Development Review Committee

March 09, 2022 at 2:00 PM
In Person and via Zoom

Meeting location: **Howey-in the-Hills Town Hall**
101 N. Palm Ave., Howey-in-the-Hills, FL 34737

Join Zoom
Meeting: https://us06web.zoom.us/j/84994876091?pwd=aHRXUGpkLzM2ZGlLa2hzWHVYdlRPdz09
Meeting ID: 849 9487 6091 | **Passcode:** 216996

CALL TO ORDER
ATTENDANCE

NEW BUSINESS

1. Discussion: **Whispering Hills / Howey - Final Subdivision Plan Review**

PUBLIC COMMENTS
Any person wishing to address the Development Review Committee and who is not on the agenda is asked to speak their name and address. Three (3) minutes is allocated per speaker.

ADJOURNMENT

To Comply with Title II of the Americans with Disabilities Act (ADA):

Qualified individuals may get assistance through the Florida Relay Service by dialing 7-1-1. Florida Relay is a service provided to residents in the State of Florida who are Deaf, Hard of Hearing, Deaf/Blind, or Speech Disabled that connects them to standard (voice) telephone users. They utilize a wide array of technologies, such as Text Telephone (TTYs) and ASCII, Voice Carry-Over (VCO), Speech to Speech (STS), Relay Conference Captioning (RCC), CapTel, Voice, Hearing Carry-Over (HCO), Video Assisted Speech to Speech (VA-STS) and Enhanced Speech to Speech.

Howey Town Hall is inviting you to a scheduled Zoom meeting.
Topic: **DRC Meeting**
Time: **Mar 9, 2022 2:00 PM Eastern Time** (US and Canada)
Join Zoom Meeting
https://us06web.zoom.us/j/84994876091?pwd=aHRXUGpkLzM2ZGlLa2hzWHVYdlRPdz09

Meeting ID: **849 9487 6091**
Passcode: **216996**

Dial by your location
+1 312 626 6799 US (Chicago)
+1 646 558 8656 US (New York)
+1 301 715 8592 US (Washington DC)

Find your local number: https://us06web.zoom.us/u/k8kJSiuSQ

Please Note: In accordance with F.S. 286.0105: Any person who desires to appeal any decision or recommendation at this meeting will need a record of the proceedings, and that for such purposes may need to ensure that a verbatim record of the proceedings is made, which includes the testimony and evidence upon which the appeal is based. The Town of Howey-in-the-Hills does not prepare or provide this verbatim record. Note: In accordance with the F.S. 286.26: Persons with disabilities needing assistance to participate in any of these proceedings should contact Town Hall, 101 N. Palm Avenue, Howey-in-the-Hills, FL 34737, (352) 324-2290 at least 48 business hours in advance of the meeting.

TMH CONSULTING, INC.
Community Planning Services

TMHConsulting@cfl.rr.com
97 N. Saint Andrews Dr.
Ormond Beach, FL 32174
PH: 386.316.8426

MEMORANDUM

TO: Howey-in-the-Hills Development Review Committee
CC: J. Brock, Town Clerk
FROM: Thomas Harowski, AICP, Planning Consultant
SUBJECT: Whispering Hills Final Subdivision Plan
DATE: March 2, 2022

The applicant, Red Jacket Development has submitted an application for final subdivision plan approval for the Whispering Hills subdivision. The following comments are the planning comments based on the plans prepared by Unroe Engineering and dated 2/18/22.

1. The plan requirements listed in Section 4.05.21 have been provided.

2. Section 4.05.21 G requires that any subdivision name recorded in Lake County be differentiated from other subdivision names. Since this project started another development using the Whispering Hills name has begun development in the Leesburg area. We recommend the subdivision name be modified to Whispering Hills of Howey-in-the-Hills as the formal name to differentiate the two projects.

3. The phasing page is unclear. Distinct colors or patterns were proposed with a key on Page C2, but the colors or patterns were not applied. We assume the pump station and Tract C are part of phase one along with the screening wall, landscaping and lots designated as Phase 1, but the page needs to be clarified.

4. Why not add lots 62, 63, 93 -95, 114-116 and 121 to Phase 1 since the streets and utilities to support these lots will be constructed as part of Phase 1.

5. Are lots 117 through 120 intended as Phase 1 or Phase 2?

6. The swales proposed for Lots S 1 through S 20 need some level of attention in the owner's documentation. Typically, owners will fill in swales once the house is built and they begin to hold water. The owners need to be advised that the swales are part of the drainage plan and environmental protection for the lake and wetlands and cannot be removed.

7. The street signs within the subdivision need to match the Town's sign standard. The County signs would only apply on Buckhill Road. Add a detail at D1/C10.

8. Sidewalks need to be a minimum of 5-feet wide. The detail on C-10 shows 4-foot sidewalks. This detail conflicts with other details and plans. To avoid any confusion the detail needs to be revised.

9. There is a detail from Andreyev Engineering on C-12. The detail dates from 2009. Is Unroe Engineering certifying this detail with their seal on the page?

10. The rear yard swale, detail 3/C12 shows a 3:1 slope on the back side of the swale. Is this too steep for rear yard application?

11. Is the property owners' association maintaining the streetlights? The Town has adopted the Duke Energy Sanibel fixture as its standard. The Sanibel fixture is similar to proposed fixture. The applicant may wish to consider converting the project to the Town's standard fixture design.

12. Please add a standard street tree typical design showing the Town's requirements to include street trees on each lot between 5-feet and 8-feet from the edge of the right of way. and a minimum of three canopy trees for each lot. Reference Section 7.08.01 for specifics. Also note that each lot will meet the other standards of this section with documentation provided when construction plans are submitted.

13. The open space and park tracts needs some improvement. Suggestions are:

    a. Tract A: Add a couple of shade trees and a bench. This tract also shows some tree removal in the area designated as open space. If there is no conflict with grading, these trees should remain.
    b. Tract B: Add some shade trees.
    c. Tract C: Add shade trees around the walking path. Some trees such as maple trees are fast growing and would add elements of shade for anyone using the walking trail for access.
    d. Tract I: The tract table shows landscaping as included but none is provided. Again, shade trees need to be added. A couple of benches would help as well.

14. There is no specification as to what landscape treatment is provided in open space areas, park areas and buffers other than the trees and shrubs as noted. Is sod to be provided? If so, this needs to be noted on the landscape plans. If not, what is proposed other than bare earth?

15. The tract table shows tracts D-1 through D-4 as being dedicated to the Town. These are proposed as private streets and the roads need to be dedicated to the property owners' association.

16. Tract E, the mail area is shown as being dedicated to the Town. Again, this dedication needs to be to the property owners' association.

GRIFFEY ENGINEERING, INC.

Whispering Hills Construction Plans – 1st Submittal
Engineering Review Comments
Page 1

1. The water system calculations need to be revised and resubmitted. The analyzed system needs to include the proposed offsite water mains up to the tie-in points on the town's system. The pressures at the tie-in should be those from the flow test provided by the town. The analysis needs to identify locations where booster pumps and pressure reducing valves will be needed.

2. Provide a hydraulic analysis of the reclaimed system.

3. What is the water source for the reclaimed system? Sheets C1 & C2 call out an irrigation pump system at the end of the cul-de-sac. Sheet C8 calls out a supply well in Tract H. Provide details & specifications for the supply source.

4. The lift station needs to meet the town's standard detail and construction specifications manual. The pumps need to be Hydromatic with recessed impellers and capable of passing 3" solids. The station needs to be equipped with a SCADA system and back-up power generation.

5. The project will need to coordinate with the power company to bring 3 phase power to the lift station.

6. Based on the design calculations for the tie-in lift station (Venezia LS#2), the excess capacity for additional inflow is 122 GPM (326 GPM pump capacity less 204 GPM peak inflow). This project is proposing a discharge into the station of 150 GPM. This lift station needs to be field tested for its current operating condition and to determine if sufficient excess capacity exists, or if pump upgrades are needed.

7. Provide a detail of the force main tie in to the existing lift station. Locate and identify all existing influent lines (sizes & inverts) to avoid conflicts.

8. The project will need to conduct a title search to verify the status of Greenbriar Avenue and/or secure an easement from the Lake County School Board for the force main going from Lakeshore Dr. to the lift station.

9. The offsite improvements (utilities & sidewalk) should be prepared as a drawing set separate from the subdivision. Provide a profile view of the off-site utilities. The routes for the offsite utilities need to be field surveyed including underground (horizontal) utility locates.

10. How will drainage be handled at the connection to N. Buckhill? Provide an intersection improvement plan that addresses stormwater, utilities, and traffic control.

11. Coordinate with Lake County regarding the traffic control condition at the intersection

of N. Buckhill and the northern entrance. The town's recommendation is an all-way stop control.

12. The project may need to dedicate additional right-of-way along N. Buckhill Road to meet minimum county standards. Show on the layout plan the required right-of-way line. The sidewalk needs to be within the right-of-way, the landscape buffer behind it.

13. The plans need to incorporate the town's standard details.

14. The minimum potable water main size is 6".

15. Add a note that gate valves are not to be placed in curb lines or in curb ramps. Adjust the depiction of the valves on the plans to show them outside of curbs and curb ramps.

16. The irrigation mainline plan from the landscape architect is inconsistent with the engineering plans. The reclaimed water main needs to be a single line within the right-of-way on the opposite side of the potable water main (not two parallel lines behind the right-of-way in an easement on the lots.

17. What is the purpose of the driveway at the end of the cul-de-sac near Lot S1? If it is to provide access to the dock, marina & boardwalk, then some vehicle parking should be provided.

18. Identify on the plans the locations where sidewalks are to be constructed with the subdivision construction.

19. Where sidewalks are being constructed, the area between the back of curb and the sidewalk will be fully sodded.

20. Provide ADA curb ramps & crosswalks on all legs of intersections. Crosswalks are to be per FDOT Design Standards 2017-18 Index 17346 Sheet 12 of 17. The crosswalks at stop conditions should be standard crosswalks. The crosswalks not at a stop condition should be special emphasis. All curb ramps are to be installed with the subdivision construction.

21. Why is there a pond liner in the wet detention pond?

22. Call out manhole (storm & sanitary) rims & inverts on the road profiles. Call out the reclaimed lines in the plan view.

23. Provide a vehicle turning evaluation to ensure that turned-away vehicles (cars & delivery trucks) can successfully navigate the route.

24. Provide dimensions & striping for the parking area near Lot 1.

25. Some back-to-back lots have up to an 18' Finish Floor Elevation difference. It is unlikely that the proposed rear lot swales will be effective and will probably be a maintenance problem. Provide full block cross-sections (road CL to road CL) demonstrating how the lots and building pads will be graded to provide maintenance-free drainage.

26. The grading plan needs to show on each lot the area that will be graded level for the building pads, including decks and swimming pools. The plan needs to address how steep slopes and grade changes will be managed.

27. Practical maintenance access needs to be provided for Swales 1-4.

28. Provide an exhibit for review that shows the trees to be protected and removed imposed over the proposed grading plan.

Additional comments may be added to these with the reviews of subsequent submittals.

FINAL CONSTRUCTIN PLANS FOR WHISPERING HILLS

Howey–in–the–Hills, Florida

PROJECT DESCRIPTION (PROPOSED IMPROVEMENTS)

- CONSTRUCTION OF A NEW 156 LOT RESIDENTIAL SUBDIVISION WITH CONNECTION TO PUBLIC SEWER AND WATER

FLOOD CERTIFICATE:

- ZONE "X" & "AE" PER FLOOD INSURANCE RATE MAP (FIRM) COMMUNITY PANEL NO. 12069C0485E, dated:12/18/2012

BEARING BASIS

- THE COORDINATE AND BEARING STRUCTURE FOR THIS SURVEY IS BASED ON FLORIDA STATE PLANE COORDINATE SYSTEM, EAST ZONE, NORTH AMERICAN DATUM OF 1983 (NAD83), 1990 ADJUSTMENT. HORIZONTAL CONTROL STATION UTILIZED WAS NATIONAL GEODETIC SURVEY (NGS) FIRST (1ST) ORDER CONTROL STATION "LC 06".

General Notes:
1. Stormwater Retention Areas to be Owned & Maintained by HOA.
2. All Streets are Private. Private Streets are in Tract "D"
3. All signage shall comply with City Codes
4. Electrical Power will be provided by underground service.
5. All Recreation and Landscape Tracts shall be maintained by HOA.
6. All sidewalks not fronting single family lots and all sidewalk ramps shall be installed during road construction.
7. All extra recreational area improvements are shown for reference. Actual implementation is contingent upon results of a market study.
8. Based upon the results of market research to be done, the developer may elect to replace traditional telephone, cable, and internet services with a multi-purpose fiber optic service.

Utility Contacts

Drinking Water
Howey–in–the–Hills
101 N Palm Ave
Howey–in–the–Hills, Fl 34737
Ph (352) 324–2264

Sewage Disposal
Howey–in–the–Hills
101 N Palm Ave
Howey–in–the–Hills, Fl 34737
Ph (352) 324–2264

Garbage Disposal
Howey–in–the–Hills
101 N Palm Ave
Howey–in–the–Hills, Fl 34737
Ph (352) 324–2264

Fire Protection
Lake County Fire Rescue
315 W Main Street
Tavares, Florida 32778
Ph (352) 343–9458

Electric
Sumter Electric
330 S US Highway 301
Sumterville, Florida 33585
Ph (352) 357–5600

Communications Options
Phone
Sprint
PO Box 770339
Winter Garden, Florida 34777
Ph (407) 814–5246
Fx (407) 814–5320

Cable
Spectrum
1670 E Highway 50 Suite D
Clermont, Florida 34711
Ph (352) 394–5541

Fiber Optic
Centurylink
33 N Main Street
Winter Garden, Florida
Ph (407) 814–5271

Description: Project Limits
A portion of Government Lots 5 and 6, in Section 36, Township 20 South, Range 25 East, Lake County, Florida,

more particularly described as follows:

Commence at the Southwest corner of the Southeast ¼ of Section 36, Township 20 South, Range 25 East, Lake County, Florida; thence coincident with the South Boundary of said Southeast ¼, S 89°50'08" E a distance of 32.76 feet to a point on the East Right–of–way Boundary of Buckhill Road per OSPREY HEIGHTS–PHASE 1A, as recorded in Plat Book 33, Page 66 of the public records of Lake County, Florida, said point being the POINT OF BEGINNING; thence departing said South Boundary, coincident with said East Right–of–way Boundary and the Northerly extension thereof, N 00°36'32" E a distance of 2184.33 feet; thence N 47°09'43" E a distance of 28.30 feet; thence N 31°02'11" E a distance of 24.81 feet; thence N 86°55'48" E a distance of 40.31 feet; thence N 55°05'08" E a distance of 38.19 feet; thence S 71°01'20" E a distance of 52.29 feet; thence N 64°09'46" E a distance of 61.62 feet; thence S 79°41'54" E a distance of 70.94 feet; thence N 60°39'33" E a distance of 110.96 feet; thence N 36°52'01" E a distance of 91.94 feet; thence N 13°52'52" W a distance of 29.71 feet; thence N 14°17'52" W a distance of 61.64 feet; thence N 06°23'22" E a distance of 30.93 feet; thence N 16°45'59" E a distance of 28.88 feet; thence S 86°22'27" E a distance of 91.79 feet; thence N 45°57'51" E a distance of 66.74 feet; thence S 55°54'12" E a distance of 29.18 feet; thence S 70°43'29" E a distance of 52.36 feet; thence N 89°10'11" E a distance of 183.00 feet; thence N 82°49'33" E a distance of 87.24 feet; thence N 69°29'41" E a distance of 52.88 feet; thence S 00°53'22" W a distance of 108.93 feet to a point coincident with a non–tangent curve concave to the Southwest, said curve having a radius of 46.00 feet, a delta angle of 38°39'48" and being subtended by a chord bearing S 56°23'48" E for a distance of 30.46 feet; thence coincident with the arc of said curve a distance of 31.04 feet; thence S 70°02'13" E a distance of 36.99 feet; thence N 66°26'02" E a distance of 104.12 feet; thence N 16°19'52 E a distance of 108.8 feet, more or less, to the waters edge of Little Lake Harris; thence Southerly coincident with the waters edge of Little Lake Harris to the Northeast corner of the lands described in Official Records Book 1775, Page 275 of the Public Records of Lake County, Florida; thence departing said waters edge, coincident with the North Boundary of said lands for the following five (5) courses: 1.) N 84°17'12" W a distance of 269.90 feet; 2.) thence N 88°21'36" W a distance of 293.43 feet; 3.) thence S 89°30'46" W a distance of 224.96 feet; 4.) thence S 84°47'04" W a distance of 179.68 feet; 5.) thence N 89°13'45" W a distance of 421.93 feet to a point on the West Boundary of said lands; thence departing said North Boundary, coincident with said West Boundary, S 09°31'29" W a distance of 636.42 feet to a point on the aforementioned South Boundary of the Southeast ¼ of said Section 36; thence coincident with said South Boundary, N 89°51'03" W a distance of 112.96 feet to the POINT OF BEGINNING.

Containing an area of 2651920.89 square feet, 60.880 acres more or less.



Location Plan

STR – 36/20/25	Scale: N.T.S
Alt Key: 3564219	

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---	Boundary Survey	
---	Project Limits Survey	
---	Topographic Survey	

Development Information

Gross Acreage	60.88 ac (2,651,933 sf)
Wetlands Area	1.25 ac (54,355 sf)
Net Acreage	59.63 Ac (2,597,578 sf)
Current Zoning	MDR-2
Future Land Use	Medium Density Residential
Maximum Density	4.0 DU/net acreage
Proposed Lakefront	20 Lots
Proposed Pond Front	8 Lots
Proposed Standard	128 Lots
Total Number of lots	156 Lots
Proposed Density	2.62 DU/Net Acre
Minimum Lot Area	9,000 sf
Minimum Lot Width	75' minimum
Code Min. Living Area	1,200 sf (Under Heat & Air) Plus 400 sf Min Garage
Developer intention	2,500 sf (average)
Maximum Height	35' feet (2.5 stories)
Max ISR	0.50
Minimum Setbacks	
Front:	25'
Rear:	25'
Side:	12.5'
Side Street:	12.5'
Phasing	Multi-Phase Project
Open Space	25% Required open space
Project Traffic	1,474 Avg daily trips
Projected School Age Population	156 units x 0.404 = 63 students
Stormwater Management	Provide Retention system per City & SJRWMD Regulations
100 yr Flood	Flood zone X & AE Per 12069C0485E, dated:12/18/2012
Projected Fire Flow	Final fire flow provided to site to be determined by final design of off-site water distribution system
Utilities	
Sewer:	Howey-in-the-Hills
Water:	Howey-in-the-Hills

Open Space Calculation
Required 25% of Gross land Area - 15.22 Ac

Provided Open Space

Category	Area
Recreation Tracts	1.58 Ac
Stormwater Tract	9.18 Ac
Wetlands area	1.25 Ac
Open Space in ROW	2.55 Ac
Landscape Buffers	1.17 Ac
Common Open Space	15.73 Ac (25.8%)
Lot Open Space	18.92 Ac
Total Open Space	34.65 Ac (56.9%)

Impervious Areas

Lots 37.84 Ac @ 50%	18.92 Ac
Roads (9,592 lf)	5.28 Ac
Entry Tract	0.27 Ac
Walks (5' Wide)	1.76 Ac
Total Impervious	26.23 Ac (43.1%)
Open Space	34.65 Ac (56.9%)
Total	60.88 Ac (100.0%)

Civil Engineer:
Darcy Unroe PE
Unroe Engineering, Inc
PO Box 690942
Orlando, Florida 32869
Ph (407) 299–0650
Darcy@UnroeEngineering.com

Owner:
Whispering Hills Unified Land Trust and Its Beneficiaries:
Whispering Hills Florida, LLC & Whispering Shores Florida, LLC & Bredco Development Group, each in its capacity as trustee
625 Waltham Road
Orlando, Florida 32809
Ph 407 855–1136
Contact Lawrence White

Surveyor:
SurvTech Solutions, Inc
10220 US Highway 92E
Tampa, Florida 33610
Ph (813) 621–4929
fx (813) 621–7194
Contact: David O'Brien Jr

Developer:
Red Jacket Development Group
625 Waltham Ave
Orlando, Florida 32809
Ph 407 855–1136
Fx 407 851–2226
Contact: Clay Frankel

Geotechnical Engineer:
Andreyev Engineering, Inc
1170 W Minneola Ave
Clermont, Fl 34711
Ph 352–241–0508
Fx 352–241–0977

Environmentalist:
Modica and Associates, Inc
302 Mohawk Street
Clermont, Florida 34711
Ph 352–394–2000
Fx 352–394–1159
Contact: Jim Modica

Revisions	#	Date	Description

Revisions	#	Date	Description

Unroe Engineering, Inc
Civil Engineering/Planning/Scientific Evaluation
PO Box 690942, Orlando, Florida 32869-0942
Business Authorization Number - EB 00006579 ph (407) 299-0650

DARCY UNROE LICENSE No 60929 STATE OF FLORIDA PROFESSIONAL ENGINEER

Darcy Unroe PE 60929

COV

G - General

G1. These notes shall apply to all work in this set of drawings.
G2. It will be the responsibility of the contractor(s) to insure that all required permits are obtained and are in hand at the job site prior to the commencement of construction. Contractors shall abide by all conditions contained therein. It is the contractors sole responsibility to ensure that all construction is in accordance with local agencies codes, regulations and requirements.
G3. Prior to commencement, the contractor shall provide a construction schedule for various site work elements so that site visits may be coordinated.
G4. Contractor shall furnish the owner with accurate certified record drawings showing all as-constructed work at the of completion of construction. The surface water system shall include elevations and dimensions of control structures, weirs, inverts, manholes and volumes in storage ponds. Water and sewer system shall include location of all piped utilities, appurtenances and devices, elevations of manhole inverts, tops and pipe crossings. Drawings shall be certified by a Florida-registered land surveyor.
G5. Structure elevations controlling water levels shall be built to 1/8"± (0.01 ft); inverts and water control elevations shall be built to 1/4"± (0.02 ft). Assigned volumes are absolute minimums. All other tolerances shall be built to local jurisdiction or industry standards.
G6. The locations of all existing utilities and storm drainage shown on plans have been field verified to the best extent possible. However, it is the contractor's responsibility to verify the field locations of all underground utilities and to determine any possible conflicts prior to the start of any construction. Any delay or inconvenience to the contractor by the relocation of the various utilities shall be incidental to the contract and no extra compensation is allowed.
G7. The contractor shall immediately notify the engineer of any discrepancies found between the drawings and the field conditions prior to construction in the area impacted by the conflict.
G8. In accordance with Florida Law (553.851) the contractor must notify the gas or other utility a minimum of 48 hours and a maximum of five days prior to excavation. (Excluding weekends).
G9. All requirements and recommendations of inspection personnel other than the owner's shall be reported to the engineer/owner prior to implementation. Compensation will not be allowed for work which is not authorized by the engineer/owner in writing.
G10. All work shall be open to and subject to inspection by authorized personnel of the utility companies, project engineer and regulatory agencies.
G11. Contractor shall notify all appropriate utility companies and water management agencies of proposed start up.
G12. Contractor shall stake all improvements using the centerline, building dimensions and pond dimensions. Contractor shall confirm the building dimensions with the drawings prior to stakeout. It is the contractors sole responsibility to completely stake and check all improvements to ensure adequate positioning, both horizontal and vertical, including minimum building setbacks prior to the installation of any improvement. Any conflicts shall be brought to the attention of the EOR prior to construction
13. All work on public right-of-away shall comply with FDOT applicable indexes and all local jurisdiction regulations. Disturbed areas shall be compacted to design density and sodded. Signs and barricades per FDOT and Manual of Uniform Traffic Control Devices.
G14. All sidewalks and curb cuts shall be installed to meet the requirements of the ADA and Florida Accessibility Code. Specifically, no running slopes greater than 5.0% and not cross slopes greater than 2.0%. All curb ramps shall be constructed per standard FDOT indexes unless specifically noted otherwise.
G15. Compact all utility trenches within the top 2' of the roadway to 98% of the modified proctor density (AASHTO T-180). All other fill shall be compacted to 95% of maximum density.
G16. Recommendations of the Geotechnical Report are made part of the specifications and notations and shall be followed carefully. A copy of the report may be obtained from the Owner or Engineer.
G17 The concrete compressive strength for curb, gutter and flatwork shall be 3000 psi at 28 days (FDOT Class I). Provide concrete test cylinders and documentation.
G18. The contractor shall reference and restore property corners and land markers disturbed during construction (under the direction of a Florida registered land surveyor).
G19. All property affected by this work shall be restored to a condition equal to or better than existed unless specifically exempted by the plans. The cost for such restoration shall be incidental to other construction and no extra compensation will be allowed.
G20. Roadway markings and striping to be installed in accordance with FDOT index #17345 and local jurisdiction standards. Striping shall be coordinated with local jurisdiction standards.
G21. If seal coat is required on new pavement, temporary striping will be required until seal coat is applied (90 day curing time is required.)
G22. Prior to implementation, the contractor shall prepare a maintenance of traffic plan. The MOT plan shall conform to FDOT and local jurisdiction standards.

EXISTING UTILITIES
THE LOCATIONS OF ALL EXISTING UTILITIES SHOWN ON THE PLANS HAVE BEEN DETERMINED FROM THE BEST INFORMATION AVAILABLE AND ARE GIVEN THE CONVENIENCE OF THE CONTRACTOR THE ENGINEER ASSUMES NO RESPONSIBILT Y FOR THEIR ACCURACY. PRIOR TO THE START OF ANY CONSTRUCTION ACTIVITY, IT SHALL BE THE CONTRACTOR' S RESPONSIBILITY TO NOTIFY THE VARIOUS UTILITIES AND TO MAKE THE NECESSARY ARRANGEMENTS FOR ANY RELOCATIONS TO THESE UTILITIES WITH THE OWNER OF THE UTILITY. THE CONTRACTOR SHALL EXERCISE CAUTION WHEN CROSSING AN UNDERGROUND UTILITY, WHETHER SHOWN ON THE PLAN OR LOCATED BY THE UTILITY COMPANY. ALL UTILITIES THAT INTERFERE WITH THE PROPOSED CONSTRUCTION SHALL BE RELOCATED BY THE RESPECTIVE UTILITY COMPANY AND THE CONTRACTOR SHALL COOPERATE WITH THEM DURING RELOCATION OPERATIONS. ANY DELAY OR INCONVENIENCE CAUSED TO THE CONTRACTOR BY THE RELOCATION OF VARIOUS UTILITIES SHALL BE INCIDENTAL TO THE CONTRACT, AND NO EXTRA COMPENSATION WILL BE ALLOWED.

DRAINAGE SYSTEMS
THE CONTRACTOR SHALL PERFORM ALL WORK PERTAINING TO DRAINAGE INCLUDING EXCAVATION OF STORMWATER POND PRIOR TO THE COMMENCEMEN TOF OTHER WORK INCLUDED IN THESE PLANS. THE DRAINAGE FACILITIES SHALL BE MAINTAINED BY THE CONTRACTOR DURING THE COURSE OF THIS CONTRACT. THE CONTRACTOR SHALL INCLUDE FUNDS IN THE DRAINAGE COSTS OF THE CONTRACT TO OPERATE AND MAINTAIN THE DRAINAGE SYSTEMS DURING THE WORK PROCESS. ANY REQUIRED DE-SILTING OF THE STORMWATER MANAGEMENT SYSTEM SHALL BE COMPLETED PRIOR TO FINAL APPROVAL BY EOR

PERMITS AND PERMIT REQUIREMENTS
THE CONTRACTO RSHALL OBTAIN FROM THE OWNER COPIES OF ALL REGULATOR YAND LOCAL AGENCY PERMITS. THE CONTRACTOR SHALL BE EXPECTED TO REVIEW AND ABIDE BY ALL THE REQUIREMENT S AND LIMITATIONS SET FORTH IN THE PERMITS. A COPY OF THE PERMIT SHALL BE KEPT ON THE JOB AT ALL TIMES.

LAYOUT AND CONTROL
UNLESS OTHERWISE NOTED ON THE PLANS, THE CONTRACTOR SHALL PROVIDE FOR THE LAYOUT OF ALL THE WORK TO BE CONSTRUCTED. BENCHMARK INFORMATION SHALL BE PROVIDED TO THE CONTRACTOR BY THE OWNER OR OWNER'S SURVEYOR. ANY DISCREPANCIES BETWEEN FIELD MEASUREMENTS AND CONSTRUCTION PLAN INFORMATION SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.

QUALITY CONTROL TESTING REQUIREMENTS
ALL TESTING RESULTS SHALL BE PROVIDED TO THE OWNER/OPERATOR AND THE ENGINEER. TESTING REQUIREMENT SARE TO BE IN ACCORDANC EWITH THE OWNER/OPERATOR 'SSPECIFICATION SAND REQUIREMENTS A LL TEST RESULTS SHALL BE PROVIDED (PASSING AND FAILING) ON A REGULAR AND IMMEDIATE BASIS. CONTRACTOR SHALL PROVIDE TESTING SERVICES THROUGH A FLORIDA LICENSED GEOTECHNICA LENGINEERING FIRM ACCEPTABL ETO THE OWNER AND THE ENGINEER. CONTRACTOR TO SUBMIT TESTING FIRM TO OWNER FOR APPROVAL PRIOR TO COMMENCING TESTING.

SHOP DRAWINGS
SHOP DRAWINGS AND CERTIFICATION SFOR ALL STORM DRAINAGE, WATER SYSTEM, SEWER SYSTEM AND PAVING SYSTEM MATERIALS AND STRUCTURES ARE REQUIRED. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL PRIOR TO ORDERING THE MATERIALS REQUIRED FOR CONSTRUCTION.

EARTHWORK
EARTHWORK QUANTITIES
THE CONTRACTO RSHALL PERFORM HIS OWN INVESTIGATION SAND CALCULATION SAS NECESSARY TO ASSURE HIMSELF OF EARTHWORK QUANTITIES. THERE IS NO IMPLICATION THAT EARTHWORK BALANCES, AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY IMPORT FILL NEEDED, OR FOR REMOVAL AND DISPOSAL OF EXCESS MATERIALS.

EROSION CONTROL
EROSION AND SILTRATION CONTROL MEASURES ARE TO BE PROVIDED AND INSTALLED PRIOR TO COMMENCEMENT OF CONSTRUCTION. IT IS THE SITE CONTACTORS RESPONSIBILITY TO OBTAIN FDEP NPDES NOI PRIOR TO ANY EARTHMOVING ACTIVITIES. THESE MEASURES ARE TO BE INSPECTED BY THE CONTRACTOR ON A REGULAR BASIS AND ARE TO BE MAINTAINED OR REPAIRED ON AN IMMEDIATE BASIS AS REQUIRED. REFER TO WATER MANAGEMEN TDISTRICT PERMIT FOR ADDITIONAL REQUIREMENTS FOR EROSION CONTROL AND SURFACE DRAINAGE. ALL AREAS DISTURBED DURING CONSTRUCTION SHALL BE STABILIZED WITH SOD WITHIN 7 DAYS OF COMPLETION OF CONSTRUCTION. SOD SHALL BE THE SAME VARIETY OF EXISTING SOD LIMITS OF DISTURBANCE.

LIMITS OF DISTURBANCE
AT NO TIME SHALL THE CONTRACTOR DISTURB SURROUNDING PROPERTIES OR TRAVEL ON SURROUNDING PROPERTIES WITHOUT WRITTEN CONSENT FROM THE PROPERTY OWNER. REPAIR OR RECONSTRUCTIO NOF DAMAGED AREAS ON SURROUNDIN GPROPERTIES SHALL BE PERFORMED BY THE CONTRACTOR ON AN IMMEDIATE BASIS. ALL COSTS FOR REPAIRS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND NO EXTRA COMPENSATIONS HALL BE PROVIDED. GRADING AND/OR CLEARING ON PROPERTIE SOTHER THAN SHOWN ON THE APPROVED PLANS IS PROHIBITED.

TREE REMOVAL
THE CONTRACTO RSHALL NOTIFY THE OWNER AND THE ENGINEER WHEN ALL WORK IS LAID OUT (SURVEY STAKED), SO THAT A DETERMINATION MAY BE MADE OF SPECIFIC TREES TO BE REMOVED. NO TREES ON THE CONSTRUCTIO NPLANS AS BEING SAVED SHALL BE REMOVED WITHOUT PERMISSION FROM THE OWNER AND ENGINEER.

CLEARING AND GRUBBING
THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEARING AND GRUBBING FOR SITE CONSTRUCTION INCLUDING CLEARING FOR PAVING, UTILITIES, DRAINAGE FACILITIES AND BUILDING CONSTRUCTION. ALL AREAS TO BE CLEARED SHALL BE FIELD STAKED AND REVIEWED BY THE OWNER AND/OR ENGINEER PRIOR TO ANY CONSTRUCTION.

MATERIAL STORAGE/DEBRIS REMOVAL
1. NO COMBUSTIBLE BUILDING MATERIALS MAY BE ACCUMULATED ON THE SITE AND NO CONSTRUCTION WORK INVOLVING COMBUSTIBLE MATERIALS MAY BEGIN UNTIL INSTALLATION OF ALL REQUIRED WATER MAINS AND FIRE HYDRANTS HAVE BEEN COMPLETED, DEP APPROVAL RECEIVED FOR THE WATER MAINS, AND THE HYDRANTS ARE IN OPERATION. CONSTRUCTION WORK INVOLVING NON-COMBUSTIBLE MATERIALS, SUCH AS CONCRETE, MASONRY AND STEEL MAY BEGIN PRIOR TO THE FIRE HYDRANTS BEING OPERATIONAL.
2. ALL MATERIA LS EXCAVATED SHALL REMAIN THE PROPERTY OF THE OWNER AND SHALL BE STOCKPILED AT ON-SITE LOCATIONS AS SPECIFIED BY THE OWNER .MATERIALS SHALL BE STOCKPILED SEPARATEL YAS TO USABLE (NON-ORGANIC) FILL STOCKPILES AND ORGANIC (MUCK) STOCKPILES IF MUCK IS ENCOUNTERED C. ONTRACTO RSHALL BE RESPONSIBL EFOR THE REMOVAL OF ALL UNSUITABLE FILL MATERIALS FROM THE SITE. ALL CLAY ENCOUNTERED SHALL BE EXCAVATED OUT AND REPLACED WITH CLEAN GRANULAR FILL MATERIALS.

FILL MATERIAL
ALL MATERIALS SHALL CONTAIN NO MUCK, STUMPS, ROOTS ,BRUSH ,VEGETATIVE MATTER ,RUBBISH OR OTHER MATERIAL THAT WILL NOT COMPACT INTO A SUITABLE AND ENDURING BACKFILL .FILL SHALL BE CLEAN ,NON-ORGANIC G, RANULAR MATERIAL WITH NOT MORE THAN 10% PASSING THE NO. 200 SIEVE.

COMPACTION
FILL MATERIALS PLACED UNDER ROADWAYS SHALL BE COMPACTED TO AT LEAST 98% OF THE MAXIMUM DENSITY AS SPECIFIED IN AASHTO T-180. ALL OTHER FILL AREAS ARE TO BE COMPACTED TO AT LEAST 95% MAXIMUM DENSITY AS SPECIFIED IN AASHTO T-180. FILL MATERIALS SHALL BE PLACED AND COMPACTED IN A MAXIMUM OF 12" LIFTS. THE CONTRACTOR SHALL PROVIDE THE ENGINEER AND OWNER WITH ALL (PASSING AND FAILING) TESTING RESULTS. RESULTS SHALL BE PROVIDED ON A TIMELY AND REGULAR BASIS PRIOR TO CONTRACTOR'S PAY REQUEST SUBMITTAL FOR THE AFFECTED WORK.

PAVEMENT AND/OR ROAD AND RIGHT-OF-WAY WORK
GENERAL DESIGN INTENT
ALL PAVING SURFACES IN INTERSECTION SAND ADJACENT SECTIONS SHALL BE GRADED TO DRAIN POSITIVELY IN THE DIRECTION SHOWN BY THE FLOW ARROWS ON THE PLANS AND TO PROVIDE A SMOOTHLY TRANSITIONED DRIVING SURFACE FOR VEHICLES WITH NO SHARP BREAKS IN GRADE, AND NO UNUSUALLY STEEP OR REVERSE CROSS SLOPES. APPROACHES TO INTERSECTION SAND ENTRANCE AND EXIT GRADES TO INTERSECTION SWILL HAVE TO BE STAKED IN THE FIELD AT DIFFERENT GRADES THAN THE CENTERLINE GRADES TO ACCOMPLISH THE PURPOSES OUTLINED. IN ADDITION, THE STANDARD CROWN WILL HAVE TO BE CHANGED IN ORDER TO DRAIN POSITIVELY IN THE AREA OF INTERSECTIONS. IT IS THE CONTRACTOR' SRESPONSIBILIT YTO ACCOMPLISH THE ABOVE AND THE ENGINEER SHALL BE CONSULTED SO THAT HE MAY MAKE ANY AND ALL REQUIRED INTERPRETATION OSF THE PLANS OR GIVE SUPPLEMENTAR YINSTRUCTION TO ACCOMPLISH THE INTENT OF THE PLANS.

