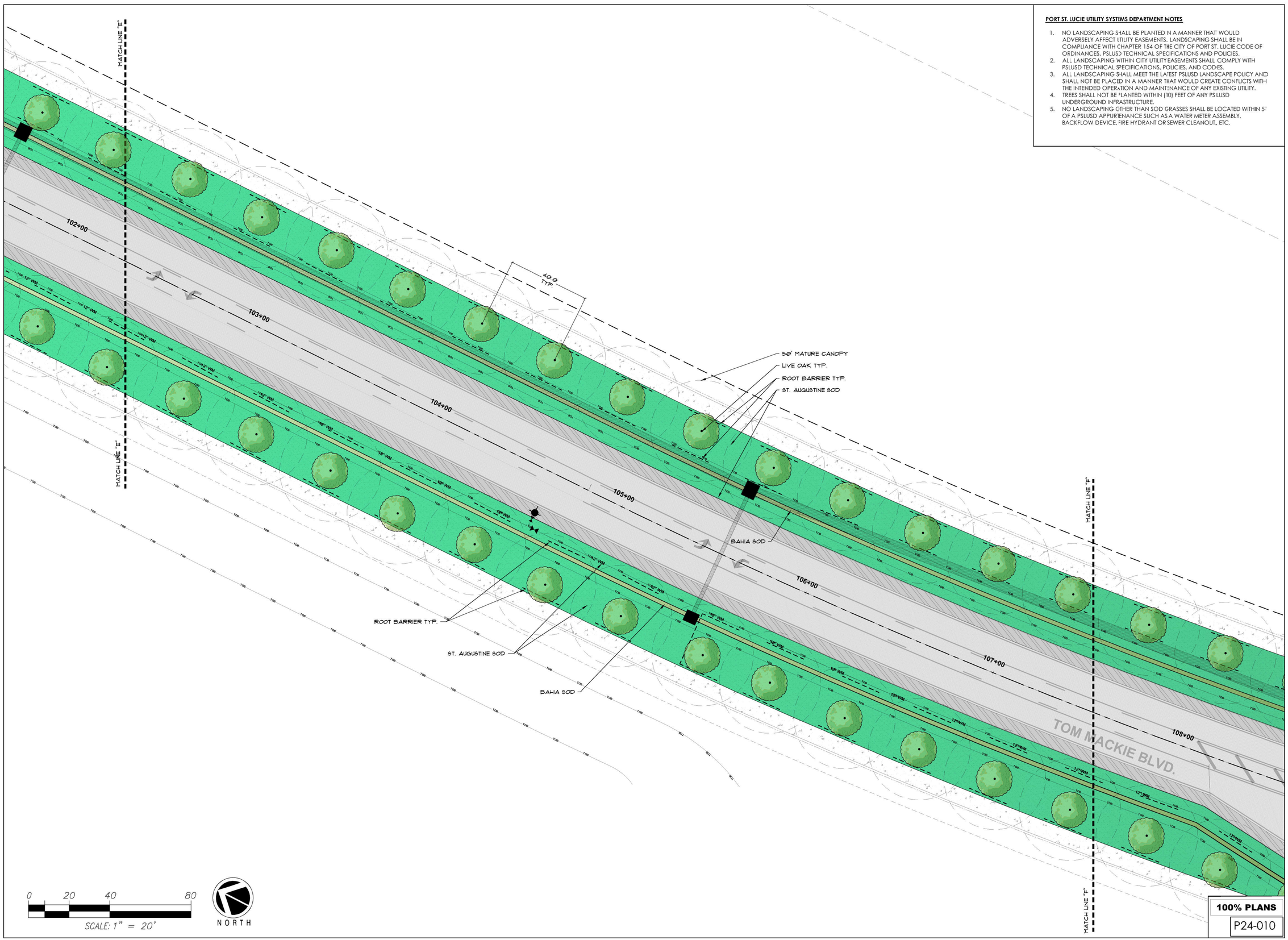
Michael Flaugh
Digitally signed by Michael Flaugh
Date: 2024.04.29 15:43:58 -04'00'

REGISTERED LANDSCAPE ARCHITECT
MICHAEL FLAUGH
LA 1728
STATE OF FLORIDA

Date: 01/12/2024
Design by: PA, MF
Reviewed by: MF
Revised:
100% PLANS: 05/01/2024

100% PLANS

P24-010



PORT ST. LUCIE UTILITY SYSTEMS DEPARTMENT NOTES

1. NO LANDSCAPING SHALL BE PLANTED IN A MANNER THAT WOULD ADVERSELY AFFECT UTILITY EASEMENTS. LANDSCAPING SHALL BE IN COMPLIANCE WITH CHAPTER 154 OF THE CITY OF PORT ST. LUCIE CODE OF ORDINANCES, PSLUSD TECHNICAL SPECIFICATIONS AND POLICIES.
2. ALL LANDSCAPING WITHIN CITY UTILITY EASEMENTS SHALL COMPLY WITH PSLUSD TECHNICAL SPECIFICATIONS, POLICIES, AND CODES.
3. ALL LANDSCAPING SHALL MEET THE LATEST PSLUSD LANDSCAPE POLICY AND SHALL NOT BE PLACED IN A MANNER THAT WOULD CREATE CONFLICTS WITH THE INTENDED OPERATION AND MAINTENANCE OF ANY EXISTING UTILITY.
4. TREES SHALL NOT BE PLANTED WITHIN (10) FEET OF ANY PSLUSD UNDERGROUND INFRASTRUCTURE.
5. NO LANDSCAPING OTHER THAN SOD GRASSES SHALL BE LOCATED WITHIN 5' OF A PSLUSD APPURTENANCE SUCH AS A WATER METER ASSEMBLY, BACKFLOW DEVICE, FIRE HYDRANT OR SEWER CLEANOUT, ETC.

Michael Flaugh
LANDSCAPE ARCHITECT
FL Reg. #LA0001728
772.419.0024
Stuart
Houzz.com/pro/MichaelFlaugh www.MikeFlaughLA.com

Sheet
L6
Planting Plan

Landscape Plan
TOM MACKIE BLVD. EXTENSION
Port St. Lucie, FL

Michael Flaugh
Digitally signed by Michael Flaugh
Date: 2024.04.29 15:44:19 -04'00'

Please note:
This landscape plan is a professional interpretation of existing and proposed site elements based on multiple sources of information. These sources may include: property surveys, architectural plans, google aerial imagery, site observations, photographs and site plans. At times, these supporting documents are inaccurate or approximate or best fond on-site adjustments to the design during installation are necessary. ***It is the contractors responsibility to verify all measurements and quantities prior to commencing work.***

REGISTERED LANDSCAPE ARCHITECT MICHAEL FLAUGH LA 0001728 STATE OF FLORIDA

Date: 01/12/2024
Design by: PA, MF
Reviewed by: MF
Revised:
100% PLANS: 05/01/2024

100% PLANS

P24-010

PORT ST. LUCIE UTILITY SYSTEMS DEPARTMENT NOTES

1. NO LANDSCAPING SHALL BE PLANTED IN A MANNER THAT WOULD ADVERSELY AFFECT UTILITY EASEMENTS. LANDSCAPING SHALL BE IN COMPLIANCE WITH CHAPTER 154 OF THE CITY OF PORT ST. LUCIE CODE OF ORDINANCES, PSLUSD TECHNICAL SPECIFICATIONS AND POLICIES.
2. ALL LANDSCAPING WITHIN CITY UTILITY EASEMENTS SHALL COMPLY WITH PSLUSD TECHNICAL SPECIFICATIONS, POLICIES, AND CODES.
3. ALL LANDSCAPING SHALL MEET THE LATEST PSLUSD LANDSCAPE POLICY AND SHALL NOT BE PLACED IN A MANNER THAT WOULD CREATE CONFLICTS WITH THE INTENDED OPERATION AND MAINTENANCE OF ANY EXISTING UTILITY.
4. TREES SHALL NOT BE PLANTED WITHIN (10) FEET OF ANY PSLUSD UNDERGROUND INFRASTRUCTURE.
5. NO LANDSCAPING OTHER THAN SOD GRASSES SHALL BE LOCATED WITHIN 5' OF A PSLUSD APPURTENANCE SUCH AS A WATER METER ASSEMBLY, BACKFLOW DEVICE, FIRE HYDRANT OR SEWER CLEANOUT, ETC.

MATCH LINE "F"

50' MATURE CANOPY
LIVE OAK TYP.
ROOT BARRIER TYP.
ST. AUGUSTINE SOD
BAHIA SOD

TOM MACKIE BLVD.

MARSHALL PARKWAY

60' FPL EASEMENT O.R.B. 97, PG. 505

108+00
109+00
110+00
111+00
112+00
113+00

40.0 TYP.

12" WM
8" WM
8" SAN
RAW

0 20 40 80
SCALE: 1" = 20'

NORTH

100% PLANS
P24-010

Michael Flaugh
LANDSCAPE ARCHITECT
FL Reg #LA0001728
772.419.0024
Stuart
Houzz.com/pro/Michael-Flaugh www.MikeFlaughLA.com

Sheet
L7
Planting Plan

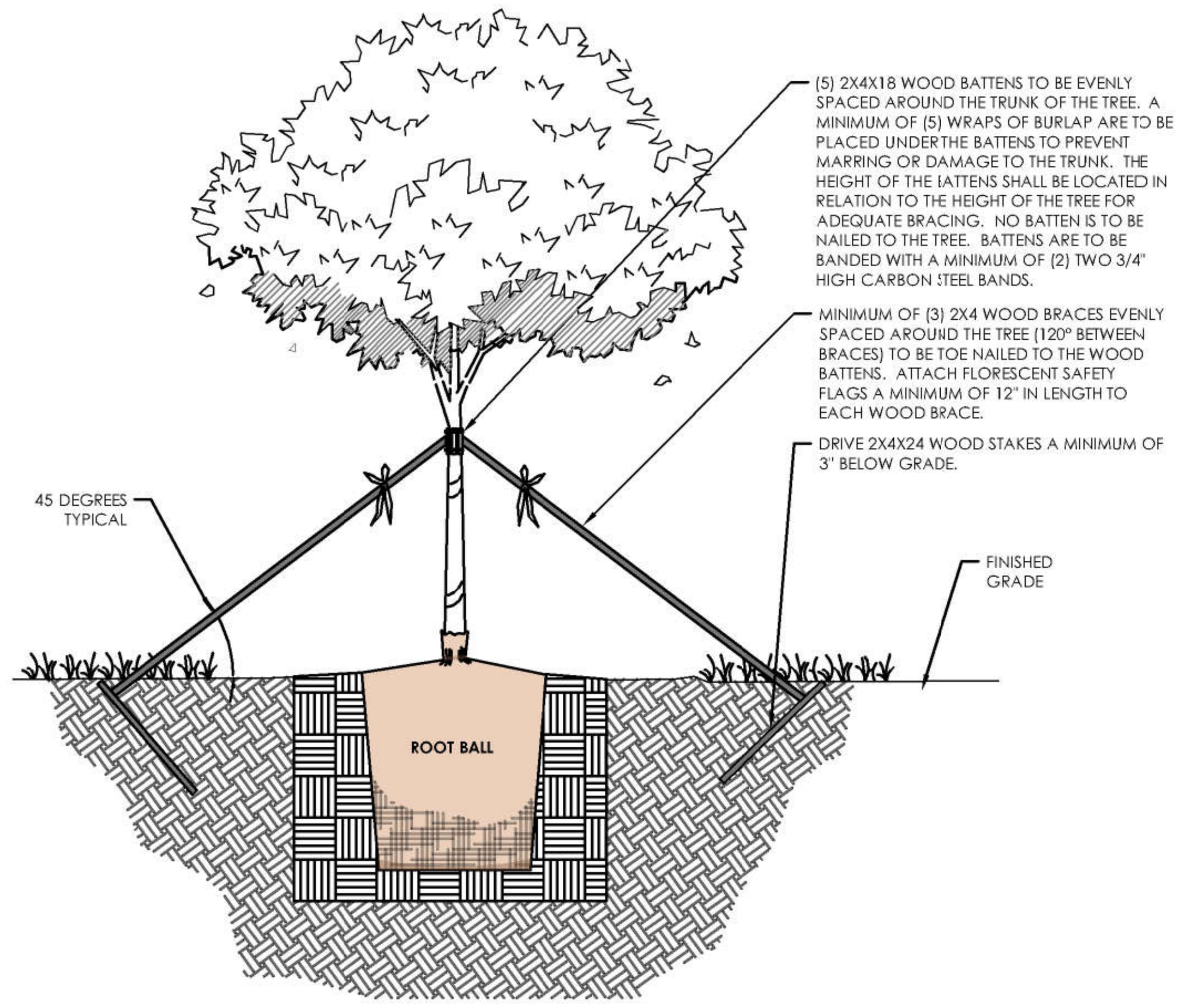
Landscape Plan
TOM MACKIE BLVD. EXTENSION
Port St. Lucie, FL

Please note:
This landscape plan is a professional interpretation of existing and proposed site elements based on multiple sources of information. These sources may include: property surveys, architectural plans, google earth imagery, site observations, photographs and site plans. At times, these supporting documents are inaccurate or approximate at best and private easements to the design community. **It is the contractors responsibility to verify all measurements and quantities prior to commencing work.**

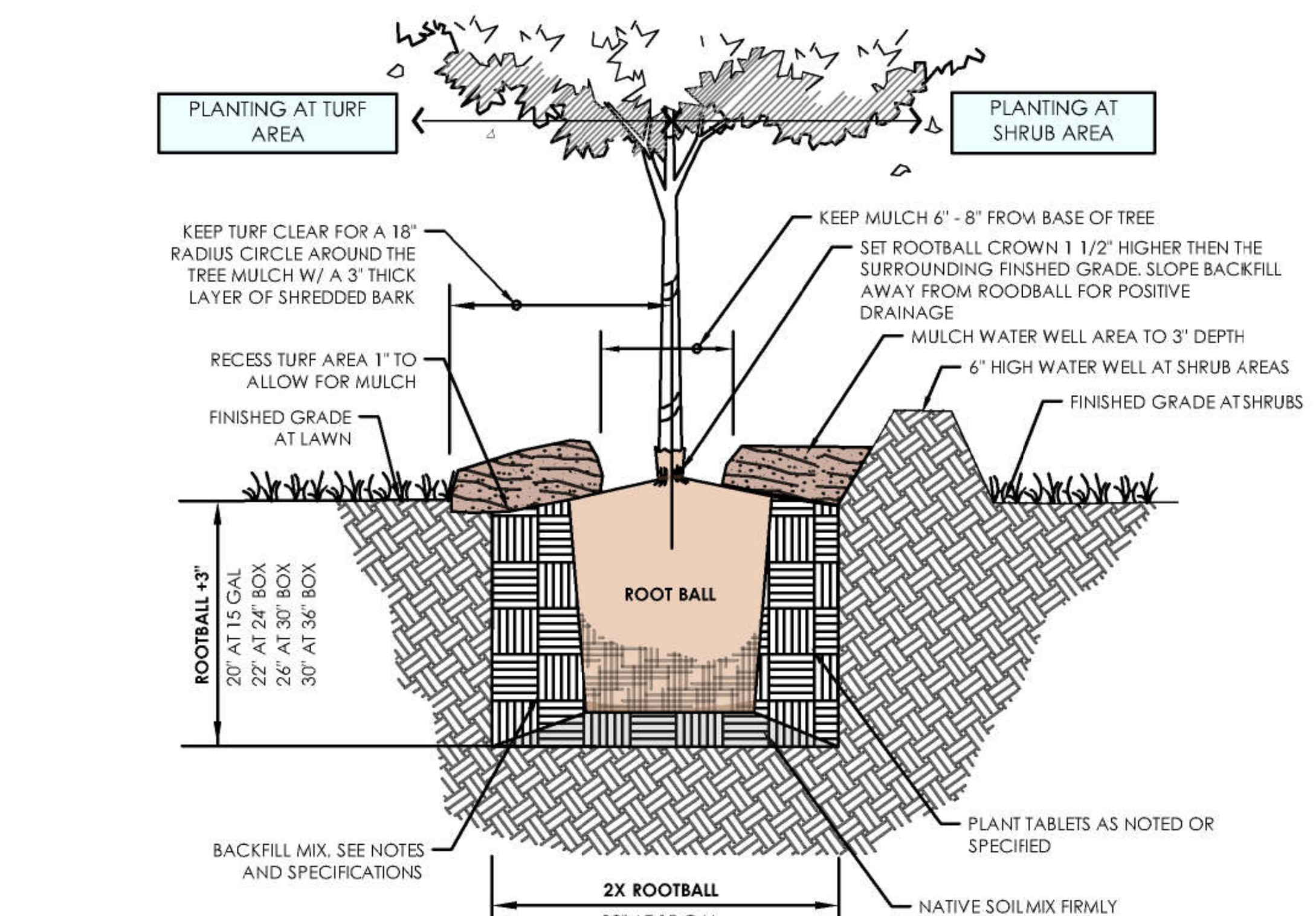
Michael Flaugh
Digitally signed by Michael Flaugh
Date: 2024.04.29 15:44:46 -04'00'

REGISTERED LANDSCAPE ARCHITECT
MICHAEL FLAUGH
LA 0001728
STATE OF FLORIDA

Date: 01/12/2024
Design by: PA, MF
Reviewed by: MF
Revised:
100% PLANS 05/01/2024



STAKING DETAIL

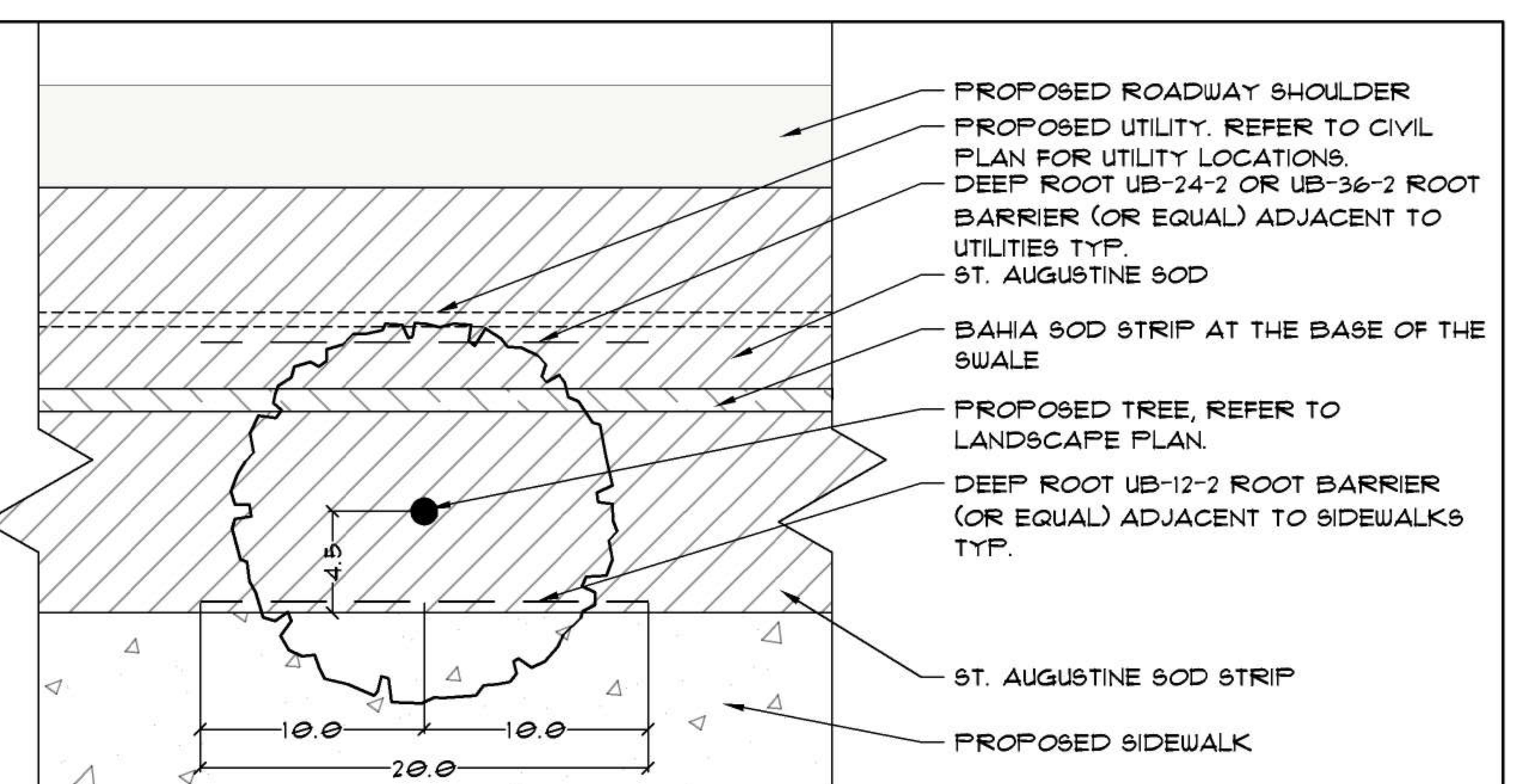


NOTES:
-ALL PRUNING SHALL BE COMPLETED AT THE DIRECTION OF THE LANDSCAPE ARCHITECT.
- NO NAILS SHALL BE DRIVEN INTO THE TREE.

PLANT PIT DETAIL

1 TREE PLANTING DETAIL

NOT TO SCALE



TREE PLACEMENT
-WHEN THE DISTANCE FROM THE SIDEWALK TO THE TOP OF THE SWALE IS +-2'-6" WIDE, PLACE THE TREE AS INDICATED IN THE DETAIL ABOVE.
-WHEN THE DISTANCE FROM THE SIDEWALK TO THE TOP OF THE SWALE WIDENS TO +-17'-0" WIDE, CENTER THE TREE BETWEEN THE SIDEWALK AND THE TOP OF THE SWALE..

ROOT BARRIER REQUIREMENTS (DEEPROOT OR EQUAL)

ADJACENT TO UTILITIES 8" IN DIAMETER OR SMALLER:	DEEPROOT UB-24-2
ADJACENT TO UTILITIES GREATER THAN 9" IN DIAMETER:	DEEPROOT UB-36-2
ADJACENT TO SIDEWALKS:	DEEPROOT UB-12-2

INSTALL "DEEPROOT" ROOT BARRIERS PER THE MANUFACTURER'S SPECIFICATIONS

2 ROOT BARRIER DETAIL

1/8" = 1'-0"

PORT ST. LUCIE UTILITY SYSTEMS DEPARTMENT NOTES

1. No landscaping shall be planted in a manner that would adversely affect utility easements. Landscaping shall be in compliance with Chapter 154 of the City of Port St. Lucie Code of Ordinances, PSLUSD technical specifications and policies.
2. All landscaping within City utility easements shall comply with PSLUSD technical specifications, policies, and codes.
3. All landscaping shall meet the latest PSLUSD Landscape Policy and shall not be placed in a manner that would create conflicts with the intended operation and maintenance of any existing utility.
4. Trees shall not be planted within (10) feet of any PSLUSD underground infrastructure.
5. No landscaping other than sod grasses shall be located within 5' of a PSLUSD appurtenance such as a water meter assembly, backflow device, fire hydrant or sewer cleanout, etc.

GENERAL NOTES

1. No plant substitutions can be made without the City of Port S. Lucie's approval.
2. All required landscape improvements must be inspected and approved by the City of Port St. Lucie prior to the issuance of a Certificate of Occupancy.
3. Any existing landscaping, sod, or irrigation damaged or destroyed during the construction shall be replaced prior to the final inspection.
4. All prohibited, exotic and invasive species shall be removed from the entire site prior to issuance of a Certificate of Occupancy.
5. Planting adjacent to fire hydrants is to have a minimum clear radius of 7.5' as required by the NFPA Uniform Fire Code Florida Edition 18.3.4.1 Hydrants. All fire hydrants and fire check valves shall have a minimum of 7.5' from the front and sides with 4' from the rear to all landscape material per the Florida Fire Prevention Code.
6. Tree locations shown on these plans are approximate. Final tree locations may be adjusted to accommodate unforeseen field conditions, to comply with safety regulations and setbacks, avoid utilities or as otherwise directed or approved by the Landscape Architect. The Contractor shall flag all tree locations for approval from the Landscape Architect prior to planting.
7. Above and below ground utilities shall be verified by the Contractor prior to commencement of work in the project area. If any utility conflicts are discovered they shall be brought to the attention of the Landscape Architect immediately in writing; the Landscape Architect will coordinate the necessary adjustments. In the event of utility conflicts, the landscaping will be adjusted and not the utility.
8. Notify Owner and have all utilities located and marked through Sunshine 811 (800-432-4770) three (3) full days in advance of beginning construction on project site.