MATERIALS/CONSTRUCTION SPECIFICATIONS
MATERIALS AND CONSTRUCTION METHODS FOR THE ROADWAY CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE FLORIDA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION LATEST EDITION.

PAVEMENT SECTION REQUIREMENTS
CONSTRUCTION OF ROADWAY, SUBGRADE PREPARATION, AND PAVEMENT INSTALLATION SHALL CONFORM TO FDOT STANDARDS AND SOILS REPORT RECOMMENDATIONS UNLESS OTHERWISE NOTED IN THE CONSTRUCTION DOCUMENTS.

SIDEWALKS
SIDEWALKS ARE TO BE CONSTRUCTED IN THE AREA AS SHOWN ON THE CONSTRUCTION PLANS. SIDEWALK SHALL BE CONSTRUCTED OF 4 INCHES OF CONCRETE WITH A 28 DAY COMPRESSION STRENGTH OF 2500 PSI. JOINTS SHALL BE EITHER TOOLED OR SAWCUT AT A DISTANCE OF 5' LENGTHS, HANDICAPPED RAMPS SHALL BE PROVIDED AT ALL INTERSECTION SAND BE IN ACCORDANCE WITH STATE REGULATIONS FOR HANDICAP ACCESSIBILITY. ALL CROSS SLOPES SHALL BE LESS THAN 2.0% AND RUNNING SLOPES SHALL BE LESS THAN 5.0%

PAVEMENT MARKINGS/SIGNAGE
PAVEMENT MARKINGS AND SIGNAGE SHALL BE PROVIDED AS SHOWN ON THE CONSTRUCTION PLANS AND SHALL MEET THE REQUIREMENTS OF THE OWNER/OPERATOR. SIGNAGE SHALL BE IN CONFORMANC EWITH MUTCD (LATEST EDITION). A 48-HOUR PAVEMENT CURING TIME WILL BE PROVIDED PRIOR TO APPLICATION OF THE PAVEMENT MARKINGS. REFLECTIVE PAVEMENT MARKINGS SHALL BE INSTALLED IN ACCORDANCE WITH FDOT INDEX NO. 17352.

TRAFFIC CONTROL
WHERE APPLICABLE A MOT PLAN SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO COMMENCEMEN OTF WORK. A MINIMUM OF 2-WAY, ONE LANE TRAFFIC SHALL BE MAINTAINED IN THE WORK SITE AREA. ALL CONSTRUCTION WARNING SIGNAGE SHALL BE IN PLACE PRIOR TO COMMENCEMEN TOF CONSTRUCTION AND BE MAINTAINED THROUGHOU TCONSTRUCTION. ACCESS SHALL BE CONTINUOUSLY MAINTAINED FOR ALL PROPERTY OWNERS SURROUNDIN GTHE WORK SITE AREA. LIGHTED WARNING DEVICES ARE TO BE OPERATIONAL PRIOR TO DUSK EACH NIGHT DURING CONSTRUCTION.

CURBING
CURBING SHALL BE CONSTRUCTED WHERE NOTED ON THE CONSTRUCTION PLANS. CONCRETE FOR CURBS SHALL BE DEPARTMENT OF TRANSPORTATION CLASS "1" CONCRETE WITH A 28 DAY COMPRESSION STRENGTH OF 2500 PSI. ALL CURBS SHALL HAVE SAW CUT CONTRACTION JOINTS AND SHALL BE CONSTRUCTED AT INTERVALS NOT TO EXCEED 10'-0" ON CENTER. CONSTRUCTION OF CURBS SHALL BE IN CONFORMANCE WITH FDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION SECTION 520 AND DETAILS PROVIDED ON THE CONSTRUCTION PLANS.

ROW RESTORATION
ALL AREAS WITHIN THE RIGHT-OF-WAY SHALL BE FINISH GRADED WITH A SMOOTH TRANSITION INTO EXISTING GROUND. ALL SWALES SHALL BE STABILIZED IMMEDIATEL YAFTER FINAL GRADING. ALL DISTURBED AREAS SHALL BE RAKED CLEAN OF ALL LIMEROCK AND ROCKS AND SODDED AFTER FINAL GRADING IN ACCORDANCE WITH THE CONSTRUCTION PLANS PRIOR TO FINAL INSPECTION. ALL GRASSING (SOD) SHALL BE MAINTAINED BY THE CONTRACTOR UNTIL FINAL ACCEPTANCE BY THE OWNER/OPERATOR.

SITE ACCESS
ALL ACCESS TO THE JOB SITE FOR CONSTRUCTION AND RELATED ACTIVITIES SHALL BE BY EXISTING STREETS AND ROADS.

LANDSCAPING
PROVIDE MINIMUM 5' SEPARATION FROM UTILITIES AND TREES WITH INVASIVE ROOT SYSTEMS.

WATER PIPE MATERIALS
WATER SYSTEM SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER AND SHALL MEET THE LOCAL JURISDICTION MINIMUM REQUIREMENTS.

POLYVINYL CHLORIDE PLASTIC PIPE (PVC) 4" THROUGH 12" SHALL BE MANUFACTURED IN ACCORDANCE WITH ANSI/AWWA C900 (LATEST EDITION) AND SHALL HAVE A MINIMUM WORKING PRESSURE OF 150 PSI AND A DR (DIMENSION RATIO) OF 18. ALL PVC PIPE SHALL BEAR THE NSF LOGO FOR POTABLE WATER. JOINTS SHALL BE OF THE PUSH-ON TYPE AND COUPLINGS CONFORMING TO ASTM D3139, DR18 PIPE.

DUCTILE IRON PIPE (DIP) SHALL BE STANDARD PRESSURE CLASS 350 IN SIZES 4" THROUGH 12" AND CONFORM TO ANSI/AWWA C150/A21.50 (LATEST EDITION). ALL DUCTILE IRON PIPE SHALL HAVE A STANDARD THICKNESS OF CEMENT MORTAR LINING AS SPECIFIED IN ANSI/AWWA C104/A21.4 (LATEST EDITION). PIPE JOINTS SHALL BE OF THE PUSH-ON RUBBER GASKET TYPE CONFORMING TO ANSI/AWWA C111/A21.11 (LATEST EDITION).

PIPE DETECTOR WITH LOCATOR WIRE SHALL BE INSTALLED ON ALL WATER MAINS PER DETAIL. PIPE SIZES GREATER THAN 12" SHALL BE SEPARATELY SPECIFIED ON THE PLANS; WITH THICKNESS CLASSES TO BE SHOWN BASED ON WORKING PRESSURES, PIPE DEPTH AND TRENCH CONDITIONS F. ITTINGS FOR DUCTILE IRON PIPE AND PVC C-900 PIPE SHALL BE DUCTILE IRON AND SHALL CONFORM TO ANSI/AWWA C153/A21.10 (LATEST EDITION) AND SHALL BE CEMENT LINED IN CONFORMANCE WITH ANSI/AWWA C104/A21.4 (LATEST EDITION).

POLYETHYLEN EWRAP USED FOR CORROSION PREVENTION ON DUCTILE IRON PIPE SHALL CONFORM TO THE REQUIREMENT SOF ANSI/ASTM D1248. THE MINIMUM NOMINAL THICKNESS SHALL BE 0.008 IN. (8 MILS). INSTALLATION OF POLY WRAP SHALL BE IN ACCORDANCE WITH AWWA C105. TRANSMISSION MAIN SHALL BE DIP RATED FOR 250 PSI.

VALVES
GATE VALVES SHALL BE RESILIENT SEAT AND SHALL CONFORM TO ANSI/AWWA C509.87 WITH WRENCH NUT, EXTENSION STEMS AND OTHER APPURTENANCE SAS REQUIRED. MANUFACTURER 'SCERTIFICATIO NOF THE VALVES COMPLIANC EWITH AWWA SPECIFICATIO NC509 AND TESTS LISTED THEREIN WILL BE REQUIRED. VALVES SHALL BE CLOW, DRESSER, KENNEDY, AMERICAN.

AIR RELEASE VALVES
AIR RELEASE VALVES SHALL BE PLACED AT HIGH POINTS OF THE TRANSMISSION MAIN TO PERMIT ESCAPE OF TRAPPED AIR. THE VALVE SIZE, LOCATION AND METHOD OF INSTALLATIO NSHALL BE INDICATED ON THE DRAWINGS, OR AS DIRECTED BY THE ENGINEER. AIR RELEASEVALVES SHALL BE CRISPN PRESSURE AIR VALVE TYPE.

WATER SERVICES
UNLESS OTHERWISE NOTED IN THE PLANS, THE UTILITY COMPANY SHALL PROVIDE AND INSTALL WATER METERS. CONTRACTOR SHALL CONSTRUCT WATER SERVICE THROUGH THE CURB STOP AND SET METER BOXES TO FINISHED GRADE AS SHOWN ON THE WATER SYSTEM DETAIL SHEET.

POLYETHYLENE (PE) PRESSURE PIPE FOR WATER SERVICES 1/2" THROUGH 3" SHALL CONFORM TO AWWA C901.88,MIN. 200 PSI. AND SHALL BE PHILLIPS DRISCO CTS 5100 (DR-9) ASTM D-2737 ,200 PSI. ALL SERVICES SHALL INCLUDE THE FOLLOWING: LOCKING CURB STOPS, WYE BRANCHES, UNIONS AS REQUIRED, PE SERVICE PIPE AND CORPORATION STOPS. THE SERVICE SHALL BE COMPLETE THROUGH THE CURB STOP AS SHOWN ON THE DETAIL SHEET AND SHALL BE OF THE TYPE REQUIRED FOR COMPATIBILITY WITH THE SERVICE LINES SPECIFIED AND FITTINGS SHALL BE MANUFACTURED BY FORD.

WHERE APPLICABLE - UNLESS OTHERWISE NOTED IN PLANS, UTILITY COMPANY SHALL PROVIDE AND INSTALL IRRIGATION METERS. WHERE RECLAIM SERVICE IS NOT PROVIDED, CONTRACTOR SHALL CONSTRUC TIRRIGATION SERVICE THROUGH THE CURB STOP AND SET NEW BOXES TO FINISHED GRADE AS SHOWN ON THE WATER SYSTEM DETAIL SHEET.

PIPE INSTALLATION
PIPE INSTALLATIO NOF PVC WATER MAIN SHALL BE IN CONFORMANC EWITH ASTM D2774 (LATEST EDITION) .INSTALLATION OF DUCTILE IRON PIPE WATER MAIN SHALL BE IN CONFORMANCE WITH AWWA C600.87.

COMPACTED BACKFILL SHALL BE TO 98% MAXIMUM DENSITY AS DETERMINED BY AASHTO T-180 UNDER ALL PAVEMENTS WITH 12" MAXIMUM LIFT THICKNESS .OTHER COMPACTION OF BACKFILL SHALL BE TO 95% MAXIMUM DENSITY AS DETERMINED BY AASHTO T-180 WITH 12" MAXIMUM LIFT THICKNESS. SEE PIPE TRENCHING DETAILS.

MINIMUM COVER OVER ALL PIPE SHALL BE 36" FROM TOP OF PIPE TO FINISHED GRADE. SEE PLAN AND PROFILE SHEETS FOR REQUIRED DEPTH.

NEW OR RELOCATED, UNDERGROUND WATER MAINS SHALL BE LAID TO PROVIDE A HORIZONTAL DISTANCE OF AT LEAST SIX FEET, AND PREFERABLY TEN FEET, BETWEEN THE OUTSIDE OF THE WATER MAIN AND THE OUTSIDE OF ANY EXISTING OR PROPOSED GRAVITY- OR PRESSURE-TYPE SANITARY SEWER, WASTEWATER FORCE MAIN, OR PIPELINE CONVEYING RECLAIMED WATER NOT REGULATED UNDER PART III OF CHAPTER 62-610, F.A.C. THE MINIMUM HORIZONTAL SEPARATION DISTANCE BETWEEN WATER MAINS AND GRAVITY-TYPE SANITARY SEWERS SHALL BE REDUCED TO THREE FEET WHERE THE BOTTOM OF THE WATER MAIN IS LAID AT LEAST SIX INCHES ABOVE THE TOP OF THE SEWER. NEW OR RELOCATED, UNDERGROUND WATER MAINS CROSSING ANY EXISTING OR PROPOSED GRAVITY- OR VACUUM-TYPE SANITARY SEWER SHALL BE LAID SO THE OUTSIDE OF THE WATER MAIN IS AT LEAST SIX INCHES, AND PREFERABLY 12 INCHES, ABOVE OR AT LEAST 12 INCHES BELOW THE OUTSIDE OF THE OTHER PIPELINE. HOWEVER, IT IS PREFERABLE TO LAY THE WATER MAIN ABOVE THE OTHER PIPELINE. AT THE UTILITY CROSSINGS DESCRIBED ABOVE, ONE FULL LENGTH OF WATER MAIN PIPE SHALL BE CENTERED ABOVE OR BELOW THE OTHER PIPELINE SO THE WATER MAIN JOINTS WILL BE AS FAR AS POSSIBLE FROM THE OTHER PIPELINE. ALTERNATIVELY, AT SUCH CROSSINGS, THE PIPES SHALL BE ARRANGED SO THAT ALL WATER MAIN JOINTS ARE AT LEAST THREE FEET FROM ALL JOINTS IN VACUUM-TYPE SANITARY SEWERS, OR PIPELINES CONVEYING RECLAIMED WATER REGULATED UNDER PART III OF CHAPTER 62-610, F.A.C., AND AT LEAST SIX FEET FROM ALL JOINTS IN GRAVITY- OR PRESSURE-TYPE SANITARY SEWERS, WASTEWATER FORCE MAINS, OR PIPELINES CONVEYING RECLAIMED WATER NOT REGULATED UNDER PART III OF CHAPTER 62-610, F.A.C.

ALL WATER MAINS SHALL BE INSTALLED WITH CONCRETE THRUST BLOCKS.
ALL PLUGS, CAPS, TEES, BENDS, FIRE HYDRANTS, VALVES, ETC. SHALL BE MECHANICAL JOINT FITTINGS.

Item 1.

#	Revisions	Date
	Description	

#	Revisions	Date
	Description	

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Civil Engineering/Planning/Scientific Evaluation
PO Box 690942, Orlando, Fl 32869-0942
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Specifications & Notations

Whispering Hills Subdivision
Buckhill Road, Howey-in-the-Hills, Florida

DP	Drawn
DP	Checked
----	Scale
MM/DD/YY	Date
WH2-SPC	File

Dwg. No.
SPC

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DARCY UNROE LICENSE No 60929 STATE OF FLORIDA PROFESSIONAL ENGINEER

Darcy Unroe PE 60929

Possible Future Boardwalk Extension Connect to Sarah Marde Mason Park

5' Wide Boardwalk

Provide Man Gate

Proposed 48 slip marina

Existing Dock to be removed

Flood Zone AE

Irrigation Pump

Open Space Tract "F"

Soils: Swamp

Soils: Pompano

Flood Zone X

Soils: Tavares

Typical Soils Boundary

SLS Tract "H"

Walking trail on top bank of pond

Retention Tract "C"

Safe Upland Line 62.10' (NAVD 1988) per Richard Malloy, Bureau of State Lands, Tallahassee, Florida (As Supplied to SurvTech by Client)

Project Boundary

100 Yr Flood Elevation 63.90 NAVD88

Soils: Candler Sand

Soils: Lake Sand

LITTLE LAKE HARRIS
WATER ELEVATION 61.85' 8-11-05

New Sidewalk shall be constructed from entrance to Lakeshore Blvd. Coordinate with Lake County.

Mailboxes/ Open Space Tract "E"

SUCKHILL ROAD (CR 327) 66' ROW

LAKE SHORE BOULEVARD

Tract D1

Tract D2

Tract D3

Tract D4

Wetland Line per Land Planning Group (As Supplied)

Soils: Open Water

Soils: Candler Sand

Tract "G"

Tract D1

Open Space Tract "A"

Soils: Candler Sand

Tract D2

Tract D3

Tract D4

Flood Zone AE

Flood Zone X

BUCKHILL ROAD (66' ROW)

Tract D1

Open Space Tract "B"

N 89°13'45" W 421.93' (F)

S 84°47'04" W 179.68' (F)

S 89°30'46" W 224.96' (F)

N 84°21'36" W 293.43' (F)

N 84°17'12" W 269.90' (F)

S 09°31'59" W 636.42' (F)

N 00°40'52" E 1624.08' (F)

Scale: 1" = 120'

Legend

- Catch Basin
- Mitered End Section
- Manhole
- Cleanout
- Hydrant
- Ex. Elevation (× 100.00)
- New Pavement
- New Concrete
- Silt Fence
- Waterline
- Storm Sewer
- Sanitary Sewer
- New Elevation (• 100.00)

Project Boundary Line/Curve Table

Curve Information: Field

CURVE	RADIUS	ARC LENGTH	CHORD BEARING	CHORD LENGTH	DELTA ANGLE	TANGENT
C1	46.00'	31.04'	S 56°23'48" E	30.46'	38°39'48"	16.14'

Line Information: Field

LINE	BEARING	DISTANCE
L1	S 89°50'08" E	32.76'
L2	N 89°36'12" W	33.26'
L3	S 59°21'44" E	39.46'
L4	S 51°48'39" E	32.32'
L5	S 20°06'30" E	52.66'
L6	S 05°48'50" E	46.69'
L7	S 04°14'38" W	63.65'
L8	S 33°26'19" W	33.87'
L9	S 42°12'38" W	63.00'
L10	S 43°27'07" W	70.97'
L11	S 34°38'41" W	66.78'
L12	S 24°34'08" W	43.64'
L13	S 12°12'12" W	51.72'
L14	S 07°46'34" E	19.89'
L15	S 14°19'43" E	34.15'
L16	S 21°00'25" E	43.53'
L17	S 27°45'01" E	76.71'
L18	S 47°28'28" E	45.18'
L19	S 42°26'57" E	51.56'
L20	S 41°22'02" E	87.92'
L21	S 40°24'32" E	86.99'
L22	S 32°00'05" E	82.70'
L23	S 35°51'18" E	158.38'
L24	S 39°44'36" E	86.83'
L25	S 38°30'16" E	48.41'
L26	S 38°37'19" E	88.55'
L27	S 18°50'58" E	150.83'
L28	S 17°00'24" E	31.36'
L29	S 17°24'59" E	66.00'
L30	S 06°59'58" E	62.36'
L31	S 04°11'13" E	110.04'
L32	S 04°23'45" E	41.16'
L33	S 04°33'28" W	36.78'
L34	S 14°23'11" W	7.18'
L35	S 20°10'10" W	13.99'
L36	S 17°31'58" W	50.58'
L37	S 22°56'32" W	68.25'
L38	S 22°36'49" W	91.03'
L39	S 11°13'03" W	51.32'

Line Information: Field

LINE	BEARING	DISTANCE
L40	N 89°51'03" W	112.96'
L41	N 47°09'43" E	28.30'
L42	N 31°02'11" E	24.81'
L43	N 86°55'48" E	40.31'
L44	N 55°05'08" E	38.19'
L45	S 71°01'20" E	52.29'
L46	N 64°09'46" E	61.62'
L47	S 79°41'54" E	70.94'
L48	N 60°39'33" E	110.96'
L49	N 36°52'01" E	91.94'
L50	N 13°52'52" W	29.71'
L51	N 14°17'52" W	61.64'
L52	N 06°23'22" E	30.93'
L53	N 16°45'59" E	28.88'
L54	S 86°22'27" E	91.79'
L55	N 45°57'51" E	66.74'
L56	S 55°54'12" E	29.18'
L57	S 70°43'29" E	52.36'
L58	N 89°10'11" E	183.00'
L59	N 82°49'33" E	87.24'
L60	N 69°29'41" E	52.88'
L61	S 00°53'22" W	108.93'
L62	S 70°02'13" E	36.99'
L63	N 66°26'02" E	104.12'
L64	N 16°19'52" E	108.8'±
L65	S 72°51'43" E	22.57'

Line Information: Deed

LINE	BEARING	DISTANCE
L66	N 89°17'20" E	146.00'

Lot Characteristic Table

Lot	Frontage	Depth	Area (ac)	Building Envelope	Lot	Frontage	Depth	Area (ac)	Building Envelope	Lot	Frontage	Depth	Area (ac)	Building Envelope
1	80.9	102.4	0.2	60'x53'	60	75	148.4	0.27	50'X85'	119	75	163.5	0.28	50'X70'
2	80.4	114.9	0.22	50'X66'	61	75	115.2	0.23	50'X68'	120	114.7	164	0.28	45'X65'
3	79.2	120.5	0.23	55'X70'	62	75	120	0.23	55'X70'	121	75	151.1	0.27	50'X70'
4	85	121.2	0.24	60'X70'	63	82.5	120	0.22	55'X70'	122	75	139.8	0.25	50'X70'
5	75	121.1	0.23	50'X70'	64	108.2	120	0.28	50'X70'	123	75	132	0.23	50'X70'
6	75	121.1	0.21	50'X70'	65	82.9	139.2	0.21	45'X65'	124	75	127.6	0.22	50'X70'
7	75	121	0.21	55'X70'	66	82.8	119	0.2	45'X65'	125	75	127	0.22	50'X70'
8	75	120.8	0.21	50'X70'	67	82.8	119	0.2	45'X65'	126	75	0.27	0.22	50'X70'
9	75	120.8	0.21	50'X70'	68	82.8	119.1	0.2	45'X65'	127	75.1	127.7	0.22	50'X70'
10	75	120.8	0.21	50'X70'	69	89	119.7	0.21	45'X65'	128	75.1	127.7	0.22	50'X70'
11	75	120.7	0.21	50'X70'	70	84.6	120	0.22	50'X70'	129	75	128.4	0.22	50'X70'
12	75	120.6	0.21	50'X70'	71	75	120	0.21	50'X70'	130	75	125.9	0.22	50'X70'
13	75	120.5	0.21	50'X70'	72	75	120	0.21	50'X70'	131	75	123.4	0.21	50'X70'
14	75	120.5	0.21	50'X70'	73	75	120	0.21	50'X70'	132	75	122.8	0.21	50'X70'
15	75	120.4	0.21	50'X70'	74	75	120	0.21	50'X70'	133	75	123.1	0.21	50'X70'
16	75	120.3	0.21	50'X70'	75	75	120	0.21	50'X70'	134	75	123.1	0.21	50'X70'
17	75	120.2	0.21	50'X70'	76	108.5	120.1	0.25	50'X70'	135	75	123.4	0.21	50'X70'
18	75	120.1	0.21	50'X70'	77	116.5	120.3	0.27	50'X70'	136	75	123.6	0.22	50'X70'
19	75	120.1	0.21	50'X70'	78	82.5	120	0.22	50'X75'	51	101.8	210.6	0.4	70'X60'
20	85.8	120.1	0.23	60'x70'	79	75	120	0.21	50'X70'	52	105.4	202.6	0.4	65'X68'
21	75.2	125.9	0.23	50'X70'	80	83.1	120	0.22	50'X75'	53	137.4	202.6	0.45	75X85'
22	75.2	121.1	0.21	50'X70'	81	52.1	120	0.26	48'X68'	54	129	204.2	0.43	80'X55'
23	75	120.1	0.21	50'X70'	82	75	120	0.21	50'X70'	55	123.7	173.5	0.4	60'X55'
24	75	120.1	0.24	50'X65'	83	75	120	0.21	50'X70'	56	100	169.7	0.35	60'X40'
25	94.2	120	0.22	50'X68'	84	75	120	0.21	50'X70'	57	100	169.7	0.4	75'X50'
26	75	120	0.23	50'X70'	85	75	120	0.21	50'X70'	58	100	175.6	0.41	75'X50'
27	65	120.7	0.21	45'X70'	86	75	120	0.21	50'X70'	59	100	171.8	0.41	75'X50'
28	76.1	120	0.25	50'X70'	87	69.8	120	0.21	50'X70'	510	100	165.5	0.39	75'X50'
29	100	120	0.27	50'X70'	88	64.9	120	0.21	45'X65'	511	100	162	0.37	75'X45'
30	82.4	135	0.29	50'X85'	89	64.9	120	0.21	45'X65'	512	100	162	0.37	75'X45'
31	75	135	0.23	50'X85'	90	64.9	120	0.21	45'X65'	513	93.3	162.6	0.42	75'X40'
32	75	135	0.23	50'X85'	91	64.9	120	0.21	45'X65'	514	91.5	157.1	0.39	75'X40'
33	75	135	0.23	50'X85'	92	69.1	120	0.21	45'X65'	515	94.5	157.1	0.39	75'X40'
34	75	135	0.23	50'X85'	93	82.5	120	0.22	50'X75'	516	94.5	159.6	0.38	75'X40'
35	75	135	0.23	50'X85'	94	75	120	0.21	50'X70'	517	100.2	159.6	0.38	75'X40'
36	75	135	0.23	50'X85'	95	82.5	120	0.23	50'X75'	518	81	164.9	0.38	70'X35'
37	75	135	0.23	50'X85'	96	87.5	120	0.23	48'X68'	519	57.6	172.8	0.4	55'X45'
38	75	135	0.23	50'X85'	97	92.9	120	0.21	48'X68'	520	54	151.3	0.45	50'X70'
39	75	135	0.23	50'X85'	98	92.9	120	0.21	48'X68'	Subtotal	3,279 lf		11.87 Ac	
40	75	135	0.23	50'X85'	99	83.4	120	0.21	48'X68'					
41	93.5	135	0.25	50'X65'	100	75	120	0.21	50'X70'					
42	86.1	135	0.23	45'X70'	101	75	120	0.23	50'X70'	Total	12,291 lf		37.84 Ac	
43	86.1	135	0.23	45'X70'	102	75	120	0.21	50'X70'					
44	86.1	135	0.23	45'X70'	103	75	120	0.21	50'X70'					
45	77.3	135	0.24	50'X85'	104	93.3	174.6	0.32	50'X70'					
46	78.6	135	0.22	35'X61'	105	75.7	121.4	0.26	50'X65'					
47	68.5	139	0.23	45'X85'	106	95	121.4	0.28	50'X65'					
48	75	139	0.24	50'X85'	107	75	120	0.21	50'X70'					
49	60	139	0.24	45'X70'	108	75	120	0.21	50'X70'					
50	60	136.4	0.24	43'X70'	109	75	120	0.21	50'X70'					
51	60	135.5	0.25	45'X70'	110	75	120	0.21	50'X70'					
52	75	135	0.23	50'X85'	111	52.5	120	0.22	48'X68'					
53	75	135	0.23	50'X85'	112	52.5	120	0.22	48'X68'					
54	75	135	0.23	50'X85'	113	82.5	120	0.22	50'X70'					
55	75	135	0.23	50'X85'	114	75	120	0.21	50'X70'					
56	75	135	0.23	50'X85'	115	75	120	0.21	50'X70'					
57	75	135	0.23	50'X85'	116	85	120	0.23	55'X70'					
58	75	137.6	0.23	50'X85'	117	112.7	139.1	0.24	45'X70'					
59	75	137.6	0.23	50'X85'	118	75	139.1	0.28	50'X70'					
Subtotal	4,430 lf		13.11 Ac		Subtotal	4,582 lf		12.66 Ac						

Table of Tracts

Label	Type	Area (Ac)	Dedicated to	Easement Dedication	Facilities*
A	Open Space	0.18	HOA	N/A	No Facilities
B	Open Space/LA	0.60	HOA	Lot 1, 2 & 3	No Facilities
C	STORMWATER/LA	9.18	HOA	N/A	Pond with walking path
D1	ROW	3.41	HOA	HOWEY-IN-THE-HILLS	
D2	ROW	2.72	HOA	HOWEY-IN-THE-HILLS	
D3	ROW	1.44	HOA	HOWEY-IN-THE-HILLS	
D4	ROW	1.82	HOA	HOWEY-IN-THE-HILLS	
E	ROW/Open Space	0.59	HOA	HOWEY-IN-THE-HILLS	
F	Open Space	0.83	HOA	N/A	Picnic Area
G	LANDSCAPE	1.17	HOA	N/A	
H	SLS	0.05	HOA	N/A	
I	Open Space	0.21	HOA	N/A	Dog Walk, Fencing, Benches & Landscaping
	TOTAL TRACTS AREA	22.20			
	TOTAL WETLANDS	0.84			
	TOTAL LOT AREA	37.84			
	TOTAL SITE AREA	60.88			

* Recreation Facilities will be constructed per the phasing plan sheet PH

Typical Lot Layout Type I

100'
Wetlands Line
20' D&U
50' Wetlands Setback
12.5' Side SB
25' D&U Easement
150'
5' UE
70'
Lot # Lot Type
5' UE
75'
10' UE
25' Front SB

Typical Lot Layout Type II

75'
10' D&U
25' Rear SB
12.5' Side SB
120'
5' UE
70'
Lot # Lot Type
5' UE
50'
10' UE
25' Front SB

Swimming Pool Setback Note

Swimming pool setbacks are called out in Section 501.08 of the City of Groveland Land Development Code. Subsection B specifies that a screen enclosure must be 10-feet from side and rear property lines. Subsection F states that pools and pool decks must be 10-feet from side and rear property lines.
Home Builders shall ensure that the placement of the pool and pool deck relative to side and rear property lines must be done with consideration as to whether a screen enclosure is planned. If a screen enclosure is planned, the pool needs to be set further back from the property lines to allow for access around the pool. The maximum height of a screen enclosure is 25 feet. Pool equipment may be placed in a side yard no closer to the property line than 5-feet. The rear yard setback for pool equipment remains at 10 feet

Description	Date	#

Revisions

Description	Date	#

Revisions

Unroe Engineering, Inc
Civil Engineering/Planning/Scientific Evaluation
PO Box 690942, Orlando, Fl 32869-0942
Business Authorization Number - EB 00006579 ph (407) 299-0650

Overall Subdivision Plan

Whispering Hills Subdivision
Buckhill Road, Howey-in-the-Hills, Florida

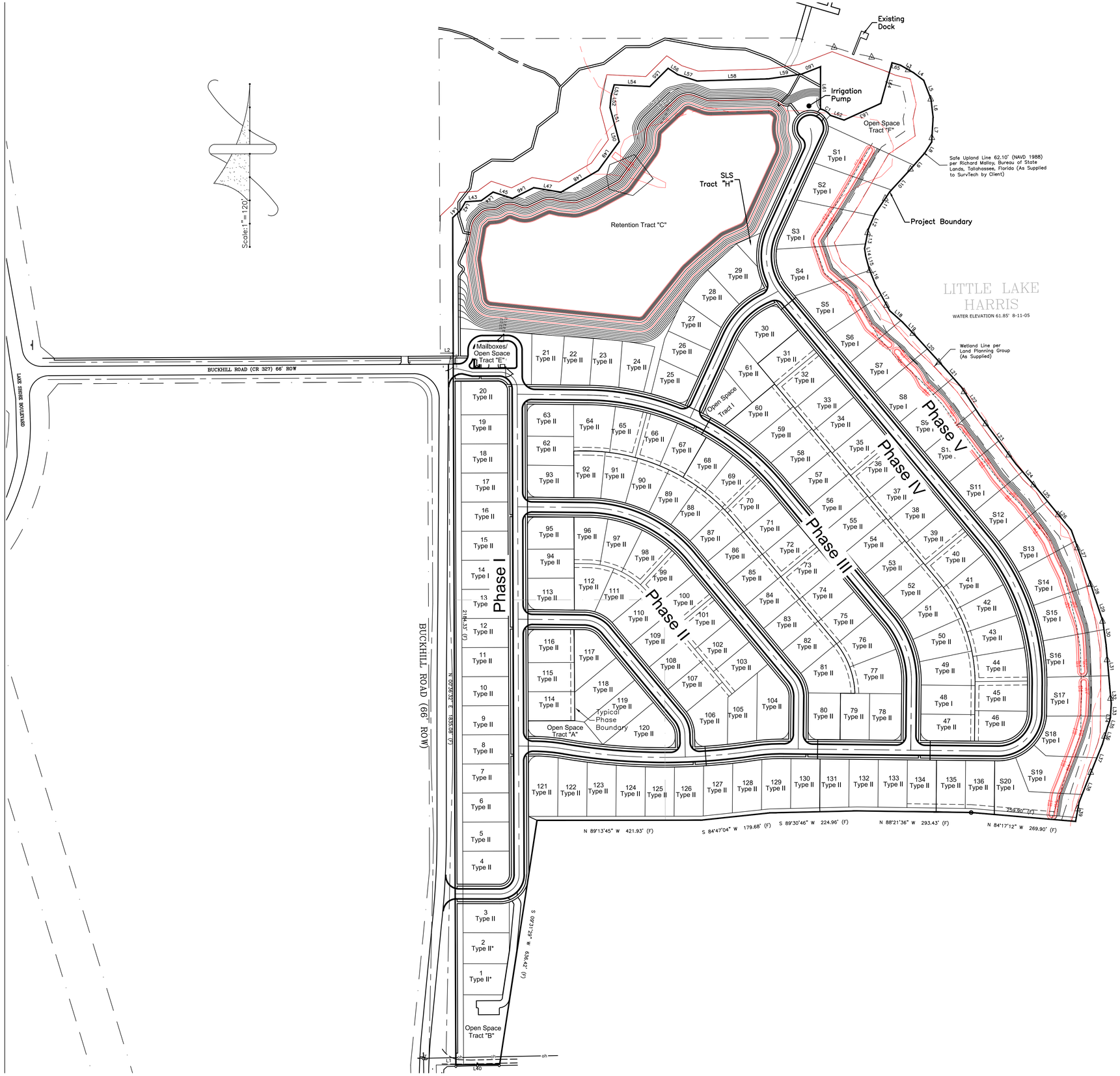
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09-07-21	Date
WH2-C1	File

Dwg. No.
C1
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Phase Hatching

Phase I	
Phase II	
Phase III	
Phase IV	
Phase V	

Note:
Phasing refers to infrastructure construction and platting of lots/roads in individual phases.

#	Revisions	Date

#	Revisions	Date

Unroe Engineering, Inc
Civil Engineering/Planning/Scientific Evaluation
PO Box 690942, Orlando, Fl 32869-0942
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Construction Phasing Plan

Whispering Hills Subdivision

Buckhill Road, Howey-in-the-Hills, Florida

DP	Drawn
DP	Checked
1"=120'	Scale
09-07-21	Date
WH2-C2	File

Dwg. No.