LIVE OAK

SABAL PALM

LANDSCAPE SPEFIFICATIONS

1. All specifications must be satisfied. If there is a problem locating a material with given specifications, the contractor shall contact the landscape architect by email prior to installation. At the discretion of the landscape architect, a substitution may be made.
2. Landscape contractor is responsible to review and reconcile plan with landscape materials list, and analyze site conditions and access prior to submitting a proposal.
3. The landscape contractor shall comply with all local and State laws, codes and ordinances.
4. All plant material furnished by the landscape contractor shall be Florida #1 or better (Grades and Standards for Nursery Plants, Florida Department of Agriculture and Consumer Services, Latest Edition), unless otherwise noted on the landscape materials list. As many species tolerate both sunny and shady growing conditions, The landscape contractor is responsible for acquiring all plant material grown in similar conditions to the site.
5. The landscape contractor shall complete all work according to the Florida Green Industries Best Management Practices.
6. The landscape contractor is responsible for locating all underground utilities prior to commencing work.
7. All planting areas shall be prepared by removing all debris, including asphalt, concrete, or similar materials not suited for landscape planting.
8. Planting soil shall be clean of rocks, sticks, roots and weeds, and shall be well-draining.
9. All landscaped areas shall be finish graded such that finished elevation will be flush and level with surrounding paved surfaces. The finished grade after planting and mulching shall not impede the flow of drainage into landscaped areas and to prevent the backwash of mulch and debris into paved areas.
10. All planting beds must drain sufficiently prior to planting. If existing soil is not adequate for establishment of plant materials due to poor drainage or chemical properties, soil amendments shall be added prior to planting.
11. Plants shall not be placed too close to one another or any hardscapes. See landscape materials list and planting details for spacing and placement of all plants.
12. All new landscape plants shall be planted slightly higher than the existing grade leaving top of the root ball exposed.
13. All plant materials shall be thoroughly watered in at the time of planting.
14. Mulch shall be laid in all landscape beds. No mulch shall be laid near tree trunks. Mulch planting areas with 3" layer of Melaleuca, Eucalyptus, or Enviromulch. Cypress Mulch is NOT ACCEPTABLE. Planting beds to receive mulch throughout the entire bed area.
15. Planting plan takes precedence over plant list.
16. Project Warranty: All plant material shall be warranted for a period of one (1) year after the date of substantial completion against defects, including death and unsatisfactory growth, except for defects resulting from abuse or damage by others or unusual phenomena or incidents which are beyond the contractor's control.
17. Any and all conditions which the contractor feels will be detrimental to the success of the planting shall be brought to the owner and Landscape Architect's attention.
18. Planting trees: Excavate hole per planting detail. When plant is set, place additional backfill consisting of a 50% mixture of Peat humus and natural soil around the base and sides of ball, and work each layer to settle backfill and eliminate voids and air pockets. When excavation is approximately 2/3 full, water thoroughly before placing remainder of backfill. Water again after placing final layer of backfill and before installing mulch.
19. Guy and stake trees in 3 directions with wood bracing and wooden stake anchors as shown in the details immediately after planting. (See detail)
20. Trees shall be fertilized with a complete natural organic fertilizer with a ratio of approximately 3:0:2 or 3:0:3 (e.g. one labeled 12-0-8). Similar analysis such as 16-0-8 (4:0:2) can also be used. Fertilizers that are slow release, controlled release, sulphur coated or with nitrogen as IBDU or ureaformaldehyde have extended release period. Thirty to fifty percent of the nitrogen should be water insoluble for slow release.

Agriform 20-0-5 twnety-one gram planting tablets may be substituted for granular fertilizer. If utilized, the following rates shall be utilized: Position plant in hole. Backfill halfway up the rootball. Place tablet(s) beside rootball about 1" from root tips. Do not place tablets in bottom of hole.
25 Gallon and B&B trees: 2 per 1" caliper

21. Maintain trees by watering, cultivating, and weeding as required for healthy growth. Restore planting saucers and mulch. Tighten and repair stake and guying and reset trees to proper grade or vertical positions as required. Spray as necessary to keep trees free of insects and disease. The contractor shall begin maintenance immediately after planting and shall continue maintenance through final acceptance when Certificate of Occupancy is issued to the General Contractor by City and project is released by the General Contractor to Client.
22. Prune trees only to remove damaged branches as directed by the Landscape Architect.
23. Planting Lawns: Provide clean, strongly rooted, uniformly sized strips of sod, machine stripped not more than 24 hours prior to laying. Grade and roll prepared lawn surface. Water thoroughly but not to create muddy soil conditions. Lay sod strips with tight joints, roll or tamp lightly, and water thoroughly.
24. Maintain positive drainage, no planting is to block drainage.
25. Drainage Testing
    Prior to planting of trees each planting pit shall be tested in the following manner to verify adequate drainage.
    A) Dig each planting pit to the minimum specified size.
    B) Fill the planting pit with (12") twelve inches of water. If the water level in the planting pit drops (4") four or more inches within (4) four hours, the drainage is sufficient and a drainage channel is not required. If the water level drops less than (4") four inches with the (4) four hour period, then a channel is required.
    C) When a drainage channel is required, the drainage channel must extend down through the non porous soil and into porous soil. (See drainage testing detail)
    D) Discard all material removed from the drainage channel.
    E) When backfilling the planting pit, add course gravel to the drainage channel. Also, care must be taken to keep the consistency of the soil mix the same throughout the planting pit.

Notes:
1. Contractor to include drainage testing for all trees in bid. If drainage is inadequate, the soil specifications in Item #8 above shall be revised for site conditions. Contractor shall notify the owner and Landscape Architect of poor drainage conditions in writing and written direction will be provided to the contractor of appropriate soil mixture specification to be used.
2. All fertilizers shall meet the City of Port St. Lucie's fertilizer ordinance.

PLANT SCHEDULE TOM MACKIE

SYMBOL	QTY	BOTANICAL NAME	COMMON NAME	CONT	CAL	SIZE	NOTES
TREES							
	124	QUERCUS VIRGINIANA	LIVE OAK	100 GAL	3.5"CAL	16` OA HT., 8` SPRD.	FULL CANOPY, 5` C.T. MIN.
PALMS							
	60	SABAL PALMETTO	SABAL PALM	B & B	SLICK	10` CT	

SYMBOL	QTY	BOTANICAL NAME	COMMON NAME	CONT	INSTALL	SPECS	NOTES
GROUND COVERS							
	11,735 SF	PASPALUM NOTATUM `ARGENTINE` ONE ROW OF BAHIA SOD DOWN THE CENTERLINE OF THE SWLAES,WEED FREE, TIGHTLY FITTED	BAHIA SOD	SOD			DROUGHT TOLERANT
	143,988	STENOTAPHRUM SECUNDATUM `FLORATAM`	FLORATAM ST. ALGUSTINE SOD	SOD			

TREE CALCULATIONS
STREET LENGTH: 3,054 LN/FT
1 TREE REQUIRED FOR EVERY 50 LN/FT
3,054 / 50 = 61 TREES ON EACH SIDE OF THE STREET
TOTAL TREES REQUIRED: 124
TOTAL TREES PROVIDED: 124

100% PLANS

P24-010

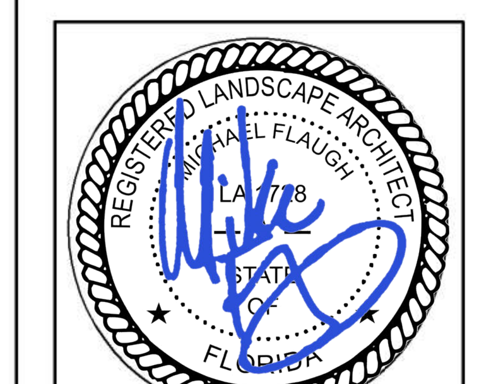
Michael Flaugh
LANDSCAPE ARCHITECT
FL Reg. #LA0001728
772.419.0024
Stuart
Houzz.com/pro/Michael-Flaugh www.MikeFlaughLA.com

Sheet
L8
Plant Schedule
Planting Details &
Specifications

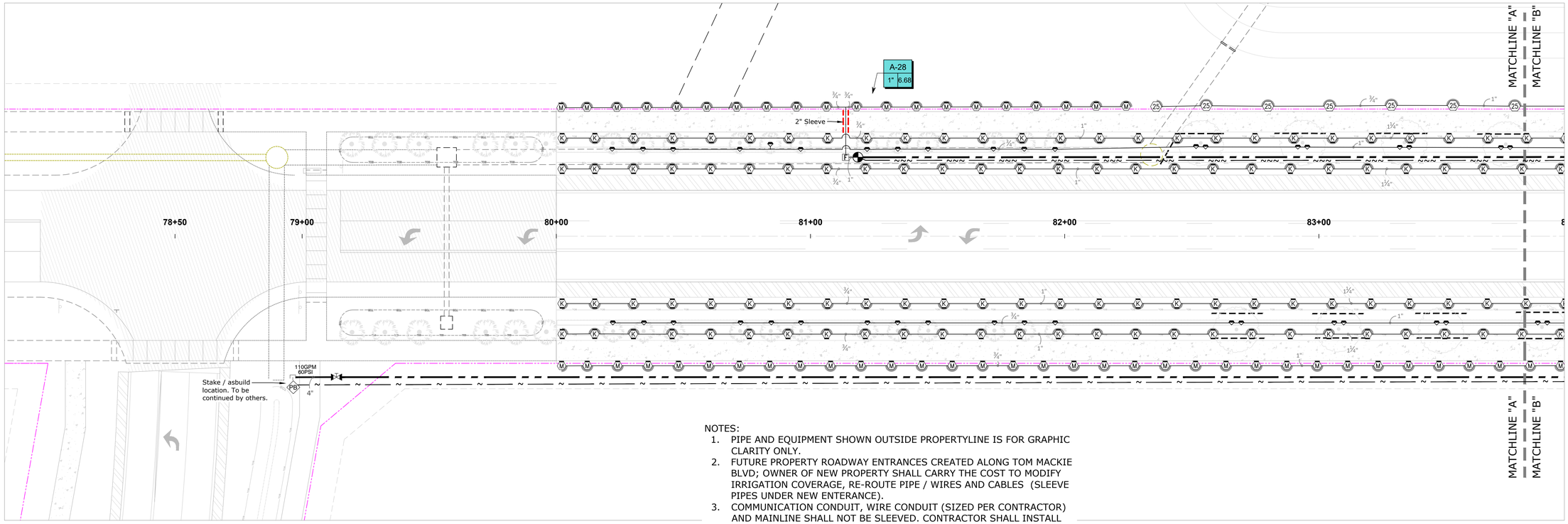
Landscape Plan
TOM MACKIE BLVD. EXTENSION
Port St. Lucie, FL

Please note: This landscape plan is a professional interpretation of existing and proposed site elements based on multiple sources of information. These sources may include: property surveys, architectural plans, google aerial imagery, site observations, photographs and site plans. At times, these supporting documents are inaccurate or approximate at best and on-site adjustments to the design during installation are necessary. ***It is the contractors' responsibility to verify all measurements and quantities prior to commencing work.***

Michael Flaugh
Digitally signed by Michael Flaugh
Date: 2024.04.29 15:45:04 -04'00'

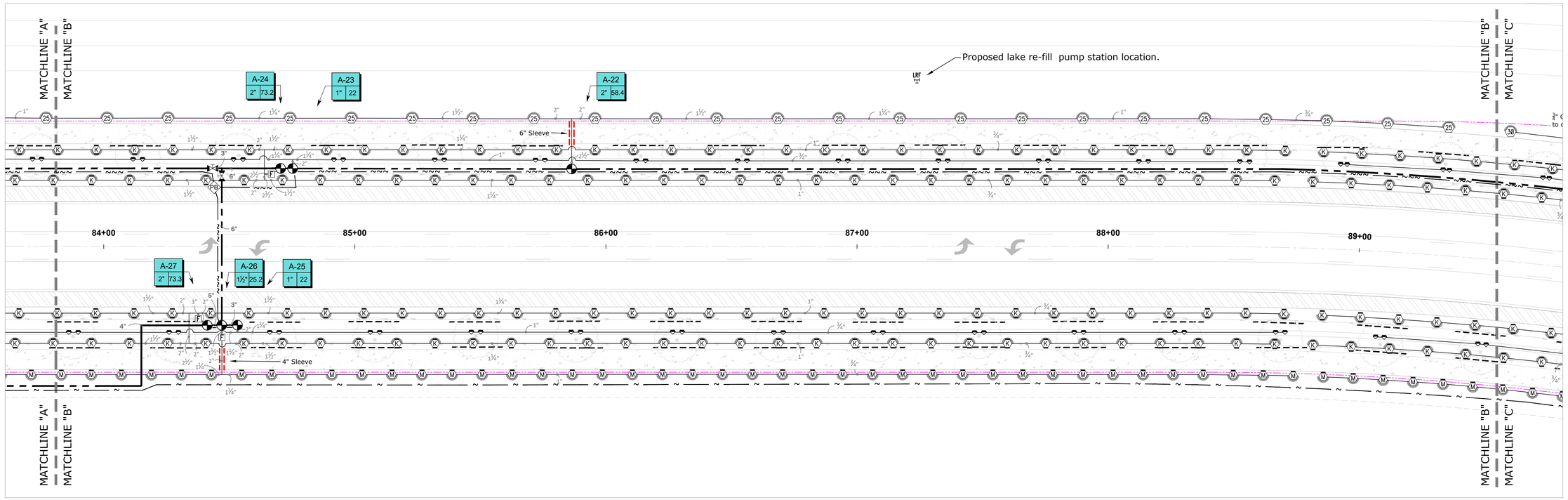


Date: 01/12/2024
Design by: PA, MF
Reviewed by: MF
Revised:
100% PLANS: 05/01/2024



NOTES:

1. PIPE AND EQUIPMENT SHOWN OUTSIDE PROPERTYLINE IS FOR GRAPHIC CLARITY ONLY.
2. FUTURE PROPERTY ROADWAY ENTRANCES CREATED ALONG TOM MACKIE BLVD; OWNER OF NEW PROPERTY SHALL CARRY THE COST TO MODIFY IRRIGATION COVERAGE, RE-ROUTE PIPE / WIRES AND CABLES (SLEEVE PIPES UNDER NEW ENTERANCE).
3. COMMUNICATION CONDUIT, WIRE CONDUIT (SIZED PER CONTRACTOR) AND MAINLINE SHALL NOT BE SLEEVED. CONTRACTOR SHALL INSTALL CONDUIT AND MAINLINE IN SUB-GRADE AS SHOWN IN DETAILS BEFORE ROADWAY ROCK LAYER IS SPREAD.
4. PUMP STATION AREA OF USEAGE; MARSHALL PW, TOM MACKIE BLVD AND E/W #2 (FROM TOM MACKIE TO VILLAGE PARKWAY.



Michael Flaugh
Digitally signed by Michael Flaugh
Date: 2024.04.29 15:45:28 -04'00'

0 20 40 60 80 feet
1" = 20'

811 Know what's below. Call before you dig.

PSL Project nr: P24-010
100% Plans

Scale:	1" = 20'
Design Date:	01-12-2024
Drawn By:	RT
Last Date: Modified	05-01-2024

Revisions:
1.
2.
3.
4.
5.
6.

IRRIGATION PLAN

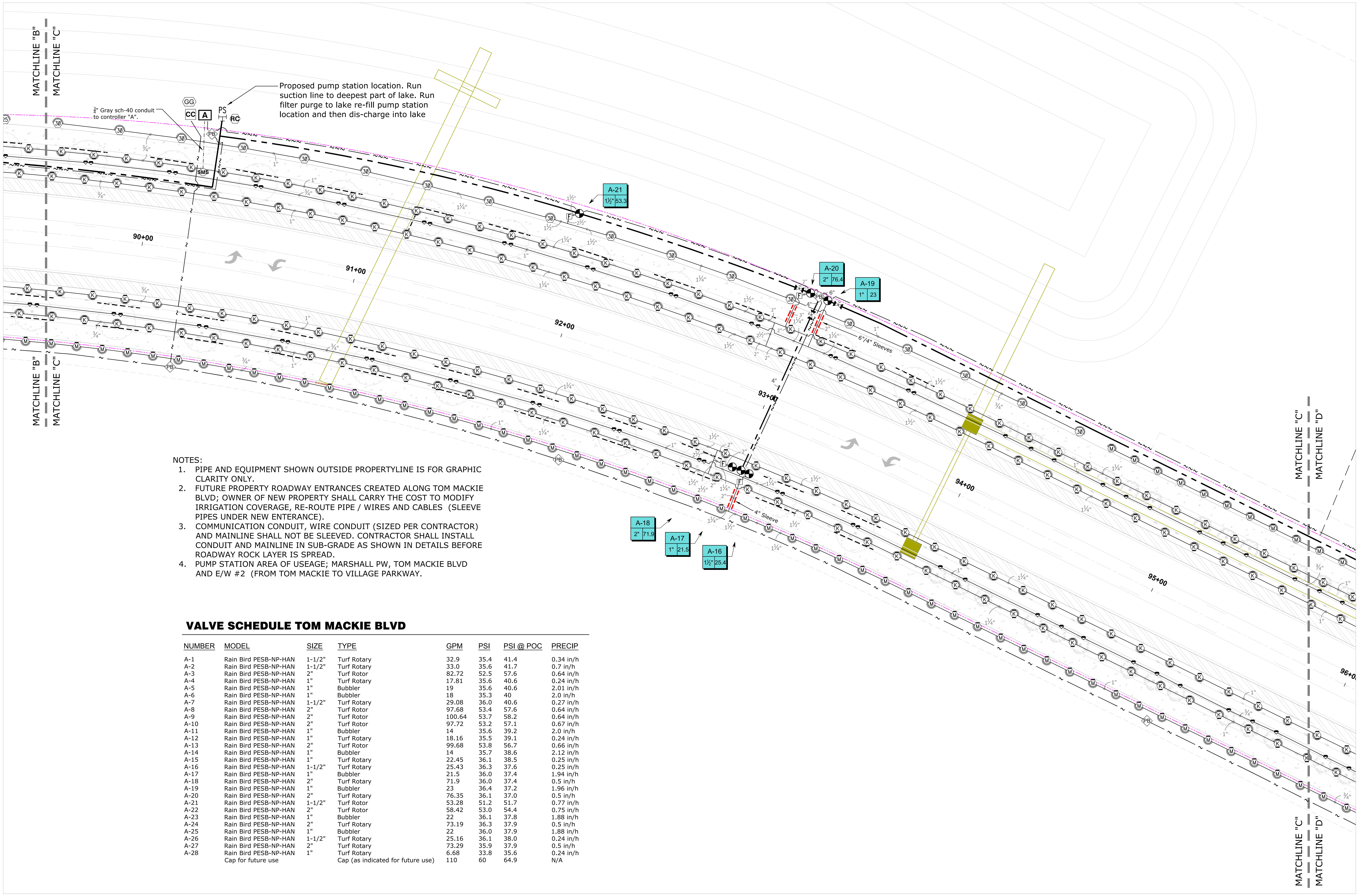
Tom Mackie Blvd. Extension
Port St. Lucie, Florida

NORTH

REGISTERED LANDSCAPE ARCHITECT
MICHAEL FLAUGH
LA 6666
STATE OF FLORIDA

IR-1
of 10

Project #
2024-01-07_TMB



NOTES:

1. PIPE AND EQUIPMENT SHOWN OUTSIDE PROPERTYLINE IS FOR GRAPHIC CLARITY ONLY.
2. FUTURE PROPERTY ROADWAY ENTRANCES CREATED ALONG TOM MACKIE BLVD; OWNER OF NEW PROPERTY SHALL CARRY THE COST TO MODIFY IRRIGATION COVERAGE, RE-ROUTE PIPE / WIRES AND CABLES (SLEEVE PIPES UNDER NEW ENTERANCE).
3. COMMUNICATION CONDUIT, WIRE CONDUIT (SIZED PER CONTRACTOR) AND MAINLINE SHALL NOT BE SLEEVED. CONTRACTOR SHALL INSTALL CONDUIT AND MAINLINE IN SUB-GRADE AS SHOWN IN DETAILS BEFORE ROADWAY ROCK LAYER IS SPREAD.
4. PUMP STATION AREA OF USEAGE; MARSHALL PW, TOM MACKIE BLVD AND E/W #2 (FROM TOM MACKIE TO VILLAGE PARKWAY).

VALVE SCHEDULE TOM MACKIE BLVD

NUMBER	MODEL	SIZE	TYPE	GPM	PSI	PSI @ POC	PRECIP
A-1	Rain Bird PESB-NP-HAN	1-1/2"	Turf Rotary	32.9	35.4	41.4	0.34 in/h
A-2	Rain Bird PESB-NP-HAN	1-1/2"	Turf Rotary	33.0	35.6	41.7	0.7 in/h
A-3	Rain Bird PESB-NP-HAN	2"	Turf Rotor	82.72	52.5	57.6	0.64 in/h
A-4	Rain Bird PESB-NP-HAN	1"	Turf Rotary	17.81	35.6	40.6	0.24 in/h
A-5	Rain Bird PESB-NP-HAN	1"	Bubbler	19	35.6	40.6	2.01 in/h
A-6	Rain Bird PESB-NP-HAN	1"	Bubbler	18	35.3	40	2.0 in/h
A-7	Rain Bird PESB-NP-HAN	1-1/2"	Turf Rotary	29.08	36.0	40.6	0.27 in/h
A-8	Rain Bird PESB-NP-HAN	2"	Turf Rotor	97.68	53.4	57.6	0.64 in/h
A-9	Rain Bird PESB-NP-HAN	2"	Turf Rotor	100.64	53.7	58.2	0.64 in/h
A-10	Rain Bird PESB-NP-HAN	2"	Turf Rotor	97.72	53.2	57.1	0.67 in/h
A-11	Rain Bird PESB-NP-HAN	1"	Bubbler	14	35.6	39.2	2.0 in/h
A-12	Rain Bird PESB-NP-HAN	1"	Turf Rotary	18.16	35.5	39.1	0.24 in/h
A-13	Rain Bird PESB-NP-HAN	2"	Turf Rotor	99.68	53.8	56.7	0.66 in/h
A-14	Rain Bird PESB-NP-HAN	1"	Bubbler	14	35.7	38.6	2.12 in/h
A-15	Rain Bird PESB-NP-HAN	1"	Turf Rotary	22.45	36.1	38.5	0.25 in/h
A-16	Rain Bird PESB-NP-HAN	1-1/2"	Turf Rotary	25.43	36.3	37.6	0.25 in/h
A-17	Rain Bird PESB-NP-HAN	1"	Bubbler	21.5	36.0	37.4	1.94 in/h
A-18	Rain Bird PESB-NP-HAN	2"	Turf Rotary	71.9	36.0	37.4	0.5 in/h
A-19	Rain Bird PESB-NP-HAN	1"	Bubbler	23	36.4	37.2	1.96 in/h
A-20	Rain Bird PESB-NP-HAN	2"	Turf Rotary	76.35	36.1	37.0	0.5 in/h
A-21	Rain Bird PESB-NP-HAN	1-1/2"	Turf Rotor	53.28	51.2	51.7	0.77 in/h
A-22	Rain Bird PESB-NP-HAN	2"	Turf Rotor	58.42	53.0	54.4	0.75 in/h
A-23	Rain Bird PESB-NP-HAN	1"	Bubbler	22	36.1	37.8	1.88 in/h
A-24	Rain Bird PESB-NP-HAN	2"	Turf Rotary	73.19	36.3	37.9	0.5 in/h
A-25	Rain Bird PESB-NP-HAN	1"	Bubbler	22	36.0	37.9	1.88 in/h
A-26	Rain Bird PESB-NP-HAN	1-1/2"	Turf Rotary	25.16	36.1	38.0	0.24 in/h
A-27	Rain Bird PESB-NP-HAN	2"	Turf Rotary	73.29	35.9	37.9	0.5 in/h
A-28	Rain Bird PESB-NP-HAN	1"	Turf Rotary	6.68	33.8	35.6	0.24 in/h
	Cap for future use		Cap (as indicated for future use)	110	60	64.9	N/A

Michael Flaugh Digitally signed by Michael Flaugh
Date: 2024.04.29 15:45:46 -04'00'

0 20 40 60 80 feet
1" = 20'

811 Know what's below. Call before you dig.

PSL Project nr: P24-010
100% Plans

Scale: 1" = 20'
Design Date: 01-12-2024
Drawn By: RT
Last Date Modified: 05-01-2024

Revisions: 1. 2. 3. 4. 5. 6.