C2

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DARCY UNROE LICENSE No 60929 STATE OF FLORIDA PROFESSIONAL ENGINEER

Darcy Unroe PE 60929

Scale: 1" = 120'

BUCKHILL ROAD (CR 327) 66' ROW

BUCKHILL ROAD (66' ROW)

Retention Tract "C"

WHISPERING HILLS DRIVE

Open Space Tract "A"

Open Space Tract "B"

Tract "A" (10' Wide)

Tract "B" (10' Wide)

Tract "C" (10' Wide)

Tract "D" (10' Wide)

Tract "E" (10' Wide)

Tract "F" (10' Wide)

Tract "G" (10' Wide)

Tract "H" (10' Wide)

Tract "I" (10' Wide)

Tract "J" (10' Wide)

Tract "K" (10' Wide)

Tract "L" (10' Wide)

Tract "M" (10' Wide)

Tract "N" (10' Wide)

Tract "O" (10' Wide)

Tract "P" (10' Wide)

Tract "Q" (10' Wide)

Tract "R" (10' Wide)

Tract "S" (10' Wide)

Tract "T" (10' Wide)

Tract "U" (10' Wide)

Tract "V" (10' Wide)

Tract "W" (10' Wide)

Tract "X" (10' Wide)

Tract "Y" (10' Wide)

Tract "Z" (10' Wide)

Tract "AA" (10' Wide)

Tract "BB" (10' Wide)

Tract "CC" (10' Wide)

Tract "DD" (10' Wide)

Tract "EE" (10' Wide)

Tract "FF" (10' Wide)

Tract "GG" (10' Wide)

Tract "HH" (10' Wide)

Tract "II" (10' Wide)

Tract "JJ" (10' Wide)

Tract "KK" (10' Wide)

Tract "LL" (10' Wide)

Tract "MM" (10' Wide)

Tract "NN" (10' Wide)

Tract "OO" (10' Wide)

Tract "PP" (10' Wide)

Tract "QQ" (10' Wide)

Tract "RR" (10' Wide)

Tract "SS" (10' Wide)

Tract "TT" (10' Wide)

Tract "UU" (10' Wide)

Tract "VV" (10' Wide)

Tract "WW" (10' Wide)

Tract "XX" (10' Wide)

Tract "YY" (10' Wide)

Tract "ZZ" (10' Wide)

See Sheet C3, C5, C7 & TM1

See Sheet C4, C6, C8 & TM2

See Inset on Sheet C4, C6, C8 & TM

#	Revisions	Date
	Description	

#	Revisions	Date
	Description	

Unroe Engineering, Inc

Civil Engineering/Planning/Scientific Evaluation

PO Box 690942, Orlando, Fl 32869-0942

Business Authorization Number - EB 00006579 ph (407) 299-0650

Subdivision Key Plan

Whispering Hills Subdivision

Buckhill Road, Howey-in-the-Hills, Florida

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DP	Checked
1"=130'	Scale
09-07-21	Date
WH2-C3	File

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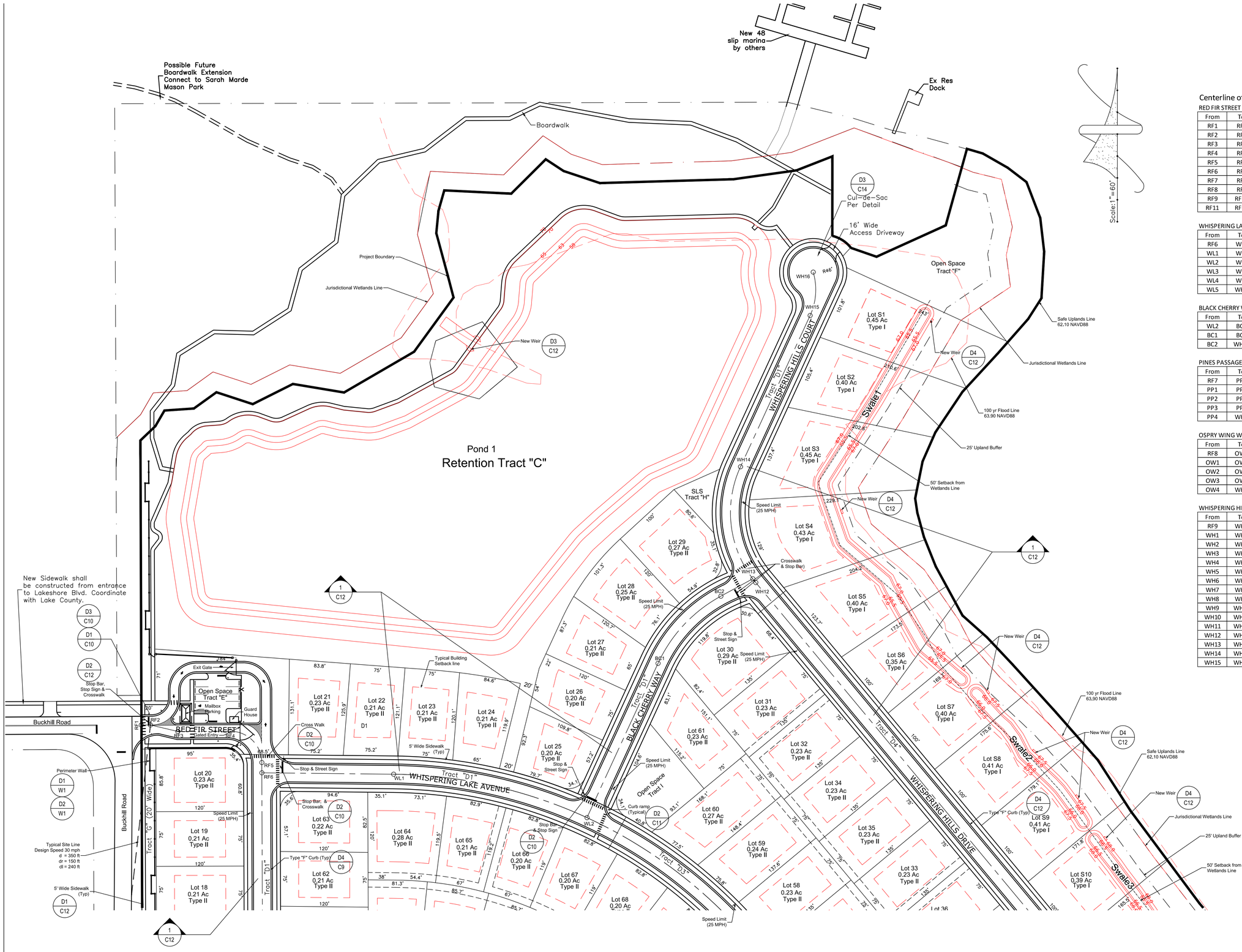
C3

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DARCY UNROE LICENSE No 60929 STATE OF FLORIDA PROFESSIONAL ENGINEER

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2/18/2022 1:10:49 PM



Centerline of Road Distances, Bearings & Radii

RED FIR STREET

From	To	Distance	Bearing	Radius
RF1	RF2	12.56	N 89d46'46" E	
RF2	RF3	38.57	N 76d43'37" W	
RF3	RF4	71.89	S 89d46'40" W	
RF4	RF5	60.81	S 45d13'20" E	43.00
RF5	RF6	14.12	S 0d13'20" E	
RF6	RF7	290.03	S 0d13'20" E	
RF7	RF8	209.03	S 0d13'20" E	
RF8	RF9	327.03	S 0d13'20" E	
RF9	RF10	331.12	S 0d13'20" E	
RF11	RF12	114.66	S 89d53'30" E	

WHISPERING LAKE AVENUE

From	To	Distance	Bearing	Radius
RF6	WL1	180.50	S 89d23'48" E	
WL1	WL2	271.53	S 77d20'29" E	650.00
WL2	WL3	287.62	S 52d30'14" E	650.00
WL3	WL4	445.31	N 39d43'13" W	
WL4	WL5	172.34	S 19d33'30" E	250.00
WL5	WH7	176.34	S 0d36'14" W	

BLACK CHERRY WAY

From	To	Distance	Bearing	Radius
WL2	BC1	232.67	N 24d42'58" E	
BC1	BC2	125.99	N 43d4'28" E	200.00
BC2	WH13	49.83	N 61d25'59" E	

PINES PASSAGE ROAD

From	To	Distance	Bearing	Radius
RF7	PP1	180.94	S 89d23'48" E	
PP1	PP2	294.04	S 64d33'31" E	350.00
PP2	PP3	407.72	S 39d43'13" E	
PP3	PP4	51.70	S 19d33'30" E	75.00
PP4	WH6	134.11	S 0d36'14" W	

OSPRY WING WAY

From	To	Distance	Bearing	Radius
RF8	OW1	169.82	S 89d23'48" E	
OW1	OW2	63.01	S 64d33'31" E	75.00
OW2	OW3	290.82	S 39d43'13" E	
OW3	OW4	49.70	S 20d22'17" E	75.00
OW4	WH3	56.46	S 1d1'21" E	

WHISPERING HILLS DRIVE

From	To	Distance	Bearing	Radius
RF9	WH1	39.42	N 89d23'46" W	
WH1	WH2	78.65	S 84d53'6" E	500.00
WH2	WH3	312.56	S 86d7'24" E	1550.00
WH3	WH4	175.00	N 84d45'6" E	1550.00
WH4	WH5	78.65	N 86d5'34" E	500.00
WH5	WH6	38.18	N 89d23'46" W	
WH6	WH7	290.00	N 89d23'46" W	
WH7	WH8	224.00	N 89d23'46" W	
WH8	WH9	141.42	N 45d36'14" E	100.00
WH9	WH10	69.79	S 0d36'14" W	
WH10	WH11	396.38	N 19d33'30" W	575.00
WH11	WH12	830.21	S 39d43'13" E	
WH12	WH13	6.50	N 38d28'44" W	150.00
WH13	WH14	154.41	N 6d15'39" W	150.00
WH14	WH15	228.09	S 24d42'58" W	
WH15	WH16	59.57	N 4d4'31" E	

Item 1.

#	Date	Description

Revisions

#	Date	Description

Revisions

Unroe Engineering, Inc
Civil Engineering/Planning/Scientific Evaluation
PO Box 690942, Orlando, Fl 32869-0942 ph (407) 299-0650
Business Authorization Number - EB 00006579

Subdivision Layout Plan - North

Whispering Hills Subdivision
Buckhill Road, Howey-in-the-Hills, Florida

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DP	Checked
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09-07-21	Date
WH2-C4	File

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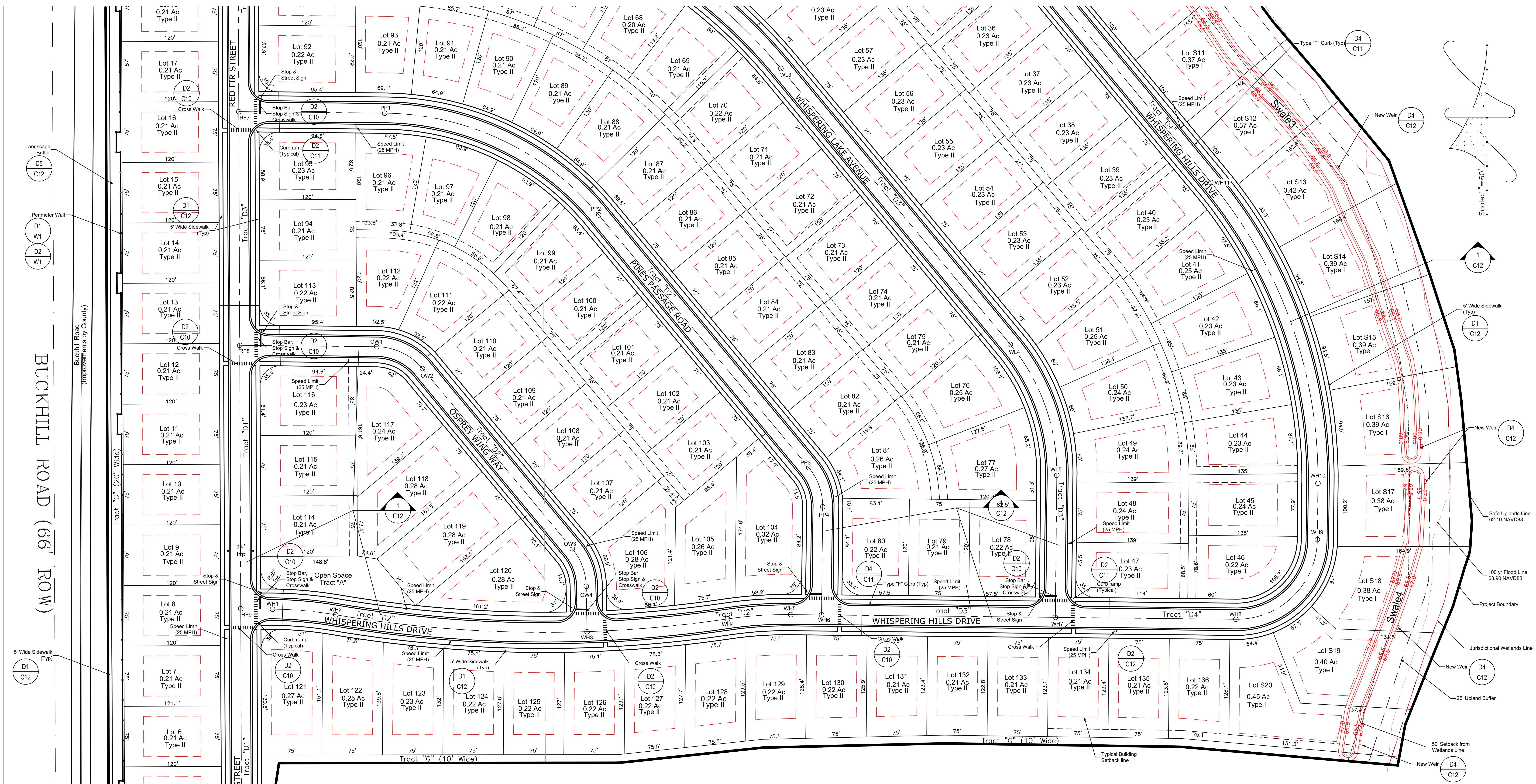
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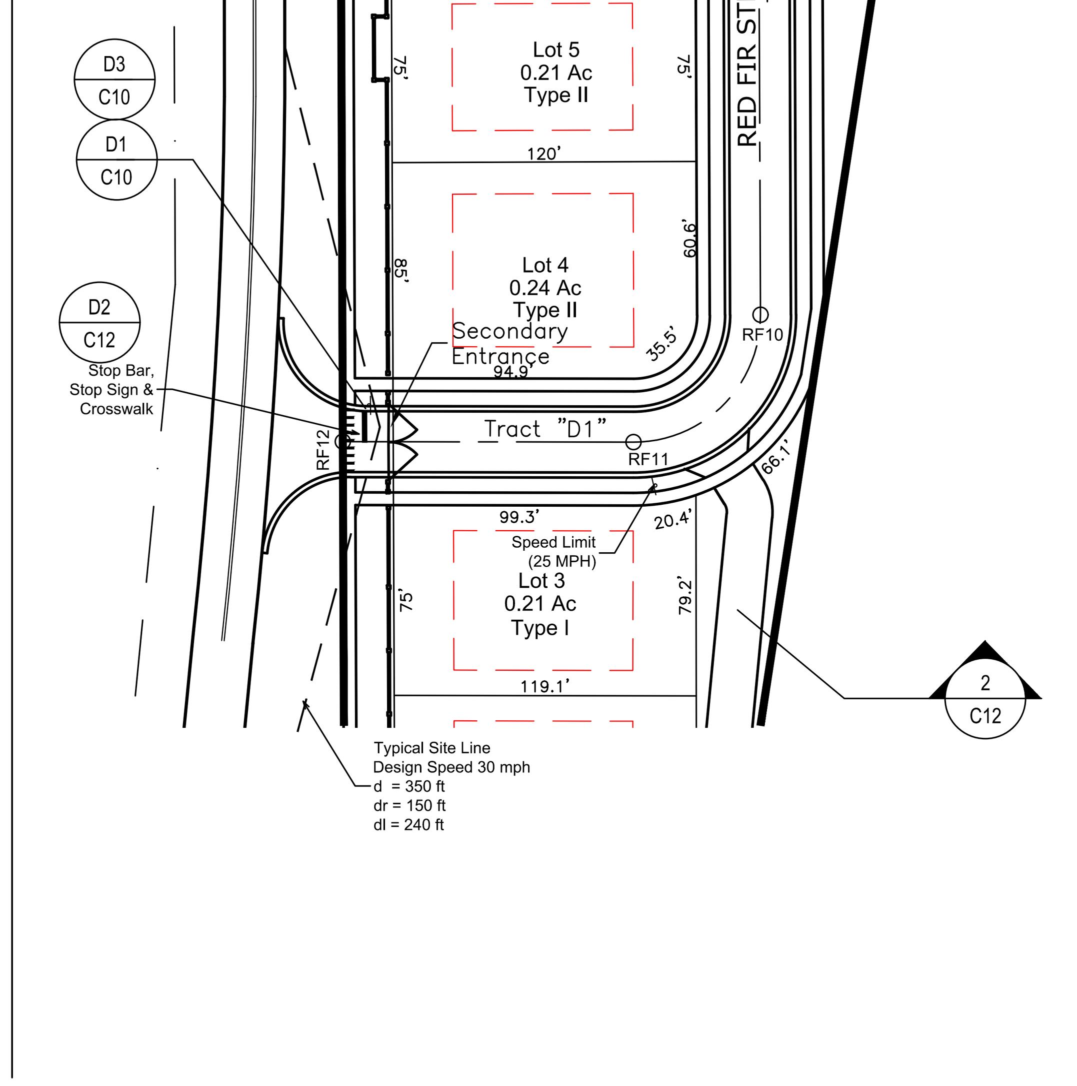
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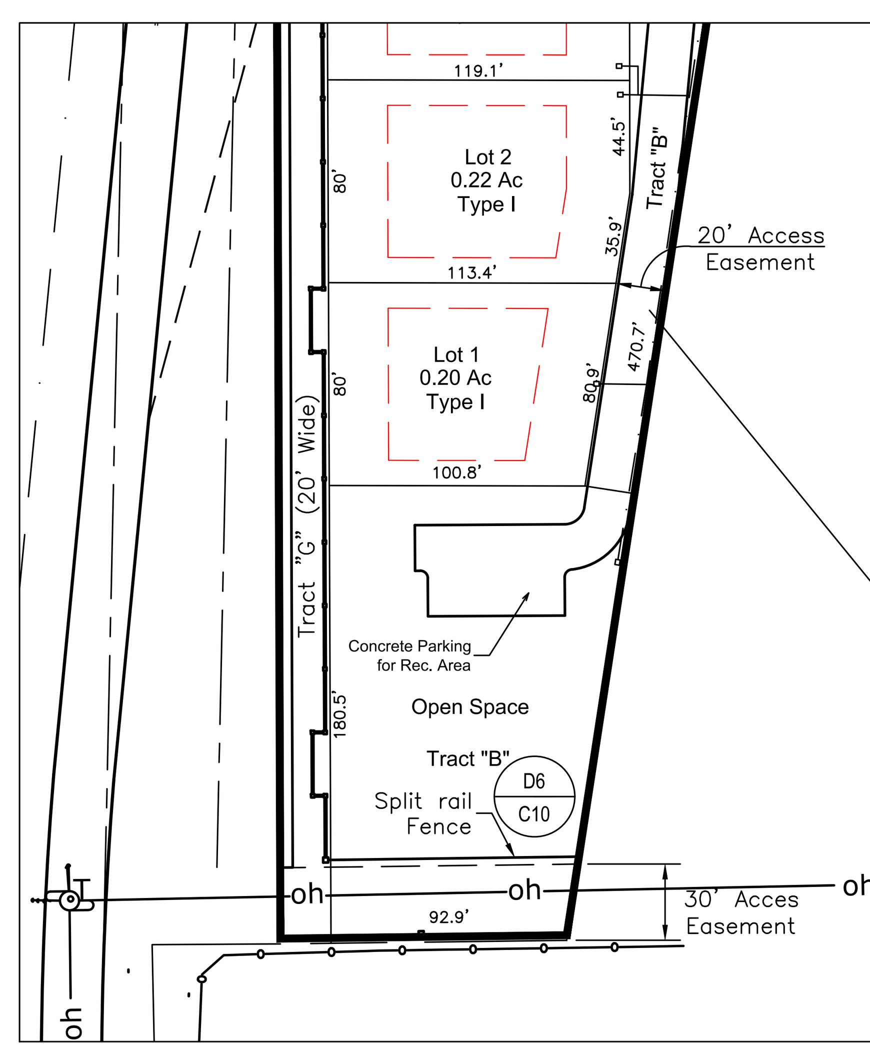
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Centerline of Road Distances, Bearings & Radii

RED FIR STREET

From	To	Distance	Bearing	Radius
RF1	RF2	12.56	N 89d46'46" E	
RF2	RF3	38.57	N 76d43'37" W	
RF3	RF4	71.89	S 89d46'40" W	
RF4	RF5	60.81	S 45d13'20" E	43.00
RF5	RF6	14.12	S 0d13'20" E	
RF6	RF7	290.03	S 0d13'20" E	
RF7	RF8	209.03	S 0d13'20" E	
RF8	RF9	327.03	S 0d13'20" E	
RF9	RF10	331.12	S 0d13'20" E	
RF11	RF12	114.66	S 89d53'30" E	

WHISPERING LAKE AVENUE

From	To	Distance	Bearing	Radius
RF6	WL1	180.50	S 89d23'48" E	
WL1	WL2	271.53	S 77d20'29" E	650.00
WL2	WL3	287.62	S 52d30'14" E	650.00
WL3	WL4	445.31	N 39d43'13" W	
WL4	WL5	172.34	S 19d33'30" E	250.00
WL5	WH7	176.34	S 0d36'14" W	

BLACK CHERRY WAY

From	To	Distance	Bearing	Radius
WL2	BC1	232.67	N 24d42'58" E	
BC1	BC2	125.99	N 43d4'28" E	200.00
BC2	WH13	49.83	N 61d25'59" E	

PINES PASSAGE ROAD

From	To	Distance	Bearing	Radius
RF7	PP1	180.94	S 89d23'48" E	
PP1	PP2	294.04	S 64d33'31" E	350.00
PP2	PP3	407.72	S 39d43'13" E	
PP3	PP4	51.70	S 19d33'30" E	75.00
PP4	WH6	134.11	S 0d36'14" W	

OSPRY WING WAY

From	To	Distance	Bearing	Radius
RF8	OW1	169.82	S 89d23'48" E	
OW1	OW2	63.01	S 64d33'31" E	75.00
OW2	OW3	290.82	S 39d43'13" E	
OW3	OW4	49.70	S 20d22'17" E	75.00
OW4	WH3	56.46	S 1d1'21" E	

WHISPERING HILLS DRIVE

From	To	Distance	Bearing	Radius
RF9	WH1	39.42	N 89d23'46" W	
WH1	WH2	78.65	S 84d53'6" E	500.00
WH2	WH3	312.56	S 86d7'24" E	1550.00
WH3	WH4	175.00	N 84d45'6" E	1550.00
WH4	WH5	78.65	N 86d5'34" E	500.00
WH5	WH6	38.18	N 89d23'46" W	
WH6	WH7	290.00	N 89d23'46" W	
WH7	WH8	224.00	N 89d23'46" W	
WH8	WH9	141.42	N 45d36'14" E	100.00
WH9	WH10	69.79	S 0d36'14" W	
WH10	WH11	396.38	N 19d33'30" W	575.00
WH11	WH12	830.21	S 39d43'13" E	
WH12	WH13	6.50	N 38d28'44" W	150.00
WH13	WH14	154.41	N 6d15'39" W	150.00
WH14	WH15	228.09	S 24d42'58" W	
WH15	WH16	59.57	N 4d4'31" E	

Description	Date	#

Revisions

Description	Date	#

Revisions

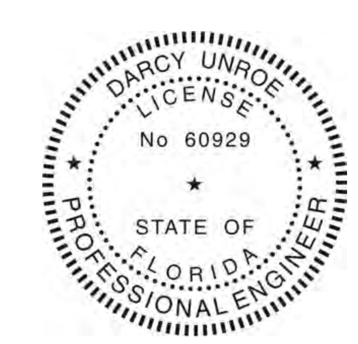
Unroe Engineering, Inc
Civil Engineering/Planning/Scientific Evaluation
PO Box 690942, Orlando, Fl 32869-0942 ph (407) 299-0650
Business Authorization Number - EB 00006579

Subdivision Layout Plan - South

Whispering Hills Subdivision
Buckhill Road, Howey-in-the-Hills, Florida

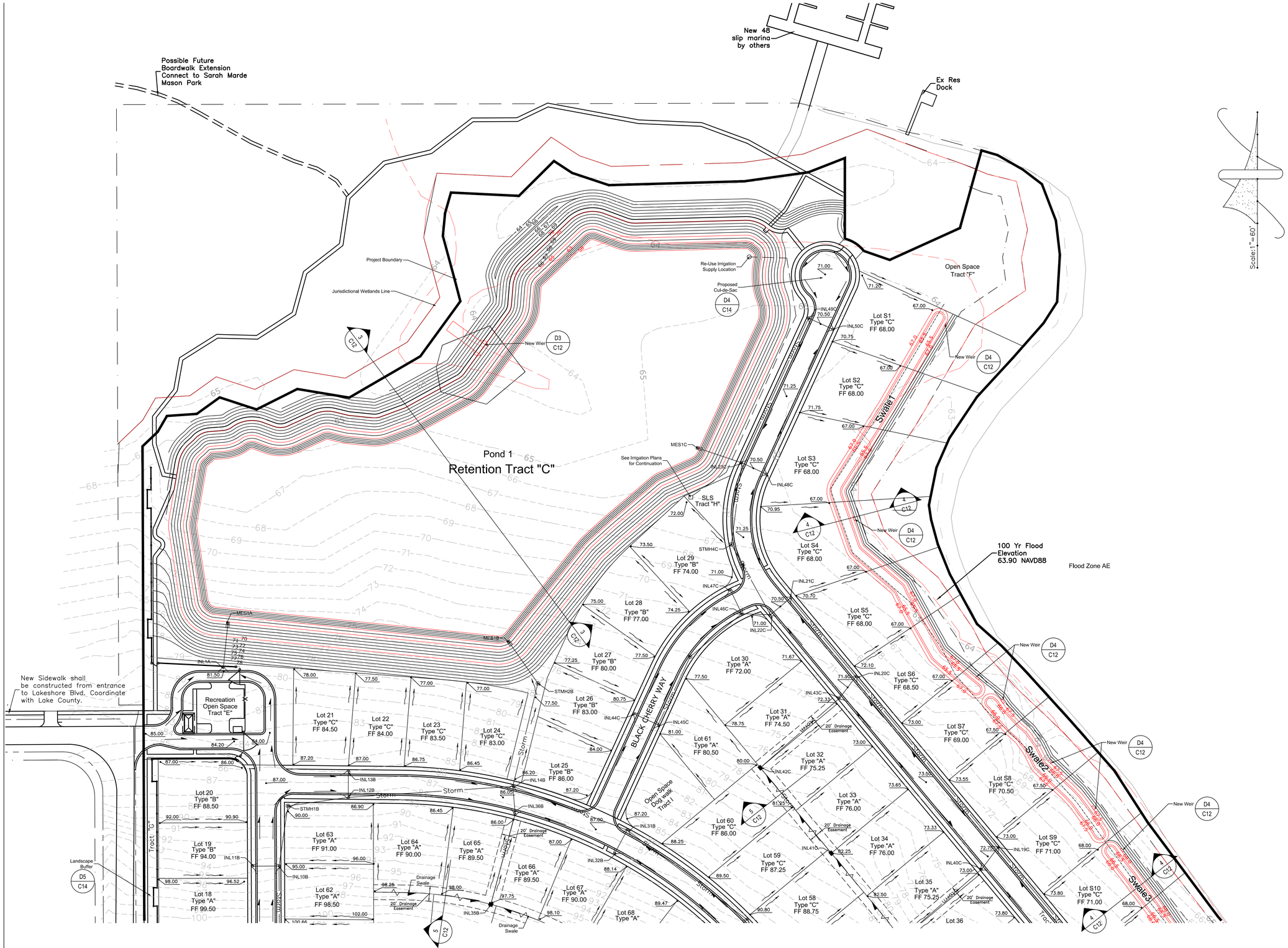
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WH2-C5	File

Dwg. No.
C5
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Item 1.

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	Revisions	
	Revisions	

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Civil Engineering/Planning/Scientific Evaluation
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Subdivision Grading Plan - South

Whispering Hills Subdivision

Buckhill Road, Howey-in-the-Hills, Florida

DP	Drawn
DP	Checked
1"=60'	Scale
09-07-21	Date
WH2-C6	File

Dwg. No.

C6

8 of 59

DARCY UNROE LICENSE No 60929 STATE OF FLORIDA PROFESSIONAL ENGINEER

Darcy Unroe PE 60929

2/18/2022 1:10:33 PM

BUCKHILL ROAD (66' ROW)

Tract "G"

Tract "D-1"

Open Space Tract "A"

Tract "G"

Drainage Swale

Tract "G"

Drainage Swale

Tract "G"

Open Space Tract "B"

Flood Zone AE

100 Yr Flood Elevation 63.90 NAVD88

Flood Zone X

Scale: 1" = 60'

Swale3

Swale4

Landscape Buffer D5 C14

New Weir D4 C12

Unroe Engineering, Inc

Civil Engineering/Planning/Scientific Evaluation

PO Box 690942, Orlando, Fl 32869-0942

Business Authorization Number - EB 0000679 ph (407) 299-0650

Subdivision Grading Plan - South

Whispering Hills Subdivision

Buckhill Road, Howey-in-the-Hills, Florida

DP	Drawn
DP	Checked
1"=60'	Scale
09-07-21	Date
WH2-C7	File

Dwg. No.

C7

9 of 59

Darcy Unroe PE 60929

DARCY UNROE LICENSE No 60929 STATE OF FLORIDA PROFESSIONAL ENGINEER

Revisions

#	Description	Date
1		

Revisions

#	Description	Date

2/18/2022 1:10:33 PM

#	Date	Description
		Revisions
		Revisions

Unroe Engineering, Inc
Civil Engineering/Planning/Scientific Evaluation
PO Box 690942, Orlando, Fl 32869-0942
Business Authorization Number - EB 0000657 ph (407) 299-0650

Subdivision Utility Plan - North

Whispering Hills Subdivision

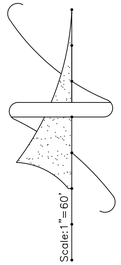
Buckhill Road, Howey-in-the-Hills, Florida

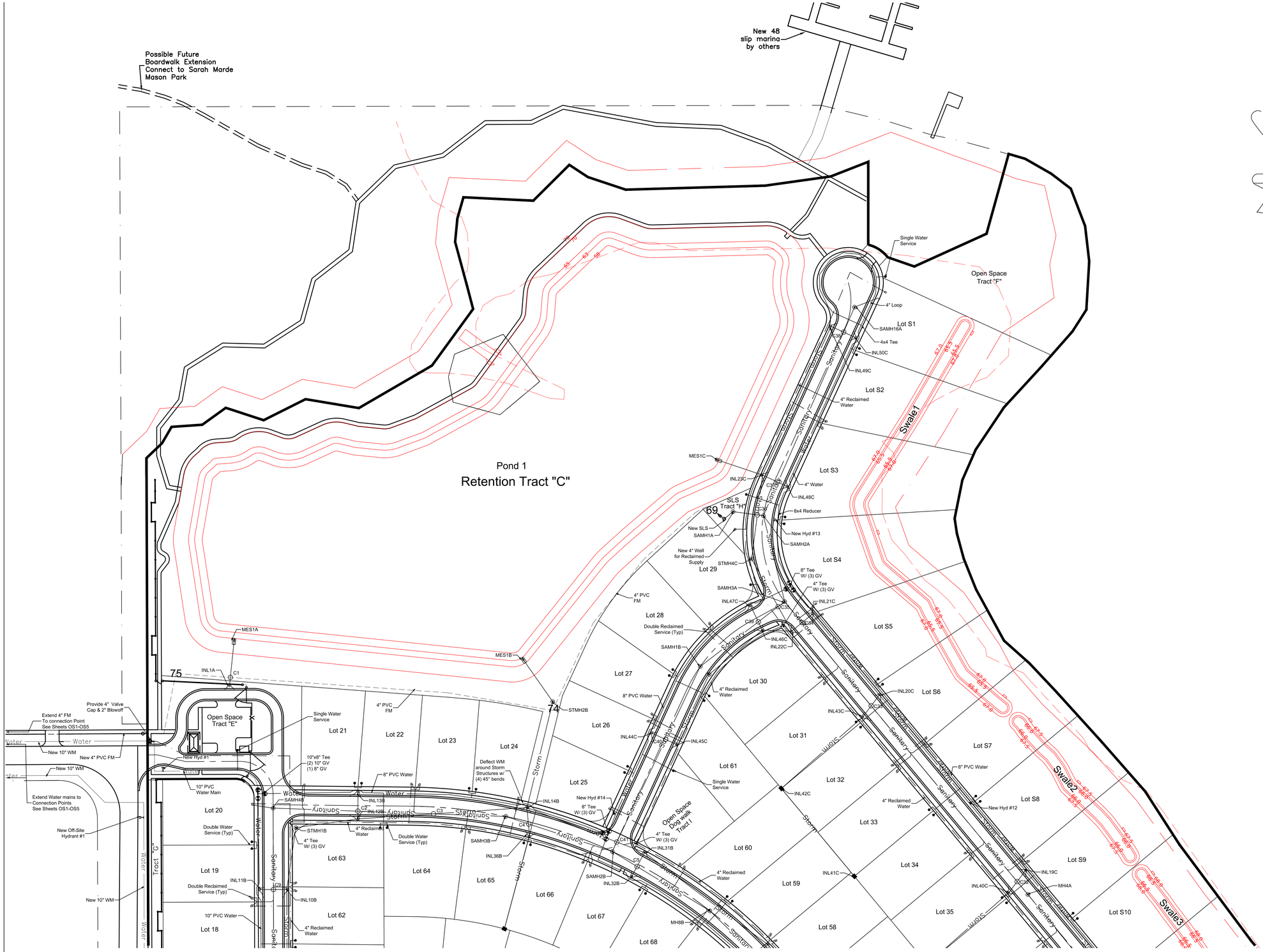
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1"=60'	Scale
09-07-21	Date
WH2-C8	File

Dwg. No.