IRRIGATION PLAN

Tom Mackie Blvd. Extension

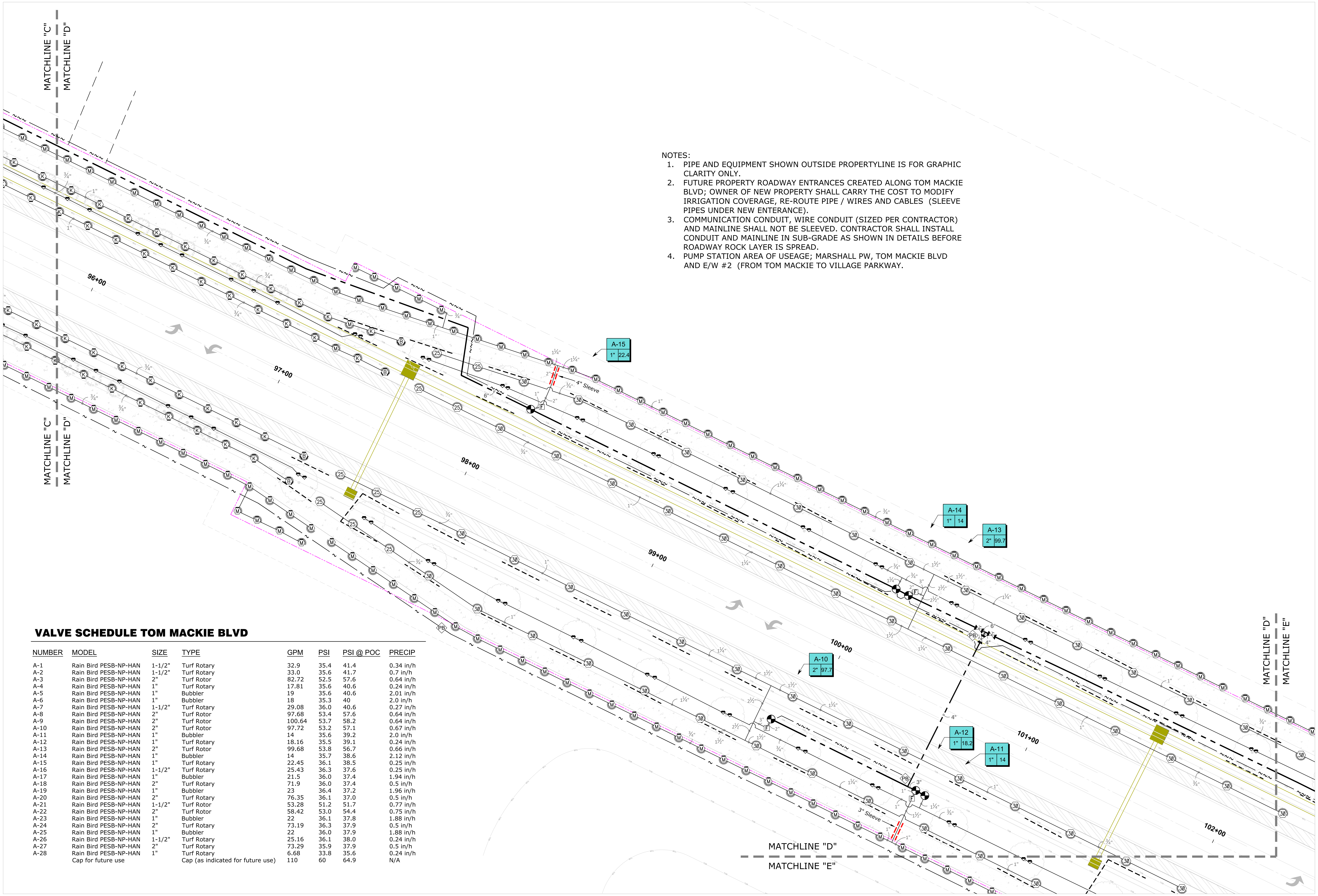
Port St. Lucie, Florida

NORTH

REGISTERED LANDSCAPE ARCHITECT MICHAEL FLAUGH LA 6 8 STATE OF FLORIDA

IR-2
of 10

Project #: 2024-01-07_TMB



NOTES:

1. PIPE AND EQUIPMENT SHOWN OUTSIDE PROPERTYLINE IS FOR GRAPHIC CLARITY ONLY.
2. FUTURE PROPERTY ROADWAY ENTRANCES CREATED ALONG TOM MACKIE BLVD; OWNER OF NEW PROPERTY SHALL CARRY THE COST TO MODIFY IRRIGATION COVERAGE, RE-ROUTE PIPE / WIRES AND CABLES (SLEEVE PIPES UNDER NEW ENTERANCE).
3. COMMUNICATION CONDUIT, WIRE CONDUIT (SIZED PER CONTRACTOR) AND MAINLINE SHALL NOT BE SLEEVED. CONTRACTOR SHALL INSTALL CONDUIT AND MAINLINE IN SUB-GRADE AS SHOWN IN DETAILS BEFORE ROADWAY ROCK LAYER IS SPREAD.
4. PUMP STATION AREA OF USEAGE; MARSHALL PW, TOM MACKIE BLVD AND E/W #2 (FROM TOM MACKIE TO VILLAGE PARKWAY).

VALVE SCHEDULE TOM MACKIE BLVD

NUMBER	MODEL	SIZE	TYPE	GPM	PSI	PSI @ POC	PRECIP
A-1	Rain Bird PESB-NP-HAN	1-1/2"	Turf Rotary	32.9	35.4	41.4	0.34 in/h
A-2	Rain Bird PESB-NP-HAN	1-1/2"	Turf Rotary	33.0	35.6	41.7	0.7 in/h
A-3	Rain Bird PESB-NP-HAN	2"	Turf Rotor	82.72	52.5	57.6	0.64 in/h
A-4	Rain Bird PESB-NP-HAN	1"	Turf Rotary	17.81	35.6	40.6	0.24 in/h
A-5	Rain Bird PESB-NP-HAN	1"	Bubbler	19	35.6	40.6	2.01 in/h
A-6	Rain Bird PESB-NP-HAN	1"	Bubbler	18	35.3	40	2.0 in/h
A-7	Rain Bird PESB-NP-HAN	1-1/2"	Turf Rotary	29.08	36.0	40.6	0.27 in/h
A-8	Rain Bird PESB-NP-HAN	2"	Turf Rotor	97.68	53.4	57.6	0.64 in/h
A-9	Rain Bird PESB-NP-HAN	2"	Turf Rotor	100.64	53.7	58.2	0.64 in/h
A-10	Rain Bird PESB-NP-HAN	2"	Turf Rotor	97.72	53.2	57.1	0.67 in/h
A-11	Rain Bird PESB-NP-HAN	1"	Bubbler	14	35.6	39.2	2.0 in/h
A-12	Rain Bird PESB-NP-HAN	1"	Turf Rotary	18.16	35.5	39.1	0.24 in/h
A-13	Rain Bird PESB-NP-HAN	2"	Turf Rotor	99.68	53.8	56.7	0.66 in/h
A-14	Rain Bird PESB-NP-HAN	1"	Bubbler	14	35.7	38.6	2.12 in/h
A-15	Rain Bird PESB-NP-HAN	1"	Turf Rotary	22.45	36.1	38.5	0.25 in/h
A-16	Rain Bird PESB-NP-HAN	1-1/2"	Turf Rotary	25.43	36.3	37.6	0.25 in/h
A-17	Rain Bird PESB-NP-HAN	1"	Bubbler	21.5	36.0	37.4	1.94 in/h
A-18	Rain Bird PESB-NP-HAN	2"	Turf Rotary	71.9	36.0	37.4	0.5 in/h
A-19	Rain Bird PESB-NP-HAN	1"	Bubbler	23	36.4	37.2	1.96 in/h
A-20	Rain Bird PESB-NP-HAN	2"	Turf Rotary	76.35	36.1	37.0	0.5 in/h
A-21	Rain Bird PESB-NP-HAN	1-1/2"	Turf Rotor	53.28	51.2	51.7	0.77 in/h
A-22	Rain Bird PESB-NP-HAN	2"	Turf Rotor	58.42	53.0	54.4	0.75 in/h
A-23	Rain Bird PESB-NP-HAN	1"	Bubbler	22	36.1	37.8	1.88 in/h
A-24	Rain Bird PESB-NP-HAN	2"	Turf Rotary	73.19	36.3	37.9	0.5 in/h
A-25	Rain Bird PESB-NP-HAN	1"	Bubbler	22	36.0	37.9	1.88 in/h
A-26	Rain Bird PESB-NP-HAN	1-1/2"	Turf Rotary	25.16	36.1	38.0	0.24 in/h
A-27	Rain Bird PESB-NP-HAN	2"	Turf Rotary	73.29	35.9	37.9	0.5 in/h
A-28	Rain Bird PESB-NP-HAN	1"	Turf Rotary	6.68	33.8	35.6	0.24 in/h
	Cap for future use		Cap (as indicated for future use)	110	60	64.9	N/A

Michael Flaugh Digitally signed by Michael Flaugh
Date: 2024.04.29 15:46:08 -04'00'

811 Know what's below. Call before you dig.

PSL Project nr: P24-010
100% Plans

Scale: 1" = 20'
Design Date: 01-12-2024
Drawn By: RT
Last Date Modified: 05-01-2024
Revisions: 1. 2. 3. 4. 5. 6.

IRRIGATION PLAN

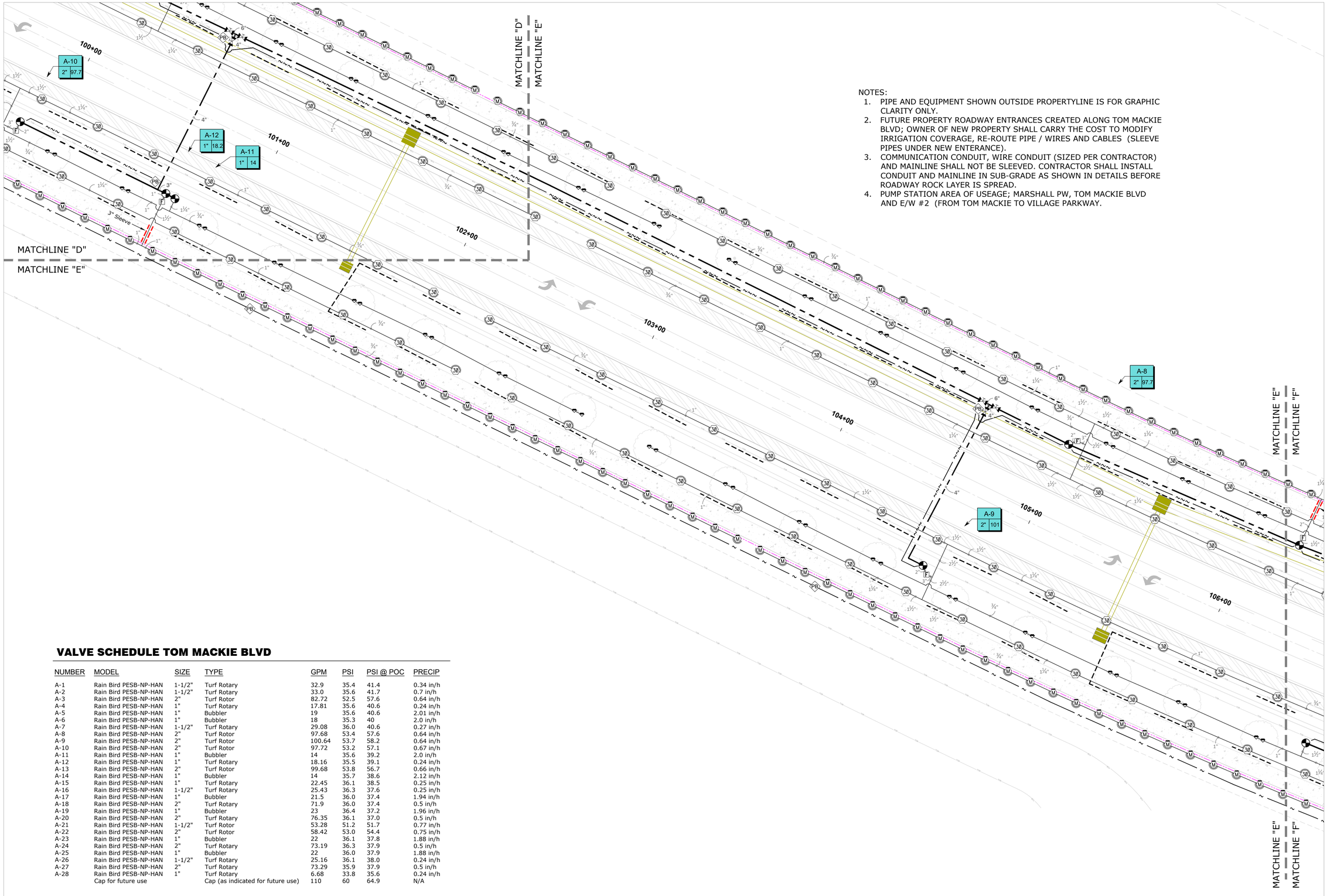
Tom Mackie Blvd. Extension

Port St. Lucie, Florida

REGISTERED LANDSCAPE ARCHITECT MICHAEL FLAUGH STATE OF FLORIDA

IR-3
of 10

Project # 2024-01-07_TMB



NOTES:

1. PIPE AND EQUIPMENT SHOWN OUTSIDE PROPERTYLINE IS FOR GRAPHIC CLARITY ONLY.
2. FUTURE PROPERTY ROADWAY ENTRANCES CREATED ALONG TOM MACKIE BLVD; OWNER OF NEW PROPERTY SHALL CARRY THE COST TO MODIFY IRRIGATION COVERAGE, RE-ROUTE PIPE / WIRES AND CABLES (SLEEVE PIPES UNDER NEW ENTERANCE).
3. COMMUNICATION CONDUIT, WIRE CONDUIT (SIZED PER CONTRACTOR) AND MAINLINE SHALL NOT BE SLEEVED. CONTRACTOR SHALL INSTALL CONDUIT AND MAINLINE IN SUB-GRADE AS SHOWN IN DETAILS BEFORE ROADWAY ROCK LAYER IS SPREAD.
4. PUMP STATION AREA OF USEAGE; MARSHALL PW, TOM MACKIE BLVD AND E/W #2 (FROM TOM MACKIE TO VILLAGE PARKWAY.

VALVE SCHEDULE TOM MACKIE BLVD

NUMBER	MODEL	SIZE	TYPE	GPM	PSI	PSI @ POC	PRECIP
A-1	Rain Bird PESB-NP-HAN	1-1/2"	Turf Rotary	32.9	35.4	41.4	0.34 in/h
A-2	Rain Bird PESB-NP-HAN	1-1/2"	Turf Rotary	33.0	35.6	41.7	0.7 in/h
A-3	Rain Bird PESB-NP-HAN	2"	Turf Rotor	82.72	52.5	57.6	0.64 in/h
A-4	Rain Bird PESB-NP-HAN	1"	Turf Rotary	17.81	35.6	40.6	0.24 in/h
A-5	Rain Bird PESB-NP-HAN	1"	Bubbler	19	35.6	40.6	2.01 in/h
A-6	Rain Bird PESB-NP-HAN	1"	Bubbler	18	35.3	40	2.0 in/h
A-7	Rain Bird PESB-NP-HAN	1-1/2"	Turf Rotary	29.08	36.0	40.6	0.27 in/h
A-8	Rain Bird PESB-NP-HAN	2"	Turf Rotor	97.68	53.4	57.6	0.64 in/h
A-9	Rain Bird PESB-NP-HAN	2"	Turf Rotor	100.64	53.7	58.2	0.64 in/h
A-10	Rain Bird PESB-NP-HAN	2"	Turf Rotor	97.72	53.2	57.1	0.67 in/h
A-11	Rain Bird PESB-NP-HAN	1"	Bubbler	14	35.6	39.2	2.0 in/h
A-12	Rain Bird PESB-NP-HAN	1"	Turf Rotary	18.16	35.5	39.1	0.24 in/h
A-13	Rain Bird PESB-NP-HAN	2"	Turf Rotor	99.68	53.8	56.7	0.66 in/h
A-14	Rain Bird PESB-NP-HAN	1"	Bubbler	14	35.7	38.6	2.12 in/h
A-15	Rain Bird PESB-NP-HAN	1"	Turf Rotary	22.45	36.1	38.5	0.25 in/h
A-16	Rain Bird PESB-NP-HAN	1-1/2"	Turf Rotary	25.43	36.3	37.6	0.25 in/h
A-17	Rain Bird PESB-NP-HAN	1"	Bubbler	21.5	36.0	37.4	1.94 in/h
A-18	Rain Bird PESB-NP-HAN	2"	Turf Rotary	71.9	36.0	37.4	0.5 in/h
A-19	Rain Bird PESB-NP-HAN	1"	Bubbler	23	36.4	37.2	1.96 in/h
A-20	Rain Bird PESB-NP-HAN	2"	Turf Rotary	76.35	36.1	37.0	0.5 in/h
A-21	Rain Bird PESB-NP-HAN	1-1/2"	Turf Rotor	53.28	51.2	51.7	0.77 in/h
A-22	Rain Bird PESB-NP-HAN	2"	Turf Rotor	58.42	53.0	54.4	0.75 in/h
A-23	Rain Bird PESB-NP-HAN	1"	Bubbler	22	36.1	37.8	1.88 in/h
A-24	Rain Bird PESB-NP-HAN	2"	Turf Rotary	73.19	36.3	37.9	0.5 in/h
A-25	Rain Bird PESB-NP-HAN	1"	Bubbler	22	36.0	37.9	1.88 in/h
A-26	Rain Bird PESB-NP-HAN	1-1/2"	Turf Rotary	25.16	36.1	38.0	0.24 in/h
A-27	Rain Bird PESB-NP-HAN	2"	Turf Rotary	73.29	35.9	37.9	0.5 in/h
A-28	Rain Bird PESB-NP-HAN	1"	Turf Rotary	6.68	33.8	35.6	0.24 in/h
	Cap for future use		Cap (as indicated for future use)	110	60	64.9	N/A

Michael Flaugh
Digitally signed by Michael Flaugh
Date: 2024.04.29 15:46:27 -04'00'

0 20 40 60 80 feet
1" = 20'

811 Know what's below. Call before you dig.

PSL Project nr: P24-010
100% Plans

Scale:	1" = 20'
Design Date:	01-12-2024
Drawn By:	RT
Last Date: Modified	05-01-2024

Revisions: 1. 2. 3. 4. 5. 6.

IRRIGATION PLAN

Tom Mackie Blvd. Extension

Port St. Lucie, Florida

NORTH

REGISTERED LANDSCAPE ARCHITECT MICHAEL FLAUGH LA 6678 STATE OF FLORIDA

IR-4
of 10

Project #
2024-01-07_TMB

NOTES:

1. PIPE AND EQUIPMENT SHOWN OUTSIDE PROPERTYLINE IS FOR GRAPHIC CLARITY ONLY.
2. FUTURE PROPERTY ROADWAY ENTRANCES CREATED ALONG TOM MACKIE BLVD; OWNER OF NEW PROPERTY SHALL CARRY THE COST TO MODIFY IRRIGATION COVERAGE, RE-ROUTE PIPE / WIRES AND CABLES (SLEEVE PIPES UNDER NEW ENTERANCE).
3. COMMUNICATION CONDUIT, WIRE CONDUIT (SIZED PER CONTRACTOR) AND MAINLINE SHALL NOT BE SLEEVED. CONTRACTOR SHALL INSTALL CONDUIT AND MAINLINE IN SUB-GRADE AS SHOWN IN DETAILS BEFORE ROADWAY ROCK LAYER IS SPREAD.
4. PUMP STATION AREA OF USEAGE; MARSHALL PW, TOM MACKIE BLVD AND E/W #2 (FROM TOM MACKIE TO VILLAGE PARKWAY.

MATCHLINE "E"

MATCHLINE "F"

A-7 1½" 29.1

A-6 1" 18

A-3 2" 82.7

A-5 1" 19

A-4 1" 17.8

A-2 1½" 33.0

A-1 1½" 32.6

106+00

107+00

108+00

109+00

110+00

111+00

112+00

21+00

20+00

4" Sleeve

3" Sleeve

END IRRIGATION FOR "TOM MACKIE BLVD SCOPE OF WORK.

Continue mainline from Tom Mackie Blvd project.

Continue PE-39 Com. Conduit to controller.

VALVE SCHEDULE TOM MACKIE BLVD

NUMBER	MODEL	SIZE	TYPE	GPM	PSI	PSI @ POC	PRECIP
A-1	Rain Bird PESB-NP-HAN	1-1/2"	Turf Rotary	32.9	35.4	41.4	0.34 in/h
A-2	Rain Bird PESB-NP-HAN	1-1/2"	Turf Rotary	33.0	35.6	41.7	0.7 in/h
A-3	Rain Bird PESB-NP-HAN	2"	Turf Rotor	82.72	52.5	57.6	0.64 in/h
A-4	Rain Bird PESB-NP-HAN	1"	Turf Rotary	17.81	35.6	40.6	0.24 in/h
A-5	Rain Bird PESB-NP-HAN	1"	Bubbler	19	35.6	40.6	2.01 in/h
A-6	Rain Bird PESB-NP-HAN	1"	Bubbler	18	35.3	40	2.0 in/h
A-7	Rain Bird PESB-NP-HAN	1-1/2"	Turf Rotary	29.08	36.0	40.6	0.27 in/h
A-8	Rain Bird PESB-NP-HAN	2"	Turf Rotor	97.68	53.4	57.6	0.64 in/h
A-9	Rain Bird PESB-NP-HAN	2"	Turf Rotor	100.64	53.7	58.2	0.64 in/h
A-10	Rain Bird PESB-NP-HAN	2"	Turf Rotor	97.72	53.2	57.1	0.67 in/h
A-11	Rain Bird PESB-NP-HAN	1"	Bubbler	14	35.6	39.2	2.0 in/h
A-12	Rain Bird PESB-NP-HAN	1"	Turf Rotary	18.16	35.5	39.1	0.24 in/h
A-13	Rain Bird PESB-NP-HAN	2"	Turf Rotor	99.68	53.8	56.7	0.66 in/h
A-14	Rain Bird PESB-NP-HAN	1"	Bubbler	14	35.7	38.6	2.12 in/h
A-15	Rain Bird PESB-NP-HAN	1"	Turf Rotary	22.45	36.1	38.5	0.25 in/h
A-16	Rain Bird PESB-NP-HAN	1-1/2"	Turf Rotary	25.43	36.3	37.6	0.25 in/h
A-17	Rain Bird PESB-NP-HAN	1"	Bubbler	21.5	36.0	37.4	1.94 in/h
A-18	Rain Bird PESB-NP-HAN	2"	Turf Rotary	71.9	36.0	37.4	0.5 in/h
A-19	Rain Bird PESB-NP-HAN	1"	Bubbler	23	36.4	37.2	1.96 in/h
A-20	Rain Bird PESB-NP-HAN	2"	Turf Rotary	76.35	36.1	37.0	0.5 in/h
A-21	Rain Bird PESB-NP-HAN	1-1/2"	Turf Rotor	53.28	51.2	51.7	0.77 in/h
A-22	Rain Bird PESB-NP-HAN	2"	Turf Rotor	58.42	53.0	54.4	0.75 in/h
A-23	Rain Bird PESB-NP-HAN	1"	Bubbler	22	36.1	37.8	1.88 in/h
A-24	Rain Bird PESB-NP-HAN	2"	Turf Rotary	73.19	36.3	37.9	0.5 in/h
A-25	Rain Bird PESB-NP-HAN	1"	Bubbler	22	36.0	37.9	1.88 in/h
A-26	Rain Bird PESB-NP-HAN	1-1/2"	Turf Rotary	25.16	36.1	38.0	0.24 in/h
A-27	Rain Bird PESB-NP-HAN	2"	Turf Rotary	73.29	35.9	37.9	0.5 in/h
A-28	Rain Bird PESB-NP-HAN	1"	Turf Rotary	6.68	33.8	35.6	0.24 in/h
	Cap for future use		Cap (as indicated for future use)	110	60	64.9	N/A

0 20 40 60 80 feet

1" = 20'

Know what's below. Call before you dig.

PSL Project nr: P24-010
100% Plans

Michael Flaugh
Digitally signed by Michael Flaugh
Date: 2024.04.29 15:46:51 -04'00'

Scale:	1" = 20'
Design Date:	01-12-2024
Drawn By:	RT
Last Date: Modified	05-01-2024

Revisions: 1. 2. 3. 4. 5. 6.

IRRIGATION PLAN

Tom Mackie Blvd. Extension

Port St. Lucie, Florida

NORTH

REGISTERED LANDSCAPE ARCHITECT MICHAEL FLAUGH LA 6666678 STATE OF FLORIDA

IR-5
of 10

Project #: 2024-01-07_TMB

MAXICOM NOTES & SPECIFICATIONS

MAXICOM design based on Irrigation plans for Tom Mackie Blvd. Contractor shall refer to these plans to coordinate controller, flow sensors, wiring, etc. installation with the general contractor and any and all other affected trades. Irrigation contractor is required to be

Each system has been designed to conform with the requirements of all applicable codes. Should any conflict exist, the requirements of the codes shall prevail. It is the responsibility of the owner/installation contractor to insure the entire system is installed according to all applicable laws, rules, regulations, all manufactures installation recommendations, and per latest MaxiCom equipment installation requirements.Irrigation contractor shall have a current MaxiCom hardware level 3 certificate.

THE WORK

The work specified in this section consists of furnishing, testing, and delivering all components necessary for a Rain Bird Maxicom2 central control system. This system shall fully comply with the current MAXICOM2 installation manual, Maxicom plans, specifications, notes, details and all applicable laws, rules, regulations, codes and ordinances. This work shall include, but not be limited to, the providing of all required material (Site-Sat Controllers, flow sensor, rain can, fittings, surge protection, grounding, wire, etc.), layout, protection to the public, excavation, assembly, installation, back filling, compacting, repair of road surfaces, controller and low voltage feeds from valves to pump station, meters, etc., cleanup, maintenance, guarantee and as-built plans.

The system is designed to be a Rain Bird MAXICOM2 system utilizing a 'cell phone accessed' Site-Sat Controller for communication between the site and the central monitoring computer. The contractor shall coordinate the installation and setup of this cell phone service. The contractor is responsible for installing all control system components. The fees associated with initial installation/connection and on going monthly fees will be paid by and coordinated with the City of Port Saint Lucie.

Contractor shall verify all underground utilities 72 hours prior to commencement of work.

It is the responsibility of the installation contractor to familiarize himself with all grade differences, location of walls, retaining walls, structures and utilities. Do not willfully install any components, as shown on the drawings, when it is obvious in the field that unknown obstructions, grade differences or differences in the area dimensions exist that might not have been considered in the engineering. Such obstructions, or differences, should be brought to the attention of the owner's authorized representative. In the event this notification is not performed, the installation contractor shall assume full responsibility for any revisions necessary.

The installation contractor shall repair or replace all items damaged by his work. He shall coordinate his work with other contractors for the location and installation of wire sleeves through walls, under roadways and paving, etc.

The contractor shall take immediate steps to repair, replace, or restore all services to any utilities which are disrupted due to his operations. All costs involved in disruption of service and repairs due to negligence on the part of the contractor shall be his responsibility.

ELECTRICAL POWER SUPPLY

Electrical supply for the controller to be provided by installation contractor. Contractor to coordinate with local utilities for the installation of, and connection to, site available power supply's for required electrical components as set forth in the Maxicom plans.

All electrical to comply with the National Electrical Code and any, and all, other applicable electrical codes, laws and regulations.

WIRING

Irrigation control wire shall be thermoplastic solid copper, single conductor, low voltage irrigation controller wire; for direct burial and continuous operation at rated voltages.

Tape and bundle control wires every 10'. At all turns in direction make a 2' coil of wire. Make electrical connections with 3M-DBR connectors when connections are below grade and/or exposed to the weather.

Number all wires, using an electrical book of numbers, according to the plans. Number wires in all valve boxes, junction boxes and at the controller.

Wire sized, numbered and colored as follows for master valve control only:
- #12 white for common
- #12 spare black common
- #14 red for hot wires
- #14 spare yellow hot wire

MAXICOM2 'two wire' (for communication between flow meters/rain cans, controllers) shall be PE-39 'three pair' #19 wire installed in 1.5" PVC grey conduit using Carson 1419 valve boxes as 'pull boxes' set a maximum of 300' apart and at all changes in direction.

Controller grounding – Contractor to utilize 4"X8' copper grounding plates, 5/8"X10' copper clad grounding rods, 'one strike' CAD welds at all connection points, #6 insulated copper wire, and earth contact material. Install these and other required components as outlined in the details. Contractor to verify that the earth to ground resistance does not exceed 10 ohms. Contractor shall provide a written certification, on an electrical contractors letter head, showing the date of the test, controller location, and test results. Each controller, CCU, and weather station shall be tested.

EQUIPMENT

All equipment shall be as specified on the plans and required in the current MAXICOM2 installation manual. All components must be installed in a manner to ensure compliance with all Federal, state, and local laws, rules, regulations, etc.

LAYOUT

Location of components, as shown on the MAXICOM2 plans, is diagrammatic in nature. The exact location of installation for each component shall be field determined and must comply with the latest MAXICOM2 installation manual. No deviations from this manual are allowed without prior written approval from the owner or owners authorized representative.

TRENCHING

Excavate straight and vertical trenches with smooth, flat or sloping bottoms. Trench width and depth should be sufficient to allow for the proper depth of coverage to provide adequate protection and comply with any and all laws, codes, regulations, etc. In no instance shall the Maxicom wire, control wires, etc. be installed with less than two (2) feet of coverage as measured from top of finished grade.

Protect existing landscaped areas. Remove and replant any damaged plant material upon job completion. The replacement material shall be of the same genus and species, and of the size of the material it is replacing. The final determination as to what needs to be replaced and the acceptability of the replacement material shall be solely up to the owner or owner's representative.

INSTALLATION

All major components are shown on the MAXICOM2 plans, notes, and details. However, all required components necessary to provide a fully functional Maxicom 2 system must be included and be in strict compliance with the current MAXICOM2 installation manual. The contractor should refer to this manual to ensure all required components, whether specifically identified in these plans or not, is included in their proposal and installation.

BACK FILL

Wiring shall be installed so the following minimum back fill depths are maintained:
- 24" for all wire whether installed in conduit or not.
- 36" for all wire installed in sleeving under roadways and walks.

Back fill shall be of suitable material free of rocks, stones, or other debris.

MAXICOM
The irrigation system shall be controlled by a Rain Bird Maxicom2 central control system. Contractor is responsible for providing a fully functional Maxicom2 system including all field components. No computer or monitoring software is included.

MAXICOM CENTRAL CONTROL SYSTEM

The irrigation shall be controlled by a Rain Bird Maxicom2 central control system. Contractor is responsible for providing a fully (field component only) functional Maxicom2 system. The system must comply with the current Rain Bird Maxicom 2 installation manual. The installation of all components shall be under the direct supervision of a person who has successfully completed both a level 2 hardware and a level 2 software class given by Rain Bird. No deviation from the installation manual will be permitted without written permission from the owner or the owner's representative.

- The Maxicom2 system to be installed will be a cell phone accessed. The installation shall consist of, but is not limited to, the following major components:
  - 1 – ESP-40SAT-2S (40 station, stainless steel pedestal, satellite controllers)
  - 1 – 4" Tipping Rain Gauge
  - 1 – Mag meter
  - 1 – Normally closed master valve
  - 1 – Model # PT322 Rain Bird 322 pulse transmitter
  - 2 – Rain Bird DECSEN Sensor Decoders
  - 1 – Rain Bird DECPUL Pulse Decoders
  - 1 – MGP-1 Surge Protector
  - 1 – Ctek 4550 cell modem with AC Adaptor and a 4g Mobile Mark paddle antenna
  - Miscellaneous velcro/zip ties for modem mounting
- Proper grounding for each controller (see details).

NOTE 1: The above list is for contractor convenience. Refer to the Maxicom2 installation manual for a complete and detailed list of required components.

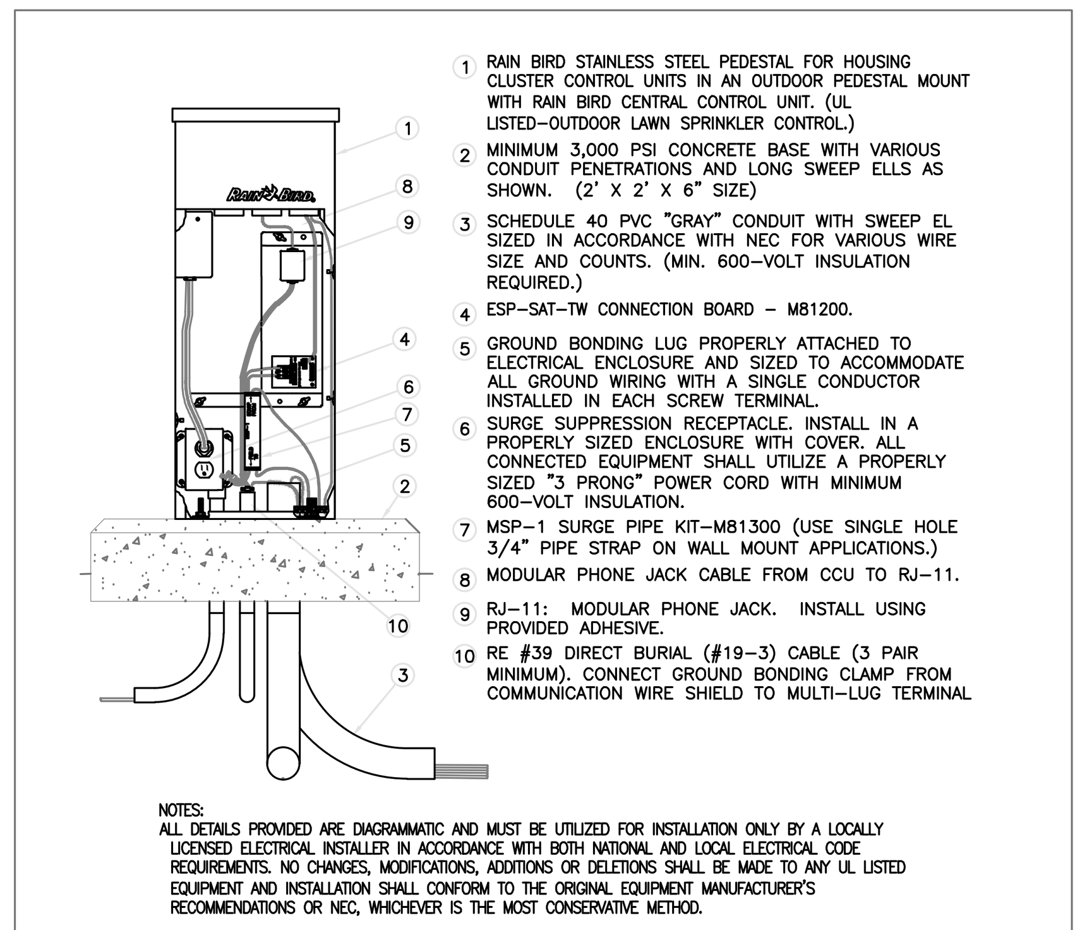
NOTE 2: City of Port St. Lucie shall provide Sim Card for connection to City's Verizon Account

MAXICOM

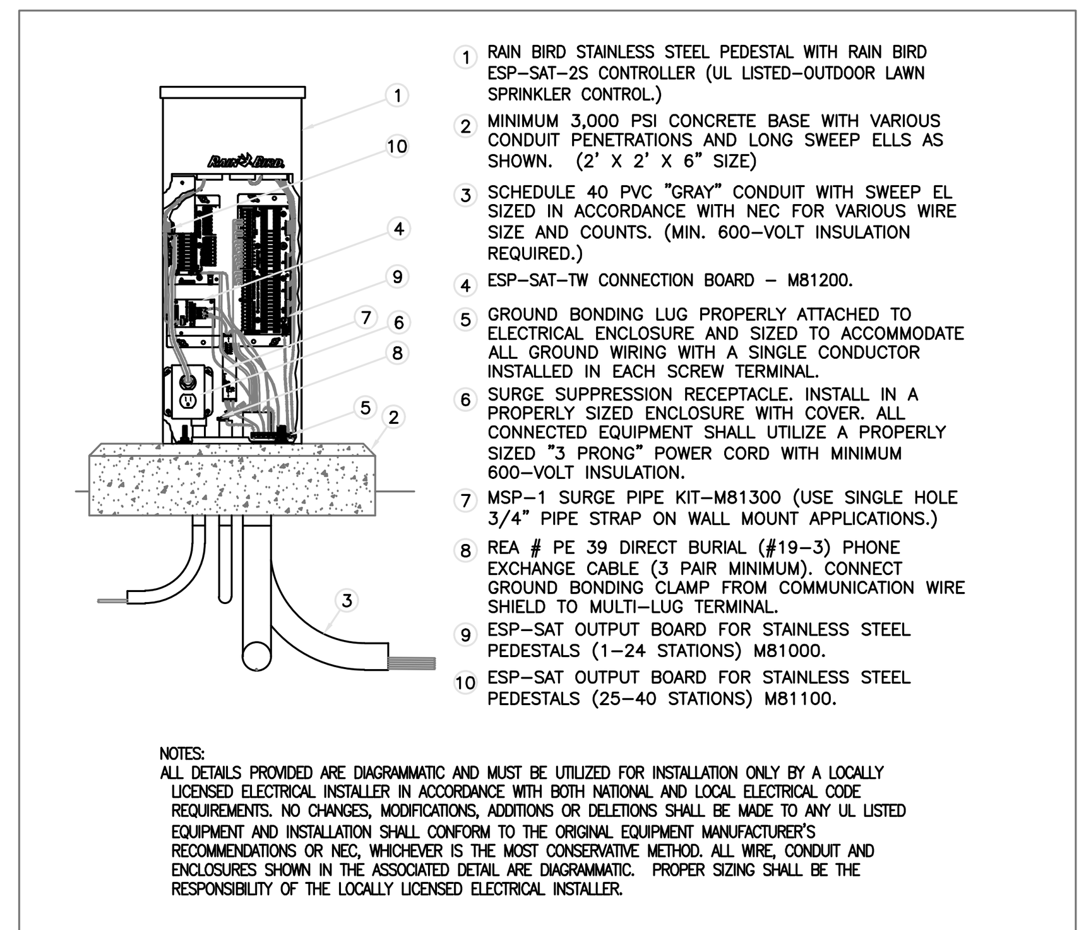
1. THE IRRIGATION SYSTEM SHALL BE CONTROLLED BY A RAIN BIRD MAXICOM2 CENTRAL CONTROL SYSTEM. CONTRACTOR IS RESPONSIBLE FOR PROVIDING A FULLY FUNCTIONAL MAXICOM2 SYSTEM, INCLUDING ALL FIELD COMPONENTS. CONTRACTOR IS NOT RESPONSIBLE FOR PROVIDING THE MONITORING COMPUTER OR SOFTWARE.
2. THE SYSTEM MUST COMPLY WITH THE CURRENT RAIN BIRD MAXICOM2 INSTALLATION MANUAL. ALL COMPONENTS SHALL BE INSTALLED BY AN EMPLOYEE WHO HAS SUCCESSFULLY COMPLETED BOTH A RAIN BIRD LEVEL 2 HARDWARE AND LEVEL 2 SOFTWARE TRAINING CLASS. NO DEVIATIONS FROM THE INSTALLATION MANUAL WILL BE PERMITTED WITHOUT WRITTEN PERMISSION FROM THE OWNER OR THE OWNER'S REPRESENTATIVE.
3. CONTRACTOR TO INSTALL FUSE BETWEEN EACH PT-322 AND IT'S POWER SUPPLY UTILIZING BUSS FUSE HOLDER MODEL # HFB (30A-32V) WITH 1/8A-3/16A, 250V SLOW BLOW BUSS FUSE
4. CONTRACTOR TO PROVIDE AND INSTALL ONE 'ICE CUBE' RELAY (OR APPROVED EQUAL) FOR EACH CONTROLLER PROVIDED AND A STANDARD RAIN BIRD 110 BY 24 VOLT TRANSFORMER. BOTH TO BE INSTALLED AT DESIGNERS DIRECTION.
5. CONTRACTOR TO GROUND EACH CONTROLLER AS INDICATED IN THE IRRIGATION NOTES AND DETAILS. PROVIDE WRITTEN CERTIFICATION, ON A MASTER ELECTRICIANS LETTER HEAD, INDICATING DATE OF TEST, IDENTITY OF THE HARDWARE TESTED (USE SYMBOLS ON THESE PLANS FOR IDENTIFIER), THE EARTH GROUND RESISTANCE MEASURED, AND THE TEST METHOD UTILIZED.
6. THE NC MASTER VALVE SHALL CONNECT TO THE MV1 TERMINAL STRIP OF CONTROLLER. UTILIZE #12 CONTROL WIRE.
7. INSTALL 'HOSPITAL GRADE', SURGE PROTECTED, DUPLEX PLUGS IN CONTROLLER PEDESTALS, PROVIDE 'PIG TAIL' TO PLUG CONTROLLER INTO THIS PLUG
8. INSTALL PULSE TRANSMITTERS, DECODERS, INLINE 'PIPE BOMB' SURGE SUPPRESSORS, BONDING, GROUNDING AND SHIELDING OF ALL COMPONENTS AS REQUIRED IN MAXICOM II MANUAL.
9. CONTRACTOR TO RUN PE-39 WIRE FROM THE MAGNETIC FLOW METER TO A PT322 PULSE TRANSMITTER INSTALLED INSIDE CONTROLLER PEDESTAL.
10. CCU-28 SETUP AND CONTROLLER CONNECTIONS:
    - CONNECT THE MAGNETIC FLOW METERS TO CHANNELS 1 & 2
    - CONNECT THE RAIN CAN TO CHANNEL 3
    - CONNECT SAT 'C1' TO CHANNELS 4 & 5
    - CONNECT SAT 'C2' TO CHANNELS 6 & 7
11. ESP-SAT CONTROLLER (SEE DETAIL # 12) SHALL HAVE THE FOLLOWING CONDUITS WITH LONG SWEEPS RUNNING INTO CONTROLLERS:
    A) (3) 0.75" CONDUIT FOR SOIL MOISTURE SENSOR, GROUNDING GRID, 120v POWER.
    B) (1) 1.5" FOR PE-39 COM CABLE.
    C) (1) 2.5"/ 2" FOR ZONE CONTROL WIRES AND SPARES.
12. CCU-28 (SEE DETAIL #11) SHALL HAVE THE FOLLOWING CONDUITS RUNNING INTO CCU:
    A) (1) 1.5" CONDUIT FOR PE-39 COM CABLE.
    B) (1) 0.75" CONDUIT FOR 120v POWER.
    C) (3) 1" CONDUIT FOR FLOW SENSORS (MAIN PUMP AND LAKE REFILL) AND RAIN CAN.

SEE SHEET IR-11 FOR ADDITIONS SPECIFICATIONS AND INSTALLATION REQUIREMENTS.

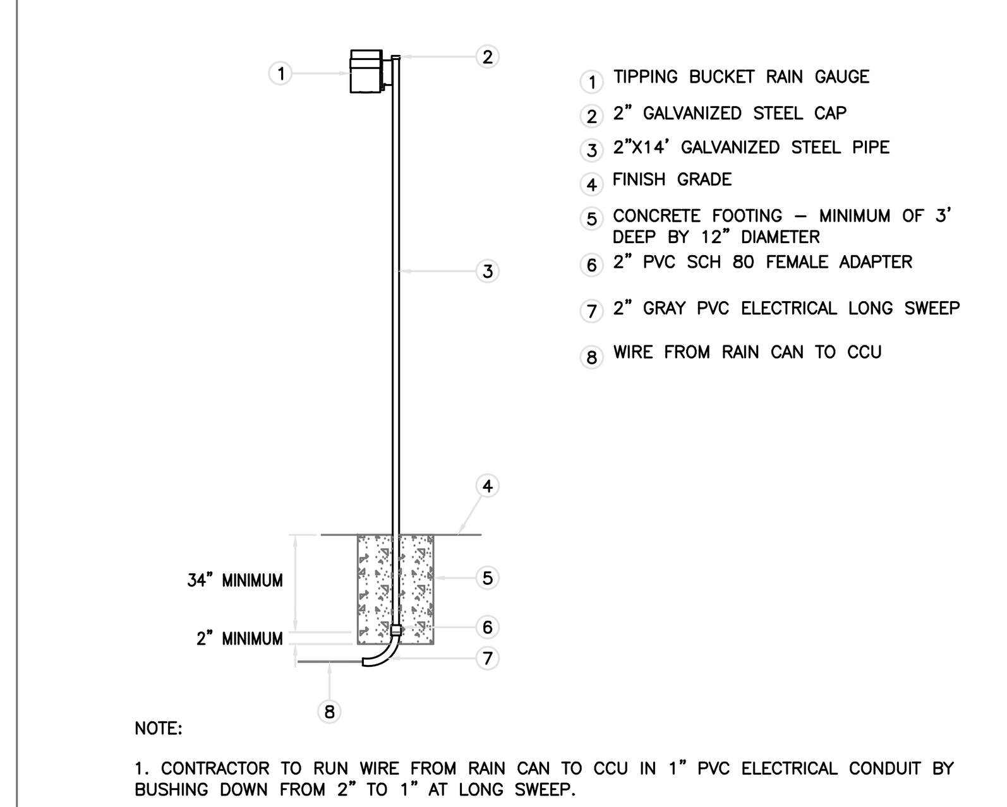
NOTE:
It SHALL BE THE IRRIGATION CONTRACTORS RESPONCIBLITY TO TO ENSURE THAT ALL MAXICOM COMPONANCE THAT MAY HAVE BEEN DISCONTINUED OR REPLACED WITH NEWER EQUIPMENT THAN THESE SHOWN IN DETAILS / SPEC'S TO PROVIDE ADDITIONAL EQUIPMENT , NEWER MAKE AND MODELS THAT ARE NEEDED TO ENSURE A FULLY FUNTIONAL CENTRAL CONTROLED SYSTEM THAT WILL COMMUNICATE WITH PORT ST. LUCIE CENTRAL CONTROL COMPUTER.