C8

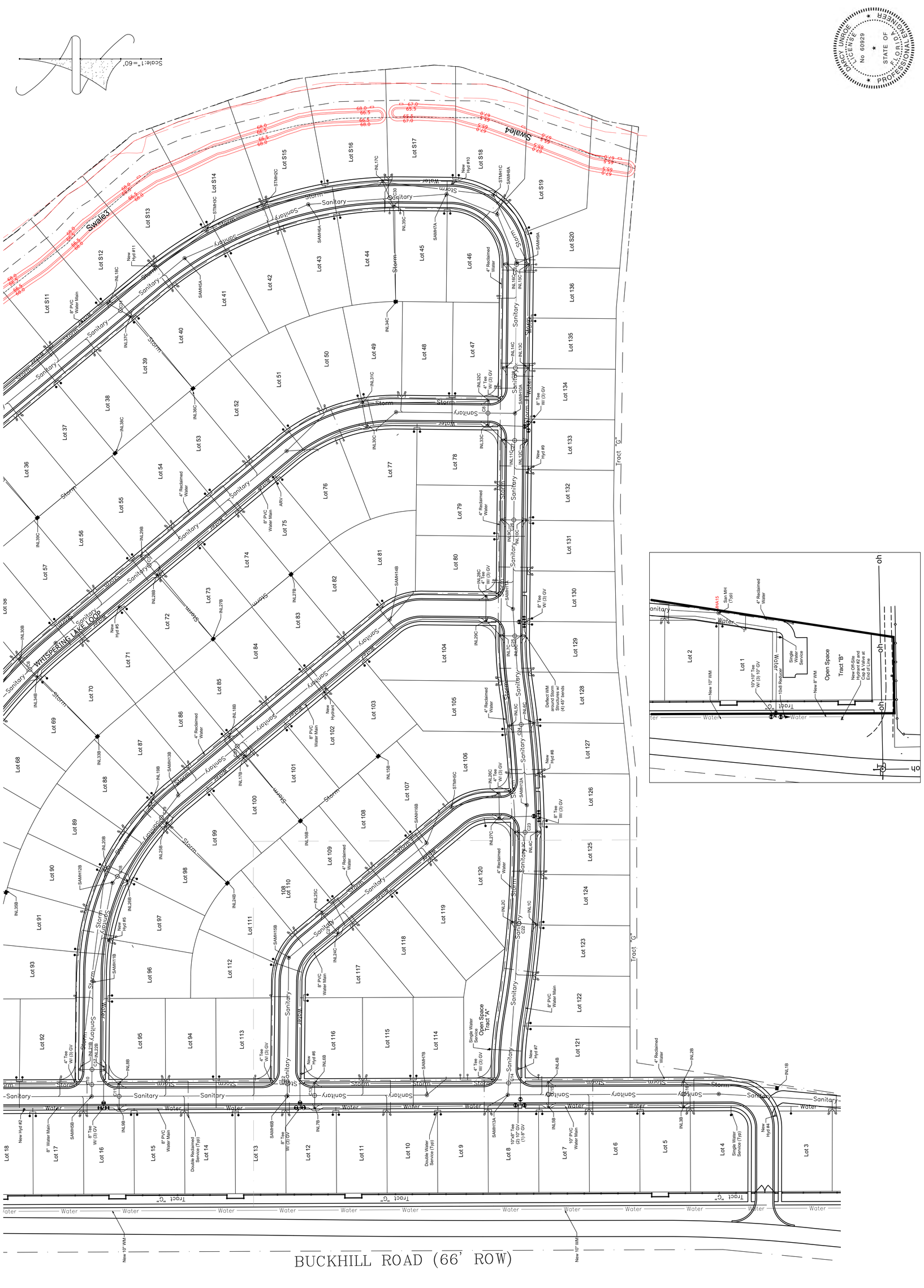
10 of 59





DARCY UNROE LICENSE No 60929 STATE OF FLORIDA PROFESSIONAL ENGINEER
Darcy Unroe PE 60929

2/18/2022 1:10:55 PM



Subdivision Utility Plan - South

Whispering Hills Subdivision

Buckhill Road, Howey-in-the-Hills, Florida

Drawn	DP
Checked	DP
Scale	1"=60'
Date	09-07-21
File	WH2-C9
Dwg. No.	C9
	11 of 59

Unroe Engineering, Inc
Civil Engineering/Planning/Scientific Evaluation
PO Box 690942, Orlando, Fl 32869-0942
Business Authorization Number - EB 0000657 9 ph (407) 299-0650

Revisions			Revisions		
#	Date	Description	#	Date	Description

Item 1

FLORIDA LICENSED PROFESSIONAL ENGINEER No 60929 STATE OF

Darcy Unroe PE 60929

2/18/2022 1:10:55 PM

18

Storm Sewer Table #1

Structure Label	Top	Inv	Drop Inv	Description
Piping System A				
INL1A	81.50	73.44		FDOT Type 2
MES1A	----	70.00		Mitered End Section
Piping System B				
INL1B	138.00	132.19		FDOT Type C
INL2B	137.30	129.41		FDOT Type 1
INL3B	137.30	129.76		FDOT Type 1
INL4B	134.15	125.41		FDOT Type 1
INL5B	134.15	125.76		FDOT Type 1
INL6B	124.25	115.00		FDOT Type 1
INL7B	124.25	115.35		FDOT Type 1
INL8B	110.80	97.60		FDOT Type 1
INL9B	110.80	97.95		FDOT Type 1
INL10B	94.75	86.65		FDOT Type 1
INL11B	94.75	87.00		FDOT Type 1
INL12B	86.75	79.27		FDOT Type 1
INL13B	86.75	79.62		FDOT Type 1
INL14B	85.75	68.12		FDOT Type 2
INL15B	119.90	110.74		FDOT Type C
INL16B	116.15	107.74		FDOT Type C
INL17B	111.65	105.20		FDOT Type 1
INL18B	111.65	104.85		FDOT Type 1
INL19B	108.75	102.50		FDOT Type 2
INL20B	108.75	101.63		FDOT Type 2
INL21B	108.50	98.65		FDOT Type 2
INL22B	108.50	98.30		FDOT Type 2
INL23B	113.45	106.46		FDOT Type C
INL24B	108.75	102.62		FDOT Type 2
INL25B	108.75	101.98		FDOT Type 2
INL26B	105.95	99.88		FDOT Type C
INL27B	104.05	95.38		FDOT Type C
INL28B	94.69	82.58		FDOT Type 1
INL29B	94.69	81.88		FDOT Type 1
INL30B	90.55	77.14		FDOT Type 1
INL31B	87.37	73.10		FDOT Type 1
INL32B	87.40	73.45		FDOT Type 1
INL33B	100.10	87.65		FDOT Type C
INL34B	90.55	77.49		FDOT Type 1
INL35B	97.75	91.68		FDOT Type C
INL36B	85.80	68.82		FDOT Type 2
STMH1B	89.00	82.55		FDOT Type J Manhole
STMH2B	77.00	60.25		FDOT Type J Manhole
MES1B	----	56.00		Mitered End Section
Piping System C				
INL1C	128.00	120.62		FDOT Type 1
INL2C	128.00	118.87		FDOT Type 1
INL3C	126.45	112.17		FDOT Type 1
INL4C	126.45	112.52		FDOT Type 1
INL5C	119.80	104.27		FDOT Type 1
INL6C	119.80	104.62		FDOT Type 1
INL7C	112.75	96.23		FDOT Type 1
INL8C	112.75	96.58		FDOT Type 1
INL9C	103.97	89.35		FDOT Type 1
INL10C	103.97	89.70		FDOT Type 1
INL11C	97.83	85.81		FDOT Type 1
INL12C	97.80	84.06		FDOT Type 1
INL13C	92.50	78.71		FDOT Type 1
INL14C	92.50	79.06		FDOT Type 1
INL15C	84.75	71.01	73.00	FDOT Type 1
INL16C	84.75	73.35		FDOT Type 1
INL17C	73.95	64.26		FDOT Type 2
INL18C	75.30	62.67		FDOT Type 1
INL19C	72.50	61.63		FDOT Type 2
INL20C	71.75	60.58		FDOT Type 1
INL21C	70.25	59.20		FDOT Type 2
INL22C	70.25	58.85		FDOT Type 2
INL23C	70.25	56.65		FDOT Type 2
INL24C	118.70	113.65		FDOT Type 2
INL25C	118.70	113.53		FDOT Type 2
INL26C	126.00	112.40		FDOT Type 1
INL27C	126.00	112.28		FDOT Type 1
INL28C	111.25	96.90		FDOT Type 1
INL29C	111.25	96.55		FDOT Type 1
INL30C	96.90	89.26		FDOT Type 1
INL31C	96.90	89.14		FDOT Type 1
INL32C	95.90	88.49		FDOT Type 1
INL33C	95.90	88.37		FDOT Type 1
INL34C	84.52	76.08		FDOT Type C
INL35C	74.17	64.64		FDOT Type 2
INL36C	87.00	80.25		FDOT Type C
INL37C	75.50	64.52		FDOT Type 1
INL38C	85.20	79.37		FDOT Type 1
INL39C	83.08	74.87		FDOT Type C
INL40C	72.75	63.43		FDOT Type C
INL41C	82.25	75.46		FDOT Type C
INL42C	80.00	70.96		FDOT Type C
INL43C	72.08	62.38		FDOT Type 1
INL44C	79.90	72.20		FDOT Type 1
INL45C	79.90	70.45		FDOT Type 1
INL46C	71.20	60.80		FDOT Type 1
INL47C	71.20	61.15		FDOT Type 1
INL48C	70.25	57.00		FDOT Type 2
INL49C	70.25	62.03		FDOT Type 2
INL50C	70.25	62.38		FDOT Type 2
STMH1C	79.43	67.56		FDOT Type J Manhole
STMH2C	78.10	63.63		FDOT Type J Manhole
STMH3C	77.15	63.30		FDOT Type J Manhole
STMH4C	71.00	57.76		FDOT Type J Manhole
STMH5C	126.60	112.66		FDOT Type J Manhole
STMH6C	76.00	65.35		FDOT Type J Manhole
MES1C	----	56.00		Mitered End Section

Storm Sewer Table #2

Upstream	Downstream	Size (in)	Length (ft)	Slope (%)	Pipe
INL1A	MES1A	18	43	8.00%	RCP
MES1A	INL1B				
INL1B	INL2B	15	139	2.00%	RCP
INL2B	INL4B	18	200	2.00%	RCP
INL4B	INL6B	18	347	3.00%	RCP
INL6B	INL8B	24	290	6.00%	RCP
INL8B	INL10B	36	219	5.00%	RCP
INL10B	STMH1B	36	82	5.00%	RCP
STMH1B	INL12B	36	82	4.00%	RCP
INL12B	INL14B	36	223	5.00%	RCP
INL14B	STMH2B	48	143	5.50%	RCP
STMH2B	MES1B	48	85	5.00%	RCP
INL3B	INL2B	15	35	1.00%	RCP
INL5B	INL4B	15	35	1.00%	RCP
INL7B	INL6B	15	35	1.00%	RCP
INL9B	INL8B	15	35	1.00%	RCP
INL11B	INL10B	15	35	1.00%	RCP
INL13B	INL12B	15	35	1.00%	RCP
INL15B	INL16B	15	150	2.00%	RCP
INL16B	INL17B	15	127	2.00%	RCP
INL17B	INL18B	18	35	1.00%	RCP
INL18B	INL19B	18	157	1.50%	RCP
INL19B	INL20B	24	116	0.75%	RCP
INL20B	INL21B	24	298	1.00%	RCP
INL21B	INL22B	24	35	1.00%	RCP
INL22B	INL8B	24	35	2.00%	RCP
INL23B	INL24B	15	128	3.00%	RCP
INL24B	INL19B	18	35	0.35%	RCP
INL25B	INL20B	15	35	1.00%	RCP
INL26B	INL27B	15	150	3.00%	RCP
INL27B	INL28B	15	128	10.00%	RCP
INL28B	INL29B	18	35	2.00%	RCP
INL29B	INL30B	24	237	2.00%	RCP
INL30B	INL31B	24	202	2.00%	RCP
INL31B	INL14B	24	166	3.00%	RCP
INL32B	INL31B	15	35	1.00%	RCP
INL33B	INL34B	15	127	8.00%	RCP
INL34B	INL30B	15	35	1.00%	RCP
INL35B	INL36B	15	127	18.00%	RCP
INL36B	INL14B	15	35	2.00%	RCP
INL1C	INL2C	15	35	5.00%	RCP
INL2C	INL3C	15	134	5.00%	RCP
INL3C	INL5C	24	158	5.00%	RCP
INL5C	INL7C	24	134	6.00%	RCP
INL7C	INL9C	30	172	4.00%	RCP
INL9C	INL11C	30	118	3.00%	RCP
INL11C	INL12C	36	35	5.00%	RCP
INL12C	INL13C	36	107	5.00%	RCP
INL13C	INL15C	36	154	5.00%	RCP
INL15C	STMH1C	36	115	3.00%	RCP
STMH1C	INL17C	36	165	2.00%	RCP
INL17C	STMH2C	42	178	0.35%	RCP
STMH2C	STMH3C	42	94	0.35%	RCP
STMH3C	INL18C	42	182	0.35%	RCP
INL18C	INL19C	42	296	0.35%	RCP
INL19C	INL20C	48	300	0.35%	RCP
INL20C	INL21C	48	138	1.00%	RCP
INL21C	INL22C	48	35	1.00%	RCP
INL22C	STMH4C	54	109	1.00%	RCP
STMH4C	INL23C	54	111	1.00%	RCP
INL23C	MES1C	54	65	1.00%	RCP
INL4C	INL3C	15	35	1.00%	RCP
INL6C	INL5C	15	35	1.00%	RCP
INL8C	INL7C	15	35	1.00%	RCP
INL10C	INL9C	15	35	1.00%	RCP
INL14C	INL13C	15	35	1.00%	RCP
INL16C	INL15C	15	35	1.00%	RCP
INL34C	INL35C	15	143	8.00%	RCP
INL35C	INL17C	18	38	1.00%	RCP
INL24C	INL25C	15	35	0.35%	RCP
INL25C	STMH5C	15	249	0.35%	RCP
STMH5C	INL26C	15	73	0.35%	RCP
INL26C	INL27C	18	35	0.35%	RCP
INL27C	INL3C	18	33	0.35%	RCP
INL28C	INL29C	15	35	1.00%	RCP
INL29C	INL7C	15	32	1.00%	RCP
INL30C	INL31C	15	35	0.35%	RCP
INL31C	INL32C	15	187	0.35%	RCP
INL32C	INL33C	15	35	0.35%	RCP
INL33C	INL11C	18	32	8.00%	RCP
INL36C	INL37C	15	143	11.00%	RCP
INL37C	INL18C	15	37	5.00%	RCP
INL38C	INL39C	15	150	3.00%	RCP
INL39C	INL40C	15	143	8.00%	RCP
INL40C	INL19C	18	36	5.00%	RCP
INL41C	INL42C	15	150	3.00%	RCP
INL42C	INL43C	15	143	6.00%	RCP
INL43C	INL20C	15	36	5.00%	RCP
INL44C	INL45C	15	35	5.00%	RCP
INL45C	STMH6C	15	102	5.00%	RCP
STMH6C	INL46C	15	91	5.00%	RCP
INL46C	INL22C	15	39	5.00%	RCP
INL47C	INL46C	15	35	1.00%	RCP
INL48C	INL23C	15	35	1.00%	RCP
INL50C	INL49C	15	35	1.00%	RCP
INL49C	INL23C	15	215	2.50%	RCP

LAKE COUNTY SIGN SPECIFICATIONS FOR COUNTY MAINTAINED ROADS

For Builders/Contractors/Developers



Street Name Signs (D3's)

Sign Blanks
- .063" thick aluminum
- Aluminum chemically treated to meet ATSM B449 standard (pretreatment for paint or reflective sheeting)
- Dimensions are to be 9" height x 24" minimum /54" maximum length.

Color
- The background shall be high intensity prismatic or greater white sheeting, with green transparent overlay film

Legend/Lettering
- One-half inch (½") white border, ½" from the edge.
- Street names shall be 6" series B letters
- The abbreviated suffix "Rd","Av", "Dr", etc., shall be 4" series B
- District number in the upper right corner of sign shall be 1½" series B

Mounting
- Mounting shall be two single-sided signs with attributes above, mounted back to back, with ends pop-riveted together, on a galvanized 9" twist bracket. No edge-clamping style mounting blocks are to be used.

Regulatory and Warning Signage

Material/Sign Blanks & Facings
- .080 Gauge
- With the exception of the Street Name Signs, all signs shall conform in color, size, legend and logo with specification in the Manual on Uniform Traffic Control Devices (MUTCD)
- Stop sign minimum 30" x 30", minimum high intensity prismatic sheeting or greater. Sheeting for all signs shall be high intensity prismatic or greater.

Placement Specifications
- Placement shall be in accordance with the MUTCD (Sections 2A-21 through 2A-27) with respect to offset from edge of road, height, etc.
- Poles should be buried to a minimum depth of 2 ½' (30"), allowing 7' to bottom of sign from the level of the traveled roadway.
- Poles are NOT to be concreted in place

Poles
- Sign posts shall be galvanized steel U-Channel poles, not less than 12' in length (14' or 16' for severe shoulder drop-offs), with minimum weight of 3 lbs. per foot, or square tube, minimum 1 ¾" galvanized steel, minimum 14 gauge, drilled ½" holes on 1" centers full length.

Form Rev. 06/27/19

Signs for Non-County Maintained Road shall NOT have the Lake County Logo

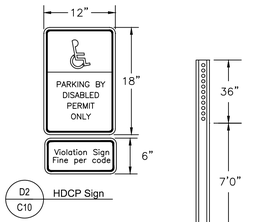
D1 C10 Typical Street Sign Detail

Sanitary Sewer Table #1

Description	Top	Inv In	Inv Out
MH1A	75.35	52.11	52.01
MH2A	70.75	52.27	52.17
MH3A	70.60	52.73	52.63
MH4A	73.00	54.73	54.63
MH5A	76.69	58.73	58.63
MH6A	76.00	60.73	60.63
MH7A	76.29	62.80	62.70
MH8A	79.60	66.85	66.75
MH9A	84.58	70.40	70.30
MH10A	96.00	77.12	77.02
MH11A	111.00	91.62	91.52
MH12A	125.69	101.84	101.74
MH13A	133.50	110.44	110.34
MH14A	138.10	126.09	125.99
MH15A	138.90	---	133.51
MH16A	70.65	---	58.20
MH17A	96.80	---	78.83
MH1B	75.60	56.23	56.13
MH2B	87.11	69.28	69.18
MH3B	86.10	71.49	71.39
MH4B	87.00	74.55	74.45
MH5B	108.50	83.10	83.00
MH6B	123.00	106.30	106.20
MH7B	129.68	---	122.81
MH8B	88.87	71.53	71.43
MH9B	90.50	74.31	74.21
MH10B	97.61	---	83.16
MH11B	109.40	88.23	88.13
MH12B	108.90	92.70	92.60
MH13B	109.60	97.56	97.46
MH14B	113.20	---	86.25
MH15B	118.50	108.35	108.25
MH16B	124.40	---	110.96
SLS	72.00	52.00	---

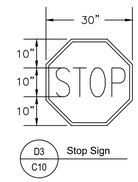
Sanitary Sewer Table #2

Upstream	Downstrea	Size (in)	Length (ft)	Slope (%)	Pipe
MH15A	MH14A	8	249	3.00%	PVC
MH14A	MH13A	8	313	5.00%	PVC
MH13A	MH12A	8	430	2.00%	PVC
MH12A	MH11A	8	292	3.50%	PVC
MH11A	MH10A	8	290	5.00%	PVC
MH10A	MH9A	8	224	3.00%	PVC
MH9A	MH8A	8	71	5.00%	PVC
MH8A	MH7A	8	81	5.00%	PVC
MH7A	MH6A	8	207	1.00%	PVC
MH6A	MH5A	8	200	1.00%	PVC
MH5A	MH4A	8	400	1.00%	PVC
MH4A	MH3A	8	500	0.40%	PVC
MH3A	MH2A	8	116	0.40%	PVC
MH2A	MH1A	8	40	0.40%	PVC
MH1A	SLS	8	15	0.40%	PVC
MH16A	MH2A	8	299	2.00%	PVC
MH17A	MH10A	8	176	1.00%	PVC
MH7B	MH6B	8	207	8.00%	PVC
MH6B	MH5B	8	290	8.00%	PVC
MH5B	MH4B	8	285	3.00%	PVC
MH4B	MH3B	8	306	1.00%	PVC
MH3B	MH2B	8	147	1.50%	PVC
MH2B	MH1B	8	261	5.00%	PVC
MH1B	MH3A	8	140	2.50%	PVC
MH10B	MH9B	8	445	2.00%	PVC
MH9B	MH8B	8	139	2.00%	PVC
MH8B	MH2B	8	150	1.50%	PVC
MH14B	MH13B	8	408	2.00%	PVC
MH13B	MH12B	8	162	3.00%	PVC
MH12B	MH11B	8	149	3.00%	PVC
MH11B	MH5B	8	171	3.00%	PVC
MH16B	MH15B	8	266	1.00%	PVC
MH15B	MH6B	8	205	1.00%	PVC



D2 C10 HDCP Sign

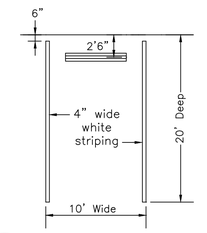
Sign Post



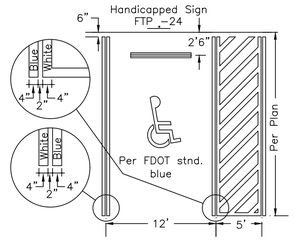
D3 C10 Stop Sign



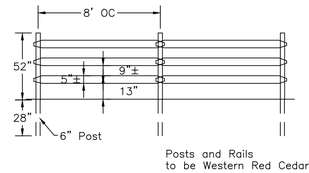
Speed Limit Sign



D4 C10 Parking Striping

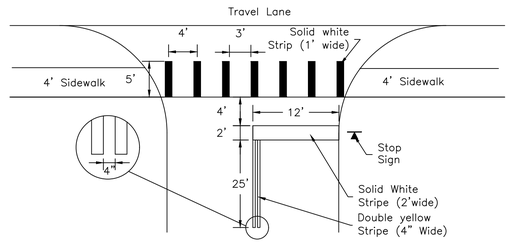


D5 C10 HDCP Parking Striping



Posts and Rails to be Western Red Cedar

D6 C10 4' High Split Rail Fence



D2 C10 Stop Bar with Crosswalk & Centerline

Unroe Engineering, Inc
Civil Engineering/Planning/Scientific Evaluation
PO Box 690942, Orlando, Fl 32869-0942
Business Authorization Number - EB 00006579 ph (407) 299-0650

Item 1.

#	Date	Description
		Revisions
#	Date	Description
		Revisions

Sewer & Storm Structure Tables

Whispering Hills Subdivision

Buckhill Road, Howey-in-the-Hills, Florida

DP	Drawn
DP	Checked
----	Scale
09-07-21	Date
WH2-C10	File

Dwg. No.

C10

12 of 59

DARCY UNROE LICENSE No 60929 STATE OF FLORIDA PROFESSIONAL ENGINEER

Darcy Unroe PE 60929

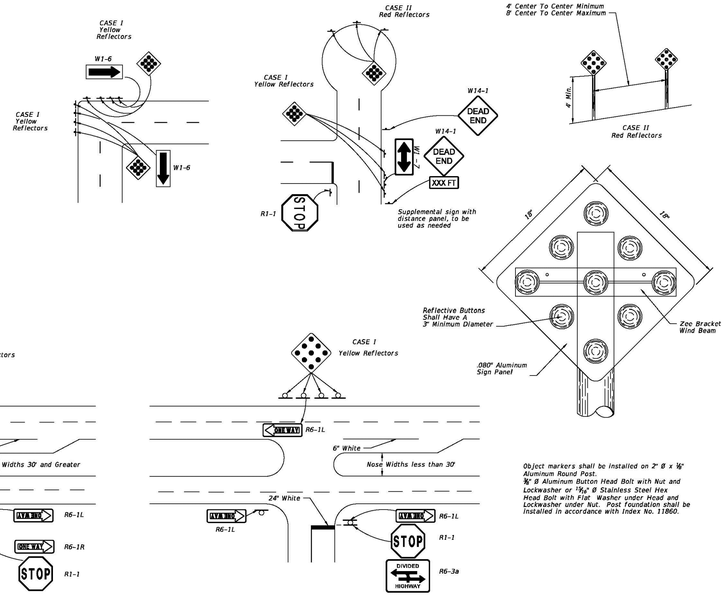
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CASE I Type 1 Object Markers shall consist of nine yellow reflectors mounted on a yellow reflective background or consist of a retroreflective panel of the same size.

CASE II End of Road Markers shall consist of nine red reflectors mounted on a red reflective background or consist of a retroreflective panel of the same size.

NOTES:

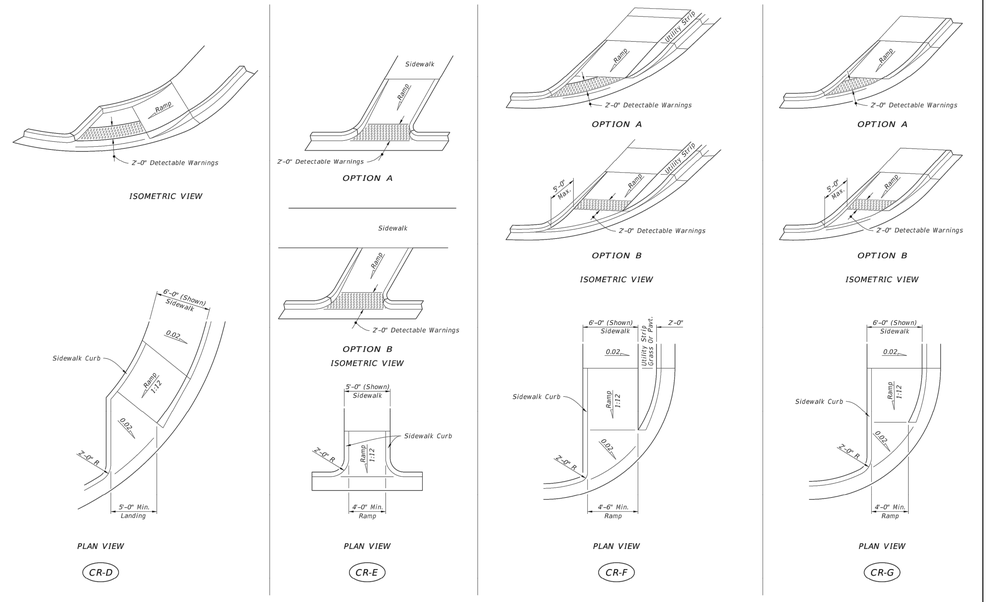
1. This index applicable to residential and minor streets only. Major streets to be evaluated on a case by case basis.
2. "T"-intersection-Two-Way arrows and reflectors are optional. The need should be based on a review of each location.
3. For additional details on aluminum round post, sign panel material and bolts, nuts and washers see Index Nos. 11860.
4. Case I Installation – The arrow panels and object markers shall be located approximately 20', but not less than 12' from the edge of the travel lane.
5. Dead end sign shall be posted a sufficient advance distance to permit the vehicle operator to avoid the dead end by turning off, if possible, at the nearest intersecting street.
6. For pavement marking see Index No. 17346
7. No guardrail is required unless special field conditions require its use.



Object markers shall be installed on 2" Ø x ⅛" Aluminum Round Post. ⅜" Ø Aluminum Button Head Bolt with Nut and Lockwasher or ⅜"x¾" Ø Stainless Steel Hex Head Bolt with Flat Washer under Head and Lockwasher under Nut. Post foundation shall be installed in accordance with Index No. 11860.

LAST REVISION	DESCRIPTION:				
07/01/12		FDOT DESIGN STANDARDS 2013	TRAFFIC CONTROLS FOR STREET TERMINATIONS	INDEX NO. 17349	SHEET NO. 1

D1 / C11 Street Termination



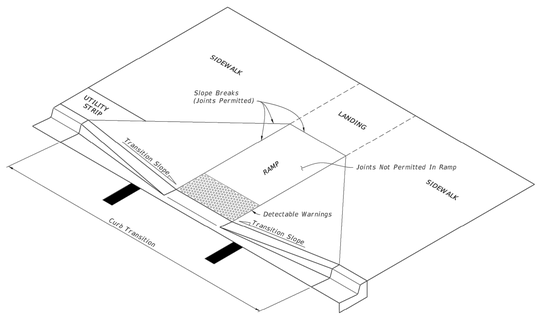
SIDEWALK CURB RAMPS CR-D, CR-E, CR-F & CR-G

LAST REVISION	DESCRIPTION:				
11/01/18		FY 2021-22 STANDARD PLANS	DETECTABLE WARNINGS AND SIDEWALK CURB RAMPS	INDEX 522-002	SHEET 4 of 7

D2 / C11 Typical Curb Ramps

GENERAL NOTES:

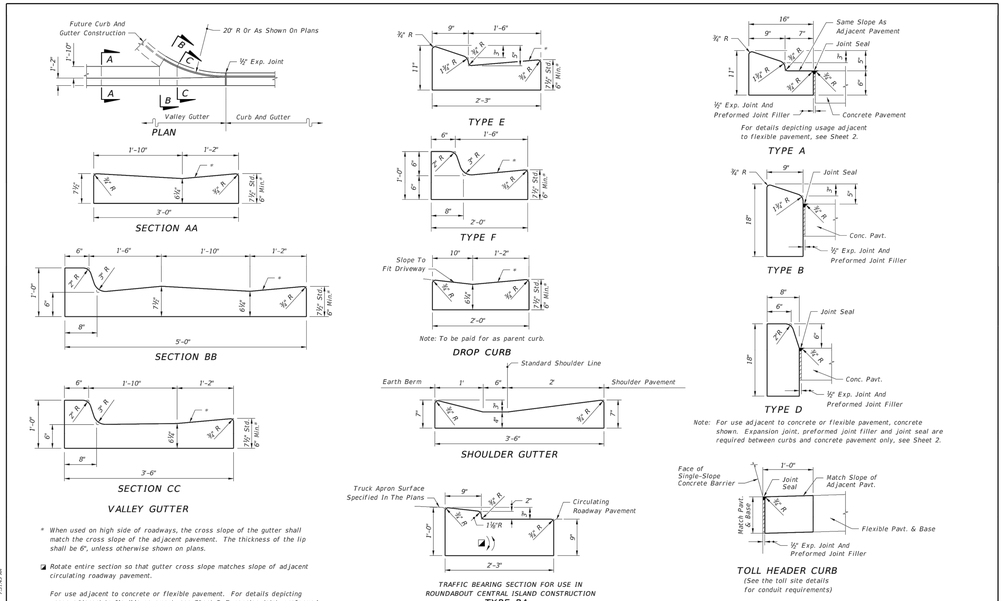
1. Cross Slopes and Grades:
   - A. Sidewalk, ramp, and landing slopes (i.e. 0.02, 0.05, and 1:12) shown in this Index are maximums. With approval of the Engineer, provide the minimum feasible slope where the requirements cannot be met.
   - B. Landings must have cross-slopes less than or equal to 0.02 in any direction.
   - C. Maintain a single longitudinal slope along each side of the curb ramp. Ramp slopes are not required to exceed 15 feet in length.
   - D. Joints permitted at the location of Slope Breaks. Otherwise locate joints in accordance with Index 522-001. No joints are permitted within the ramp portion of the Curb Ramp.
2. Curb, Curb and Gutter and/or Sidewalk:
   - A. Refer to Index 522-001 for concrete thickness and sidewalk details.
   - B. Remove any existing curb, curb and gutter, or sidewalk to the nearest joint beyond the curb transition or to the extent that no remaining section is less than 5 feet long.
3. Curb Ramp Alpha-Identification:
   - A. Sidewalk curb ramp alpha-identifications (e.g. CR-A) are provided for reference purposes in the Plans.
   - B. Alpha-identifications CR-I and CR-J are intentionally omitted.
4. Detectable Warnings:
   - A. Install detectable warnings in accordance with Specification 527.
   - B. Place detectable warnings across the full width of the ramp or landing, to a minimum depth of 2 feet measured perpendicular to the curb line and no greater than 5 feet from the back of the curb or edge of pavement.
   - C. If detectable warnings are shown in the Plans on slopes greater than 5%, align the truncated domes with the centerline of the ramp; otherwise, the truncated domes are not required to be aligned.
5. Detectable Warnings – Acceptance Criteria:
   - A. Color and texture shall be complete and uniform.
   - B. 90% of individual truncated domes shall be in accordance with the Americans with Disabilities Act Standards for Transportation Facilities, Section 705.
   - C. There shall be no more than 4 non-compliant domes in any one square foot.
   - D. Non-compliant domes shall not be adjacent to other non-compliant domes.
   - E. Surfaces shall not deviate more than 0.10" from a true plane.



CURB RAMP NOMENCLATURE

LAST REVISION	DESCRIPTION:				
11/01/19		FY 2021-22 STANDARD PLANS	DETECTABLE WARNINGS AND SIDEWALK CURB RAMPS	INDEX 522-002	SHEET 1 of 7

D3 / C11 Detectable Warning Surface



* When used on high side of roadways, the cross slope of the gutter shall match the cross slope of the adjacent pavement. The thickness of the lip shall be 6", unless otherwise shown on plans.

◪ Rotate entire section so that gutter cross slope matches slope of adjacent circulating roadway pavement.

For use adjacent to concrete or flexible pavement. For details depicting usage adjacent to flexible pavement, see Sheet 2. Expansion joint, preformed joint filler and joint seal are required between curb & gutter and concrete pavement only, see Sheet 2.

CONCRETE CURB AND GUTTER

LAST REVISION	DESCRIPTION:				
11/01/20		FY 2021-22 STANDARD PLANS	CURB AND GUTTER	INDEX 520-001	SHEET 1 of 2

D4 / C11 Typical Curbs Detail

Unroe Engineering, Inc
Civil Engineering/Planning/Scientific Evaluation
PO Box 690942, Orlando, Fl 32869-0942 ph (407) 299-0650
Business Authorization Number - EB 00006579

Revisions

#	Date	Description

Revisions

#	Date	Description

General Details Sheet 1

Whispering Hills Subdivision

Buckhill Road, Howey-in-the-Hills, Florida

DP	Drawn
DP	Checked
----	Scale
09-07-21	Date
WH2-C11	File

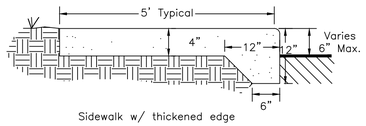
Dwg. No. C11

13 of 59

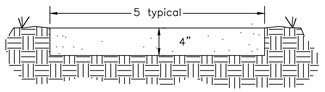
DARCY UNROE LICENSE No 60929 STATE OF FLORIDA PROFESSIONAL ENGINEER

Darcy Unroe PE 60929

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Sidewalk w/ thickened edge



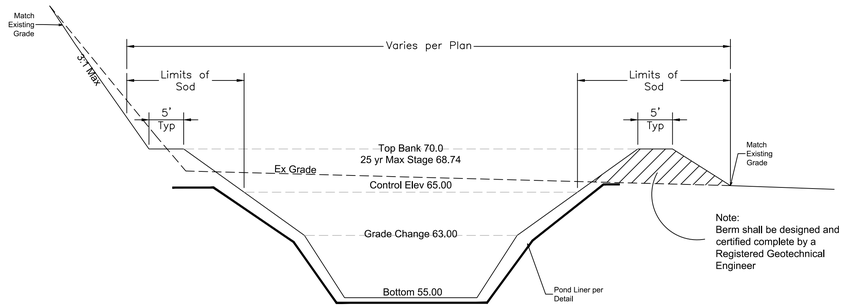
Standard sidewalk

Notes:
1. All concrete shall be 3,000 psi @ 28 days, fibermesh reinforced.
2. Soil below new walks shall be compacted to 95% max density.
3. Control joints shall be sawcut 1.5" deep in concrete at 5' on center.
4. Construction joints shall be provided at 50' OC max.
5. Sidewalks/crosswalks in Traffic areas shall be increased to 6" Thickness.

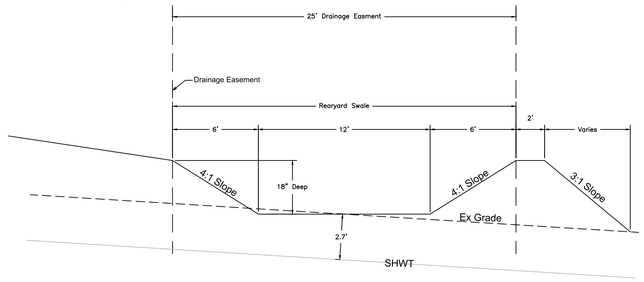
D1 / C12 Typical Sidewalk Details

Accessibility Notes

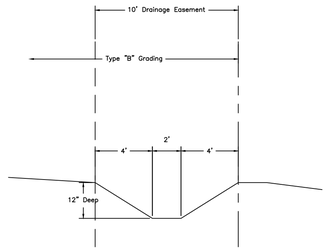
1. All handicapped parking spaces and access aisles adjacent to the handicap parking spaces shall have a maximum of 2% slope in all directions (this includes running slope and cross slope).
2. An accessible route from the public street or sidewalk to the building entrance must be provided. this accessible route shall be a minimum of 60" wide. The running slope of an accessible route shall not exceed 5% and the cross slope shall not exceed 2%.
3. Slopes exceeding 5% but less than 8% will require a ramp and must conform to the Florida Building Code requirements for ramp design (handrails, curbs, landings). No ramp shall exceed an 8% running slope or 2% cross slope.
4. Special attention shall be required during staking to make sure the 2% cross slope is met in the cross walk.
5. It will be the responsibility of the general contractor to ensure that the handicap parking spaces, accessible routes, and sidewalks/crosswalks are constructed to meet ADA requirements.
6. Any requirements listed above that can not be met shall be brought to the attention of the EOR prior to construction.



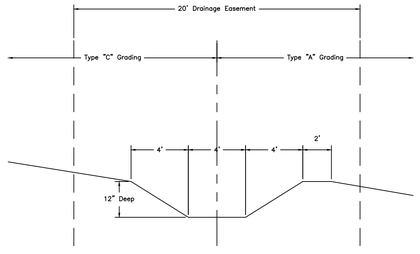
3 / C12 Wet Detention Pond Section



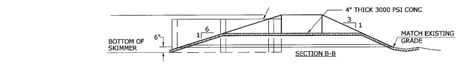
4 / C12 Rear Yard Swale Detail

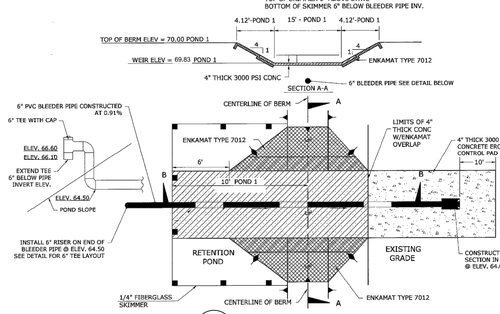


6 / C12 Conveyance Swale Detail

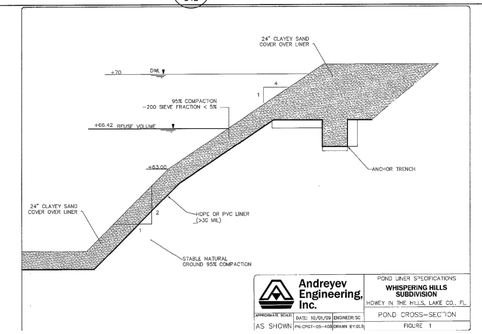


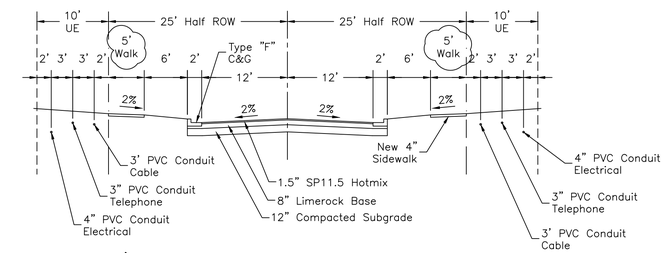
5 / C12 Conveyance Swale Detail





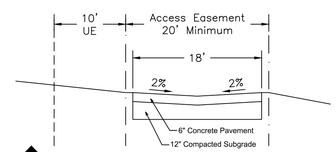
D3 / C12 BROAD CRESTED WEIR N.T.S.



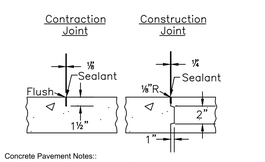


1 / C12 Typical 50' Wide ROW Pavement Section

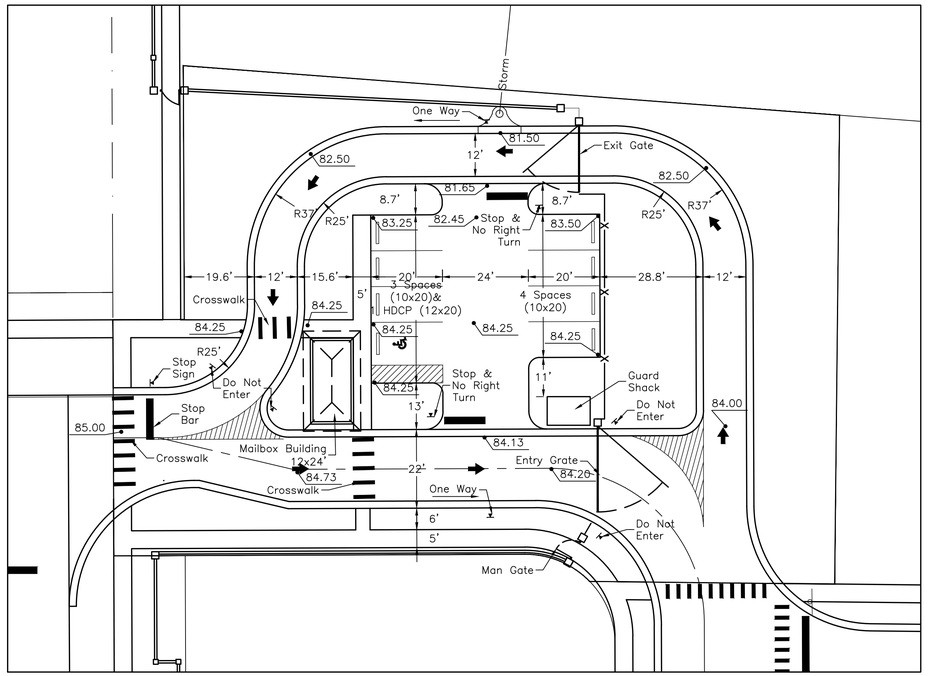
Notes:
1. Contractor to pave the first lift as ¾" and second ¾" lift will be installed at the time of substantial completion of homes for each phase.
2. Pavement section as shown is taken from Geotechnical Engineer's recommendations/
3. Site contractor to coordinate with developer to install sleeves for use by electrical, cable, telephone and etc.
4. After application of the first lift the contractor and homebuilders are jointly responsible for maintenance of pavement. The developer shall be notified when all repairs have been completed.



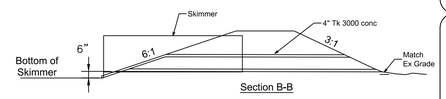
2 / C12 Typical Access Easement Section



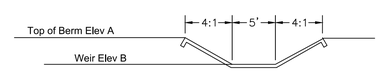
Concrete Pavement Notes::
1. 6" Thick on 12" Compacted Subgrade
2. All concrete 4,000 psi/28 day strength Portland Cement Type I
3. Contractor shall submitt jointing plan for approval prior to construction.
4. Expansion joints required at abutting structures, curbs, walks, etc.
5. Contraction joints shall be saw cut 1 " deep, maximum spacing 20'.
6. Construction or cold joints shall be doweled or keyed on joint line only.
7. Site contractor to coordinate with developer to install sleeves for use by electrical, cable, telephone and etc.



Tract "E" Site Plan
Scale: 1"=20'



Section B-B



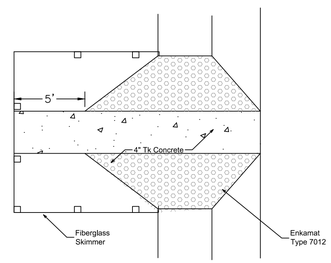
Section A-A

Swale #1
A - 67.00, B - 66.30

Swale #2
A - 67.50, B - 66.80

Swale #3
A - 68.0, B - 67.30

Swale #4
A - 67.0, B - 66.30



D4 / C12 Swale Weir

Unroe Engineering, Inc
Civil Engineering/Planning/Scientific Evaluation
PO Box 690942, Orlando, Fl 32869-0942
Business Authorization Number - EB 00006579 ph (407) 299-0650

Revisions

#	Description	Date

Revisions

#	Description	Date

General Details Sheet 2

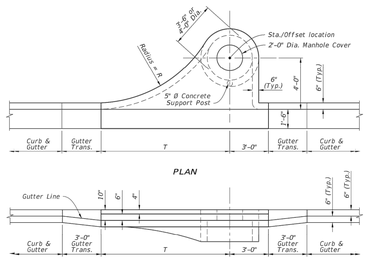
Whispering Hills Subdivision
Buckhill Road, Howey-in-the-Hills, Florida

DP	Drawn
DP	Checked
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09-07-21	Date
WH2-C12	File

Dwg. No.
C12
14 of 59

DARCY UNROE LICENSE No 60929 STATE OF FLORIDA PROFESSIONAL ENGINEER

Darcy Unroe PE 60929

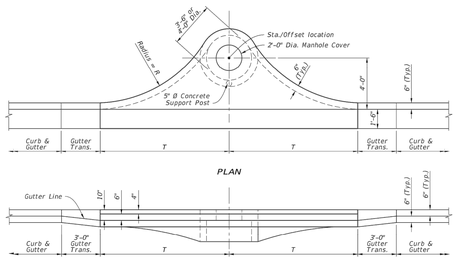


PLAN

ELEVATION

TYPE 1 AND 3

TABLE 1 INLET DIMENSIONS		
Inlet Type	R	T
1	10'-0"	10'-0"
2	10'-0"	10'-0"
3	6'-0"	6'-0"
4	6'-0"	6'-0"

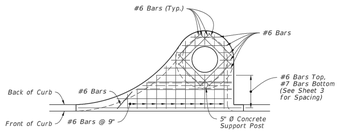


PLAN

ELEVATION

TYPE 2 AND 4

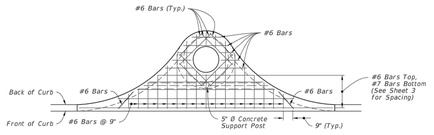
TOP DIMENSIONAL DETAILS



PLAN

TYPE 1 AND 3

NOTE:
For transverse section reinforcement, see Sheet 3.



PLAN

TYPE 2 AND 4

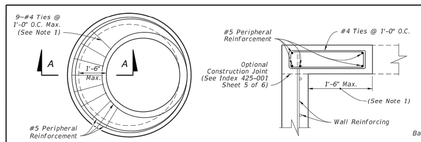
TOP REINFORCING DETAILS

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TOP DIMENSIONAL AND TOP REINFORCING DETAILS

LAST REVISION 11/01/20	REVISION	DESCRIPTION:	FDOT FY 2021-22 STANDARD PLANS	CURB INLET TOP TYPES 1, 2, 3, AND 4	INDEX 425-020	SHEET 2 of 3

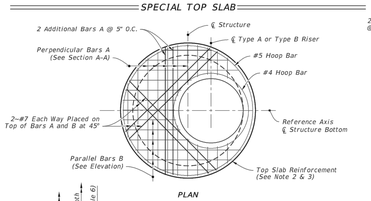
D1 C13 Curb Inlet Details



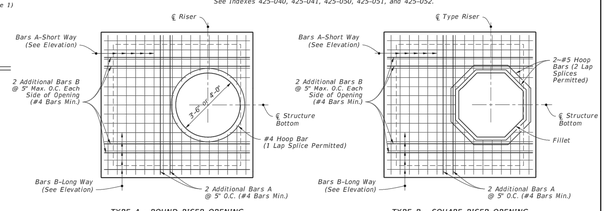
PLAN

SECTION A-A

SPECIAL TOP SLAB



PLAN

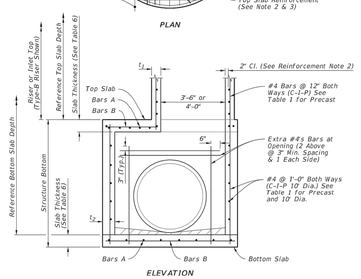


TYPE A - ROUND RISER OPENING

PLAN

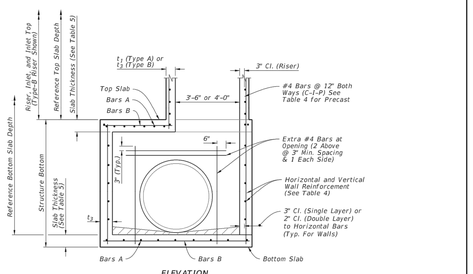
TYPE B - SQUARE RISER OPENING

PLAN



ELEVATION

TYPE J BOTTOM - ALTERNATE A



ELEVATION

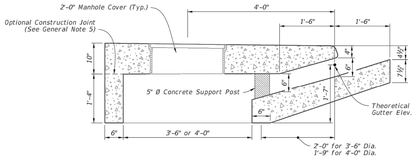
TYPE J BOTTOM - ALTERNATE B

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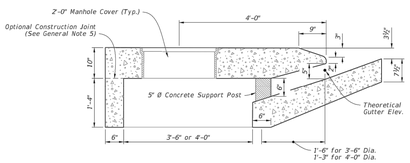
DIMENSIONAL AND REINFORCING DETAILS

LAST REVISION 11/01/20	REVISION	DESCRIPTION:	FDOT FY 2021-22 STANDARD PLANS	STRUCTURE BOTTOMS TYPE J AND P	INDEX 425-010	SHEET 2 of 4

D3 C13 Storm Structure Bottom Details

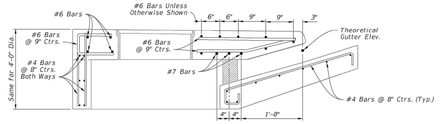


INLET SECTION WITH TYPE F CURB AND GUTTER

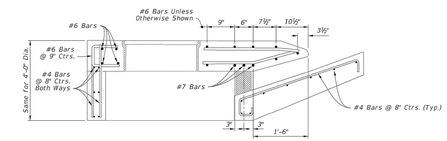


INLET SECTION WITH TYPE E CURB AND GUTTER

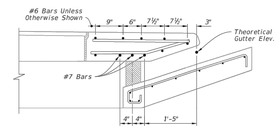
TRANSVERSE DIMENSIONAL DETAILS



3'-6" DIA. STRUCTURE BOTTOM

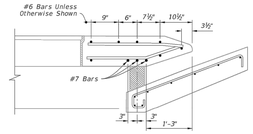


3'-6" DIA. STRUCTURE BOTTOM



4'-0" DIA. STRUCTURE BOTTOM

INLET SECTION WITH TYPE F CURB AND GUTTER



4'-0" DIA. STRUCTURE BOTTOM

INLET SECTION WITH TYPE E CURB AND GUTTER

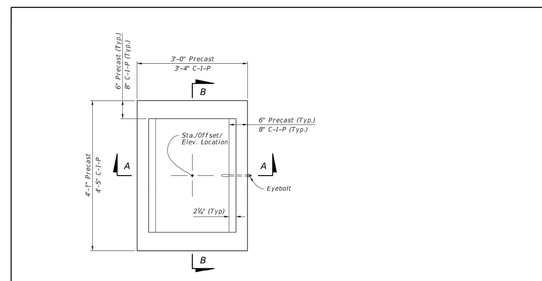
TRANSVERSE REINFORCING DETAILS

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TRANSVERSE DIMENSIONAL AND REINFORCING DETAILS

LAST REVISION 11/01/20	REVISION	DESCRIPTION:	FDOT FY 2021-22 STANDARD PLANS	CURB INLET TOP TYPES 1, 2, 3, AND 4	INDEX 425-020	SHEET 3 of 3

D2 C13 Curb Inlet Details



PLAN

STEEL GRATE DETAIL

(Approx. 104 Lbs. – See Sheet 7 For Cast Iron Grates)

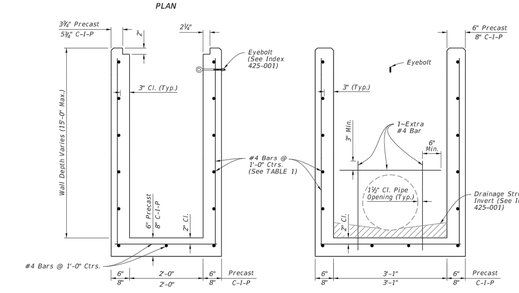


TABLE 1 HORIZONTAL WALL REINFORCING SCHEDULE				
WALL DEPTH	SCHEDULE	AREA (in²/ft.)	MAX. SPACING BARS	MAX. SPACING WWF
0' - 15'	A12	0.20	12"	8"

NOTES:
1. Grate, Concrete Apron, and Sod not shown on structure detail.
2. See Sheet 8, 9, and 10 for Concrete Apron and Sodded Area details.

DIMENSIONAL AND REINFORCING DETAILS

TYPE C - DIMENSIONAL, REINFORCING, AND STEEL GRATE DET

LAST REVISION 11/01/20	REVISION	DESCRIPTION:	FDOT FY 2021-22 STANDARD PLANS	DITCH BOTTOM INLET TYPE C, D, E, AND H	INDEX 425-052	SHEET 2 of

D4 C13 Type "C" Ditch Bottom Inlet

Item 1.

Description	Date	#

Revisions

Description	Date	#

Revisions

Unroe Engineering, Inc
Civil Engineering/Planning/Scientific Evaluation
PO Box 690942, Orlando, Fl 32869-0942
Business Authorization Number - EB 00006579 ph (407) 299-0650

General Details Sheet 3

Whispering Hills Subdivision

Buckhill Road, Howey-in-the-Hills, Florida

DP	Drawn
DP	Checked
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09-07-21	Date
WH2-C13	File

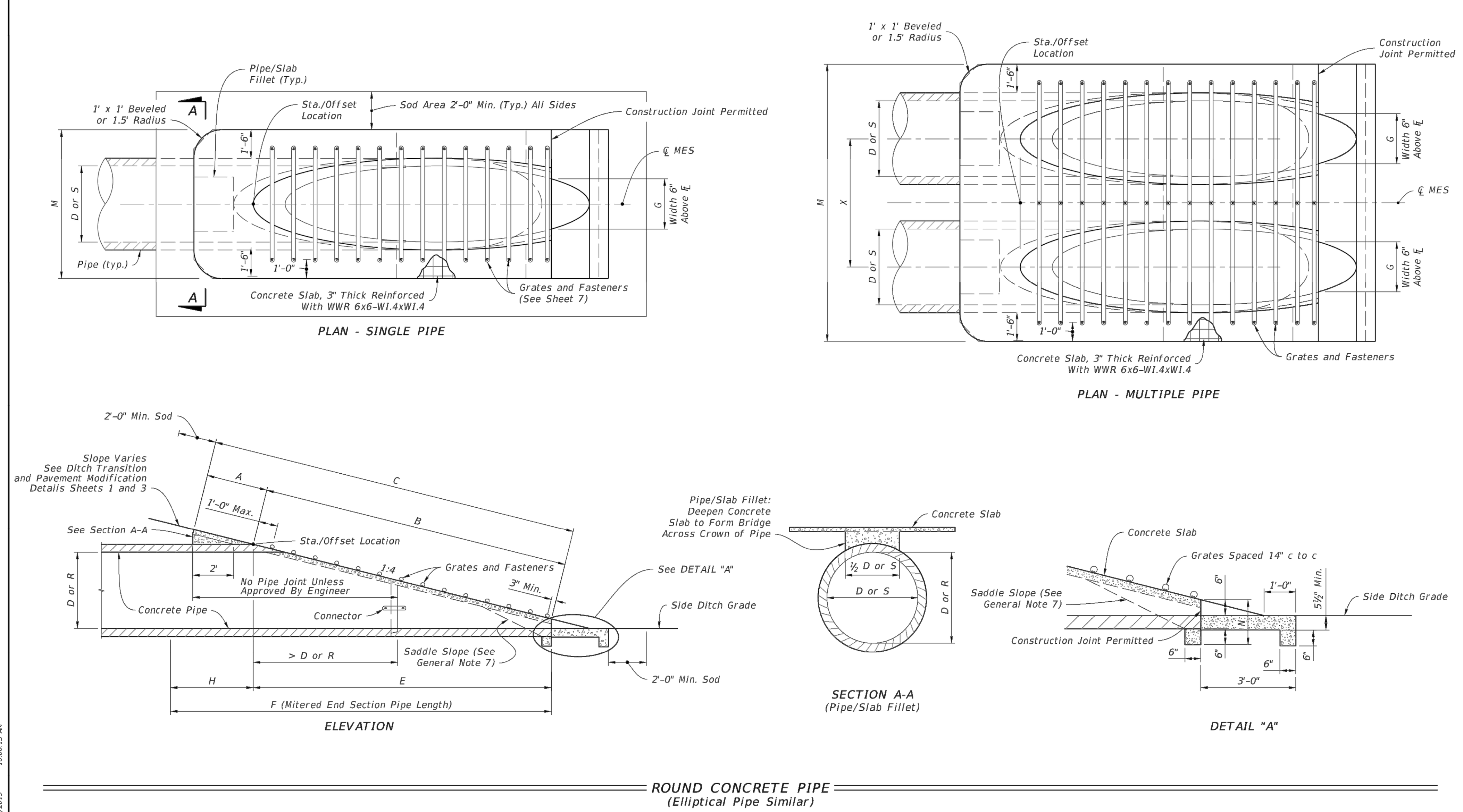
Dwg. No.

C13

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DARCY UNROE LICENSE No 60929 STATE OF FLORIDA PROFESSIONAL ENGINEER

Darcy Unroe PE 60929



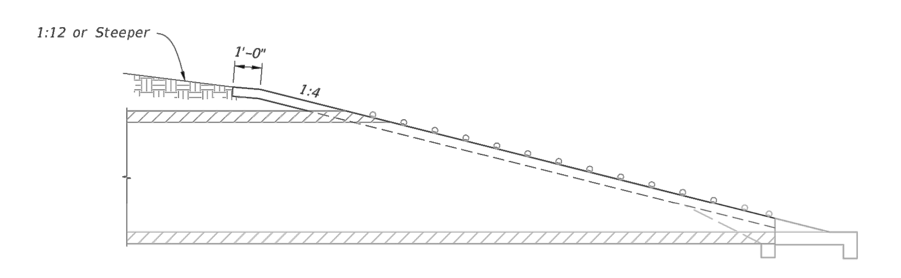
LAST REVISION 11/01/18	REVISION	DESCRIPTION:	FDOT FY 2020-21 STANDARD PLANS	SIDE DRAIN MITERED END SECTION	INDEX 430-022	SHEET 2 of 7

D1 C14 Mitered End Section

SINGLE AND MULTIPLE CONCRETE PIPE DIMENSIONS AND QUANTITIES

Pipe	Dia. D	Rise R	Span S	X	A	B	C	E	F	G	H	M Single Pipe	M Double Pipe	M Triple Pipe	M Quad. Pipe	N	Grate Sizes Standard Weight Pipe	Grate Sizes Extra Strong Pipe	3" Conc. Slab (CY) Single Pipe	3" Conc. Slab (CY) Double Pipe	3" Conc. Slab (CY) Triple Pipe	3" Conc. Slab (CY) Quad. Pipe	Sodding (SY) Single Pipe	Sodding (SY) Double Pipe	Sodding (SY) Triple Pipe	Sodding (SY) Quad. Pipe
Round Concrete	15"	—	—	2'-7"	2.27'	4.09'	6.36'	4.03'	8'	1.22'	4.0'	4.63'	7.21'	9.79'	12.37'	1.19'			0.76	1.16	1.54	1.94	8	10	11	12
	18"	—	—	2'-10"	2.36'	5.12'	7.48'	5.03'	9'	1.41'	4.0'	4.92'	7.75'	10.58'	13.42'	1.21'			0.85	1.28	1.71	2.17	9	10	12	13
	24"	—	—	3'-5"	2.53'	7.18' △	9.71'	7.03' △	11'	1.73'	4.0'	5.50'	8.92'	12.33'	15.75'	1.25'			1.02	1.58	2.15	2.75	10	12	13	15
	30"	—	—	4'-3"	2.70'	9.25'	11.95'	9.03'	13'	2.00'	4.0'	6.08'	10.33'	14.58'	18.83'	1.29'	2½"	3"	1.23	1.98	2.74	3.50	12	14	15	17
	36"	—	—	5'-1"	2.87'	11.31' ◇	14.18'	11.03' ◇	15'	2.24'	4.0'	6.67'	11.75'	16.83'	21.92'	1.33'	2½"	3"	1.40	2.38	3.33	4.24	13	15	17	20
	42"	—	—	6'-0"	3.05'	13.37'	16.42'	13.03'	17'	2.45'	4.0'	7.25'	13.25'	19.25'	25.25'	1.38'	2½"	3½"	1.60	2.83	4.04	5.26	14	17	19	22
	48"	—	—	6'-9"	3.22'	15.43'	18.65'	15.03'	19'	2.65'	4.0'	7.83'	14.58'	21.33'	28.08'	1.42'	2½"	3½"	1.81	3.26	4.70	6.14	15	18	21	24
	54"	—	—	7'-8"	3.39'	17.49'	20.88'	17.03'	21'	2.83'	4.0'	8.42'	16.08'	23.75'	31.42'	1.46'	3"	4"	2.03	3.78	5.54	7.28	17	20	23	27
	60"	—	—	8'-6"	3.56'	19.55'	23.11'	19.03'	23'	3.00'	4.0'	9.00'	17.50'	26.00'	34.50'	1.50'	3"	4"	2.28	4.36	6.43	8.50	18	22	25	29
Elliptical Concrete	—	12"	18"	2'-10"	2.36'	3.06'	5.42'	3.03'	5'	1.50'	2.0'	4.92'	7.75'	10.58'	13.42'	1.21'			0.68	1.04	1.41	1.77	8	9	11	12
	—	14"	23"	3'-4"	2.44'	3.75'	6.19'	3.70'	6'	1.90'	2.3'	5.38'	8.71'	12.04'	15.38'	1.23'			0.76	1.19	1.63	2.05	9	10	12	13
	—	19"	30"	4'-0"	2.62'	5.47'	8.09'	5.36'	8'	2.37'	2.6'	6.04'	10.04'	14.04'	18.04'	1.27'	2½"	3"	0.95	1.52	2.09	2.65	10	12	13	15
	—	24"	38"	5'-0"	2.79'	7.18'	9.97'	7.03'	10'	2.85'	3.0'	6.79'	11.79'	16.79'	21.79'	1.31'	2½"	3"	1.18	1.95	2.74	3.53	11	13	15	18
	—	29"	45"	5'-11"	3.05'	8.90'	11.95'	8.70'	12'	3.19'	3.3'	7.50'	13.42'	19.33'	25.25'	1.38'	2½"	3½"	1.41	2.42	3.44	4.45	12	15	18	20
	—	34"	53"	7'-0"	3.22'	10.62'	13.84'	10.36'	13'	3.57'	2.6'	8.25'	15.25'	22.25'	29.25'	1.42'	3"	3½"	1.63	2.92	4.22	5.52	13	17	20	23
	—	38"	60"	7'-10"	3.39'	11.99'	15.38'	11.70'	15'	3.95'	3.3'	8.92'	16.75'	24.58'	32.42'	1.46'	3"	4"	1.83	3.36	4.89	6.41	14	18	21	25
	—	43"	68"	8'-11"	3.56'	13.71'	17.27'	13.36'	17'	4.28'	3.6'	9.67'	18.58'	27.50'	36.42'	1.50'	3"	4"	2.09	3.95	5.80	7.65	16	20	23	27
	—	48"	76"	9'-11"	3.73'	15.43'	19.16'	15.03'	19'	4.59'	4.0'	10.42'	20.33'	30.25'	40.17'	1.54'	3"	HSS 5"x5/16"	2.37	4.54	6.73	8.92	17	21	26	30
	—	53"	83"	10'-8"	3.91'	17.15'	21.06'	16.70'	20'	4.77'	3.3'	11.08'	21.75'	32.42'	43.08'	1.58'	3"	HSS 5"x5/16"	2.61	5.09	7.56	10.03	18	23	27	32
	—	58"	91"	11'-8"	4.08'	18.87'	22.95'	18.36'	22'	5.01'	3.6'	11.83'	23.50'	35.17'	46.83'	1.63'	3½"	HSS 5"x3/8"	2.91	5.77	8.64	11.50	19	24	29	35

△6.42' △6.25' Dimensions permitted to allow use of 8' standard pipe lengths.
◇10.40' ◇10.10' Dimensions permitted to allow use of 12' standard pipe lengths.

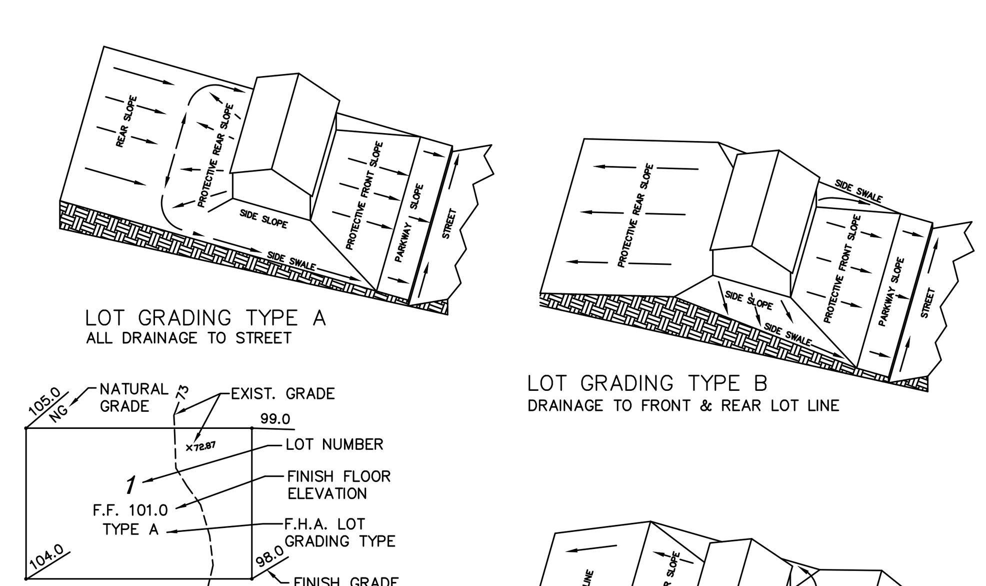


PERMISSIBLE PAVEMENT MODIFICATION

CONCRETE PIPE DIMENSIONS AND QUANTITIES AND PERMISSIBLE PAVEMENT MODIFICATION

LAST REVISION 11/01/19	REVISION	DESCRIPTION:	FDOT FY 2020-21 STANDARD PLANS	SIDE DRAIN MITERED END SECTION	INDEX 430-022	SHEET 3 of 7

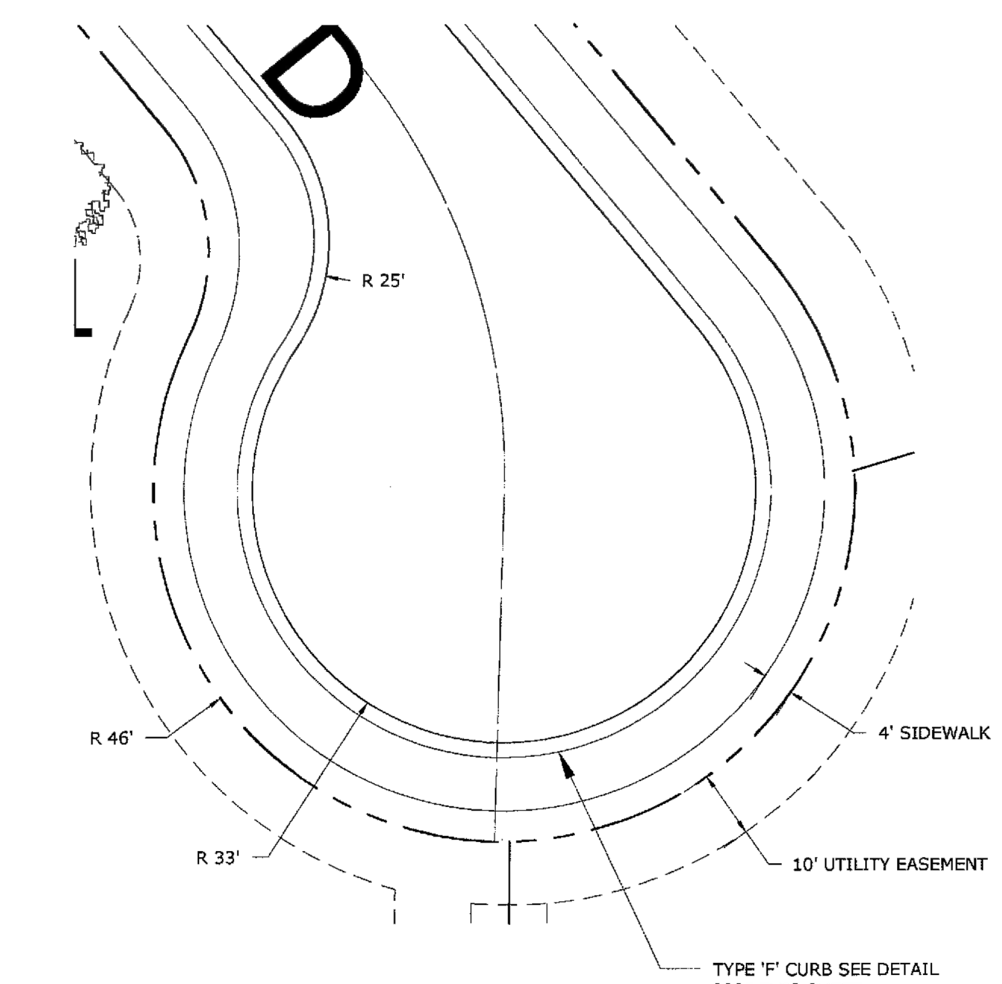
D2 C14 Mitered End Section



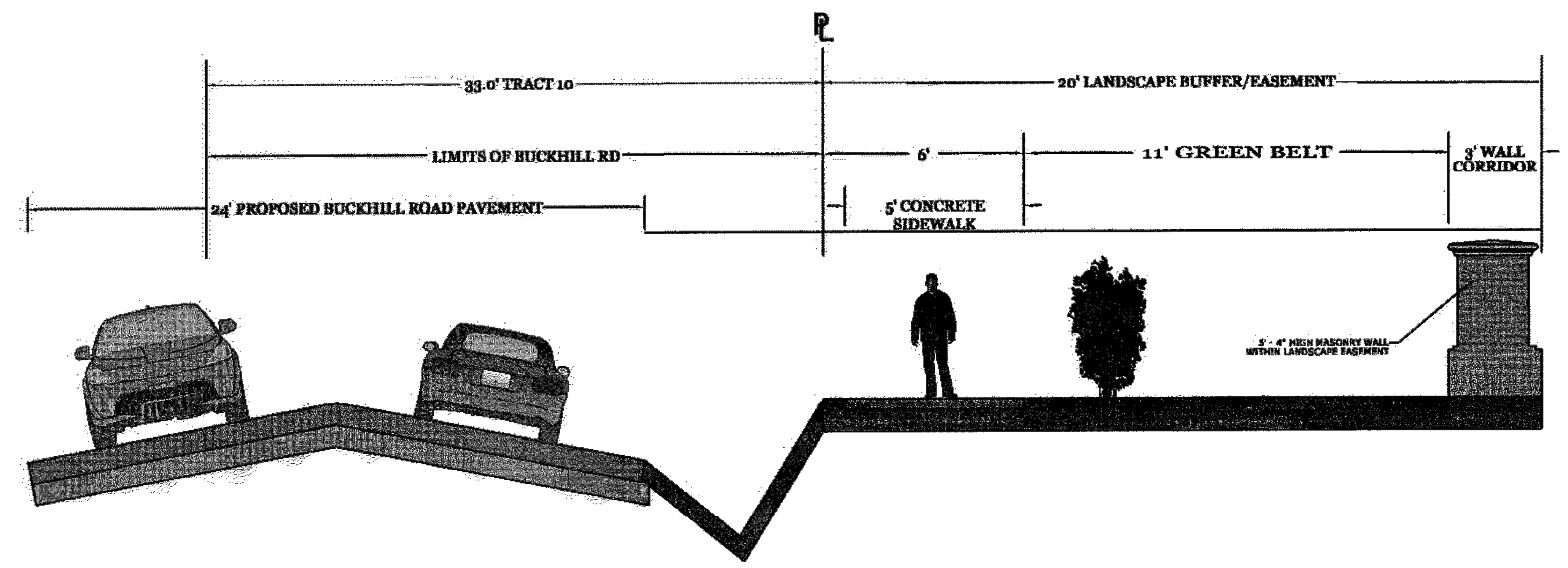
GENERAL NOTES

1. FINISH FLOOR ELEVATIONS INDICATED FOR TYPE A & B LOTS ARE MINIMUM & ARE 18" ABOVE HIGHEST ADJACENT STREET CENTER-LINE GRADE. FINISH FLOOR ELEVATIONS MAY BE RAISED IF DESIRABLE.
2. FINISH FLOOR ELEVATIONS INDICATED FOR TYPE C LOTS ARE MINIMUM & ARE 12" ABOVE HIGHEST FINISHED CONTOURS THAT ABUTS THE BUILDING. FINISH FLOOR ELEVATIONS MAY BE RAISED IF DESIRABLE.
3. DRIVEWAYS SHALL NOT EXCEED A SLOPE OF 14%+/-

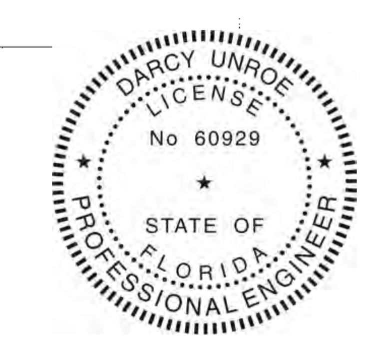
D3 C14 LOT GRADING DETAILS
NTS



D4 C14 TYPICAL CUL-DE-SAC DETAIL
1"=20'



D5 C14 Buckhill Road Landscape Buffer



Darcy Unroe PE 60929

Item 1.

#	Date	Description

Revisions

#	Date	Description

Revisions

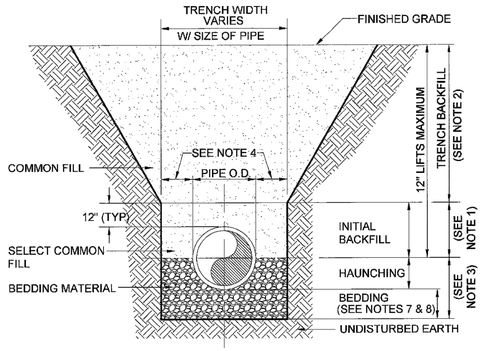
Unroe Engineering, Inc
Civil Engineering/Planning/Scientific Evaluation
PO Box 690942, Orlando, Fl 32869-0942 ph (407) 299-0650
Business Authorization Number - EB 00006579

General Details Sheet 4
Whispering Hills Subdivision
Buckhill Road, Howey-in-the-Hills, Florida

DP	Drawn
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09-07-21	Date
WH2-C14	File

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DATE: November 2007 **BEDDING AND TRENCHING - TYPE A** **FIGURE A101**



NOTES:
1. INITIAL BACKFILL: SELECT COMMON FILL COMPACTED TO 95% OF THE MAXIMUM DENSITY AS PER AASHTO T-180.
2. TRENCH BACKFILL: COMMON FILL COMPACTED TO 95% OF THE MAXIMUM DENSITY AS PER AASHTO T-180.
3. TYPE A BEDDING MATERIAL SHALL CONFORM TO FDOT NO. 57 AGGREGATE.
4. 15" MAX. (12" MIN.) FOR PIPE DIAMETER LESS THAN 24" AND 24" MAX (12" MIN) FOR PIPE DIAMETER 24" AND LARGER.
5. WATER SHALL NOT BE PERMITTED IN THE TRENCH DURING CONSTRUCTION.
6. ALL PIPE TO BE INSTALLED WITH BELL FACING UPSTREAM TO THE DIRECTION OF THE FLOW.
7. BEDDING DEPTH SHALL BE 4" MINIMUM FOR PIPE DIAMETER UP TO 12" AND 6" MINIMUM FOR PIPE DIAMETER 16" AND LARGER.
8. DEPTH FOR REMOVAL OF UNSUITABLE MATERIAL SHALL GOVERN DEPTH OF BEDDING ROCK BELOW THE PIPE. UTILITIES SHALL DETERMINE IN THE FIELD REQUIRED REMOVAL OF UNSUITABLE MATERIAL TO REACH SUITABLE FOUNDATION.
9. FINAL RESTORATION IN IMPROVED AREAS SHALL BE IN COMPLIANCE WITH ALL APPLICABLE REGULATIONS OF GOVERNING AGENCIES. SURFACE RESTORATION WITHIN TOWN OF HOWEY-IN-THE-HILLS RIGHT-OF-WAY SHALL COMPLY WITH REQUIREMENTS OF R/W UTILIZATION REGULATIONS AND ROAD CONSTRUCTION SPECIFICATIONS.

101 - TYPE A BEDDING AND TRENCHING DETAIL
N.T.S.
(FIG. 101)

DATE: November, 2007 **RESTRAINED PIPE TABLE** **FIGURE A104-1**
WATER AND RECLAIMED WATER MAINS

MINIMUM LENGTH (FT) TO BE RESTRAINED ON EACH SIDE OF FITTING(S)										
TYPE	PIPE SIZE									
	4"	6"	8"	10"	12"	16"	20"	24"	30"	36"
90° BEND	20	29	37	44	51	65	77	89	105	120
45° BEND	8	12	15	18	21	27	32	37	44	50
22-1/2° BEND	4	6	7	9	10	13	15	18	21	24
11-1/4° BEND	2	3	4	5	6	7	8	9	10	12
PLUG OR BRANCH OF TEE	42	59	77	93	108	138	166	194	231	265
VALVE	21	30	39	47	54	69	83	97	116	133

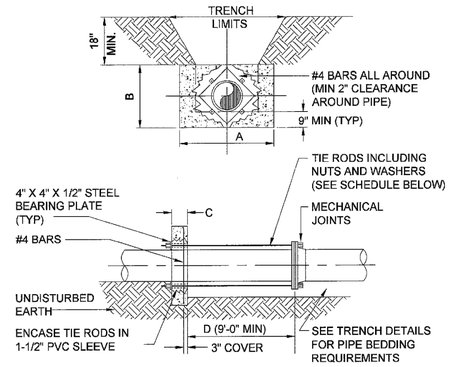
NOTES:
1. FITTINGS SHALL BE RESTRAINED JOINTS UNLESS OTHERWISE INDICATED.
2. INSTALL FULL LENGTH JOINTS WITH TOTAL LENGTH EQUAL TO OR GREATER THAN SHOWN IN THE TABLE.
3. WHERE TWO OR MORE FITTINGS ARE TOGETHER, USE FITTING WHICH YIELDS GREATEST LENGTH OF RESTRAINED PIPE.
4. ALL LINE VALVES AND THROUGH RUN OF TEES SHALL BE RESTRAINED.
5. LENGTHS SHOWN IN THE TABLE HAVE BEEN CALCULATED IN ACCORDANCE WITH THE PROCEDURE OUTLINED IN "THRUST RESTRAINT DESIGN FOR DUCTILE IRON PIPE" AS PUBLISHED BY DIPRA, WITH THE FOLLOWING ASSUMPTIONS:

   WORKING PRESSURE: 150 PSI
   SOIL DESIGNATION: SM (SAND SILT)
   LAYING CONDITIONS: 3

6. FOR HDPE, PVC OR PIPE ENCASED IN POLYETHYLENE, INCREASE THE GIVEN VALUE BY A FACTOR OF 1.25.

103 - RESTRAINED PIPE TABLE
N.T.S.