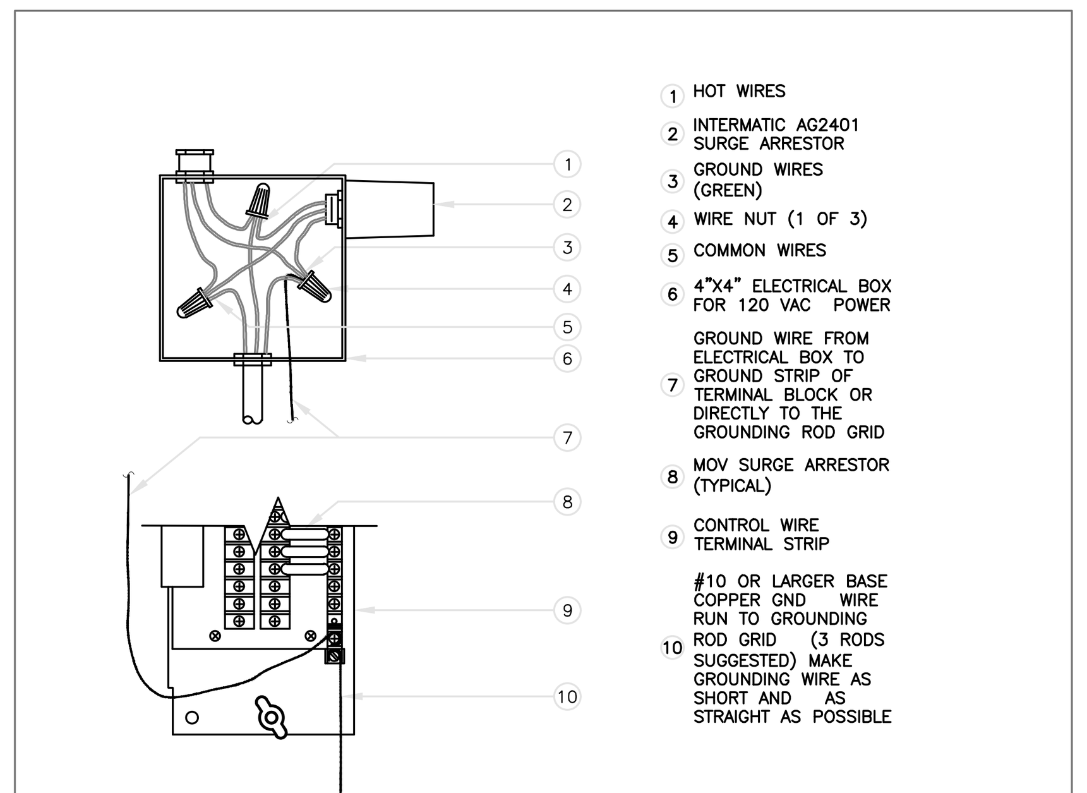
11 CCU-28, Cell Phone Communication
Mounted in SS Strong Box, Mod. SB-16-F DETAIL-FILE



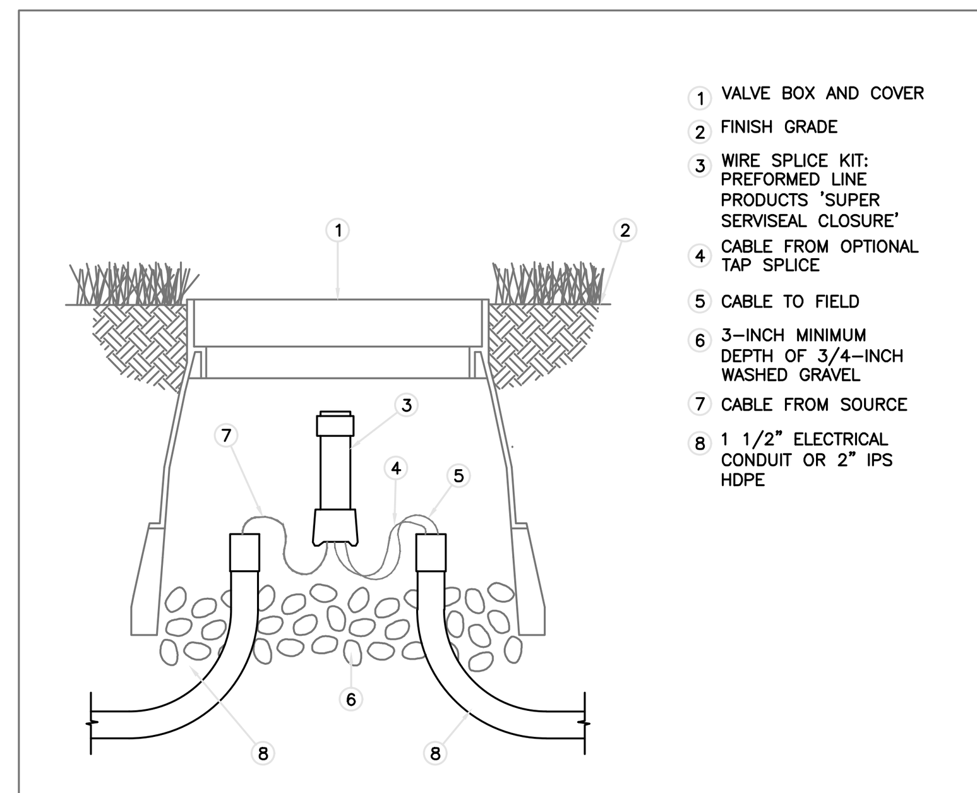
12 ESP-40SAT-2W, Model #M71900
1" = 1" DETAIL-FILE



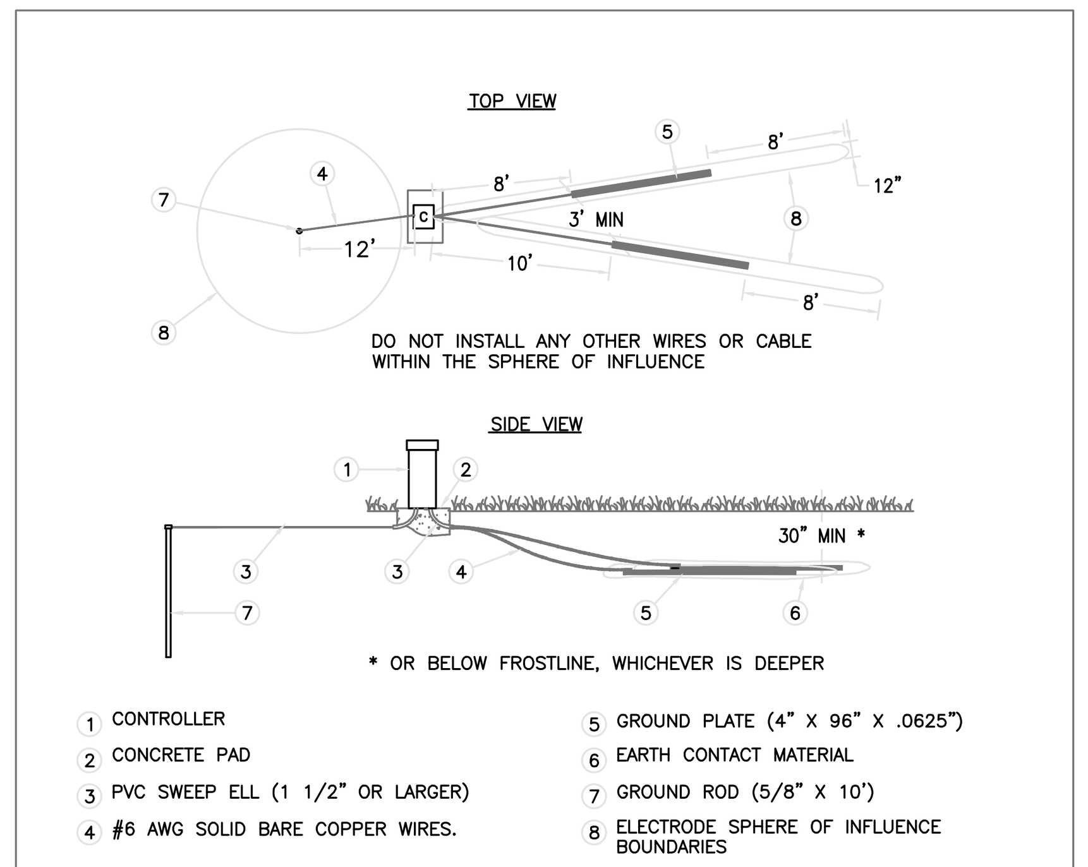
13 RAIN GAUGE, M61010



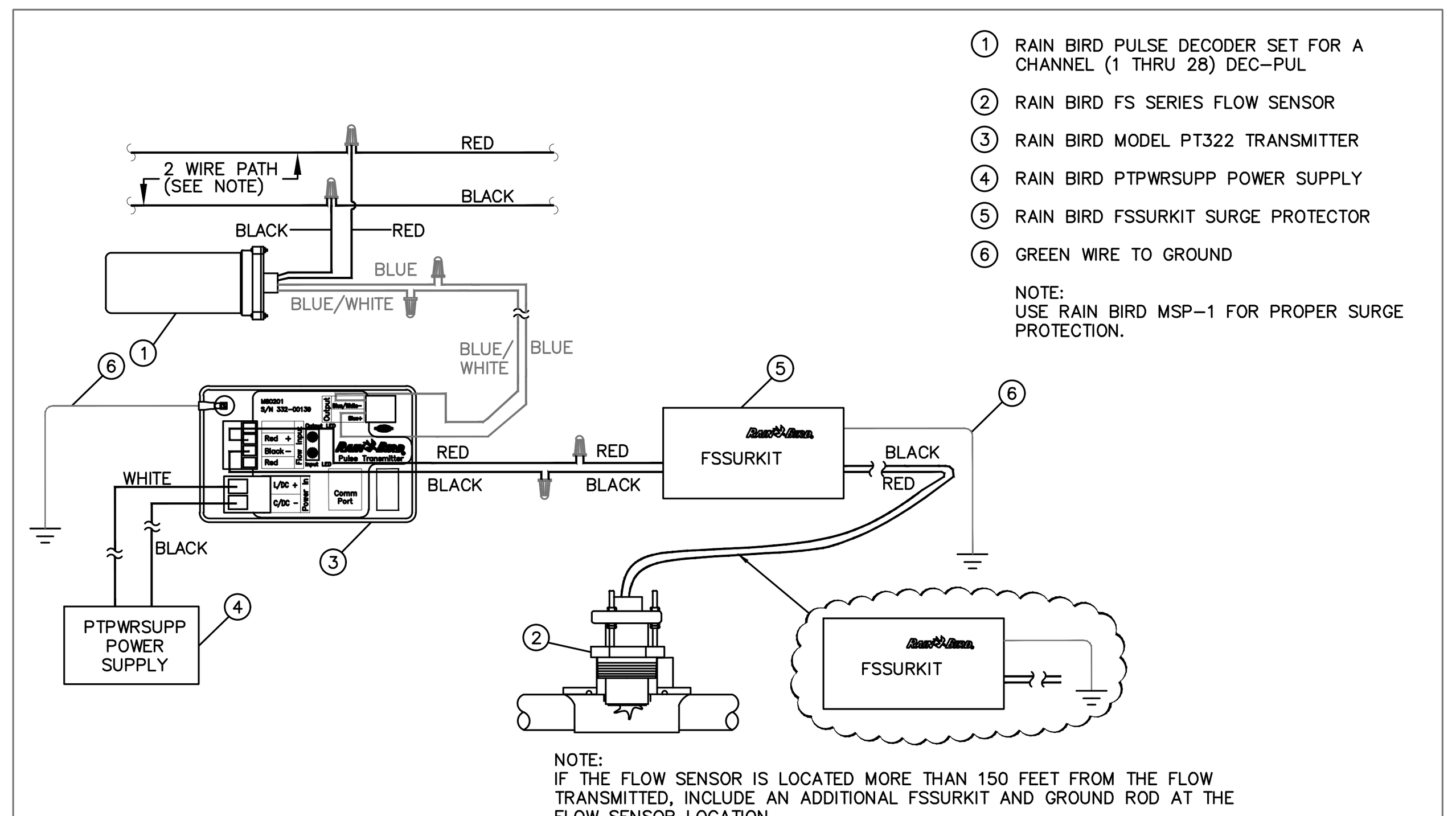
14 120 VOLT SURGE SUPPRESSION
DETAIL-FILE



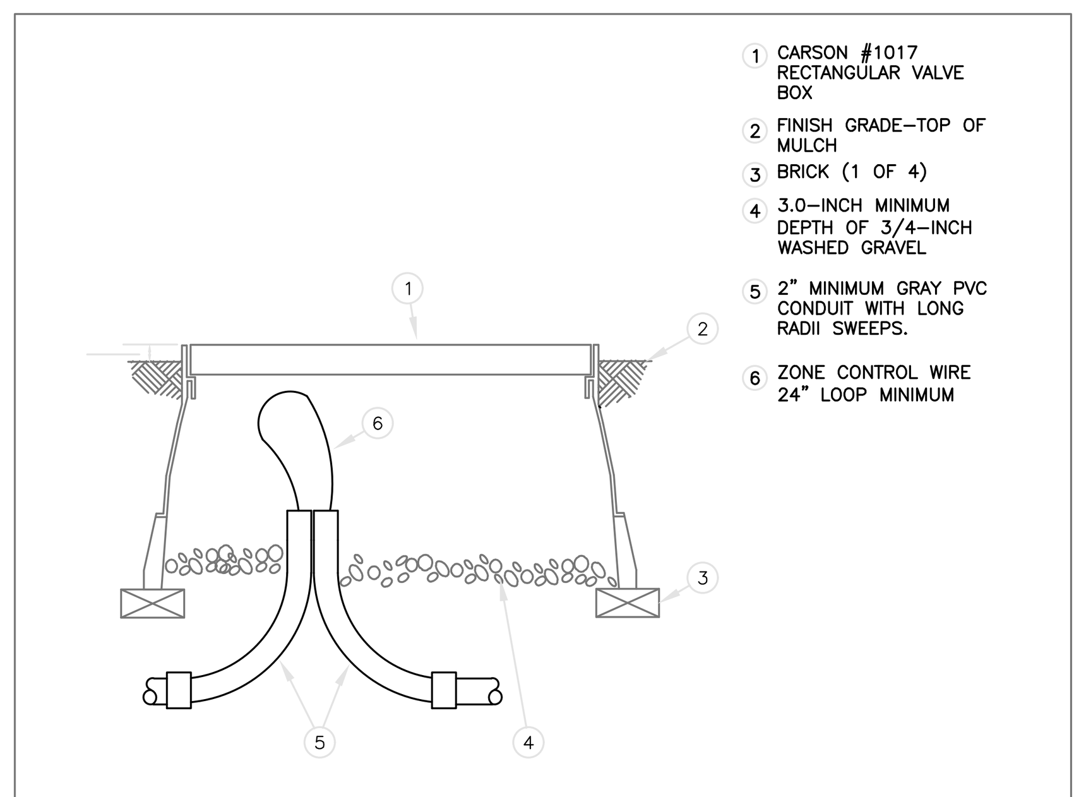
15 PE-39-19 GAUGE, 3-PAIR



16 CONTROLLER GROUND



17 MAXICOM PULSE DECODER AND FLOW SENSOR WIRING
PT322. TWO-WIRE COMMUNICATION



18 CONTROL WIRE PULL / SPLICE BOX

Michael Flaugh Digitally signed by Michael Flaugh
Date: 2024.04.29 15:47:10 -04'00'

PSL Project nr: P24-010
100% Plans

Scale: 1" = 20'
Design Date: 01-12-2024
Drawn By: RT
Last Date: Modified 05-01-2024
Revisions: 1. 2. 3. 4. 5. 6.

MAXICOM DETAILS

Tom Mackie Blvd. Extension
Port St. Lucie, Florida

NORTH

IR-6
of 10

Project # 2024-01-07_TMB

CITY OF PORT ST LUCIE VILLAGE PKWY _ TOM MACKIE AREA LAKE L22B
LAKE REFILL PUMP SYSTEM

SPECIFICATIONS

SINGLE SUBMERSIBLE PUMP SYSTEM
FIBERGLASS ENCLOSED
VARIABLE FREQUENCY DRIVE (VFD)

PURPOSE:
To provide a complete prefabricated skid mounted variable frequency drive submersible pump system from a sole source company, herein after referred to as the "manufacturer", whose primary business is the manufacture of prefabricated pump systems. The manufacturer will manufacture, install and warrant the system to meet all specified operating requirements described below and in the system detail. The system shall be a Model HSRF-10CSV-230/3-F,M,R3,W,Z as manufactured by Hoover Pumping Systems of Pompano Beach, Florida USA 954-971-7350 specified below and shown on the plan details. This specification describes the general components and minimal operating requirements and shall not be construed as a manufacturing guide or complete list of required system components and appurtenances.

The contractor shall submit seven (7) complete copies of the shop drawings to the designer for approval, prior to system order placement. The submittal shall contain cut sheets for all system components. To be considered an equal, 12 days prior to bid opening the contractor must submit the following: manufacturer brochure showing prefabricated pump systems manufacturing is the primary business of the manufacturer or division proposed to manufacture the system, written specifications, dimensioned layout detail, electrical schematic, product sheets for all main components, Underwriters Laboratory electrical control panel and "Packaged Pumping System" manufacturer's file numbers, list of 6 projects with similar operating systems with current name and phone number of person responsible for system operation, manufacturer's insurance certificate for general liability showing minimum coverage of $1 million, and written certification from the manufacturer stating the proposed system meets all requirements described in this specification, the detail and the bid documents.

If the data submitted is determined to be an equal by the designer the bidder will be notified prior to the bid date.

FIBERGLASS ENCLOSURE:
The pump station shall be protected by a fiberglass enclosure with chemical and ultraviolet resistant open mold resin with exterior finish that is uniform in color and texture, reinforced with fiberglass and stiffeners for rigidity. The enclosure shall open clear of the equipment for ease of service with the aid of gas filled struts, a stainless steel hinge and latching lockable handle. The enclosure shall be of dimensions adequate to contain the pump system mounted on the skid as shown on the system detail.

MOUNTING ASSEMBLY:
The pump station shall be mounted on a prefabricated aluminum or hot dipped galvanized skid. Pedestals shall be provided to mount the pump motor and control panel assemblies. The entire station shall be installed on a reinforced concrete slab sized as noted on the system detail.

PUMP AND MOTOR:
The pump shall be a submersible type coupled to a submersible motor rated at 10 HP, voltage and phase to match site electric, 60 Hz. The pump system shall be designed for operation at 3450 RPM.

Submersible Pump 6" and larger: The pump bowls will be of close grained, cast iron ASTM A48 Class 30 with water passages lined to reduce friction losses and shall be free of holes and other detrimental defects. The pump discharge adapter shall be of close grain ductile iron; cast iron shall not be acceptable. The impellers shall be of bronze, enclosed type and dynamically balanced. Impellers shall be securely fastened to the shaft with steel tapered split bushings.

The pump shaft shall be of stainless steel A276 Grade 416 turned, ground and polished. It shall be supported by bronze bearings above and below each impeller. The size of the shaft shall be no less than that determined by ANSI/AWWA Specifications E101, Section A4.3 paragraph 4.3.3. The motor coupling shall be constructed of A276 type 416 stainless steel either keyed or splined as required to fit the motor shaft.

The motor shall be a submersible type designed for continuous underwater operation and with a combination of a maximum water temperature and minimum velocity past the motor, such that the service factor shall be 1.15 minimum. The motor shall be of the water-filled type and fitted with a segmented plate type thrust bearing. A stainless steel cable guard for the entire bowl length shall protect the motor leads. The motor rating shall be selected so that the load at design is not greater than the name plate rating at 1.0 service factor and at no point on the curve shall the load exceed the name plate rating plus 10 percent.

The power cable shall be sized such that the voltage drop will not exceed three percent at the motor rated full load current and voltage. Cables shall be designed specifically for submersible pump service and shall consist of either individually insulated conductors or individual conductors insulated and the whole covered with an outer jacket.

IRRIGATION PUMP CONTROL PANEL:
The control panel assembly shall be Underwriters Laboratories listed in accordance with section 508A for "enclosed industrial control panels." All control devices and electronic auto-sensory circuitry shall be housed in a self-contained weather-resistant stainless steel control cabinet. The control cabinet shall contain the following protection and control equipment:

Operation
The station operates as a campus level/clock start, retirement system. System features include Low Pressure and No Flow protection. The system is equipped with "No Flow" indicator light, and a 'Hand-Off/Reset-Auto' (H-O-A) selector switch. The self-diagnostic control panel assembly includes LED status indicator lights for power failure, no flow, and pump run. Pump level start relay and auxiliary contacts are also provided.

Level Start
The pump starts when the water level is below the low level switch and the time clock is in the on position.

Level/Clock Retirement
The pump shuts off when the water level is above the high level switch.

No Flow Protection
If no flow is detected for 60 seconds during pump operation, the pump will shut off and the 'No Flow' light will turn on. The pump will remain off and the 'No Flow' light will remain on until manually reset with the H-O-A selector switch.

Hoover-Flow Software features include flow control of pump starts, sequencing and retirement; automatic pump alternation; Loss of Prime/No-flow protection, High Pressure protection; diagnostic information, flow and pressure history, service counters, elapsed run time meters, date and time stamping; Phase Loss protection, Phase Unbalance protection, Voltage monitoring and protection, operating mode meters, Service required alerts; Remote Communication Link interface; Hoover Drive control; emergency bypass operation, cooling system control, self-cleaning intake screen control; Booster bypass control; fail-safe data protection.

Drive Fault
In case of a drive fault, including under or over voltage, over current, heatsink thermal, and ground fault, the affected pump will shut off, the 'Alarm' light will illuminate, and the operator interface will display 'Drive Fault'. The pump will remain off until the system is 'Reset'.

No Flow Protection
If no flow is detected for 60 seconds during pump operation, the pump will shut off and the 'No Flow' light will turn on. The pump will remain off and the 'No Flow' light will remain on until manually reset with the H-O-A selector switch.

Hand - Off / Reset - Auto Switch
The station is equipped with an H-O-A selector switch, which operates as follows:

Position		Function
Hand	-	Manual pump start. This position overrides all protective features and start controls.
Off / Reset	-	Pump will not run. This position resets all alarms.
Auto	-	Pump will start automatically. In this position, all start controls and protective features are active.

Operator Interface
A mobile device or PC HMI (Human Machine Interface) shall be provided with status display and control of operating mode, I/O status, system pressure, system flow, pressure and flow setpoints, elapsed run times, fault timer values and presets, display brightness, clock time, alarm and event logs with date and time stamps, and diagnostic information including counters and alarm indicators.

Protection Equipment
- Front operated main power disconnect
- Motor fuses for motor and drive short circuit and ground fault protection
- Surge Protection Device - Type 1

PENETRATION STANDARD REQUIREMENTS:
All control panel penetrations shall be performed by a licensed electrician to minimum NEMA 4X requirements, and compliant with International Electrotechnical Commissions (IEC) IP56 rating under its IP code, to protect against dust ingression and against any harmful effects from water projected in powerful jets from any direction and protection against corrosion.

VARIABLE FREQUENCY DRIVES (VFD):
Variable Frequency Drives with the following characteristics shall be provided for each main pump motor: 32-bit microprocessor controlled Pulse Width Modulated output, IGBT transistors, line reactors, built-in adjustable PID control, acceleration ramp up and down, forced-air ventilation, variable torque control, 32 character alphanumeric English full text parameter display, single function keys, block parameter access, dual analog outputs, automatic and manual reset, opto-isolated outputs, log of last 30 events retained in memory.

PRESSURE TRANSMITTER:
A 4-20mA-pressure transmitter shall provide a feedback signal to drive PID loops and for system pressure control. The transmitter shall be CE & UL recognized and built with an all stainless steel housing and pressure port, rated to NEMA 4, and able to withstand shock and vibration levels to MIL-STD-810E.

MAGNETIC FLOW METER:
A full-bore magnetic flow sensor shall be provided to control pump retirement and allow display of flow rate and total flow. The flow sensor shall have the following characteristics: no moving parts, unobstructed bore (no pressure loss), NEMA 5/IP 67 protection, international standard traceable calibration, stainless steel 1.4301 flow tube, 316 stainless steel electrodes, overall system accuracy for flows 1.5 fps of better than +/- 0.5% of actual rate, and for flows <1.5 fps of better than +/- 0.32/v[fps] % of actual rate.

DISCHARGE PIPE MANIFOLD:
The pipe discharge manifold shall be constructed of galvanized steel pipe with galvanized roll groove fittings. A flow-switch, pressure gauge and hose bib will be provided on the station discharge. A wafer type butterfly valve will be provided at pump station discharge.

PUMP DISCHARGE:
The minimum pump discharge size shall be 2" diameter or larger as required for a maximum of 15 feet per second velocity flow. The pipe shall be schedule 40 galvanized steel with galvanized roll groove or threaded fittings. Each discharge shall have a bronze poppet check valve for lines smaller than 3" and cast iron roll groove swing check valve for larger sizes located as shown on the system detail.

Well Source: Each pump will be placed in a separate well. The pump/motor assembly shall be placed directly in the well unless a flow inducer is required for adequate water velocity across the motor. The discharge pipe and submersible cable shall exit the well head through a well seal with a junction box as shown in the system detail.

LEVEL TRANSMITTER CONTROL AND MONITORING: HOOVER FLOWGUARD
The level transmitter shall be securely mounted in the water source a minimum of 12" below the expected low water level. The transmitter cable shall be installed in 1" UL listed PVC conduit from the control panel to the transmitter support. Transmitter signal shall be compatible with Hoover Flowguard controls to allow remote monitoring of levels, elevation graphing, email alerts, and adjustment of activation and shutoff levels and scaling to local NAVD/NGVD elevation data. Remote establishment of Low-Level shutoff alarm, normal level reset and intermediate low level warning levels, events logged, elevation graphed and email alerts initiated through Hoover Flowguard®

FLOWGUARD COMMUNICATION LINK:
Hoover supplied communication
- High speed modem, antenna and broadband Data communication plans

THE HOOVER FLOWGUARD
An easy to use Internet based irrigation system management tool providing real time monitoring and control that include:

-- PROACTIVE TROUBLESHOOTING TOOLS
Solve minor irrigation problems before they escalate into major landscape issues.

-- LANDSCAPE MANAGEMENT TOOL
Supplement random "wet check" expense with specifically identified irrigation repairs.
Evaluate data that can be effectively used for troubleshooting performance issues.
Field manually bypass button to override a closed Flowguard shutoff valve in two (2) hour increments each time pressed by field service personnel.
Rain sensor

-- AUTOMATED COMPLIANCE TOOLS
Daily municipal water use restrictions.
Water Management District water usage reporting
Budget water usage to assure compliance with Consumptive Water Use Permit

-- AUTOMATIC E-MAIL ALARMS & WARNINGS
Receive automatic e-mail alarms & warnings when irrigation system problems occur. Automatic adjustable alarm shut-downs with time delay between restarts.

-- REPORTS
Daily water usage
Specific events, a comprehensive list of alarms, warnings and pump operations

-- COMMUNICATION via Hoover High Speed Modem and Cellular Broadband service.

-- REMOTE CONTROL access to pump control and protection features, including: sequencing and retirement controls and setup parameters.

-- DIAGNOSTIC DATA: Real time and historical graphing of flow, pressure, source water level, water salinity, booster water source pressure, rain sensor, system status and maintenance alerts.

-- WATER USE MONITORING: Set and automatically monitor Daily, Monthly, and Annual water use volumes per Water Management District Use Permit. User - set alarms and warnings, with automatic and/or manual restarts.

-- WATER USE REPORTS: Print Reports for Daily, Monthly, and Annual flow volume history. View and print reports for graphing, logs, usage, audit trails, and maintenance status.

-- SECURITY ACCESS CONTROL: Multi-user capability with User ID and password protection.

-- USER TRAINING provides new user classes, support and phone assistance to set up initial parameters such as Water Windows, budgets and other user - set functions.

FLOWGUARD3 RAIN GAUGE:
The rain gauge with the following features:
- Remotely adjustable Shutoff and Restart levels, and remotely settable drying rate.
- Measurement of rainfall, with one-hundredth of an inch resolution.
- Recording of daily rainfall amounts.
- Display of today's total rainfall.
- Display of estimated time to restart when system shuts-down due to rain.

WARRANTIES:
The manufacturer of the Pump and Water Management system shall warrant all hardware components for a period of one (1) year from date of manufacture.

The manufacturer of the pumping station shall warrant all components for a period of one (1) year from date of manufacture.

Well Requirements:
1. All wells must be gravel packed utilizing galvanized or black steel casings that are made via an extrusion process. No piping made from flat steel stock and then welded will be allowed.

2. When submersible pumps are utilized they must be installed inside wells with casings one pipe size larger than the pump and motor diameter (example - 6" motor must be installed inside an 8" well casing).

3. Step Test- All wells, whether for irrigation withdraw or lake recharge shall have a six-hour step test performed and the results submitted to the City for approval. This test shall be conducted as follows: Well driller shall pump the well for 30 minutes at 50% maximum system design flow, the next 30 minutes shall be at 75% maximum flow, next 60 minutes at 100% of maximum design flow. Then for the next four hours the well shall be pumped at 125% of maximum design flow. The well driller shall record the time the test starts, the water level in the well at the start of the test (before pumping begins) and then every 15 minutes thereafter until the test is complete. This report must be submitted to the City for approval prior to purchasing and installing the pump station.

4. Water quality analysis – All well water must be tested by an approved laboratory for 'landscape suitability'. The test results must be submitted to the City for approval.

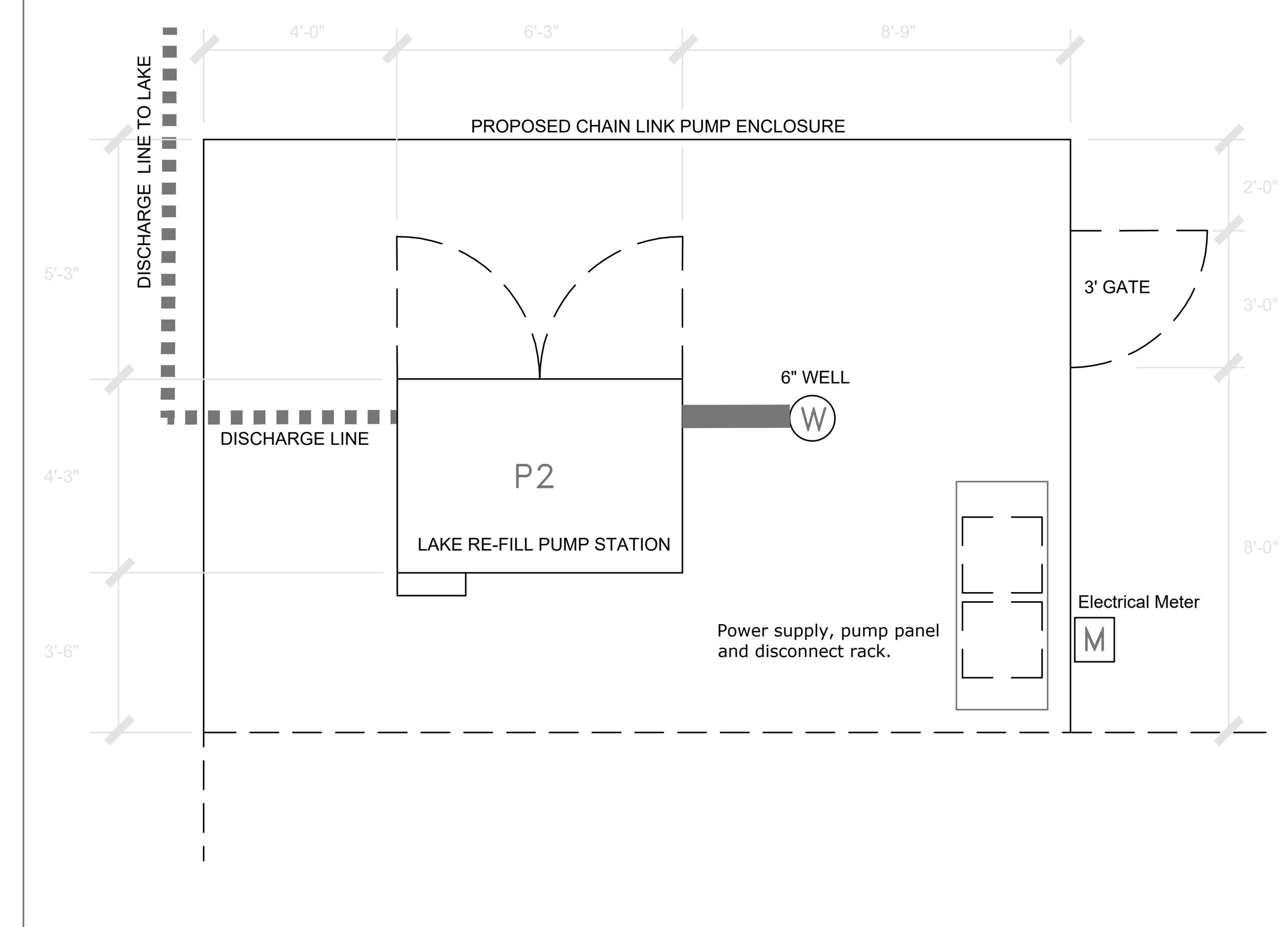
5. Water 'particle size' analysis – All well water must be tested for a particle size analysis, by a reputable lab experienced in conducting such tests. The results shall be provided to the City of PSL for review and approval.

• Filtration requirements – Any water test deemed to require filtration (at the sole discretion of the City of PSL) will require primary filtration at the point of connection (POC).

1. If filtration is required, Netafim 'Apollo' disc filter technology shall be utilized with 140 mesh disc and automated 'pressure differential' flushing.

2. All flushing must return to the surface water body from which it came (lake draw). Lake draw filtration, discharge/filtration must be discharged a minimum 300' from the suction line of any pump station pulling from that surface water body.

3. All drip zones and MP rotator zones require Netafim disc filters be installed immediately downstream of each remote control valves, reqardless if the water quality testing indicates primary filtration at the pump station is needed or not.



A PUMP ENCLOSURE LAYOUT

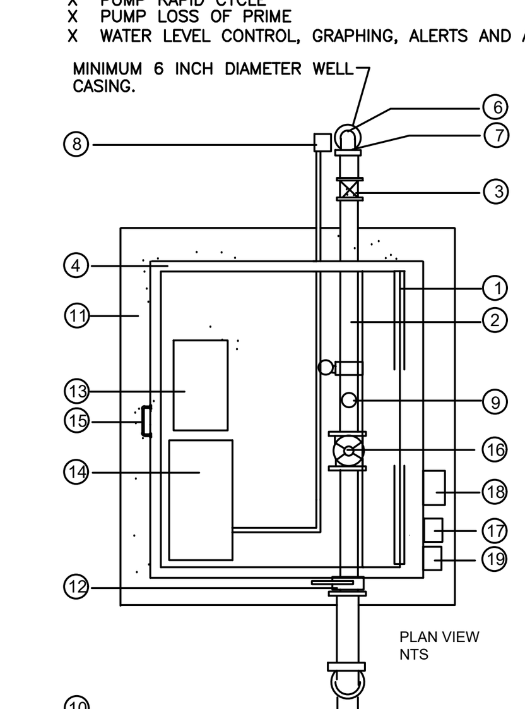
NOTE:
CONTRACTOR TO EXTEND PUMP DISCHARGE LINES FROM PUMP STATION TO LAKE . KEEP MINIMUM 100-FEET AWAY FROM MAIN PUMP IN-TAKE.

NOTE: DISCHARGE PIPES & HEADER TO IRRIGATION MAIN SHALL BE SCHED 40 GALVANIZED STEEL PIPE WITH GALV. ROLL GROOVE FITTINGS. PUMP DROP PIPE SHALL BE HDPE HEAT FUSED OR SCHED 40 GALV. STEEL. SET PUMP 60' ON 3" PIPE. INSTALL MOTOR CABLE SPLICE BETWEEN MOTOR AND CONTROL PANEL IN NEMA 4X JUNCTION BOX ADJACENT TO WELL IN ACCORDANCE WITH ELECTRICAL CODES.

WELL DRILLER SHALL NOTIFY THE PUMP SYSTEM MANUFACTURER IN WRITING WITHIN 24 HOURS OF DEVELOPING THE WELL IF THE WELL PUMPING LEVEL IS GREATER THAN 45' BELOW FINISHED GRADE AFTER 8 HOURS OF CONTINUOUS PUMPING AT 125% OF THE DESIGN FLOW BELOW.

PROVIDE MINIMUM OF 4' CLEARANCE ON ALL SIDES OF PUMP SYSTEM

HOOVER FLOWGUARD WELL SYSTEM REMOTE CONTROL, COMMUNICATION AND FEATURES:
COMMUNICATION VIA CELLULAR MODEM.
USER DEFINED INTERNET BASED CONTROL PARAMETERS USING STANDARD WEB BROWSER WITH EVENT LOGGING AND EMAIL ALERTS FOR WARNINGS AND ALARMS AS FOLLOWS:
X HMI CONTROL INTERFACE AND DISPLAY ON CONTROL PANEL
X MAXIMUM GALLON PER MINUTE USAGE WITH ADJUSTABLE TIME DELAY AND NUMBER OF RESTART ATTEMPTS
X MINIMUM TOTAL DAILY WATER USAGE
X DAILY, MONTHLY AND ANNUAL WATER USAGE BUDGETS
X GRAPHING OF REAL TIME AND HISTORICAL FLOW, INCOMING AND DISCHARGE PRESSURE LAKE LEVEL AND SYSTEM EVENTS WITH TIME AND DATE SHOWN
X RAIN GAUGE PRECIPITATION REPORTING, ADJUSTABLE SHUTDOWN
X HISTORIC WATER USAGE BY DAY AND MONTH
X VFD FAULT/STARTER OVERLOAD FAULT SHUTDOWN
X POWER OFF/ON ALERT
X PUMP RAPID CYCLE
X PUMP LOSS OF PRIME
X WATER LEVEL CONTROL, GRAPHING, ALERTS AND ALARMS



1 4' X 4' FIBERGLASS REINFORCED ENCLOSURE WITH FOREST GREEN GELCOAT FINISH
2 GALV. STEEL DISCHARGE HEADER PIPE WITH GALV. ROLL GROOVE FITTINGS
3 CHECK VALVE
4 4' x 4' ALUMINUM SKID BOLTED TO CONCRETE PAD
5 N/A
6 6" 10HP SUBMERSIBLE PUMP/MOTOR IN WELL
7 WELL SEAL IN WELL
8 J-BOX WITH UL PVC CONDUIT TO CONTROL PANEL
9 PRESSURE TRANSDUCER
10 HDPE LAKE FILL PIPE INTO LAKE
11 4' X 4' X 4" PRECAST REINFORCED CONCRETE PAD 4,000 PSI STRENGTH AT 28 DAYS
12 DISCHARGE BUTTERFLY VALVE
13 VARIABLE FREQUENCY DRIVE
14 CONTROL PANEL STAINLESS STEEL UL LISTED ASSEMBLY MAINTAIN 42" CLEARANCE
15 LOCKABLE HANDLE
16 MAGNETIC FLOW METER
17 JUNCTION BOX WITH 110VAC POWER FOR CONTROLLER
18 ELECTRICAL SERVICE CHASEWAY TO CONTROL PANEL
19 LOW LEVEL TRANSDUCER IN LAKE

NOTE: FENCE AROUND PUMP SYSTEM PER ST LUCIE REQUIREMENTS

ELECTRIC SERVICE TO BE, IN ORDER OF PREFERENCE:
460V 3-PHASE, 230V CLOSED-DELTA 3-PHASE,
208 WYE 3-PHASE, 230 1-PHASE, 208V 1-PHASE,
230 OPEN-DELTA 3-PHASE.

PUMP PERFORMANCE
100 GPM @ 95 TDH, 40 PSI

HOOVER PUMPING MODEL: HSRF-10CSV-230/3-F,M,R3,W,Z FILE: PN16909.DWG 01/24
Pompano Beach, Florida, Tel 954-971-7350

CITY OF PORT ST LUCIE VILLAGE PARKWAY
TOM MACKIE AREA – LAKE L22B
SUBMERSIBLE WELL LAKE REFILL
PUMP SYSTEM DETAIL
FIBERGLASS ENCLOSED WELL SUCTION
CLOCK START, VARIABLE FREQUENCY DRIVE (VFD)
HOOVER FLOWGUARD®

Michael Flaugh Digitally signed by Michael Flaugh
Date: 2024.04.29 15:47:30 -04'00'

PSL Project nr: P24-010
100% Plans

Scale:	1" = 20'
Design Date:	01-12-2024
Drawn By:	RT
Last Date: Modified	05-01-2024

Revisions:
1.
2.
3.
4.
5.
6.

Lake Re-Fill
Pump Station

Tom Mackie Blvd. Extension
Port St. Lucie, Florida

NORTH

REGISTERED LANDSCAPE ARCHITECT
MICHAEL FLAUGH
STATE OF FLORIDA

IR-7
of 10

Project #
2024-01-07_TMB

CITY OF PORT ST LUCIE VILLAGE PKWY - TOM MACKIE AREA LAKE L22B
MAIN IRRIGATION PUMP SYSTEM

SPECIFICATIONS

SINGLE CENTRIFUGAL PUMP SYSTEM
FIBERGLASS ENCLOSED PRESSURE DEMAND VFD

PURPOSE:
To provide a complete prefabricated variable frequency drive skid mounted fiberglass enclosed pressure demand centrifugal pump system from a sole source company, herein after referred to as the "manufacturer", whose primary business is the manufacture of prefabricated pump systems. The manufacturer will manufacture, flow test, install and warrant the system to meet all specified operating requirements described below and in the system detail. The system shall be a Model HCF-25PDV-230/3-H,L,M,R3,Z as manufactured by Hoover Pumping Systems of Pompano Beach, Florida USA 954-971-7350 specified below and shown on the plan details. This specification describes the general components and minimal operating requirements and shall not be construed as a manufacturing guide or complete list of required system components and appurtenances.

The contractor shall submit seven (7) complete copies of the shop drawings to the designer for approval, prior to system order placement. The submittal shall contain cut sheets for all system components. To be considered an equal, the contractor must submit the following 12 days prior to bid opening: manufacturer brochure showing prefabricated pump systems manufacturing is the primary business of the manufacturer or division proposed to manufacture the system, written specifications, dimensioned layout detail, electrical schematic, product sheets for all main components, Underwriters Laboratory electrical control panel and "Packaged Pumping System" manufacturer's file numbers, list of 6 projects with similar operating systems with current name and phone number of person responsible for system operation, manufacturer's insurance certificate for general liability showing minimum coverage of $1 million, and written certification from the manufacturer stating the proposed system meets all requirements described in this specification, the detail and the bid documents.

If the data submitted is determined to be an equal by the designer the bidder will be notified prior to the bid date.

FIBERGLASS ENCLOSURE:
The pump station shall be protected by a fiberglass enclosure with chemical and ultraviolet resistant open mold resin with exterior finish that is uniform in color and texture, reinforced with fiberglass and stiffeners for rigidity. The enclosure shall open clear of the equipment for ease of service with the aid of gas filled struts, a stainless steel hinge and latching lockable handle. The enclosure shall be of dimensions adequate to contain the pump system mounted on the skid as shown on the system detail.

MOUNTING ASSEMBLY:
The pump station shall be mounted on a prefabricated aluminum or hot dipped galvanized skid. Pedestals shall be provided to mount the pump motor and control panel assemblies. The entire station shall be installed on a reinforced concrete slab sized as noted on the system detail.

PUMP AND MOTOR:
The pump shall be a centrifugal type pump with flanged suction and discharge connections **(threaded connections are not acceptable)**. A thermal sensor for pump overheat protection shall be mounted into the pump volute.

The motor specifications shall include:
-- NEMA Premium Efficiency
-- Inverter Rated (MG1 Part 31)
-- Tropicalized Windings
-- VPI Impregnated
-- EISA Compliant
-- Totally Enclosed Fan Cooled (TEFC) (IP55). **Open Drip Proof (ODP) motors are not acceptable**.
-- UL 1004 Approved
-- 1.25 Service Factor

The main motor shall be rated at 25 HP at 60 Hz.

PUMP STATION PERFORMANCE:
The required pump performance as noted on the pump system detail.

IRRIGATION PUMP CONTROL PANEL:
The control panel assembly shall be Underwriters Laboratories listed in accordance with section 508A for "enclosed industrial control panels." All control devices and electronic auto-sensory circuitry shall be housed in a self-contained weather-resistant stainless steel control cabinet. The control panel shall be identified with a permanent label approved by Underwriters Laboratories Inc. containing the word "LISTED", the name and / or symbol of Underwriters Laboratories Inc., a control number and the product name "Enclosed Industrial Control Panel". An electrical schematic shall be permanently mounted inside the cabinet. The control cabinet shall contain the following protection and control equipment:

Operation
This station operates as a Variable Frequency Drive (VFD) pressure demand start, reduced-flow retirement system. The station automatically maintains a constant discharge pressure from a pressure transducer input regardless of varying flow demands within the station operating range. The system is equipped with a remote 'Hand-Off-Auto' (H-O-A) selector switch. The self-diagnostic control panel assembly includes a remote 'Alarm' indicator light, and an remote operator interface for display of status and diagnostic messages, event lists, and operation history. The remote operator interface also allows for viewing of system setup parameters.

Hoover-Flow Software features include flow control of pump starts, sequencing and retirement; automatic pump alternation; Loss of Prime/No-flow protection, High Pressure protection, Pump Overheat protection; diagnostic information, flow and pressure history, service counters, elapsed run time meters, date and time stamping; Phase Loss protection, Phase Unbalance protection, Voltage monitoring and protection, operating mode meters, Service required alerts; Remote Communication Link interface; Hoover Drive control; emergency bypass operation, cooling system control, self-cleaning intake screen control; Booster bypass control; fail-safe data protection.

Pressure Demand
The main pump starts when the mainline pressure drops below the setting of the start pressure switch.

No-flow Retirement
The pump shuts off if water stops flowing for 15 seconds.

Loss of Prime Protection
If the system pressure remains below the start pressure, and there is no flow of water through the system during pump operation for 45 seconds, the pump will shut off and the 'Loss of Prime' light will turn on. The system will remain off until 'Reset'.

Thermal Protection
If the temperature at the pump volute exceeds 43C after at least 3 minutes of pump operation, the pump will shut off, and the 'Pump Overheat' light will turn on. The system will remain off until 'Reset'.

Drive Fault
In case of a drive fault, including under or over voltage, over current, heat sink thermal, and ground fault, the affected pump will shut off, the 'Alarm' light will illuminate, and the operator interface will display 'Drive Fault'. The pump will remain off until the system is 'Reset'.

Hand - Off - Auto Switch
The pump is equipped with a remote H-O-A selector switch that operates as follows:

Position		Function
Hand	-	Manual pump start. This position overrides all protective features and start controls.
Off	-	Pump will not run.
Auto	-	Pump will start automatically. In this position, all start controls and protective features are active.

Operator Interface
A mobile device or PC HMI (Human Machine Interface) shall be provided with status display and control of operating mode, I/O status, system pressure, system flow, pressure and flow setpoints, elapsed run times, fault timer values and presets, display brightness, clock time, alarm and event logs with date and time stamps, and diagnostic information including counters and alarm indicators.

Protection Equipment
- Front operated main power disconnect
- Motor fuses for motor and drive short circuit and ground fault protection
- Surge Protection Device - Type 1

Specification
Electric service to be, in order of preference:
460V 3-Phase (A, B, C, Ground)
230V Closed-Delta 3-Phase (A, B, C, Neutral, Ground)
208V Wye 3-Phase (A, B, C, Neutral, Ground)
230V 1-Phase (A, B, Neutral, Ground)
208V 1-Phase (A, B, Neutral, Ground)
230V Open-Delta 3-Phase (A, B, C, Neutral, Ground).
Selection of 230V Open-Delta 3-Phase may require an increase in electrical equipment size to meet desired performance criteria.

PENETRATION STANDARD REQUIREMENTS:
All control panel penetrations shall be performed by a licensed electrician to minimum NEMA 4X requirements, and compliant with International Electro technical Commissions (IEC) IP56 rating under its IP code, to protect against duct ingression and against any harmful effects from water projected in powerful jets from any direction and protection against corrosion.

VARIABLE FREQUENCY DRIVES (VFD):
The pump motor is controlled by an individual dedicated Variable Frequency Drive (VFD) that is environmentally sealed against water, insects and dust infiltration. The VFD is properly sized to match pump, motor, and site power requirements.

The Variable Frequency Drive provided for the pump motor shall have the following characteristics:
Variable Frequency Drive with the following characteristics shall be provided for the pump motor: 32-bit microprocessor controlled Pulse Width Modulated output, IGBT transistors, line reactors, built-in adjustable PID control, and acceleration ramp up and down, single pump VFD systems 25 hp or less NEMA 12 or NEMA 4 VFD with forced-air cooling over heat-sink **(outside airflow over electronics not acceptable)**. All other VFD system cooling is by industrial air conditioner. Variable torque control, 32 character alphanumeric English full text parameter display, single function keys, block parameter access, dual analog outputs, automatic and manual reset, opto-isolated outputs, log of last 30 events retained in memory.