DATE: November, 2007 **THRUST COLLAR (150 psi)** **FIGURE A105-1**
WATER AND RECLAIMED WATER MAINS



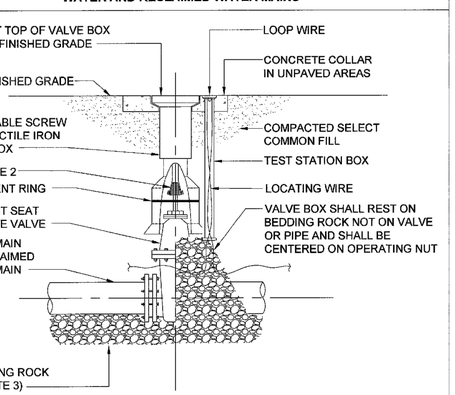
NOTES:
1. ADDITIONAL REINFORCEMENTS SHALL BE AS SPECIFIED BY THE ENGINEER.
2. MINIMUM COMPRESSIVE STRENGTH FOR CONCRETE SHALL BE 3000 PSI.
3. BEDDING, BACKFILL AND COMPACTION SHALL BE AS SPECIFIED ELSEWHERE IN THE STANDARD DRAWINGS.
4. ALL FORM BOARDS SHALL BE REMOVED PRIOR TO BACKFILL.
5. NO ALLOWANCE SHALL BE MADE FOR FRICTION BETWEEN THE PIPE WALL AND THE THRUST COLLAR.
6. DESIGN PRESSURE: 150 PSI.

SCHEDULE OF DIMENSIONS AND MATERIALS						
PIPE SIZE (INCHES)	DIMENSIONS (FT.)				TIE RODS REQ'D	
	A	B	C	D	DIA.	NO.
6	2.0	2.0	1.0		3/4	2
8	2.5	2.5	1.0		3/4	2
10	3.5	3.0	1.0		3/4	2
12	5.0	3.0	1.0		3/4	2
16	6.0	4.0	1.5		3/4	4
20	8.0	5.0	1.5		3/4	6
24	9.0	6.0	1.5		3/4	8

NOTE: THRUST COLLAR AREAS TO BE COMPUTED ON BASIS OF 2000 LBS/SF SOIL RESTRAINT BEARING.

103 - THRUST COLLAR DETAIL
N.T.S.

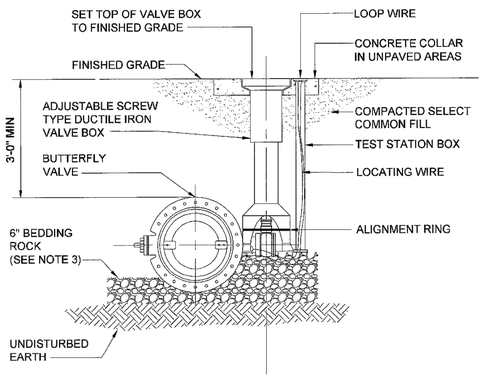
DATE: November, 2007 **GATE VALVE AND BOX** **FIGURE A107**
WATER AND RECLAIMED WATER MAINS



NOTES:
1. PVC PIPE OR DUCTILE IRON PIPE EXTENSIONS SHALL NOT BE USED ON VALVE BOX INSTALLATION.
2. THE VALVE ACTUATING NUT SHALL BE EXTENDED TO BE WITHIN 3' OF FINISHED GRADE.
3. BEDDING MATERIAL SHALL CONFORM TO FDOT NO. 57 AGGREGATE.
4. WIRE SHALL TERMINATE IN TEST STATION BOX.
5. REFER TO FIGURE A111 FOR INSTALLATIONS AT A DEPTH OF 6' OR GREATER.

104 - GATE VALVE & BOX DETAIL
N.T.S.

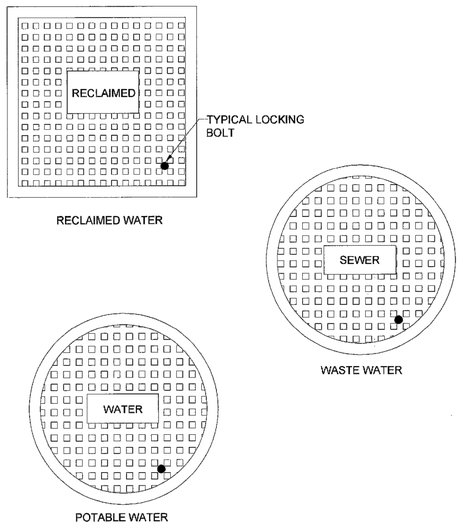
DATE: November, 2007 **BUTTERFLY VALVE AND BOX** **FIGURE A108**
WATER AND RECLAIMED WATER MAINS



NOTES:
1. PVC PIPE OR DUCTILE IRON PIPE EXTENSIONS SHALL NOT BE USED ON VALVE BOX INSTALLATION.
2. THE ACTUATING NUT FOR VALVES SHALL BE EXTENDED TO 3' OF FINISHED GRADE.
3. BEDDING MATERIAL SHALL CONFORM TO FDOT NO. 57 AGGREGATE.
4. WIRE SHALL TERMINATE IN TEST STATION BOX.
5. VALVE BOX SHALL REST ON BEDDING ROCK NOT ON VALVE OR PIPE AND SHALL BE CENTERED ON OPERATING NUT.
6. REFER TO FIGURE A111 FOR INSTALLATIONS AT A DEPTH OF 6' OR GREATER.

105 - BUTTERFLY VALVE & BOX DETAIL
N.T.S.

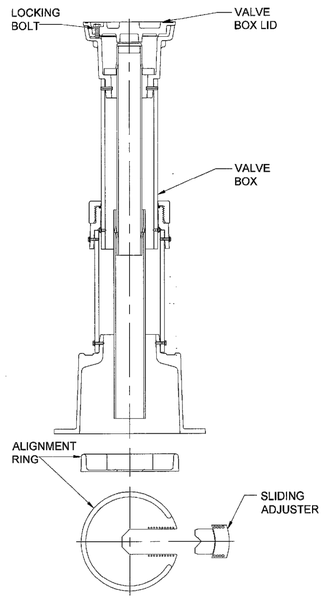
DATE: November, 2007 **TYPICAL VALVE BOX COVER** **FIGURE A110**



NOTE:
1. LOCKING LIDS ARE REQUIRED ON ALL VALVE BOXES.

106 - VALVE BOX COVER DETAIL
N.T.S.

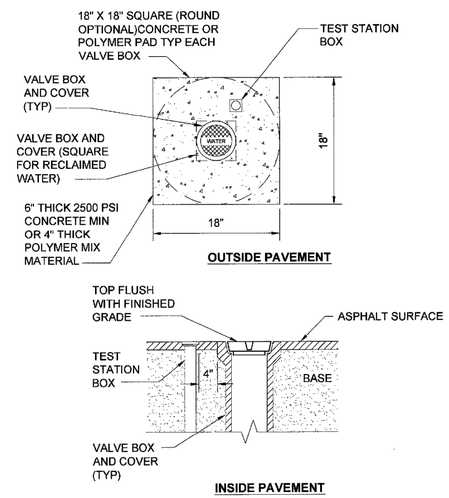
DATE: November, 2007 **ADJUSTABLE SEALED VALVE BOX** **FIGURE A111**



NOTES:
1. ALL MAINS 6' DEEP OR GREATER.
2. FOR MAINS 16" IN DIAMETER OR GREATER REGARDLESS OF DEPTH.

107 - ADJUSTABLE SEALED VAVLE BOX DETAIL
N.T.S.

DATE: November, 2007 **VALVE COLLAR** **FIGURE A112**



NOTES:
1. BRONZE IDENTIFICATION DISC SHALL BE REQUIRED FOR ALL VALVES 16" AND LARGER LOCATED OUTSIDE OF PAVEMENT.
2. LABEL TYPE AS WATER, SEWER OR RECLAIMED WATER.

108 - VALVE COLLAR DETAIL
N.T.S.

DARCY UNROE LICENSE No 60929 STATE OF FLORIDA PROFESSIONAL ENGINEER

Darcy Unroe PE 60929

Item 1.

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	Revisions	
#	Description	Date
	Revisions	

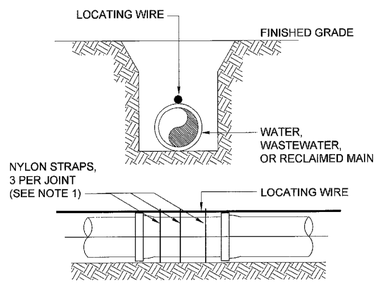
Unroe Engineering, Inc
Civil Engineering/Planning/Scientific Evaluation
PO Box 690942, Orlando, Fl 32869-0942
Business Authorization Number - EB 00006579 ph (407) 299-0650

Howey-in-the-HillsDetails 1
Whispering Hills Subdivision
Buckhill Road, Howey-in-the-Hills, Florida

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09-07-21	Date
WH2-C15	File

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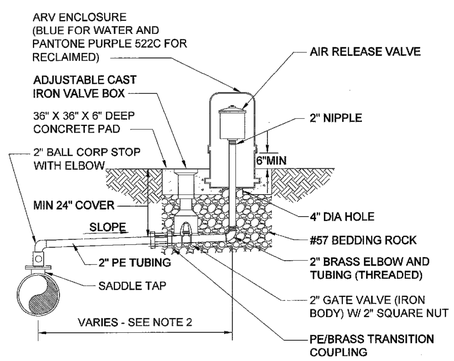
DATE: November, 2007 **PIPE LOCATING WIRE** **FIGURE A114**



NOTES:
1. ALL PIPE SHALL REQUIRE INSULATED LOCATING WIRE (10 GAUGE SOLID COPPER) CAPABLE OF DETECTION BY A CABLE LOCATOR AND SHALL BE WRAPPED WITH NYLON STRAPS TO TOP CENTERLINE OF THE PIPE.
2. LOCATING WIRE SHALL TERMINATE INSIDE THE TEST STATION BOX AND SHALL EXTEND 12" ABOVE TOP OF COLLAR.

203 DT-2 PIPE LOCATING WIRE DETAIL
N.T.S.

DATE: November, 2007 **AIR OR COMBINATION AIR/VACUUM RELEASE WATER AND RECLAIMED WATER** **FIGURE A115-1**



NOTES:
1. FOR WATER OR RECLAIMED WATER USE ONLY.
2. OFFSET DISTANCE TO BE FIELD DETERMINED AND AS CLOSE TO THE R/W AS POSSIBLE.
3. ADJUST HORIZONTAL LOCATION OF SIDEWALK, AS REQUIRED TO AVOID ARV ENCLOSURE.
4. LOCATE ARV ENCLOSURE WITHINN 6" OF R/W.

204 DT-2 AIR/VACUUM RELEASE VALVE DETAIL
N.T.S.

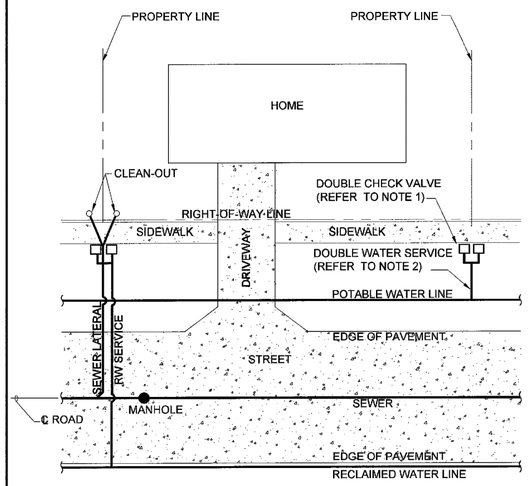
DATE: November, 2007 **MINIMUM HORIZONTAL SEPARATION REQUIREMENTS WATER, WASTEWATER AND RECLAIMED WATER MAINS** **FIGURE A116**

PROPOSED UTILITY	HORIZONTAL & VERTICAL SEPARATION REQUIREMENTS								
	POTABLE WATER (PW)		RECLAIMED WATER (RW)		SAN SEWER (SS) GRAVITY & FM)		STORM SEWER		ACCEPTABLE VARIANCES
	HORIZ	VERT	HORIZ	VERT	HORIZ	VERT	HORIZ	VERT	
POTABLE WATER	-	-	3'	12"	6'	12"	3'	12"	REFER TO GENERAL NOTE #4
RECLAIMED WATER	3'	12"	-	-	3'	12"	-	-	
SANITARY SEWER	6'	12"	3'	12"	-	-	-	-	

GENERAL NOTES:
1. THE TABLE MEETS SEPARATION REQUIREMENTS AS DESCRIBED BY FDEP IN THE FLORIDA ADMINISTRATION CODE (FAC). THESE SEPARATION REQUIREMENTS SHALL APPLY BETWEEN NEWLY PROPOSED UTILITY LINES AND EXISTING OR PROPOSED UTILITY LINES.
2. FOR THE PURPOSE OF THIS TABLE, RECLAIMED WATER SHALL MEAN UNRESTRICTED PUBLIC ACCESS REUSE WATER AS DEFINED BY F.A.C. 62-610. OTHER TYPES OF RECLAIMED WATER ARE CONSIDERED RAW SEWAGE AND SEPARATION LISTED FOR SANITARY SEWER SHALL APPLY.
3. ALL SEPARATION DISTANCES ARE FROM OUTSIDE OF PIPE TO OUTSIDE OF PIPE.
4. ACCEPTABLE VARIANCES:
   A. WHERE HORIZONTAL SEPARATION IS NOT ATTAINABLE FOR NEW INSTALLATIONS OF PW AND SS, THE PIPES WILL BE INSTALLED IN SEPARATE TRENCHES AND THE BOTTOM OF THE PW MAIN WILL BE 12" HIGHER THAN THE TOP OF THE SS.
   B. WHERE HORIZONTAL SEPARATION IS NOT ATTAINABLE FOR NEW SS AND A NEW OR EXISTING PW MAIN, THE SS WILL BE UPGRADED TO A DR OF 18.
   C. WHERE INSTALLATION OF A NEW PW MAIN IS IN CONFLICT WITH EXISTING SS, THE FOLLOWING SHALL BE MAINTAINED:
      1. VERTICAL CONFLICT: DEFLECT NEW PW MAIN 12" ABOVE THE EXISTING SS WITH SUFFICIENT COVER FOR THE PW OR 12" BELOW THE EXISTING SS. WHERE DEFLECTION IS NOT POSSIBLE OR MINIMUM COVER NOT MET, THE PW MAIN SHALL BE UPGRADED TO DIP AND CENTERED AT CROSSING.
      2. HORIZONTAL CONFLICT: PW MAIN SHALL BE INSTALLED 18" HIGHER THAN THE EXISTING SS WITH SUFFICIENT COVER OR THE PW WILL BE DIP.
   D. SEPARATION REQUIREMENTS BETWEEN PW AND STORM SEWER ARE THE SAME AS WITH PW AND SS. SPECIAL SUPPORT MAY BE REQUIRED.
   E. WHERE VERTICAL AND HORIZONTAL SEPARATIONS ARE NOT ATTAINABLE FOR PW AND FM, THE FOLLOWING SHALL BE MAINTAINED:
      1. FM UPGRADED TO DR 14 (12" DIA AND UNDER) AND DR 18 (14" DIA AND OVER). WHERE FM IS EXISTING, PW SHALL BE UPGRADED TO DIP.
      2. STAGGER THE LOCATION OF JOINTS FOR EACH PIPE.
5. NO WATER PIPE SHALL PASS THROUGH OR COME IN CONTACT WITH ANY PART OF A SANITARY OR STORM WATER MANHOLE OR STRUCTURE.

205 DT-2 PIPE SEPARATION TABLE DETAIL
NTS

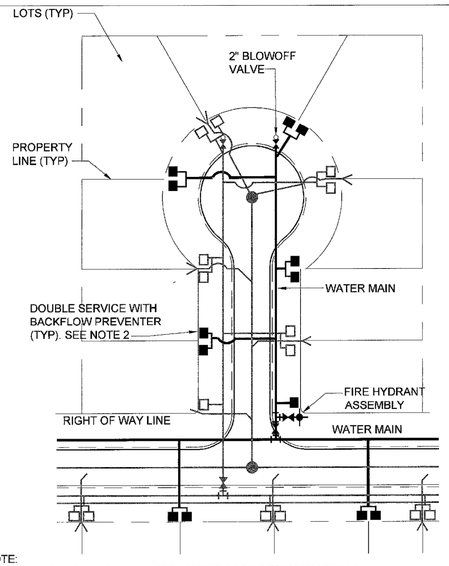
DATE: November, 2007 **RESIDENTIAL SERVICE LOCATIONS (TYPICAL)** **FIGURE A118**



NOTE:
1. DOUBLE CHECK BACKFLOW PREVENTER REQUIRED WHEN RECLAIMED WATER SERVICE IS AVAILABLE.
2. USE SINGLE POTABLE WATER SERVICES IF RECLAIMED WATER SERVICE IS UNAVAILABLE.

206 DT-2 RESIDENTIAL SERVICE LOCATION DETAIL
N.T.S.

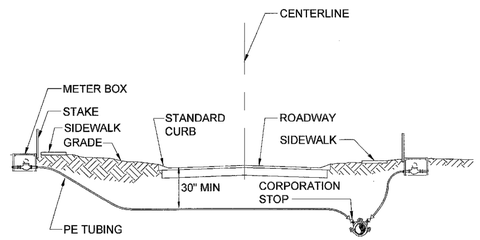
DATE: November, 2007 **SINGLE FAMILY RESIDENTIAL UTILITY PLAN (TYPICAL) - WATER** **FIGURE A119-1**



NOTE:
1. DOUBLE CHECK BACKFLOW PREVENTER REQUIRED WHEN RECLAIMED WATER SERVICE IS AVAILABLE.
2. USE SINGLE POTABLE WATER SERVICES IF RECLAIMED WATER SERVICE IS UNAVAILABLE.
3. CONTRACTOR TO LOCATED CURB STOP BY PLACING A 2" X 2" SQUARE STAKE 24" ABOVE THE GROUND. THE TOP OF THE STAKE SHALL BE PAINTED WITH THE COLOR OF THE UTILITY SERVICE PROVIDED AND LABELED WITH THE LOT NUMBER IT SERVES.

207 DT-2 RESIDENTIAL UTILITY LAYOUT DETAIL
N.T.S.

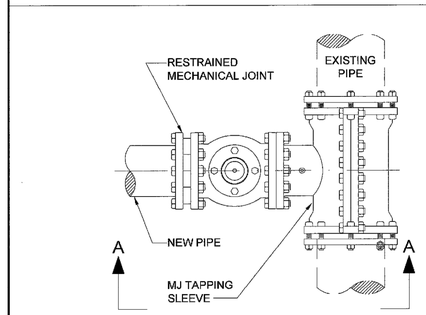
DATE: November, 2007 **WATER AND RECLAIMED WATER SERVICES (TYPICAL)** **FIGURE A120**



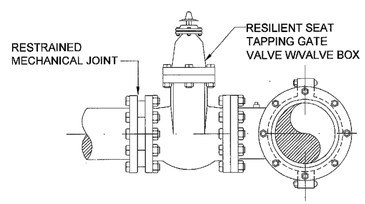
NOTES:
1. DRAWING NOT TO SCALE.
2. SERVICE BOXES FURNISHED BY UTILITIES.
3. METER SHALL BE INSTALLED ON R/W SIDE OF THE SIDEWALK.
4. MINIMUM SEPARATION BETWEEN CURB AND METER BOX AND BETWEEN METER BOX AND SIDEWALK.
5. CONTRACTOR TO LOCATE CURB STOP BY PLACING A STAKE (2" X 2" SQUARE AT 24" ABOVE GROUND) TOP PAINTED WITH THE COLOR OF THE UTILITY SERVICE AND WITH THE LOT NUMBERS IT SERVES.

208 DT-2 WATER/RECLAIM SERVICE DETAIL
N.T.S.

DATE: November, 2007 **MJ TAPPING SLEEVE AND GATE VALVE ASSEMBLY FOR WATER AND RECLAIM WATER** **FIGURE A121-1**



PLAN

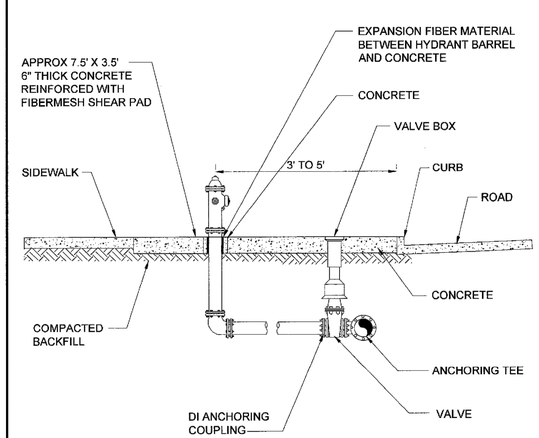


SECTION A - A

NOTE: VALVES SHALL BE MANUFACTURED BY AMERICAN AVK

209 DT-2 WATER TAPPING SLEEVE/VALVE DETAIL
N.T.S.

DATE: November, 2007 **FIRE HYDRANT ASSEMBLY** **FIGURE A203**



NOTES:
1. CENTER OF THE FLANGE CONNECTION SHALL BE 5" FROM THE TOP OF THE SLAB.

210 DT-2 FIRE HYDRANT ASSEMBLY DETAIL
N.T.S.

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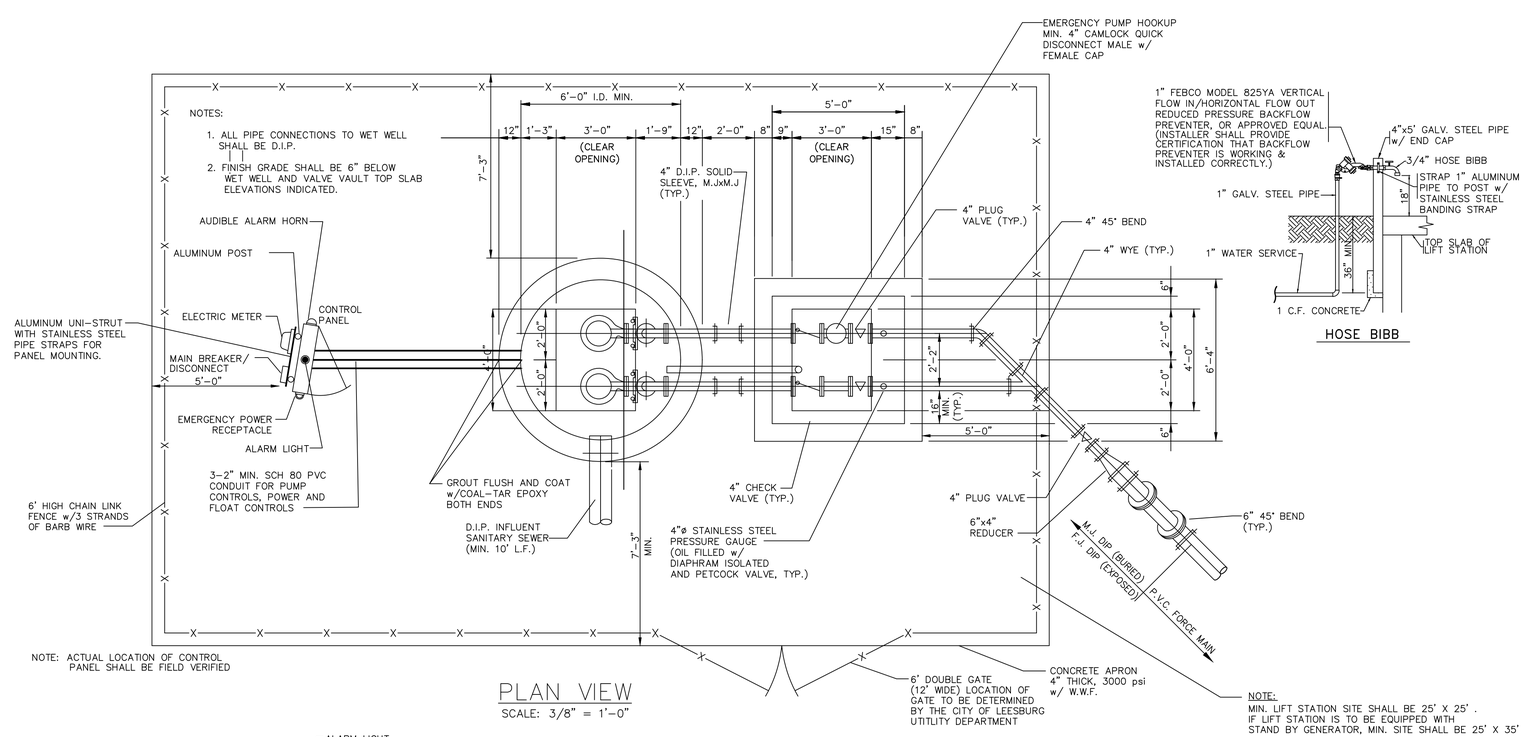
#	Date	Description
		Revisions
		Revisions

Howey-in-the-HillsDetails 2
Whispering Hills Subdivision
Buckhill Road, Howey-in-the-Hills, Florida

DP	Drawn
DP	Checked
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09-07-21	Date
WH2-C16	File

Dwg. No.
C16
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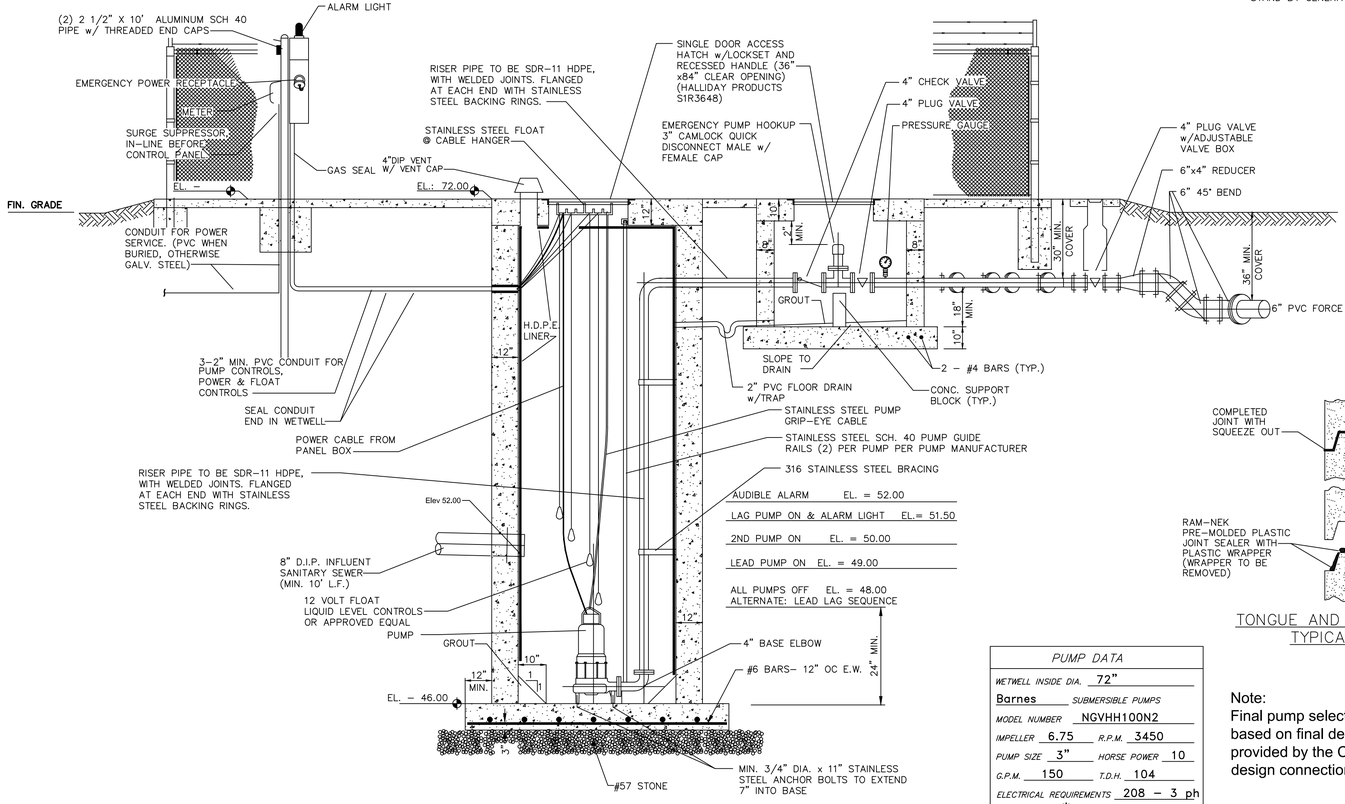
PLAN VIEW
SCALE: 3/8" = 1'-0"

HOSE BIBB

NOTES:

1. PUMPS: SHALL BE HYDROMATIC SUBMERSIBLE PUMPS.PUMPS SHALL HAVE (2) 2" STAINLESS STEEL GUIDE RAILS PER PUMP AND A BPI FRONT DUPLEX SYSTEM.
2. LEVEL CONTROLS: SHALL BE IN ACCORDANCE WITH SECTION 8 OF THE CITY UTILITY MANUAL.
3. WET WELL ACCESS COVER: SHALL HAVE CLEAR OPENING OF 36"x84" AS MANUFACTURED BY HALLIDAY PRODUCTS OR APPROVED EQUAL. ACCESS FRAME AND COVER SHALL HAVE A 1/4" THICK ONE-PIECE, MILL FINISH, EXTRUDED ALUMINUM FRAME, INCORPORATING A CONTINUOUS CONCRETE ANCHOR. DOOR PANEL(S) SHALL BE 1/4" ALUMINUM DIAMOND PLATE, REINFORCED TO WITHSTAND A LIVE LOAD OF 300 psf. DOOR(S) SHALL OPEN TO 90° AND AUTOMATICALLY LOCK WITH STAINLESS STEEL HOLD OPEN ARMS WITH ALUMINUM RELEASE HANDLES. DOOR(S) SHALL CLOSE FLUSH WITH THE FRAME. UNIT SHALL LOCK WITH A NONCORROSIVE LOCKING BAR. FRAME SHALL SUPPORT GUIDE RAILS AND CABLE HOLDER FOR ELECTRICAL WIRING. ALL ACCESS FRAME, COVER, AND HARDWARE SHALL BE CONSTRUCTED OF STAINLESS STEEL. ALL SURFACES IN CONTACT WITH CONCRETE SHALL HAVE A SHOP COAT OF ZINC CHROMATIC PRIMER APPROVED ALKALI RESISTANT PAINT OR APPROVED PROTECTIVE COATING. DOUBLE DOOR ACCESS COVERS SHALL HAVE REMOVABLE CENTER BAR SUPPORT. COVER MUST BE COMPATIBLE WITH PUMP.
4. VALVE VAULT ACCESS COVER: SHALL HAVE CLEAR OPENING OF 36"x84" ACCESS AS MANUFACTURED BY HALLIDAY PRODUCTS OR APPROVED EQUAL. ACCESS FRAME AND COVER SHALL HAVE A 1/4" THICK ONE-PIECE, MILL FINISH, EXTRUDED ALUMINUM FRAME, INCORPORATING A CONTINUOUS CONCRETE ANCHOR. DOOR PANEL(S) SHALL BE 1/4" ALUMINUM DIAMOND PLATE, REINFORCED TO WITHSTAND A LIVE LOAD OF 300 psf. DOOR(S) SHALL OPEN TO 90° AND AUTOMATICALLY LOCK WITH STAINLESS STEEL HOLD OPEN ARMS WITH ALUMINUM RELEASE HANDLES. DOOR(S) SHALL CLOSE FLUSH WITH THE FRAME. UNIT SHALL LOCK WITH A NONCORROSIVE LOCKING BAR. ALL ACCESS FRAME, COVER, HARDWARE, AND FASTENERS SHALL BE CONSTRUCTED OF 316 STAINLESS STEEL. ALL SURFACES IN CONTACT WITH CONCRETE SHALL HAVE A SHOP COAT OF ZINC CHROMATIC PRIMER, APPROVED ALKALI RESISTANT PAINT OR APPROVED PROTECTIVE COATING. DOUBLE DOOR ACCESS COVERS SHALL HAVE REMOVABLE CENTER BAR SUPPORT. COVER MUST BE COMPATIBLE WITH PUMP.
5. ELECTRICAL SERVICE ENTRANCE: PROVIDE METER SOCKET AND MAIN DISCONNECT MEETING APPLICABLE ELECTRIC CODES AND REQUIREMENTS OF POWER COMPANY. LIGHTNING AND VOLTAGE SURGE PROTECTION TO BE PROVIDED.**COST FOR THE ELECTRICAL SERVICE AND COORDINATION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
6. CONTROL PANEL: SHALL BE IN ACCORDANCE WITH SECTION 8 OF THE CITY UTILITY MANUAL. PANEL SHALL BE EQUIPPED WITH THREE, 2" X 6" ALUMINUM NIPPLES TO THE SEALOFFS, WITH SCH 80 PVC TO WET WELL.
7. PAINT: INSIDE AND OUTSIDE OF VALVE VAULT SHALL BE PAINTED WITH TWO COATS OF "POXITAR" OR EQUAL APPLIED AS PER MANUFACTURER'S RECOMMENDATIONS.
8. VALVE VAULT : PRECAST CONCRETE 60"x 84" (MINIMUM) INSIDE DIMENSIONS.
9. STEEL PLACED IN BOTTOM SLAB IS TO BE IDENTICAL TO THE TOP SLAB EXCEPT THAT DIAGONAL BARS AND OPENINGS ARE ELIMINATED, STEEL IS CONTINUOUS AND SLAB IS SOLID.
10. CONTRACTOR TO CONFIRM SERVICE ARRANGEMENTS WITH POWER COMPANY BEFORE COMMENCING WORK. CONTRACTOR TO RUN UNDERGROUND WIRING TO NEAREST TRANSFORMER OR HAND HOLE.
11. ALL FASTENERS ON FLANGES AND ETC. INSIDE WET WELL WILL BE STAINLESS STEEL
12. DIMENSIONS BETWEEN CENTERLINE OF PIPES ARE STANDARD FOR PIPE SIZES SPECIFIED.
13. SHOP DRAWINGS OF ENTIRE INSTALLATION MUST BE APPROVED BY CITY PRIOR TO PLACEMENT OF ORDER.
14. PLUG VALVES SHALL BE SERIES 100, AS MANUFACTURED BY DEZURIK CORP., AND CLOW OR APPROVED EQUAL. VALVES SHALL BE CONSTRUCTED WITH RESILIENT FACED PLUGS. ON BY-PASS LINES, VALVES SHALL BEBURIED WITH ACCESS THROUGH CAST IRON VALVE BOXES. VALVES SHALL HAVE A 2" OPERATION NUT. ONE(1) 5' LONG VALVE WRENCH SHALL BE PROVIDED TO THE CITY OF LEESBURG PER LIFT STATION. ALL PLUG VALVES 8" AND SMALLER SHALL BE 1/4 TURN TYPE.
15. ALL EXPOSED AND EMBEDDED CONDUITS TO BE SCHEDULE 80 PVC.
16. ALL EXPOSED METAL SHALL BE PAINTED WITH TWO (2) COATS OF EXTERIOR BLACK ENAMEL PAINT.
17. ALL EXTERNAL PIPING SHALL BE DUCTILE IRON CLASS 50 (FLANGED JOINT FOR EXPOSED PIPE & MECHANICAL JOINT FOR BURIED PIPE). ALL INTERNAL WET WELL PIPING FROM THE PUMP DISCHARGE ELBOW TO THE VALVE BOX SHALL BE MINIMUM SDR-11 HDPE.
18. ALL DIMENSIONS AND LOCATIONS OF UTILITIES TO BE FIELD VERIFIED BY CONTRACTOR.
19. PRESSURE GAUGES SHALL BE STAINLESS STEEL WITH STAINLESS STEEL DIAPHRAGM, LIQUID FILLED, 4" DIAMETER DIAL WITH 0-100 psi RANGE. GAUGES SHALL BE AS MANUFACTURED BY WKA, LOWER MOUNT, TYPE 233.30 AND DIAPHRAGMS SHALL BE AS MANUFACTURED BY HYETT, MODEL 43MCR-01 OR APPROVED EQUALS.
20. CHECK VALVES SHALL BE MUELLER, KENNEDY, AMERICAN-DARLING, OR DRESSER WITH OUTSIDE LEVER AND WEIGHT.
21. PADLOCKS FOR ACCESS COVERS AND CONTROL PANEL SHALL BE MASTER NO. 4 BRASS PADLOCK, KEYED ALIKE, FURNISH TWO(2) KEYS PER LOCK. BOLTS IN LOCKING DEVICE SHALL BE STAINLESS STEEL.
22. WET WELL TO BE H.D.P.E. LINED WITH AN AGRU SURE GRIP LINER OR APPROVED EQUAL, WITH A MINIMUM THICKNESS OF 2 MM, MECHANICALLY ANCHORED TO THE CONCRETE.ALL JOINTS SHALL BE EXTRUSION WELDED BY CERTIFIED WELDERS.
23. SOD ALL AREAS DISTURBED BY CONSTRUCTION.
24. ALL ALUMINUM SURFACES IN CONTACT WITH CONCRETE WILL REQUIRE SHOP COATING OF SUITABLE PROTECTIVE COATING TO RESIST CORROSION.
25. BYPASS PUMPING: CONTRACTOR SHALL BE RESPONSIBLE FOR ALL BYPASS PUMPING. A BYPASS PUMPING PLAN SHALL BE SUBMITTED AT THE TIME OR PERMIT APPLICATION TO THE ENVIRONMENTAL SERVICES DIRECTOR. CITIZEN CONSIDERATION WILL BE REVIEWED WHEN BYPASS PUMPING EQUIPMENT IS REQUIRED. SOUND ATTENUATING ENCLOSURES MAY BE REQUIRED, AT THE DISCRETION OF THE ENVIRONMENTAL SERVICES DIRECTOR.