MAGNETIC FLOW METER:
A full-bore magnetic flow sensor shall be provided to control pump retirement and allow display of flow rate and total flow **(insertion type flow meters are not acceptable)**. The flow sensor shall have the following characteristics: no moving parts, unobstructed bore (no pressure loss), NEMA 5/IP 67 protection, international standard traceable calibration, stainless steel 1.4301 flow tube, 316 stainless steel electrodes, overall system accuracy for flows 1.5 fps of better than +/- 0.5% of actual rate, and for flows <1.5 fps of better than +/- 0.32/v [fps] % of actual rate.

PRESSURE TRANSMITTER:
A 4-20mA-pressure transmitter shall provide a feedback signal to drive PID loops and for system pressure control. The transmitter shall be CE & UL recognized and built with an all stainless steel housing and pressure port, rated to NEMA 4, and able to withstand shock and vibration levels to MIL-STD-810E.

DISCHARGE PIPE MANIFOLD:
The pipe discharge manifold shall be constructed of galvanized steel pipe with galvanized roll groove fittings. A wafer type butterfly valve will be provided on headers 3" or greater and bronze ball valve on smaller headers at the pump station discharge. A hydro pneumatic pressure tank with isolation valve will be installed on the pump system skid inside the enclosure connected to the discharge header.

SELF-CLEANING DISCHARGE FILTER:
1. All pump discharge water will flow through the 110 psi working pressure, 120 mesh disc filter assembly, and discharge into the irrigation main. The filter housing and disk assembly is non-corrosive. The disk assembly is readily accessed without tools. The discs shall provide a minimum 5/16" depth filtration. Screen or fabric type filters are not acceptable. Inlet and outlet solenoid actuated valves allow the filter to backflush via the controller with adjustable range pressure differential and/or adjustable timer. The backflush is done without the introduction of compressed air or use of electric motors or gears. During the backflush mode one filter battery is cleaned with filtered water and the remaining filter battery continue to supply clean water for the irrigation system. The filter discs will separate during the backflush cycle for optimal cleaning.

2. Flowguard manages the following filtration operations; Complete filtration operation, remote adjustments based on seasonal operating conditions, remote reporting of proactive filter system operating diagnostic warning and alarms. The discharge filter backwash line contains a separate magnetic flow meter for automatic subtraction of filter backwash water returning to the lake for accurate water management CUP reporting.

SUCTION LINE:
The minimum size suction line shall be as noted on the pump system detail and no less than required for a maximum of 5 feet per second velocity flow. If a reducing fitting is required at the pump suction, an eccentric reducer shall be installed. Any above ground pipe at the pump system exposed to sunlight shall be schedule 40 galvanized steel with galvanized roll groove fittings. Suction pipe and fittings shall be HDPE DR17 heat fused (**PVC is not acceptable**).

Lake Source: Suction screen assembly shall be 316 stainless steel 10 meshes, supported 18" off the lake/canal bottom with a cast iron roll groove swing check valve and have a minimum of 4' water cover. The suction pipe from the screen assembly to the pump station shall be high density polyethylene HDPE piping.

DISCHARGE LINE:
The discharge pipe shall be schedule 40 galvanized steel with galvanized roll groove fittings terminating with a 36" length schedule 40 plain end nipple for tie-in to the irrigation main. The steel 90 fitting shall be thrust blocked so no movement of the fitting will occur.

SYSTEM CONTROL POWER SUPPLY PROTECTION: Combination UL listed power supply and 24 VDC industrial uninterruptible power supply (UPS), includes:
- minimum 1.3 Amp-hour rechargeable 24 VDC battery to power control electronics and modem
- signaling for charging process, operational readiness, buffer mode, and alarm messages
- temperature-compensated charging protection for battery module at high ambient temperatures
- residual ripple < 50 mVpp
- operating temperature -25°C to 70°C
- electronic protection against short-circuit and reverse feed
- integrated timeout

MASTER/SHUTOFF VALVE:
The valve shall be 230 psi working pressure with the following features:
- Continuous duty industrial solenoid
- Large capacity disk filter on pilot control tubing
- 220 psi polyethylene control tubing with prest-o-lock fittings
- Cast iron body and bonnet with polymer coating
- 316 Stainless steel nuts, bolts, washers, shaft and spring
- Stainless steel seat

For Irrigation controller use, the solenoid shall be energized to open, the valve wires will be stubbed into a NEMA 4X junction box on the back of the pump system for connection to the controller by the irrigation contractor. For Hoover Flowguard® the solenoid shall be energized to close.

FLOWGUARD/MAXI-COM MAGNETIC FLOW METER/SHUT-OFF VALVE CONVERTER ASSEMBLY
Flowguard/Maxi-Com Magnetic Flow Meter/Shut-Off Valve converter Assembly

FLOWGUARD COMMUNICATION LINK:
Hoover supplied communication
- High speed modem, antenna and broadband Data communication plans

THE HOOVER FLOWGUARD
An easy to use Internet based irrigation system management tool providing real time monitoring and control that include:

-- PROACTIVE TROUBLESHOOTING TOOLS
Solve minor irrigation problems before they escalate into major landscape issues.

-- LANDSCAPE MANAGEMENT TOOL
Supplement random "wet check" expense with specifically identified irrigation repairs.
Evaluate data that can be effectively used for troubleshooting performance issues.
Field manually bypass button to override a closed Flowguard shutoff valve in
Two (2) hour increments each time pressed by field service personnel.
Rain sensor

-- AUTOMATED COMPLIANCE TOOLS
Daily municipal water use restrictions.
Water Management District water usage reporting
Budget water usage to assure compliance with Consumptive Water Use Permit

-- AUTOMATIC E-MAIL ALARMS & WARNINGS
Receive automatic e-mail alarms & warnings when irrigation system problems occur. Automatic Adjustable alarm shut-downs with time delay between restarts.

-- REPORTS
Daily water usage
Specific events, a comprehensive list of alarms, warnings and pump operations

-- COMMUNICATION Hoover High Speed Modem and Cellular Broadband service.

-- REMOTE CONTROL access to pump control and protection features, including: sequencing and retirement controls and setup parameters.

-- DIAGNOSTIC DATA: Real time and historical graphing of flow, pressure, source water level, water salinity, booster water source pressure, rain sensor, system status and maintenance alerts, and power supply interruption.

-- WATER USE MONITORING: Set and automatically monitor Daily, Monthly, and Annual water use volumes per Water Management District Use Permit. User - set alarms and warnings, with automatic and/or manual restarts.

-- WATER USE REPORTS: Print Reports for Daily, Monthly, and Annual flow volume history. View and print reports for graphing, logs, usage, audit trails, and maintenance status.

-- SECURITY ACCESS CONTROL: Multi-user capability with User ID and password protection.

-- USER TRAINING provides new user classes, support and phone assistance to set up initial parameters such as Water Windows, budgets and other user - set functions.

FLOWGUARD3 RAIN GAUGE:
The rain gauge with the following features:
- Remotely adjustable Shutoff and Restart levels, and remotely settable drying rate.
- Measurement of rainfall, with one-hundredth of an inch resolution.
- Recording of daily rainfall amounts.
- Display of today's total rainfall.
- Display of estimated time to restart when system shuts-down due to rain.

WARRANTIES:
Prior to shipping, the manufacturer shall flow test the system and submit a certified report to the designer stating the system is within 1% + or - of the specified flow rate and pressure, and meets the operational requirements.

The manufacturer of the pumping station shall warrant all components for a period of one (1) year from date of manufacture.

REVISED# PN16908

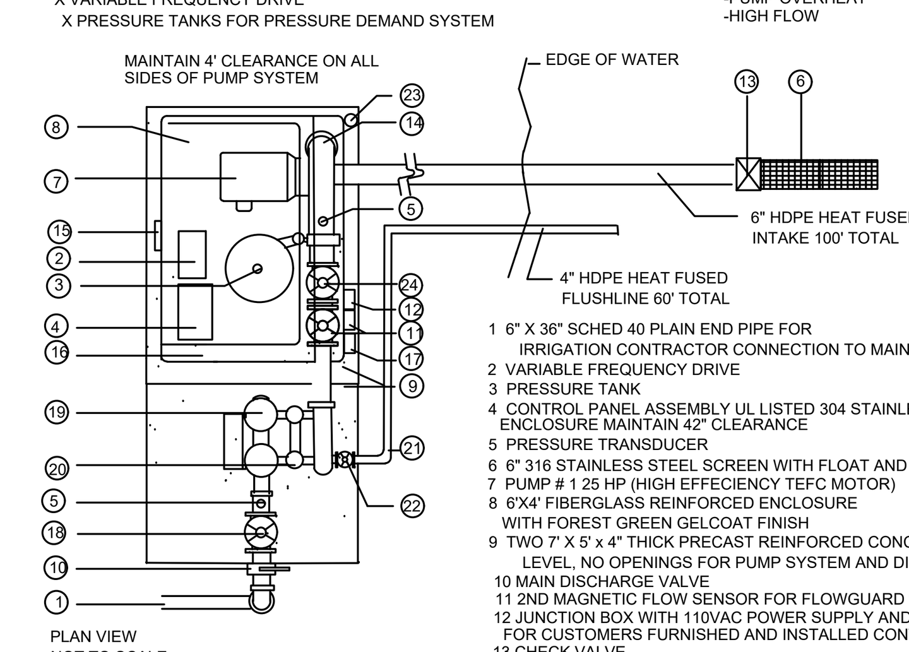
NOTE: SUCTION PIPE AND FITTINGS SHALL BE HDPE HEAT FUSED. CHECK VALVES 3" LARGER SHALL BE SWING TYPE, 2" AND SMALLER SHALL BE POPPET STYLE.
ALL EXPOSED SUCTION & DISCHARGE PIPE SHALL BE GALVANIZED STEEL.

SYSTEM MANAGEMENT: HOOVER FLOWGUARD
COMMUNICATION VIA CELLULAR MODEM OR 10/100 BASE T DIRECT ETHERNET CONNECTION.
USER DEFINED INTERNET BASED CONTROL PARAMETERS USING STANDARD WEB BROWSER WITH EVENT LOGGING AND EMAIL ALERTS FOR WARNINGS AND ALARMS AS FOLLOWS:

X MAXIMUM GALLON PER MINUTE USAGE WITH ADJUSTABLE TIME DELAY AND NUMBER OF RESTART ATTEMPTS
X MINIMUM TOTAL DAILY WATER USAGE
X DAILY, MONTHLY AND ANNUAL WATER USAGE BUDGETS
X GRAPHING OF REAL TIME AND HISTORICAL FLOW AND PRESSURE AND SYSTEM EVENTS EVENTS WITH TIME AND DATE SHOWN
X RAIN SENSOR STATUS
X HISTORIC WATER USAGE BY DAY AND MONTH
X LOSS OF PRIME
X VFD FAULT
X WATER LEVEL CONTROL, GRAPHING, ALERTS AND ALARMS
X PUMP HIGH TEMPERATURE
X PUMP RAPID CYCLE
X SHUT OFF VALVE STATUS
X DISCHARGE FILTER CONTROL AND MANAGEMENT

SAFETY FEATURES
PRESSURE DEMAND:
-TRANSIENT SURGE
-LOSS OF PRIME
-PUMP OVERHEAT
-HIGH FLOW

* FEATURES ARE INCLUDED IF MARKED WITH AN "X"
X VARIABLE FREQUENCY DRIVE
X PRESSURE TANKS FOR PRESSURE DEMAND SYSTEM



1 6" X 36" SCHED 40 PLAIN END PIPE FOR IRRIGATION CONTRACTOR CONNECTION TO MAINLINE
2 VARIABLE FREQUENCY DRIVE
3 PRESSURE TANK
4 CONTROL PANEL ASSEMBLY UL LISTED 304 STAINLESS STEEL ENCLOSURE MAINTAIN 42" CLEARANCE
5 PRESSURE TRANSDUCER
6 6" 316 STAINLESS STEEL SCREEN WITH FLOAT AND MOORING
7 PUMP # 1 25 HP (HIGH EFFECIENCY TEFC MOTOR)
8 6'X4' FIBERGLASS REINFORCED ENCLOSURE WITH FOREST GREEN GELCOAT FINISH
9 TWO 7' X 5' x 4" THICK PRECAST REINFORCED CONCRETE PADS LEVEL, NO OPENINGS FOR PUMP SYSTEM AND DISCHARGE FILTER
10 MAIN DISCHARGE VALVE
11 2ND MAGNETIC FLOW SENSOR FOR FLOWGUARD WITH OUTPUT TO MAXI-COM CONTROLLER
12 JUNCTION BOX WITH 110VAC POWER SUPPLY AND MASTER VALVE CIRCUIT FOR CUSTOMERS FURNISHED AND INSTALLED CONTROLLER CONNECTION BY CUSTOMER.
13 CHECK VALVE
14 GALV. STEEL DISCHARGE HEADER
15 LOCKABLE HANDLE
16 6' X 4' GALV STEEL SKID
17 ELECTRIC SERVICE CHASEWAY TO CONTROL PANEL
18 MASTER/SHUTOFF VALVE CONNECTED TO HOOVER FLOWUGARD
19 FILTER BATTERY, 120 MESH FILTRATION
20 BACKWASH VALVE
21 4" HDPE FUSION WELD BACKWASH LINE
22 MAGNETIC FLOW METER ON FLUSHLINE
23 FG RAIN GAUGE ON 8' POLE
24 MAGNETIC FLOW METER

ELECTRIC SERVICE TO BE, IN ORDER OF PREFERENCE:
460V 3-PHASE, 230V CLOSED-DELTA 3-PHASE, 208 WYE 3-PHASE, 230 1-PHASE, 208V 1-PHASE, 230 OPEN-DELTA 3-PHASE.

PUMP SYSTEM WILL PROVIDE:
210 GPM @ 162 TDH 70 PSI AT 10' LIFT
DURING DISCHARGE FILTER BACKWASH CYCLE

NOTE: FENCE AROUND PUMP SYSTEM PER ST LUCIE REQUIREMENTS

HOOVER MODEL: HCF-25PDV-230/3-H,L,M,R3,Z
Pompano Beach, Florida, Tel 954-971-7350

FILE PN16908.DWG 03/24

CITY OF PORT ST LUCIE VILLAGE PARKWAY
TOM MACKIE AREA – LAKE L22B
CENTRIFUGAL PUMP SYSTEM DETAIL
FIBERGLASS ENCLOSED SINGLE LAKE SUCTION
PRESSURE DEMAND VARIABLE FREQUENCY DRIVE, DISCHARGE FILTER, HOOVER FLOWGUARD®

Michael Flaugh
Digitally signed by Michael Flaugh
Date: 2024.04.29 15:47:52 -04'00'

PSL Project nr: P24-010
100% Plans

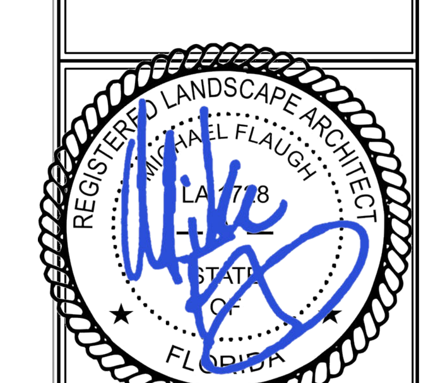
Scale:	1" = 20'
Design Date:	01-12-2024
Drawn By:	RT
Last Date: Modified	05-01-2024

Revisions:
1.
2.
3.
4.
5.
6.

Main Pump Station

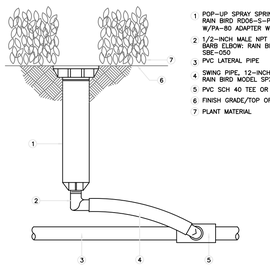
Tom Mackie Blvd. Extension
Port St. Lucie, Florida

NORTH

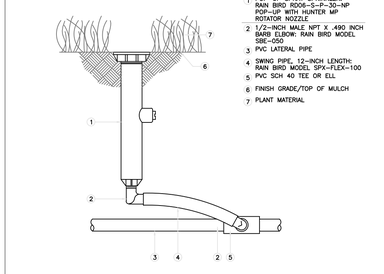


IR-8
of 10

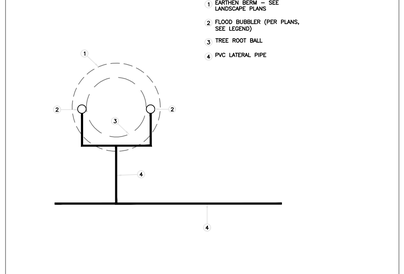
Project # 2024-01-07_TMB



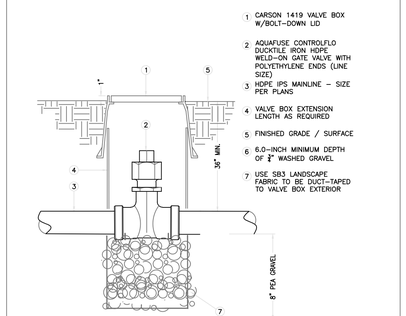
20 RAIN BIRD RD-6-S-P-30-NP
W/ PA-8 and 1400 Series Bubbler



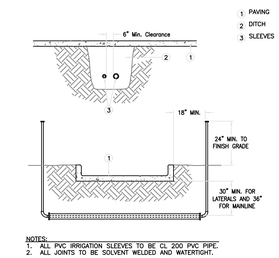
21 RAIN BIRD RD06-S-P-30-NP



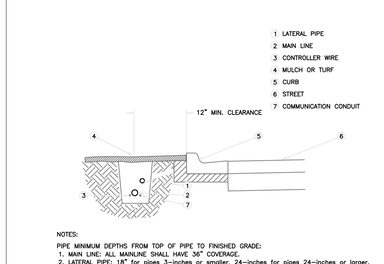
22 BUBBLER PLACEMENT



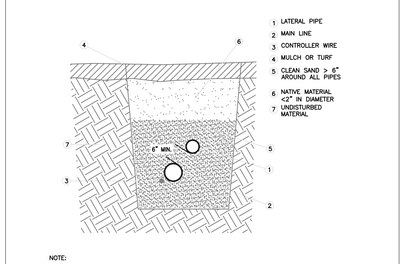
23 AQUAFUSE CONTROLFLO
DUCKTILE IRON GATE VALVE



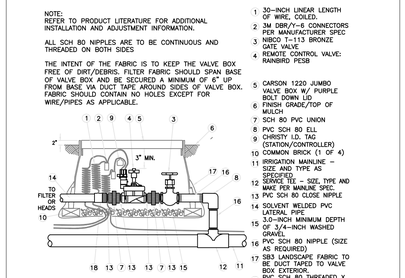
24 SLEEVING



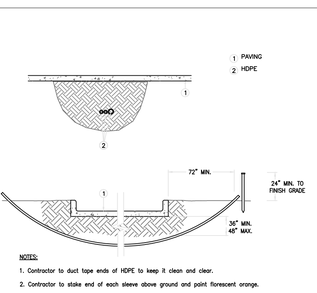
25 Mainline and Lateral Placement



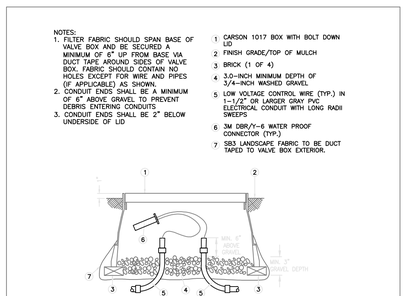
26 Pipe Back Filling



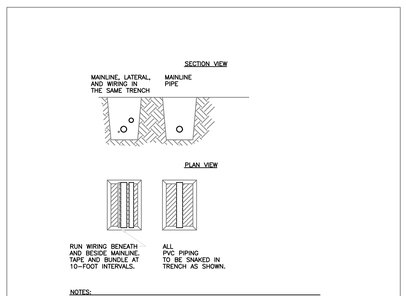
27 RAIN BIRD PESB Zone Control Valve
W/ Nibco T-113 Gate Valve



28 HDPE DIRECTIONAL BORING



29 Zone Control Wire Splice



30 Pipe and Trenching

IRRIGATION SCHEDULE TOM MACKIE BLVD

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
M L O	Hunter MP1000, Rain Bird RD06-P-30-NP Turf Rotator, 6in. pop-up with check valve, reclaimed body cap, pressure regulated to 30 psi. M=Maroon adj arc 90 to 210, L=Light Blue 210 to 270 arc, O=Olive 360 arc.
K G R	Hunter MP2000, Rain Bird RD06-P-30-NP Turf Rotator, 6in. pop-up with check valve, reclaimed body cap, pressure regulated to 30 psi. K=Black adj arc 90-210, G=Green adj arc 210-270, R=Red 360 arc.
B Y A	Hunter MP3000, Rain Bird RD06-P-30-NP Turf Rotator, 6in. pop-up with factory installed check valve, reclaimed body cap, pressure regulated to 30PSI B=Blue adj arc 90-210, Y=Yellow adj arc 210-270, A=Gray 360 arc.
1401 1402 1404 1408	Rain Bird 1806-SAM-1400 Flood Flood Bubbler 6.0in. popup with check valve
30 25	Hunter I-20-06-PRB-R-MPR 25 Turf Rotor, 6in. Pop-Up. Adjustable and Full Circle. Plastic Riser. Drain Check Valve. MPR Nozzle. With Reclaimed Water Purple ID Cover. Pressure Regulating Body.
	Rain Bird PESB-NP-HAN 1in., 1-1/2in., 2in., 3in. Durable Chlorine-Resistant Remote Control Valve for Reclaimed Water Applications. With Scrubber Mechanism Technology, and Purple Flow Control Handle.
	Aquafuse Aquafuse Ductile Iron
CC	Rain Bird CCU-28-W 28 Channels, Metal Wall Mount. Cluster Control Unit for Maxicom.
A	Rain Bird ESP-40SAT-2S 40 Stations Satellite Controller for Maxicom and SiteControl. 120 VAC. Two-Wire Satellite Data Path. Stainless Steel Pedestal.
F	Hunter HY-100 1in. MPT x MPT threaded inlet and outlet filter with 150 mesh stainless steel screen
X X	Cap for future use Cap at the mainline or lateral line for future use. The pressure and flow provided to that location are indicated next to the cap symbol.
GG	Controller Grounding Grid Grounding grid shall consits of (1) Ground Copper Clad Rod (5/8"x 10') and (2) Ground Plates (4"x 96"x 0.0625"). See detail drawing and specifications for installation.
PB	Pull / Spice Box Carson rectangular valve box model # 1017. For zone control wires, boxes shall have a maximum spacing of 300-Feet. Leave minimum 24-inches additional loose wire in valve box. Use only 3m DBY/R-6 splice kits.
PS	Main Pump Station Lake L22B east of Tom Mackie Blvd.
LRF	Point of Connection 6" Well W/ Submersible Pump
———	Irrigation Lateral Line: PVC Class 200 SDR 21-NP Class 200 SDR 21 solvent weld bell end Purple PVC pipe. Use only Weld-On Medium body 721 Blue glue with P-70 purple primer. Apply solvent weld glue per manufactures instructions. See specifications and details for additional installation instructions.
—— – – ——	Irrigation Mainline: HDPE PE4710 DR 11-NP
——— ~ ———	Irrigation Mainline: PVC Schedule 40, Gray Com Pipe For communication cable - Paige Electric PE-39-19 - three pair, installed inside a 1.5-inch gray gray PVC electrical conduit using long-radii sweeps in all directional changes. Install pull boxes every 300-feet and for every ML intersection.
——— ~~~ ———	Irrigation Mainline: PVC Sch- 40 Gray Conduit For zone control wires, Minimum size 1.5". Contractor shall increase pipe size as number of wires increase. Solvent welded pipe and fittings from 2-1/2" and above shall bewelded together utilizing Weld-On purple ECO primer and 711 ECO Gray cement.
========	Pipe Sleeve: PVC Class 200 SDR 21 Class 200 SDR 21 solvent weld bell end Purple PVC pipe. Use only Weld-On Medium body 721 Blue glue with P-70 purple primer. Apply solvent weld glue per manufactures instructions. See specifications and details for additional installation instructions.

Valve Callout
Valve Number
#" # Valve Flow
Valve Size

Michael Flaugh

Digitally signed by Michael Flaugh
Date: 2024.04.29 15:48:14 -04'00'

PSL Project nr: P24-010
100% Plans

Scale:	1" = 20'
Design Date:	01-12-2024
Drawn By:	RT
Last Date: Modified	05-01-2024

Revisions: 1 2 3 4 5 6

GENERAL DETAILS

Tom Mackie Blvd. Extension
Port St. Lucie, Florida

NORTH

REGISTERED LANDSCAPE ARCHITECT MICHAEL FLAUGH STATE OF FLORIDA

IR-9
of 10

Project # 2024-01-07_TMB

REFER TO; CITY OF PORT ST LUCIE PUBLIC WORKS IRRIGATION STANDARDS 328400 FOR COMPLE SPECIFICATION AND REQUIREMENTS

The system has been designed to conform with the requirements of all applicable codes, laws, ordinances, rules, regulations and conventions. Should any conflict exist, the requirements of the codes shall prevail. It is the responsibility of the owner/installation contractor to ensure the entire system is installed as designed. Irrigation contractor responsible for obtaining all required permits according to federal, state and local laws.

THE WORK

The work specified in this section consists of furnishing all components necessary for the installation, testing, and delivery of a complete, fully functional automatic landscape irrigation system that complies with the irrigation plans, specifications, notes, and details. This work shall include, but not be limited to, the providing of all required material if applicable (pump(s), backflows, pipes, valves, fittings, controllers, wire, primer, glue, etc.), layout, protection to the public, excavation, assembly, installation, back filling, compacting, repair of road surfaces, controller and low voltage feeds to valves, cleanup, maintenance, guarantee and as-built plans.

All irrigated areas shall provide 100% head-to-head coverage from a fully automatic irrigation system with a rain/freeze shut off device. The shut off device shall be installed to prevent activation by adjacent heads and in a visually un-obtrusive location approved by owner. Zones are prioritized first by public safety and then by hydraulic concerns. This sequencing will be a mandatory punch list item.

These plans have been designed to satisfy/exceed the Florida Building Code (FBC) Appendix F and the Florida Irrigation Society Standards and Specifications for Turf and Landscape Irrigation Systems, fourth edition. All products should be installed per manufacturer's recommendation. Contractor shall verify all underground utilities 72 hours prior to commencement of work.

It is the responsibility of the irrigation contractor to familiarize themselves with all grade differences, location of walls, retaining walls, structures and utilities. Do not willfully install the sprinkler system as shown on the drawings when it is obvious in the field that unknown obstruction, grade differences or differences in the area dimensions exist that might not have been considered in the engineering. Such obstructions, or differences, should be brought to the attention of the owner's authorized representative. In the event this notification is not performed, the irrigation contractor shall assume full responsibility for any revisions necessary.

Irrigation contractor shall repair or replace all items damaged by their work. Irrigation contractor shall coordinate their work with other contractors for the location and installation of pipe sleeves and laterals through walls, under roadways and paving, etc.

The contractor shall take immediate steps to repair, replace, or restore all services to any utilities which are disrupted due to their operations. All costs involved in disruption of service and repairs due to negligence on the part of the contractor shall be their responsibility.

POINT OF CONNECTION (P.O.C.)

A new Hoover Pumping System Centrifical Pump station with an 'Apollo' self-cleaning 140 mesh discfilter providing 210 gpm @ 70 psi. The water supply is a lake (L22B) located north east of 'Tom Mackie Blvd'. A new lake re-fill pump station 100 gpm 40 psi and 6" Well, with lake level floats. Both pump stations Well, CCU-28 and ESP-SAT controller to be enclosed with-' Black vinyl 9 Gauge chain link fence WITH a 3' main gate. Well must be test according to Port St. Lucie

THE PIPE

Pipe locations shown on the plan are schematic and shall be adjusted in the field. When laying out mainlines place a minimum of 18" away from either the back of curb, front of walk, back of walk, or other hardscape to allow for ease in locating and protection from physical damage. Install all lateral pipe near edges of pavement or against buildings whenever possible to allow space for plant root balls. Always install piping inside project's property boundary.

All pipes are to be placed in planting beds. If it is necessary to have piping under hardscapes, such as roads, walks, and patios, the pipes must be sleeved using Sch-40 for pipe sizes up to 4-inch, and Class 200 PVC for pipe sizes 6-inch or larger. Sleeve diameter shall be minimum twice the size of the pipe it is carrying, minimum sleeve size shall be 2-inches. No sleeve shall have turns or fittings that prevent a pipe from being manually pushed/pulled through after it is installed. All directional bores shall be HDPE per plans.

Pipe sizes shall conform to those shown on the drawings. No substitutions of smaller pipe sizes shall be permitted, but substitutions of larger sizes may be approved. All damaged and rejected pipe shall be removed from the site at the time of said rejection.

Class 200 gasketted pantone purple PVC mainline with LEEMCO ductile iron fittings with fitting restraints and bell retraints (pipe size per plans).

Contractor shall refer to LEEMCO manufacturers restraint tables, recommended installation practices.

PVC pipe joint compound and primer: The PVC cement shall be Weld-On 711 ECO (gray, ultra-low VOC, medium setting, maximum strength) and the primer shall be Weld-On ECO Primer (purple tinted, ultra-low VOC, fast acting) or approved equals.

ELECTRICAL POWER SUPPLY

Electrical supply for irrigation controllers & sensors to be provided by irrigation contractor (contractor shall hire an Electrical Contractor). Contractor to coordinate with local utilities for the installation of, and connection to, site available power supplies for required electrical components as set forth in the irrigation plans.

All electrical work is to comply with the National Electrical Code and any, and all, other applicable electrical codes, laws and regulations. A licensed electrician shall perform all electrical hook-ups. Power for each controller shall be a dedicated 120 volt, 20 amp circuit unless otherwise specified in the plans.

WIRING

Irrigation control wire shall be thermoplastic solid copper, single conductor, low voltage irrigation controller wire; suitable for direct burial and continuous operation at rated voltages.

Tape and bundle control wires every 10' and run alongside the mainline. At all turns in direction make a 2' coil of wire. At all valve boxes coil wire around a 1" piece of PVC pipe to make a coil using 30 linear inches of wire. Make electrical connections with 3M DBR/Y-6 connectors.

Number all wires, using an electrical book of numbers, according to the plans. Number wires in all valve boxes, junction boxes and at the controller.

Wire sized, numbered and colored as follows:
#12 white for common
#12 spare black common
#14 individual color coded hot wire
#14 spare yellow hot wire

SPARE WIRES

Leaving each controller, run six spare wires. Install as 2 common spares and 4 hot wires. Loop these wires into each RCV along their path and terminate in the last valve box controlled by the wires respective controller. The loop into each valve box shall extend up into the valve box a minimum of 8" and be readily accessible by opening the valve box lid. These wires must be all numbered and color coded as required in these plans.

CONTROLLER AND PUMP STATION CONTROL PANEL GROUNDING

Contractor to utilize 4"X96"X0.0625" copper grounding plates, 5/8"X10' copper clad grounding rods, 'One Strike' CAD welds at all connection points, #6 insulated copper wire, and earth contact material. Install these and other required components as outlined in the detail. Contractor to verify that the earth to ground resistance does not exceed 10 ohms. Contractor shall provide a written certification, on a licensed electrical contractors letter head, showing the date of the test, controller/pump location, and test results. Each controller/pump shall be so grounded and tested. Each component must have its own separate grounding grid, unless they are sitting side by side, in which case up to two controllers can share a common grounding grid.

LAYOUT

Lay out irrigation system mainlines and lateral lines. Make the necessary adjustments as required to take into account all site obstructions and limitations prior to excavating trenches.

Stake all sprinkler head locations. Adjust location and make the necessary modifications to nozzle types, etc. required to ensure 100% head to head coverage. Refer to the Edge of Pavement Detail on the Irrigation Detail Sheet.

Spray heads shall be installed 4" from sidewalks or curbed roadways and 18" from uncurbed roadways and building foundations.

Shrub heads shall be installed on 3/4" Sch 40 PVC risers. The risers shall be set between plant material, but no closer than 18" off sidewalks, roadway curbing, building foundations, and/or any other hardscaped areas. Shrub heads shall be installed to a standard height of 4" below maintained height of plants and shall be installed a minimum of 6" within planted masses to be less visible and offer protection. Paint all shrub risers with flat black or forest green paint, unless irrigation system will utilize reuse water; in this case the risers shall be purple PVC and shall not be painted.

Locate valves prior to excavation. Ensure that their location provides for easy access and that there is no interference with physical structures, plants, trees, poles, etc. Valve boxes must be placed a minimum of 12" and a maximum of 13" from the edge of pavement, curbs, etc. and the top of the box must be 2" above finish grade. No valve boxes shall be installed in turf areas without approval by the irrigation designer - only in shrub beds.

VALVES

Sequence all valves so that the farthest valve from the P.O.C. operates first and the closest to the P.O.C. operates last. The closest valve to the P.O.C. should be the last valve in the programmed sequence.

Adjust the flow control on each RCV to ensure shut off in 10 seconds after deactivation by the irrigation controller.

Using an electric branding iron, brand the valve I.D. letter/number on the lid of each valve box. This brand must be 2"-3" tall and easily legible.

EQUIPMENT

All pop-up heads and shrub risers shall be pressure compensating. All pop-up heads shall be mounted on flex-type swing joints.

All sprinkler equipment, not otherwise detailed or specified on these plans, shall be installed as per manufacturer's recommendations and specifications, and according to local and state laws.

TRENCHING

Excavate straight and vertical trenches with smooth, flat or sloping bottoms. Trench width and depth should be sufficient to allow for the proper vertical and horizontal separation between piping as shown in the pipe installation detail on the detail sheet.

Protect existing landscaped areas. Remove and replant any damaged plant material upon job completion. The replacement material shall be of the same genus and species, and of the same size as the material it is replacing. The final determination as to what needs to be replaced and the acceptability of the replacement material shall be solely up to the owner or owner's representative.

INSTALLATION

Solvent Weld Pipe: Cut all pipe square and deburr. Clean pipe and fittings of foreign material; then apply a small amount of primer while ensuring that any excess is wiped off immediately. Primer should not puddle or drip from pipe or fittings. Next apply a thin coat of PVC cement; first apply a thin layer to the pipe, next a thin layer inside the fitting, and finally another very thin layer on the pipe. Insert the pipe into the fitting. Insure that the pipe is inserted to the bottom of the fitting, then turn the pipe a 1/4 turn and hold for 10 seconds. Make sure that the pipe doesn't recede from the fitting. If the pipe isn't at the bottom of the fitting upon completion, the glue joint is unacceptable and must be discarded.

Pipes must cure a minimum of 30 minutes prior to handling and placing into trenches. A longer curing time may be required; refer to the manufacturer's specifications. The pipe must cure a minimum of 24 hours prior to filling with water.

HDPE4710-DR11 MAINLINE PIPE;
Refer to current; Port St Lucie public works Irrigation Standards.

BACK FILL

The Back fill 6" below, 6" above, and around all piping shall be of clean sand and anything beyond that in the trench can be of native material but nothing larger than 2" in diameter. In all planting beds backfill all trenches to 85% Proctor and all trenches under hardscapes to be backfilled and compacted to 95% Proctor.

Main line pipe depth measured to the top of pipe shall be:

- 36" minimum for 3" & 4" PVC with a 36" minimum at vehicular crossings.
- 36" minimum for 6" PVC with a 36" minimum at vehicular crossings.

Lateral line depths measured to top of pipe shall be:

- 18" minimum for 3/4"-3" PVC with a 30" minimum at vehicular crossings.

Contractor shall backfill all piping, both mainline and laterals, prior to performing any pressure tests. The pipe shall be backfilled with the exception of 2' on each side of every joint (bell fittings, 90's, tees, 45's, etc.). These joints shall not be backfilled until all piping has satisfactorily passed its appropriate pressure test as outlined below.

FLUSHING

Prior to the placement of valves, flush all mainlines for a minimum of 13 minutes or until lines are completely clean of debris, whichever is longer.

Prior to the placement of heads, flush all lateral lines for a minimum of 13 minutes or until lines are completely clean of debris, whichever is longer.

Use screens in heads and adjust heads for proper coverage avoiding excess water on walls, walks and paving.

TESTING

Soil: At a minimum of 2 locations on the site, soil tests for infiltration and texture shall be performed according to the USDA Soil Quality Test Kit Guide. The tests shall be documented in a USDA Soil Worksheet.

All of the above is available at:
https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/health/assessment/?cid=nrcs142p2_053873

The completed worksheet shall be submitted to the owners representative for review/approval. Do not proceed without written direction from the owner/owner's representative.

Schedule testing with Owner's Representative a minimum of three (3) days in advance of testing.

Contractor to utilize soil test data to inform the irrigation scheduling at the project, using BMP's issued by the Irrigation Association which can be download on line at:
https://irrigation.org/IA/Advocacy/Standards-Best-Practices/Landscape-Irrigation-BMPs/IA/Advocacy/Landscape-Irrigation-BMPs.aspx?hkey=93b546ad-c87a-41b8-bf70-8c4fd2cff931 (link at bottom of the webpage).

Read pages 47-52 in Appendix C for how to create irrigation schedules.

If these parameters are exceeded, locate the problem; repair it; wait 24 hours and retry the test. This procedure must be followed until the mainline passes the test.

Lateral Lines: The lateral lines must be fully filled to operational pressure and visually checked for leaks. Any leaks detected must be repaired.

Operational Testing -Once the mainline and lateral lines have passed their respective tests, and the system is completely operational, a coverage test and demonstration of the system is required. The irrigation contractor must demonstrate to the owner, or his/her representative, that proper coverage is obtained and the system works automatically from the controller. This demonstration requires each zone to be turned on, in the proper sequence as shown on the plans, from the controller. Each zone will be inspected for proper coverage and function. The determination of proper coverage and function is at the sole discretion of the owner or owner's representative.

Upon completion of the operational test, run each zone until water begins to puddle or run off. This will allow you to determine the number of irrigation start times necessary to meet the weekly evapotranspiration requirements of the planting material in each zone. In fine sandy soils, it is possible no puddling will occur. If this is experienced, then theoretical calculations for run times will be required for controller programming.

SUBMITTALS

Pre-Construction: Deliver five (5) copies of submittals to Owner's Representative within ten (10) working days from date of Notice to Proceed. Furnish information in 3-ring binder with table of contents and index sheet. Index sections for different components and label with specification section number and name of component. Furnish submittals for components on material list. Indicate which items are being supplied on catalog cut sheets when multiple items are shown on one sheet. Incomplete submittals will be returned without review. In lieu of hardcopies, an electronic package in PDF format can be submitted.

After project completion:
As a condition of final acceptance, the irrigation contractor shall provide the owner with:

1. Irrigations As-builts - shall be provided utilizing a sub-foot Global Navigation Satellite System (GNSS) to accurately locate all mainlines, sleeves, remote control valves, gate valves, independent wire runs, wire splice boxes, controllers, high voltage supply sources/conduit path, control mechanisms, sensors, wells and water source connections in Florida East State Plane, NAD 83, and CORS 96 format. The data collected shall be in POINT format and include an ID for each data point with Manufacturer, Type, Size, and Depth. All mainline and independent runs of wire shall be located every 30' for straight runs and at every change of direction. Sleeves will be located at end points and every 20' of length. All underground items shall include depth in inch format. These POINTS once collected shall be imported into an AutoCAD DWG geo-referenced base file to be labeled accordingly. The completed AS-Built shall be a Geo-Referenced DWF file and delivered to the owner on a compact disk (CD).
2. Controller charts - Upon completion of "as-built" prepare controller charts; one per controller. Indicate on each chart the area controlled by a remote control valve (using a different color for each zone). This chart shall be reduced to a size that will fit inside of the controller door. The reduction shall be hermetically sealed inside two 2ml pieces of clear plastic.
3. Grounding Certification - Provide ground certification results for each controller and pump panel grounding grid installed. This must be on a licensed electrician letter head indicating location tested (using IR plan symbols), date, time, test method, and testing results.

INSPECTIONS AND COORDINATION MEETINGS REQUIRED - Contractor is required to schedule, perform, and attend the following, and demonstrate to the owner and/or owners representative to their satisfaction, as follows:

1. Pre-construction meeting - Designer and contractor to review entire install process and schedule with owner/general contractor.
2. Mainline installation inspection(s) - all mainline must be inspected for proper pipe, fittings, depth of coverage, backfill. and installation method
3. Mainline pressure test - All mainline shall be pressure tested according to this design's requirements
4. Flow Meter calibration - All flow meters must be calibrated, provide certified calibration report for all flow meters.
5. USDA Soil Quality Tests for infiltration/texture
6. Coverage and operational test
7. Final inspection
8. Punch list inspection

FINAL ACCEPTANCE

Final acceptance of the irrigation system will be given after the following documents and conditions have been completed and approved. Final payment will not be released until these conditions are satisfied.

1. All above inspections are completed, documented, and approved by owner.
2. Completion and acceptance of `as-built' drawings.
3. Acceptance of required controller charts and placement inside of controllers.
4. All other submittals have be made to the satisfaction of the owner.

GUARANTEE

The irrigation system shall be guaranteed for a minimum of one calendar year from the time of final acceptance.

MINIMUM RECOMMENDED IRRIGATION MAINTENANCE PROCEDURES

1. Every irrigation zone should be checked monthly and written reports generated describing the date(s) each zone was inspected, problems identified, date problems repaired, and a list of materials used in the repair. At minimum, these inspections should include the following tasks:
   - 1.A. Turn on each zone from the controller to verify automatic operation.
   - 1.B. Check schedules to ensure they are appropriate for the season, plant and soil type, and irrigation method. Consult an I.A. certified auditor for methods used in determining proper irrigation scheduling requirements.
   - 1.C. Check remote control valve to ensure proper operation.
   - 1.D. Check setting on pressure regulator to verify proper setting, if present.
   - 1.E. Check flow control and adjust as needed; ensure valve closure within 10-15 seconds after deactivation by controller.
   - 1.F. Check for leaks - mainline, lateral lines, valves, heads, etc.
   - 1.G. Check all heads as follows:
     - 1.G.a. Proper set height (top of sprinkler is 1" below mow height)
     - 1.G.b. Verify head pop-up height - 6" in turf, 12" in ground cover, and pop-up on riser in shrub beds.
     - 1.G.c. Check wiper seal for leaks - if leaking, clean head and re-inspect.
     - 1.G.d. If still leaking, replace head with the appropriate head with pressure regulator and built-in check valve.
     - 1.G.e. All nozzles checked for proper pattern, clogging, leaks, correct make and model, etc. - replace as needed.
     - 1.G.f. Check for proper alignment - perfectly vertical; coverage area is correct; minimize over spray onto hardscapes.
     - 1.G.g. Riser height raised/lowered to accommodate plant growth patterns and ensure proper coverage.
   - 1.H. Verify the pop-up riser retracts after operation. If not, repair/replace as needed
2. Check controller/C.C.U. grounds for resistance (10 ohms or less) once per year. Submit written reports.
3. Check rain shut-off device monthly to ensure it functions properly.
4. Inspect all filters monthly and clean/repair/replace as needed.
5. Inspect backflow devices by utilizing a properly licensed backflow inspector. This should be done annually, at minimum.
6. Inspect all valve boxes to ensure they are in good condition, lids are in place and locked.
7. Winterize, if applicable, as weather in your area dictates. Follow manufacturer recommendations and blow out all lines and equipment using compressed air. Perform seasonal startup of system as per manufacturer recommendations.
8. Conduct additional inspections, maintenance tasks, etc. that are particular for your site.

VALVE SCHEDULE TOM MACKIE BLVD

NUMBER	MODEL	SIZE	TYPE	GPM	PSI	PSI @ POC	PRECIP
A-1	Rain Bird PESB-NP-HAN	1-1/2"	Turf Rotary	32.9	35.4	41.4	0.34 in/h
A-2	Rain Bird PESB-NP-HAN	1-1/2"	Turf Rotary	33.0	35.6	41.7	0.7 in/h
A-3	Rain Bird PESB-NP-HAN	2"	Turf Rotor	82.72	52.5	57.6	0.64 in/h
A-4	Rain Bird PESB-NP-HAN	1"	Turf Rotary	17.81	35.6	40.6	0.24 in/h
A-5	Rain Bird PESB-NP-HAN	1"	Bubbler	19	35.6	40.6	2.01 in/h
A-6	Rain Bird PESB-NP-HAN	1"	Bubbler	18	35.3	40	2.0 in/h
A-7	Rain Bird PESB-NP-HAN	1-1/2"	Turf Rotary	29.08	36.0	40.6	0.27 in/h
A-8	Rain Bird PESB-NP-HAN	2"	Turf Rotor	97.68	53.4	57.6	0.64 in/h
A-9	Rain Bird PESB-NP-HAN	2"	Turf Rotor	100.64	53.7	58.2	0.64 in/h
A-10	Rain Bird PESB-NP-HAN	2"	Turf Rotor	97.72	53.2	57.1	0.67 in/h
A-11	Rain Bird PESB-NP-HAN	1"	Bubbler	14	35.6	39.2	2.0 in/h
A-12	Rain Bird PESB-NP-HAN	1"	Turf Rotary	18.16	35.5	39.1	0.24 in/h
A-13	Rain Bird PESB-NP-HAN	2"	Turf Rotor	99.68	53.8	56.7	0.66 in/h
A-14	Rain Bird PESB-NP-HAN	1"	Bubbler	14	35.7	38.6	2.12 in/h
A-15	Rain Bird PESB-NP-HAN	1"	Turf Rotary	22.45	36.1	38.5	0.25 in/h
A-16	Rain Bird PESB-NP-HAN	1-1/2"	Turf Rotary	25.43	36.3	37.6	0.25 in/h
A-17	Rain Bird PESB-NP-HAN	1"	Bubbler	21.5	36.0	37.4	1.94 in/h
A-18	Rain Bird PESB-NP-HAN	2"	Turf Rotary	71.9	36.0	37.4	0.5 in/h
A-19	Rain Bird PESB-NP-HAN	1"	Bubbler	23	36.4	37.2	1.96 in/h
A-20	Rain Bird PESB-NP-HAN	2"	Turf Rotary	76.35	36.1	37.0	0.5 in/h
A-21	Rain Bird PESB-NP-HAN	1-1/2"	Turf Rotor	53.28	51.2	51.7	0.77 in/h
A-22	Rain Bird PESB-NP-HAN	2"	Turf Rotor	58.42	53.0	54.4	0.75 in/h
A-23	Rain Bird PESB-NP-HAN	1"	Bubbler	22	36.1	37.8	1.88 in/h
A-24	Rain Bird PESB-NP-HAN	2"	Turf Rotary	73.19	36.3	37.9	0.5 in/h
A-25	Rain Bird PESB-NP-HAN	1"	Bubbler	22	36.0	37.9	1.88 in/h
A-26	Rain Bird PESB-NP-HAN	1-1/2"	Turf Rotary	25.16	36.1	38.0	0.24 in/h
A-27	Rain Bird PESB-NP-HAN	2"	Turf Rotary	73.29	35.9	37.9	0.5 in/h
A-28	Rain Bird PESB-NP-HAN	1"	Turf Rotary	6.68	33.8	35.6	0.24 in/h
	Cap for future use		Cap (as indicated for future use)	110	60	64.9	N/A

Michael Flaugh

Digitally signed by Michael Flaugh
Date: 2024.04.29 15:48:35 -04'00'

PSL Project nr: P24-010
100% Plans

Scale:	1" = 20'
Design Date:	01-12-2024
Drawn By:	RT
Last Date: Modified	05-01-2024

Revisions: 1 2 3 4 5 6

GENERAL SPECIFICATIONS

Tom Mackie Blvd. Extension

Port St. Lucie, Florida

NORTH

REGISTERED LANDSCAPE ARCHITECT MICHAEL FLAUGH LA 6778 STATE OF FLORIDA

IR-10
of 10

Project #
2024-01-07_TMB