NOTE:
MIN. LIFT STATION SITE SHALL BE 25' X 25' .
IF LIFT STATION IS TO BE EQUIPPED WITH STAND BY GENERATOR, MIN. SITE SHALL BE 25' X 35'

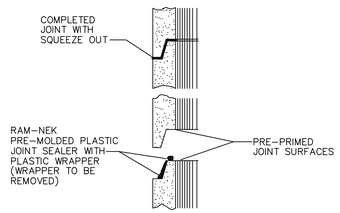


SECTION

PUMP DATA	
WETWELL INSIDE DIA.	72"
Barnes	SUBMERSIBLE PUMPS
MODEL NUMBER	NGVHH100N2
IMPELLER 6.75	R.P.M. 3450
PUMP SIZE 3"	HORSE POWER 10
G.P.M. 150	T.D.H. 104
ELECTRICAL REQUIREMENTS	208 – 3 ph
–	*

*NOTE: ELECTRICAL REQUIREMENT TO BE VERIFIED BY CONTRACTOR.

Note:
Final pump selection and design is TBD based on final design information provided by the City. Specifically the design connection pressure.



TONGUE AND GROOVE JOINT
TYPICAL DETAIL

Item 1.

#	Revisions	Date
	Description	

#	Revisions	Date
	Description	

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SANITARY SEWER LIFT STATION
Whispering Hills Subdivision
Buckhill Road, Howey-in-the-Hills, Florida

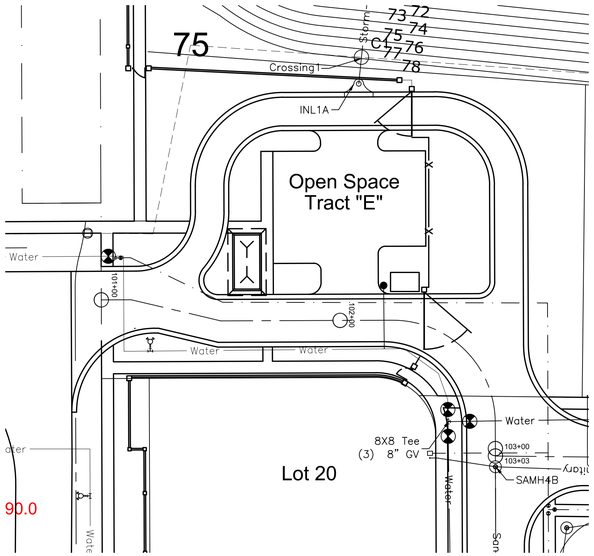
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19 of 59

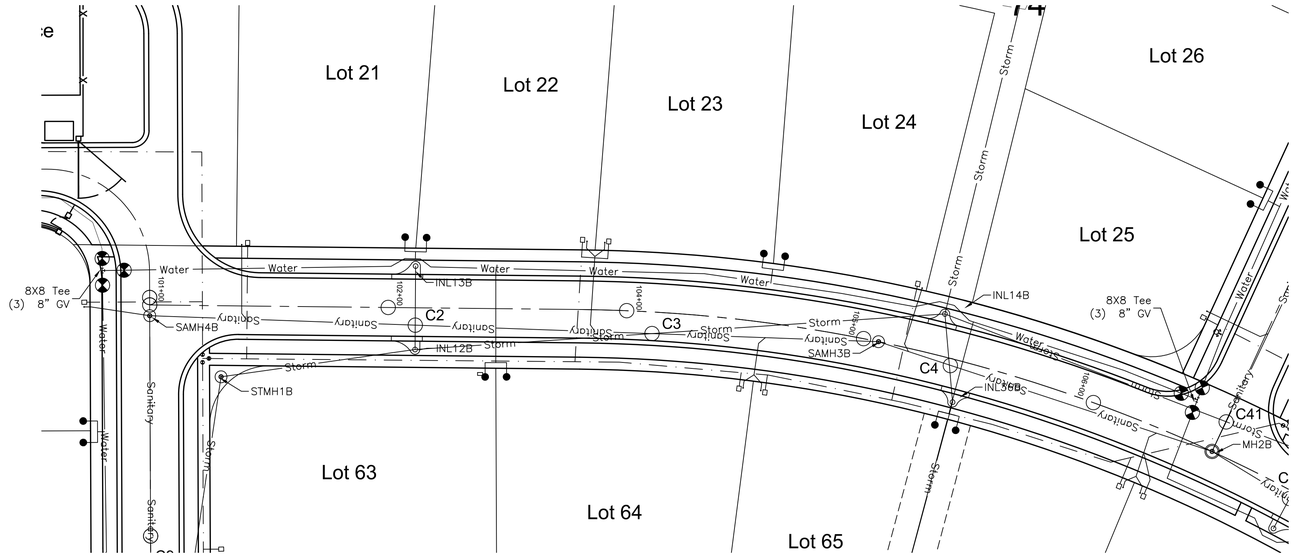
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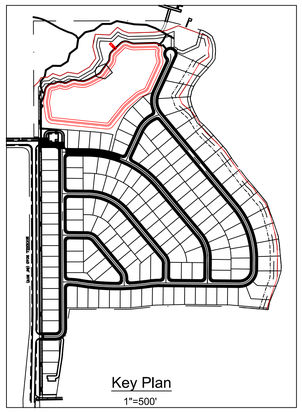
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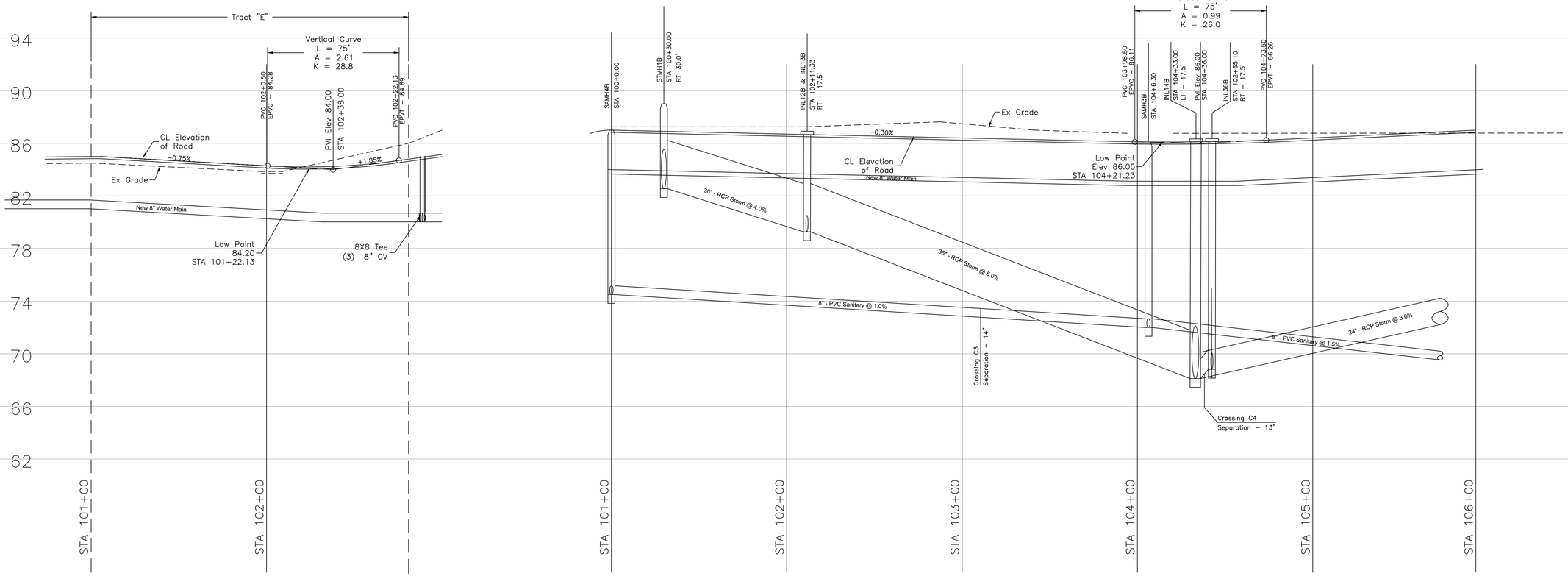


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Plan View
Scale: 1"=30"





Profile View
Scale: 1/4"=1'

Profile View
Scale: 1/4"=1'

#	Revisions	Date	Description

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Plan - Profile Sheet 1

Whispering Hills Subdivision

Buckhill Road, Howey-in-the-Hills, Florida

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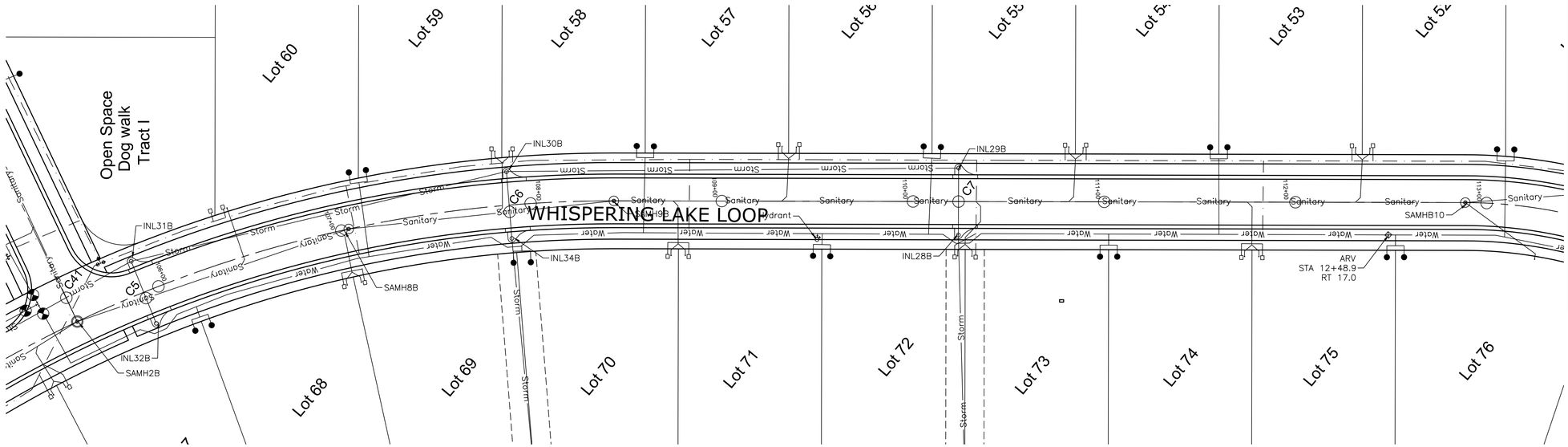
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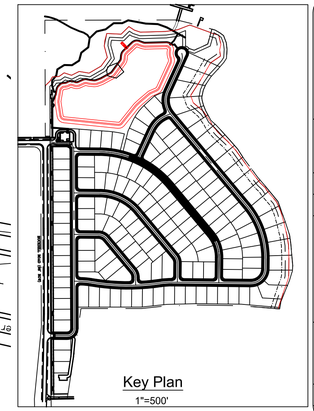
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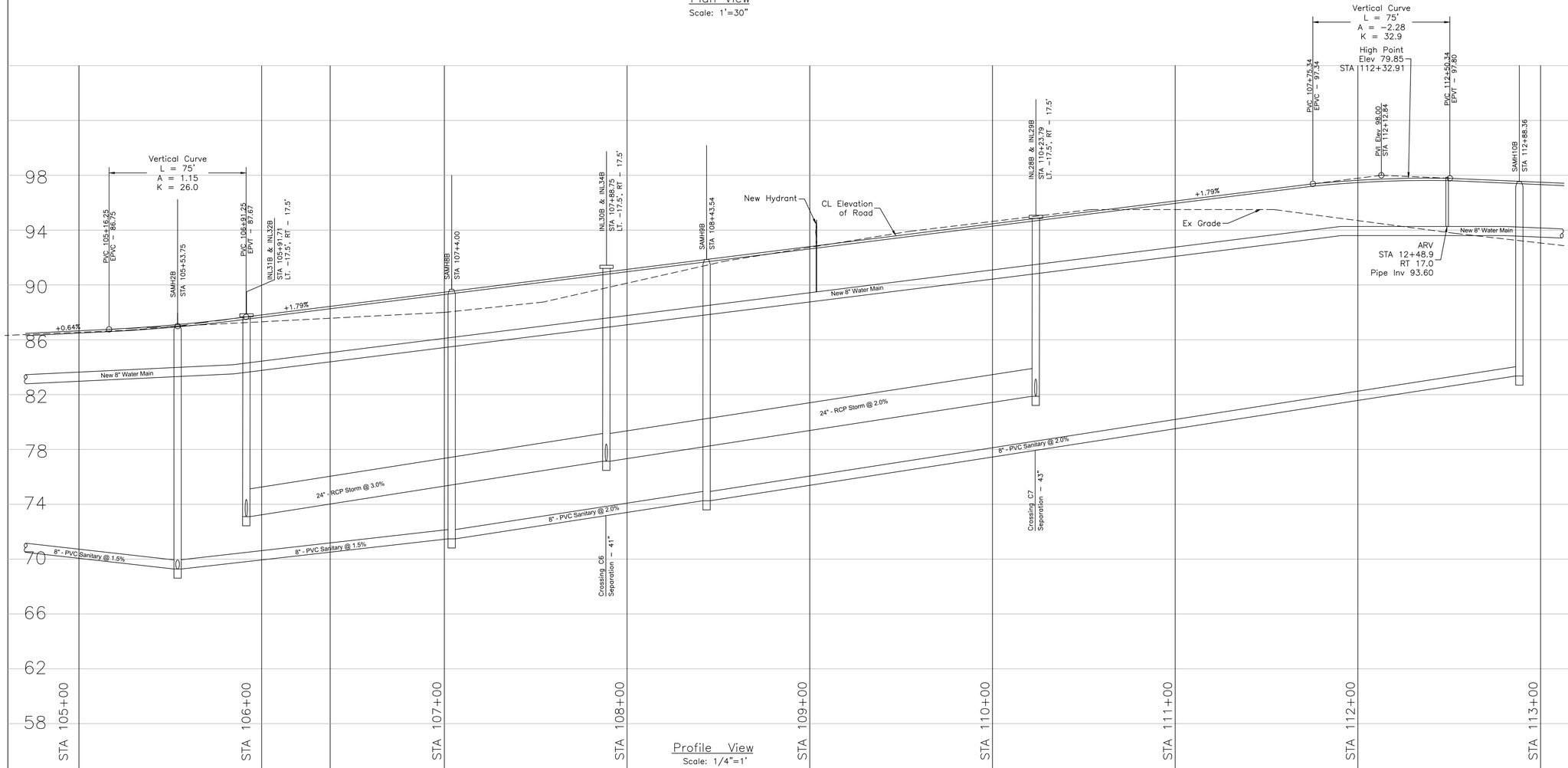
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Plan View
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Profile View
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#	Description	Date
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	Description	Date
	Revisions	

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Plan - Profile Sheet 2

Whispering Hills Subdivision

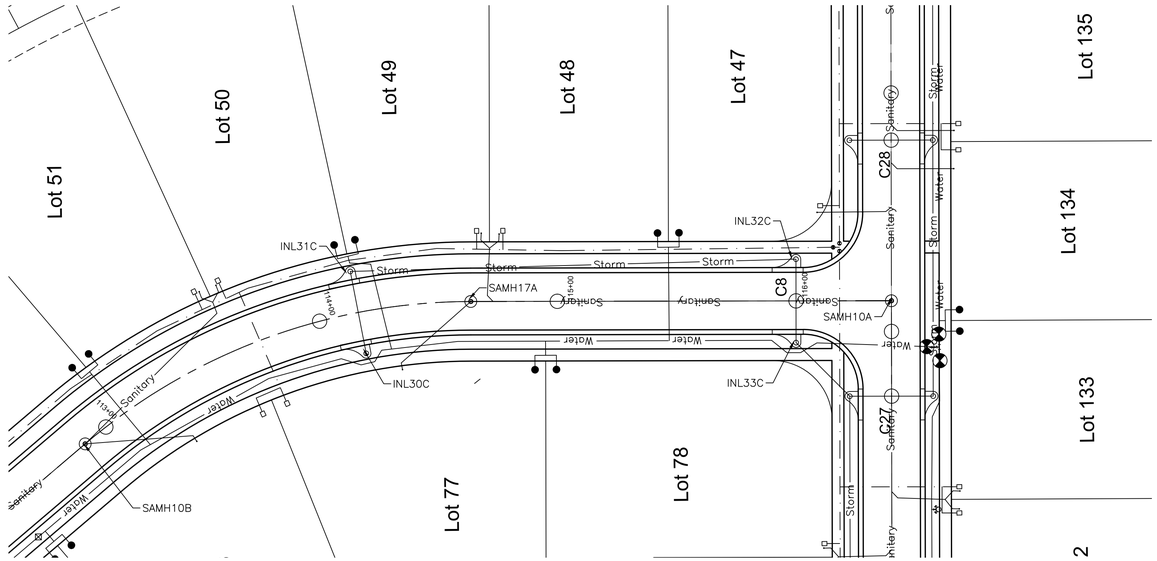
Buckhill Road, Howey-in-the-Hills, Florida

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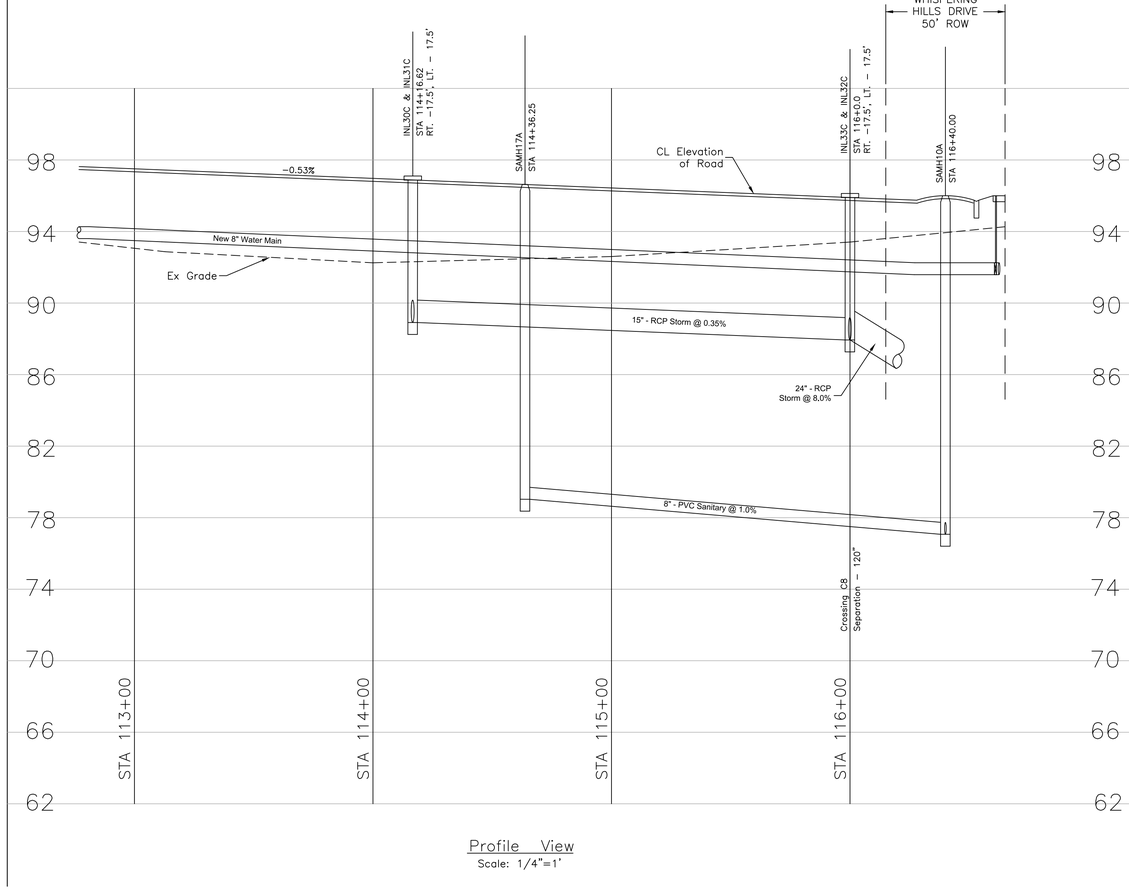
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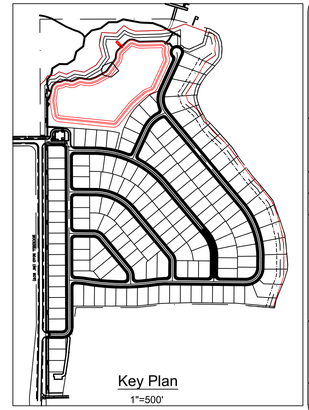
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Item 1.

#	Date	Description

Revisions

#	Date	Description

Revisions

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Plan - Profile Sheet 1

Whispering Hills Subdivision

Buckhill Road, Howey-in-the-Hills, Florida

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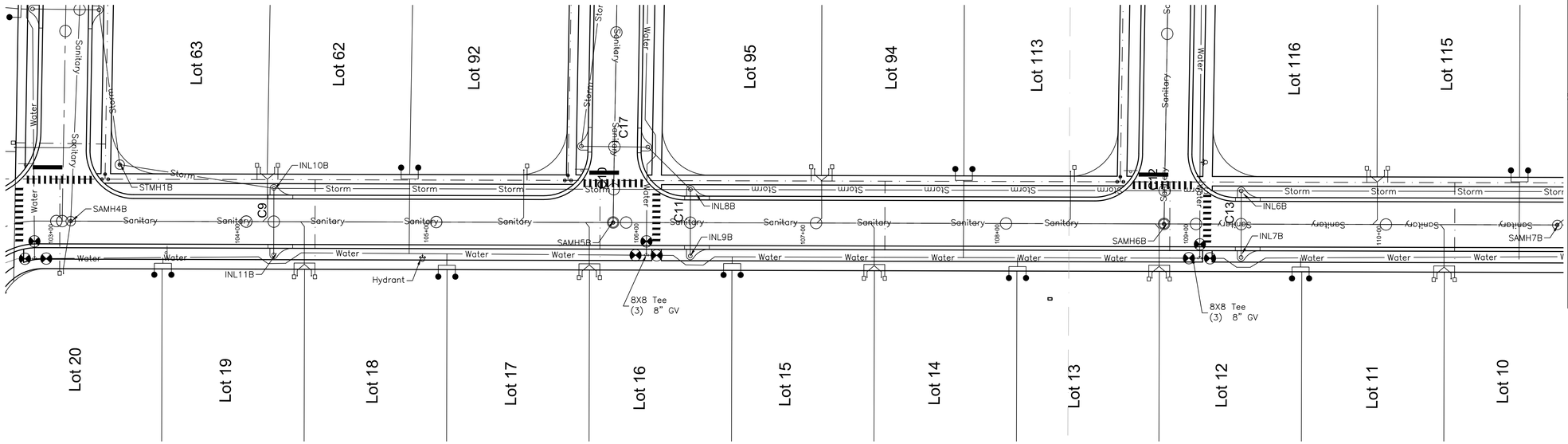
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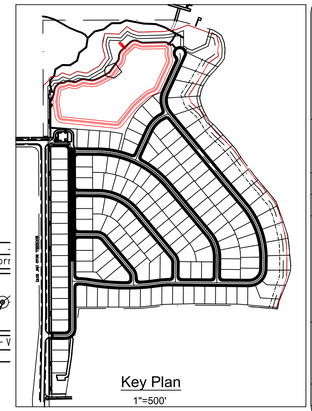
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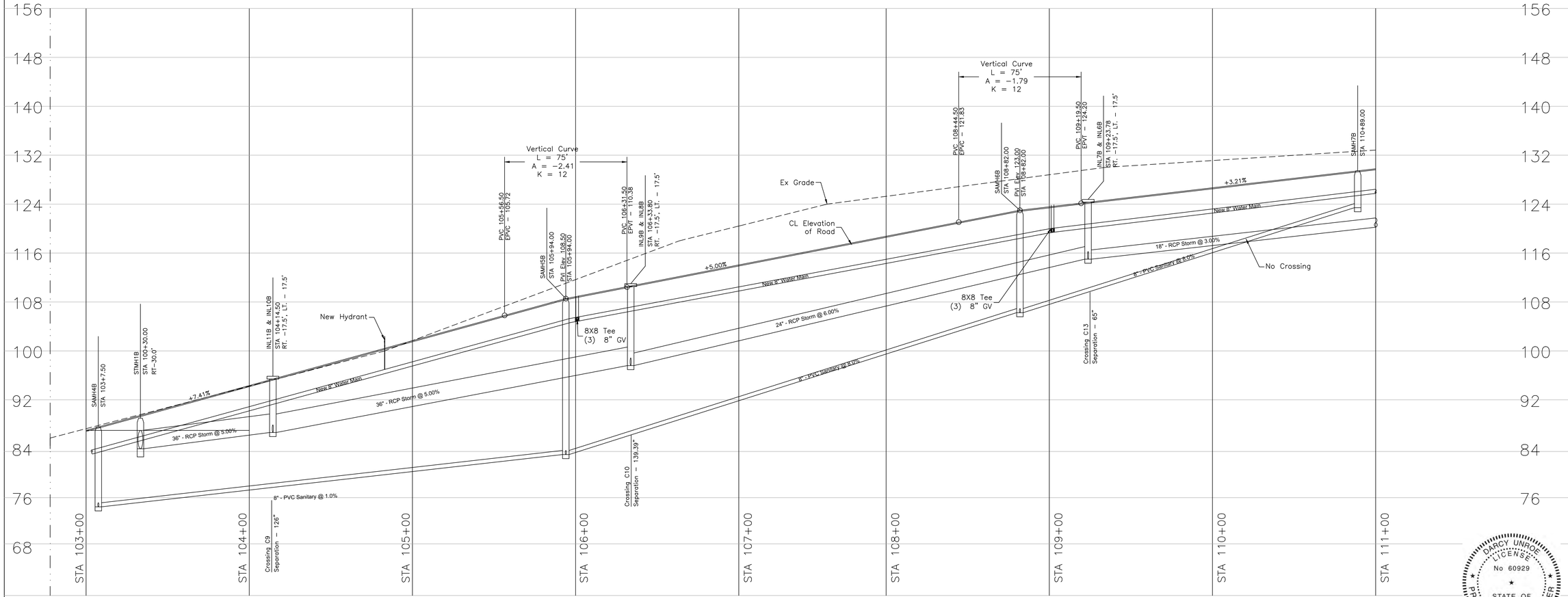
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Profile View
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Plan - Profile Sheet 4

Whispering Hills Subdivision

Buckhill Road, Howey-in-the-Hills, Florida

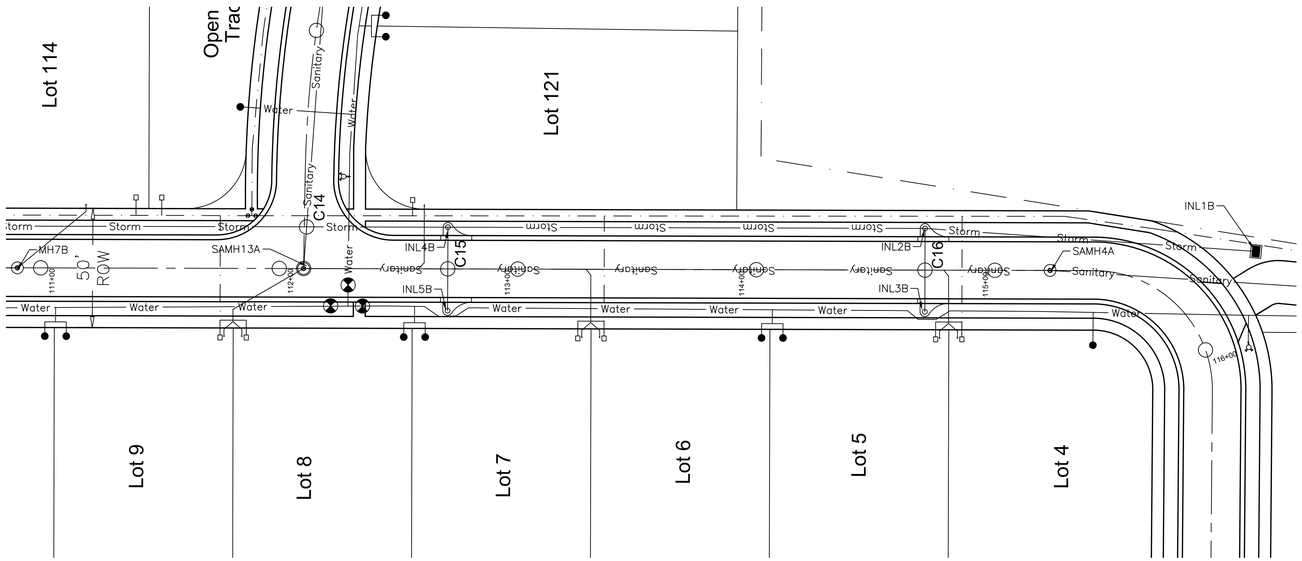
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PP4
21 of 59

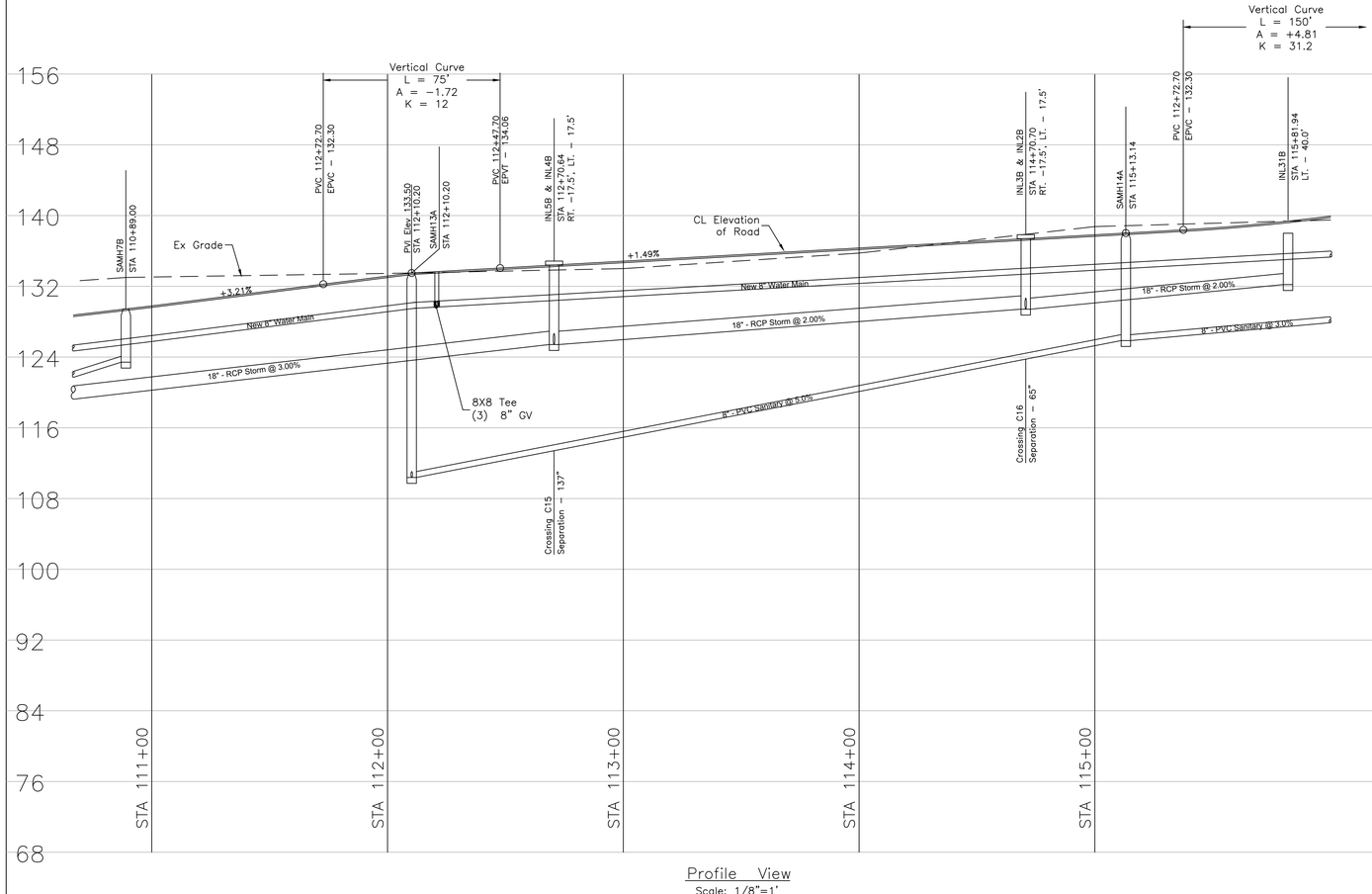
DARCY UNROE LICENSE No 60929 STATE OF FLORIDA PROFESSIONAL ENGINEER

Darcy Unroe PE 60929

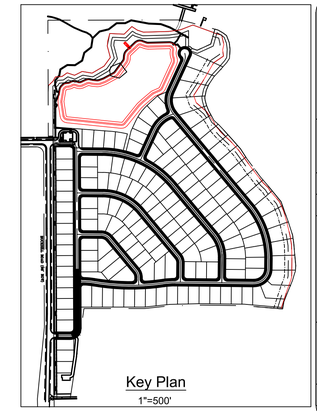
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Plan View
Scale: 1"=30'



Profile View
Scale: 1/8"=1'



Item 1.

#	Date	Description
		Revisions
#	Date	Description
		Revisions

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Plan - Profile Sheet 5

Whispering Hills Subdivision

Buckhill Road, Howey-in-the-Hills, Florida

DP	Drawn
DP	Checked
1"=30'	Scale
09-07-21	Date
WH2-PP5	File

Dwg. No.

PP5

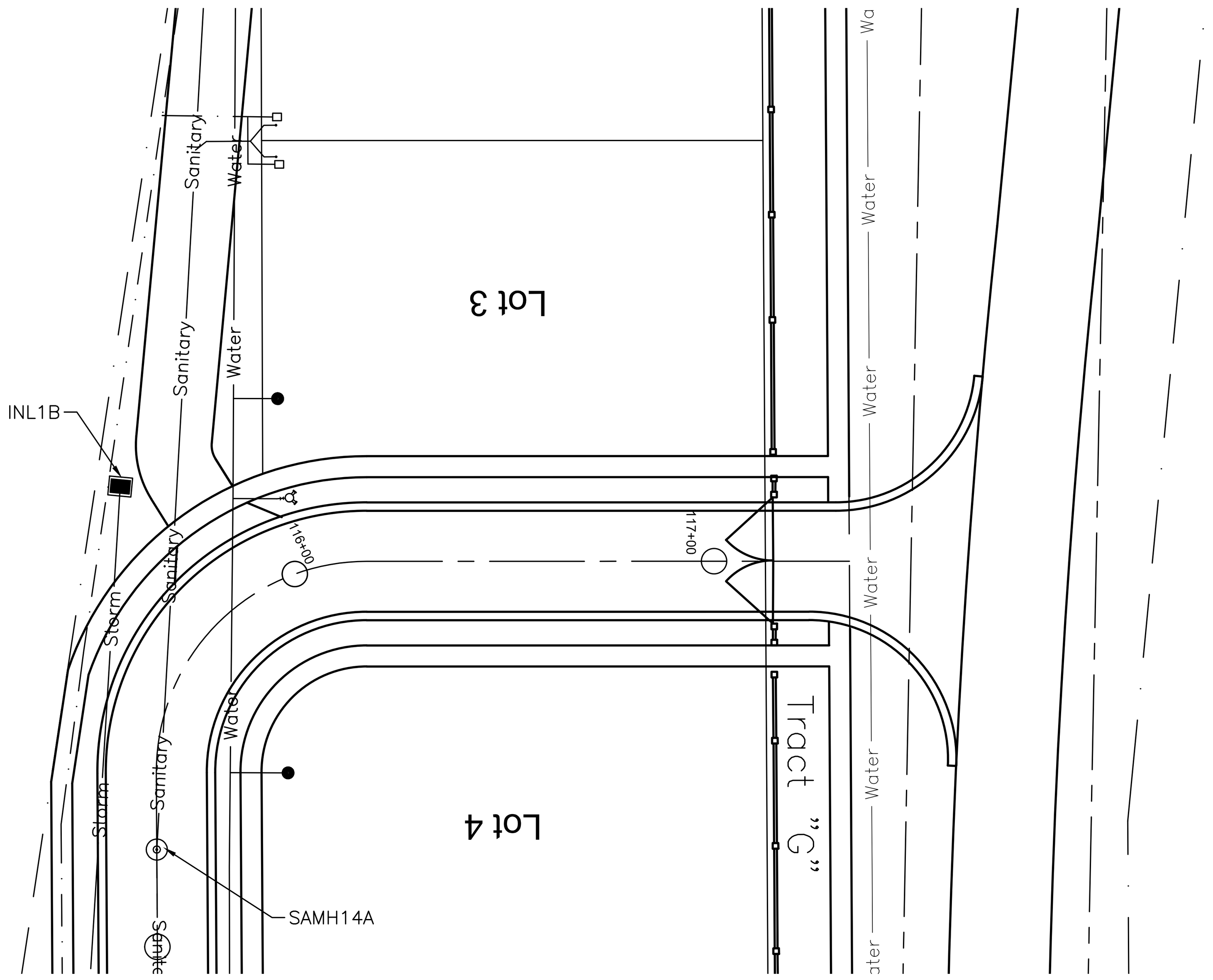
22 of 58

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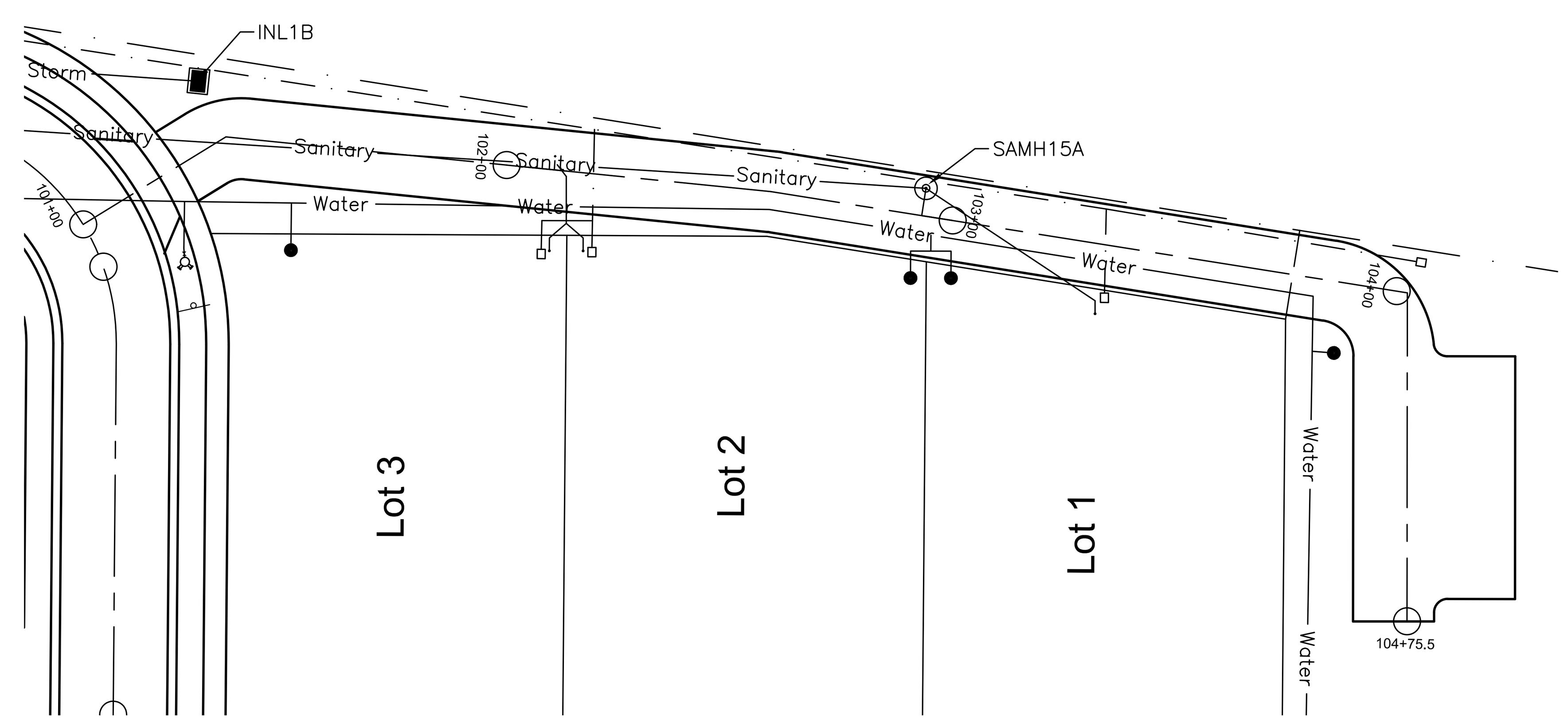
Darcy Unroe PE 60929

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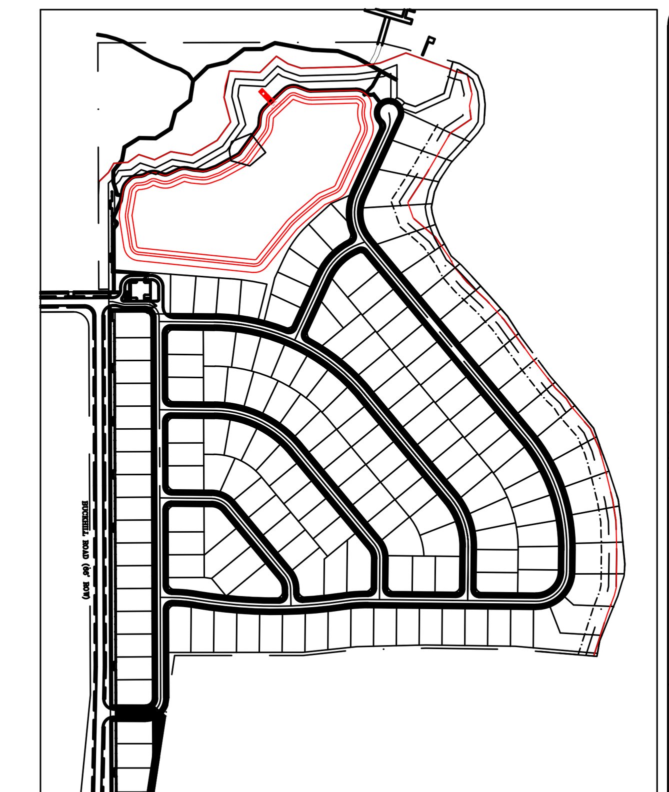
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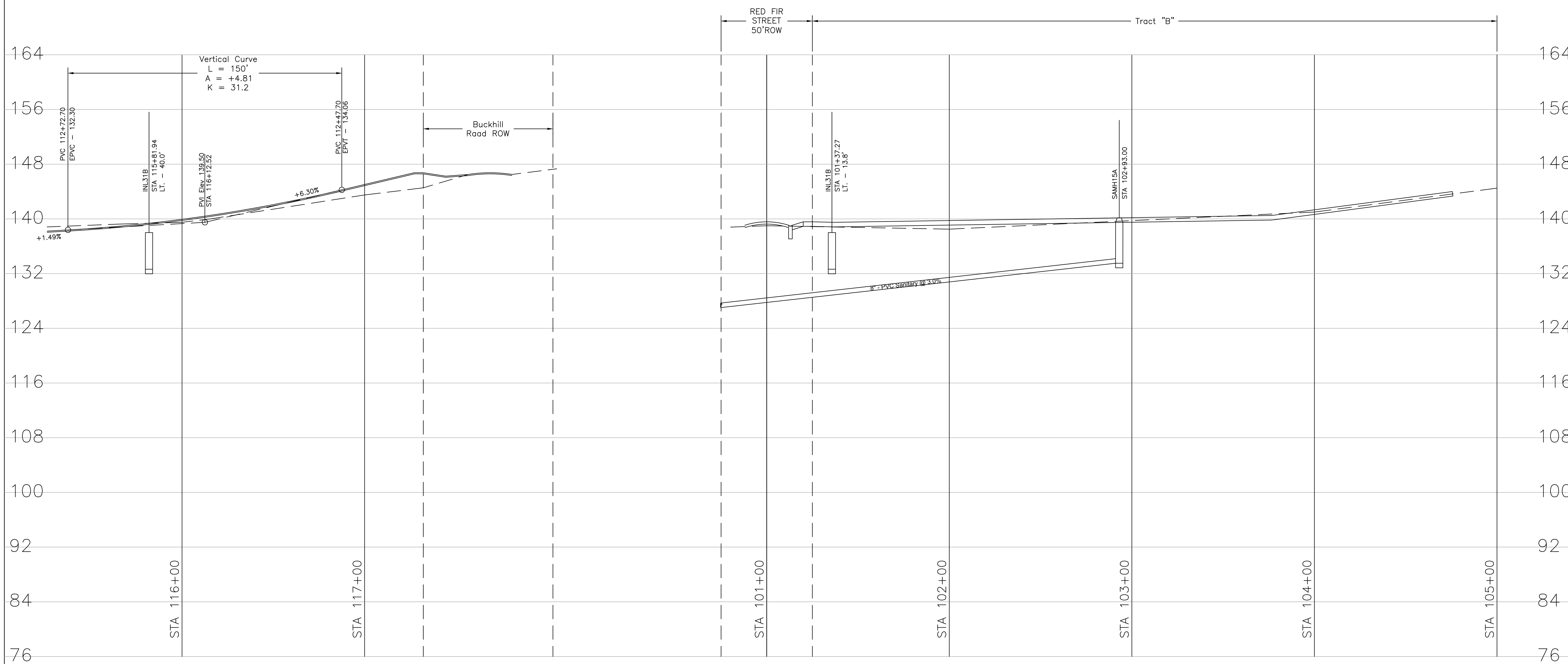
Plan View
Scale: 1'=30"



Plan View
Scale: 1'=30"



Key Plan
1"=500'



Profile View
Scale: 1/8"=1'

Profile View
Scale: 1/8"=1'

#	Date	Description

Revisions

#	Date	Description

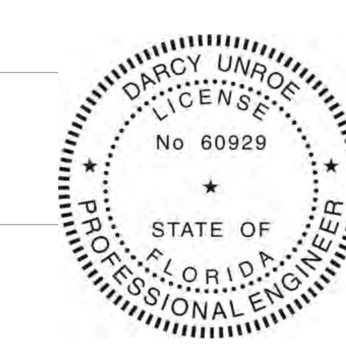
Revisions

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Plan - Profile Sheet 6
Whispering Hills Subdivision
Buckhill Road, Howey-in-the-Hills, Florida

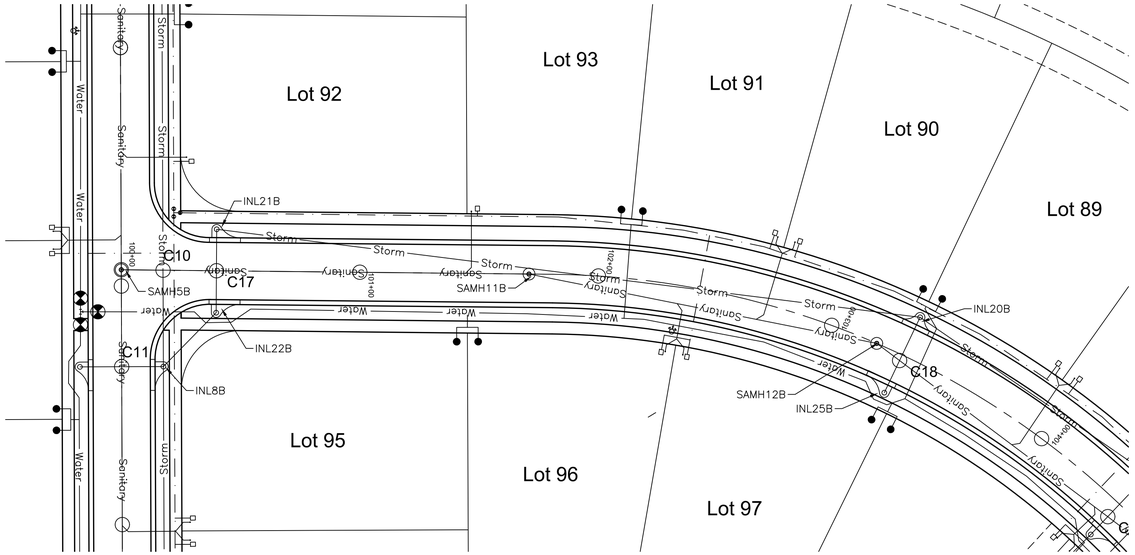
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DP	Checked
1"=30'	Scale
09-07-21	Date
WH2-PP6	File

Dwg. No.
PP6
23 of 58

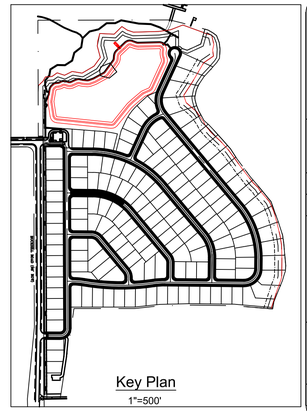


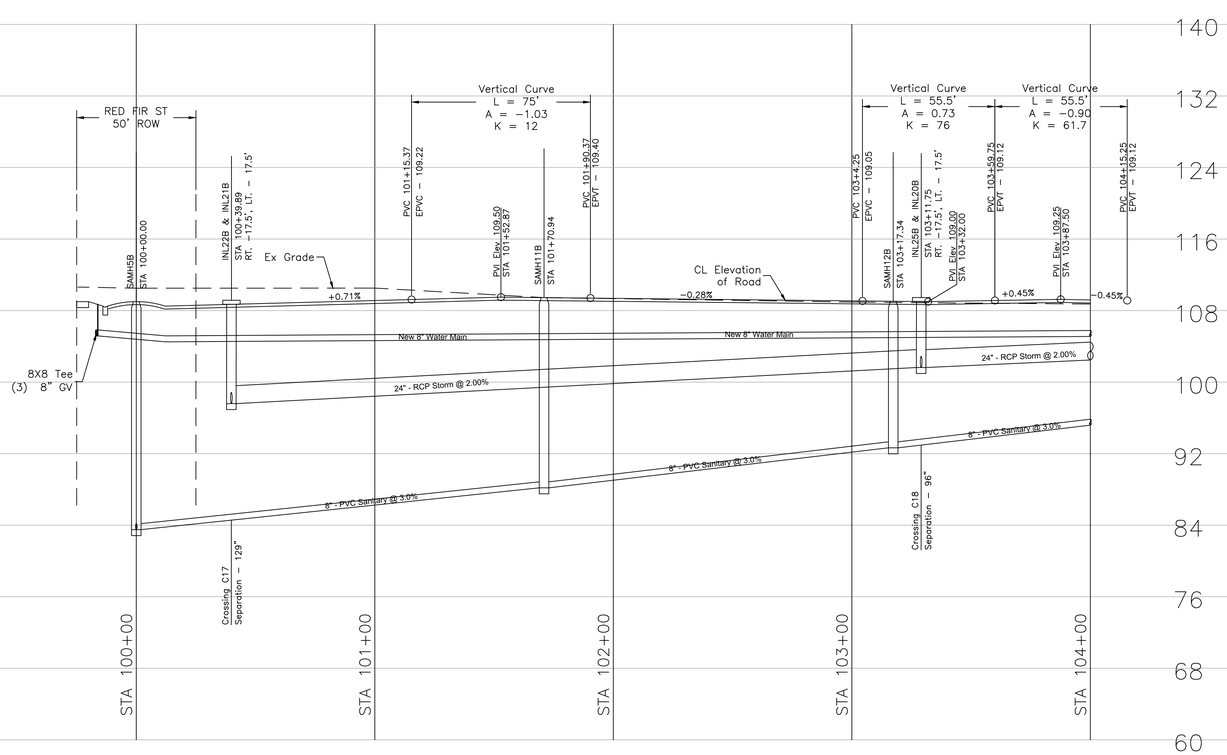
Darcy Unroe PE 60929

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Plan View
Scale: 1"=30'





Profile View
Scale: 1/4"=1'

Item 1.

#	Description	Date
Revisions		
#	Description	Date
Revisions		

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Plan - Profile Sheet 7

Whispering Hills Subdivision

Buckhill Road, Howey-in-the-Hills, Florida

DP	Drawn
DP	Checked
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09-07-21	Date
WH2-PP7	File

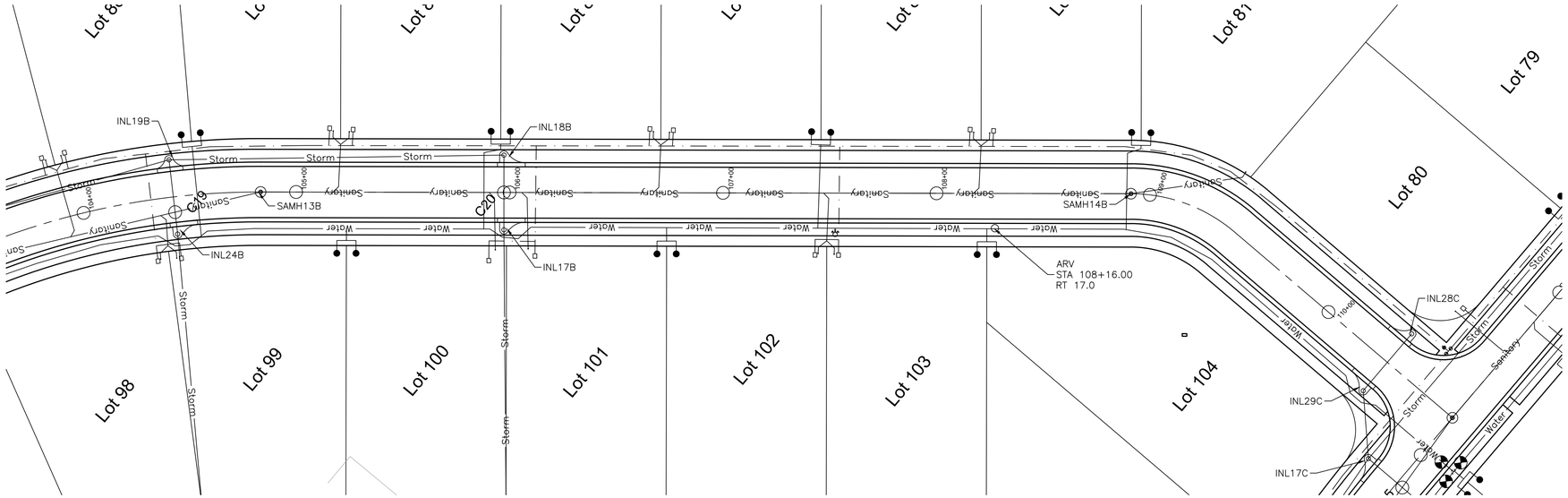
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PP7

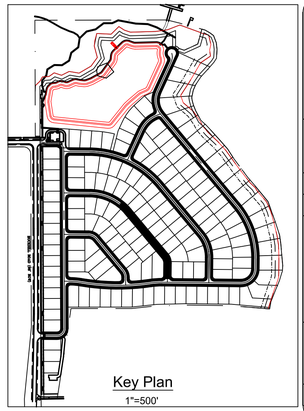
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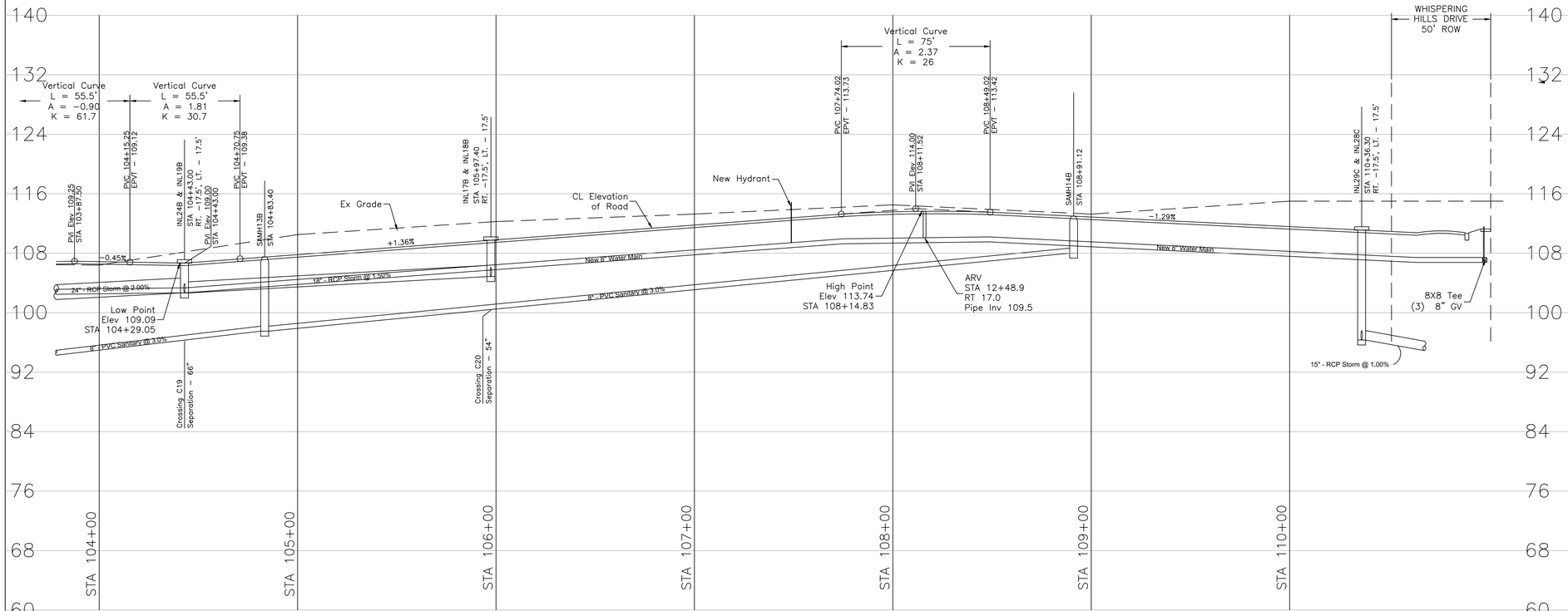
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Darcy Unroe PE 60929



Plan View
Scale: 1"=30"





Profile View
Scale: 1/8"=1'

Item 1.

#	Description	Date
Revisions		
#	Description	Date
Revisions		

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Plan - Profile Sheet 8

Whispering Hills Subdivision

Buckhill Road, Howey-in-the-Hills, Florida

DP	Drawn
DP	Checked
1"=30'	Scale
09-07-21	Date
WH2-PP8	File

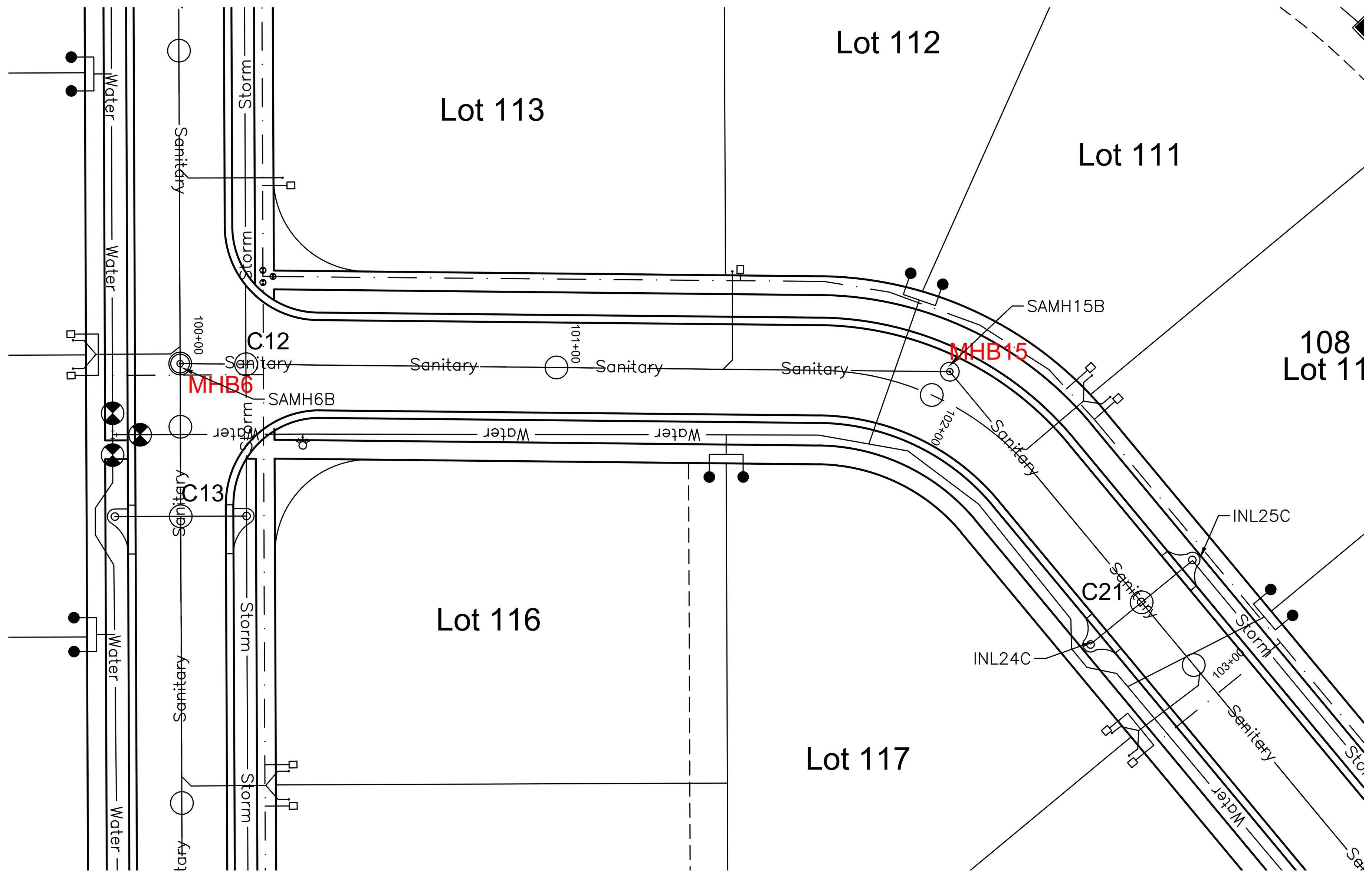
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PP8

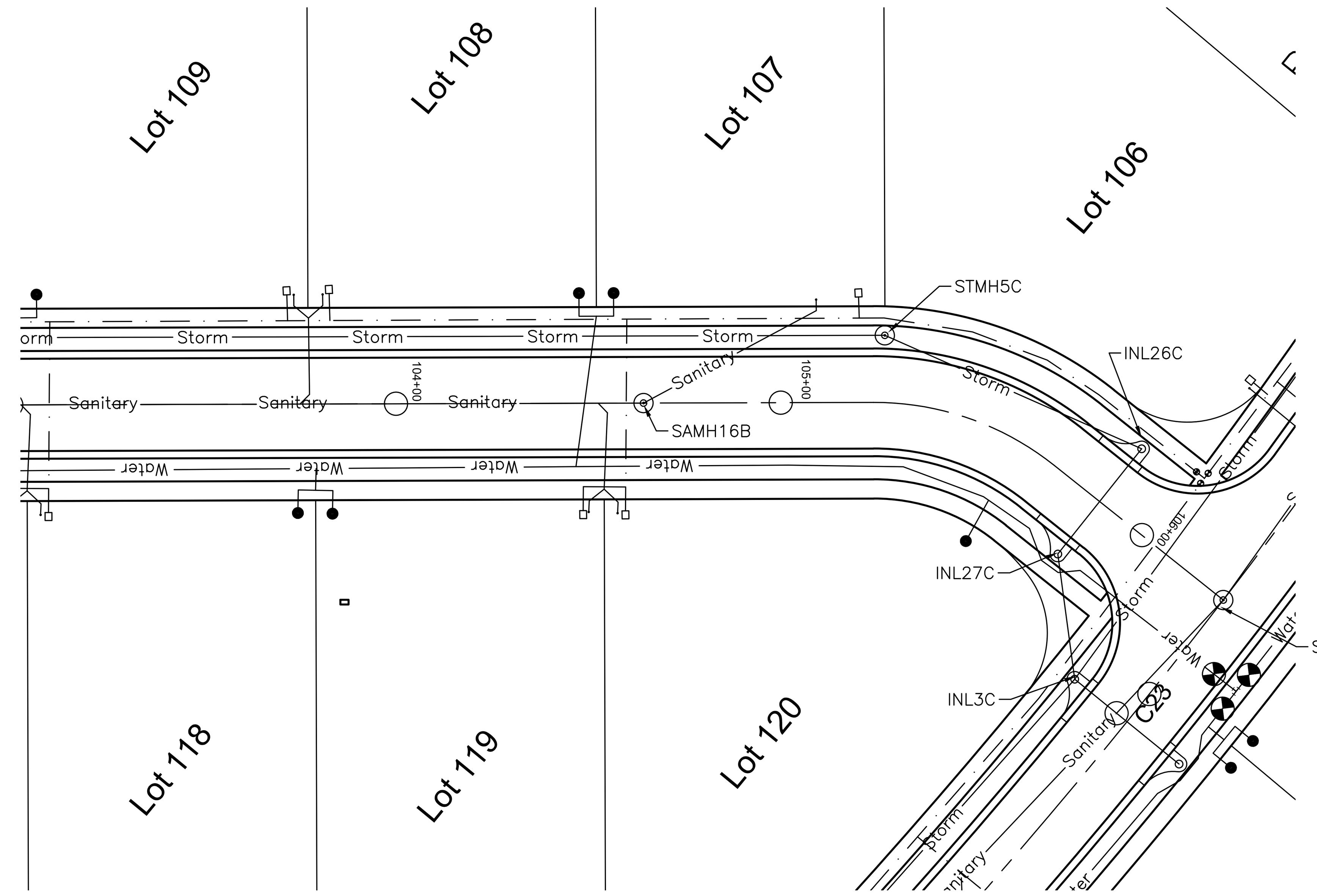
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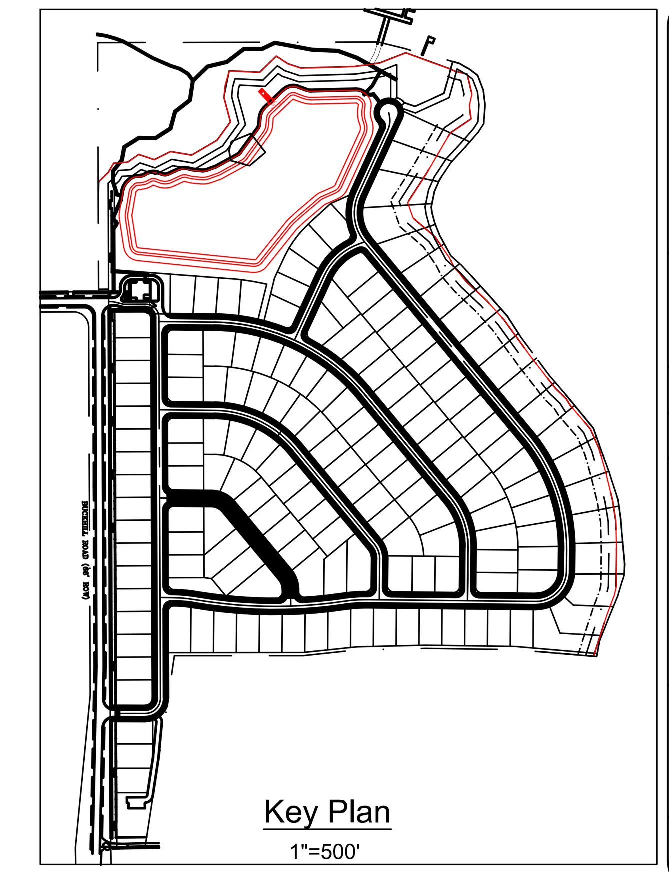
Darcy Unroe PE 60929

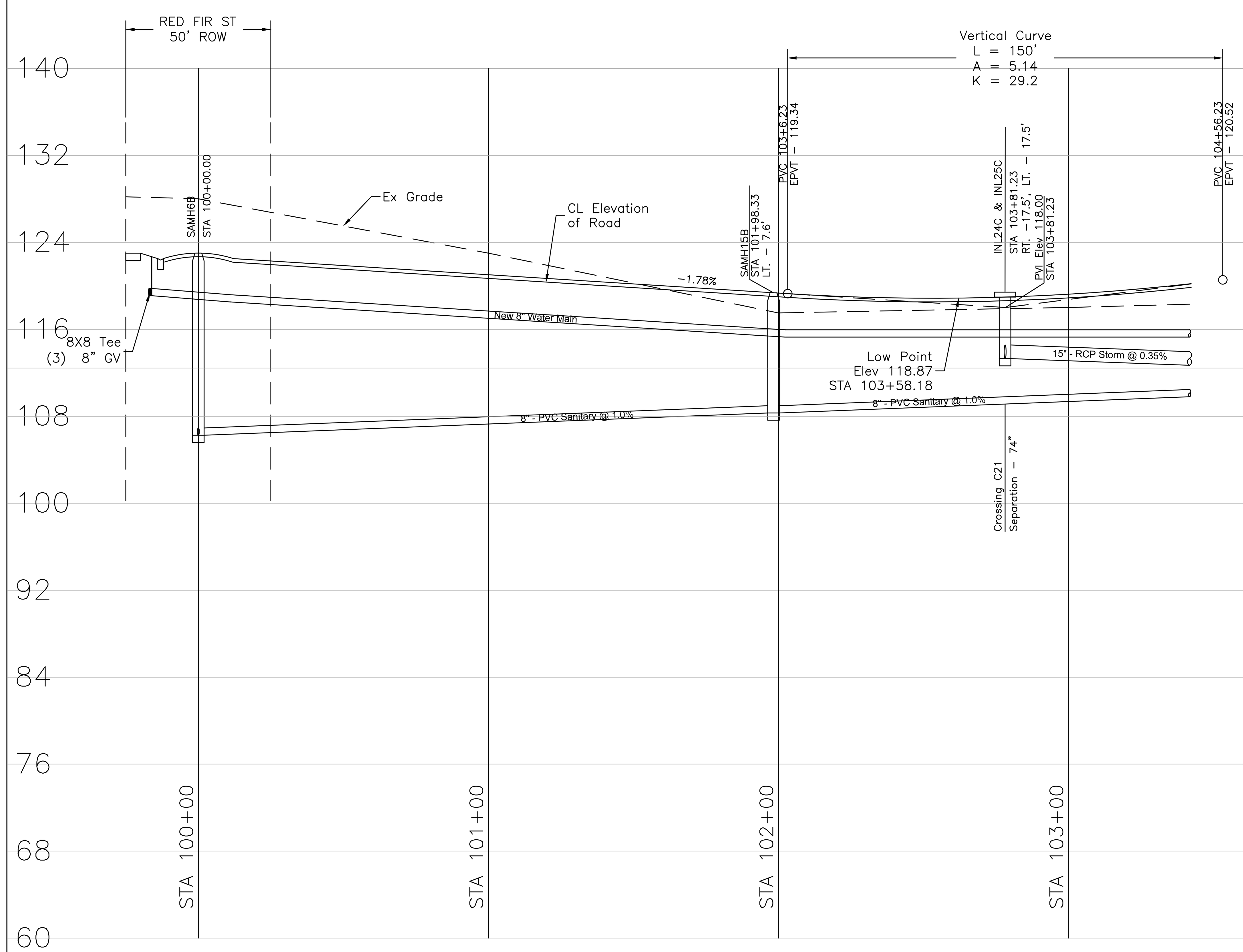


Plan View
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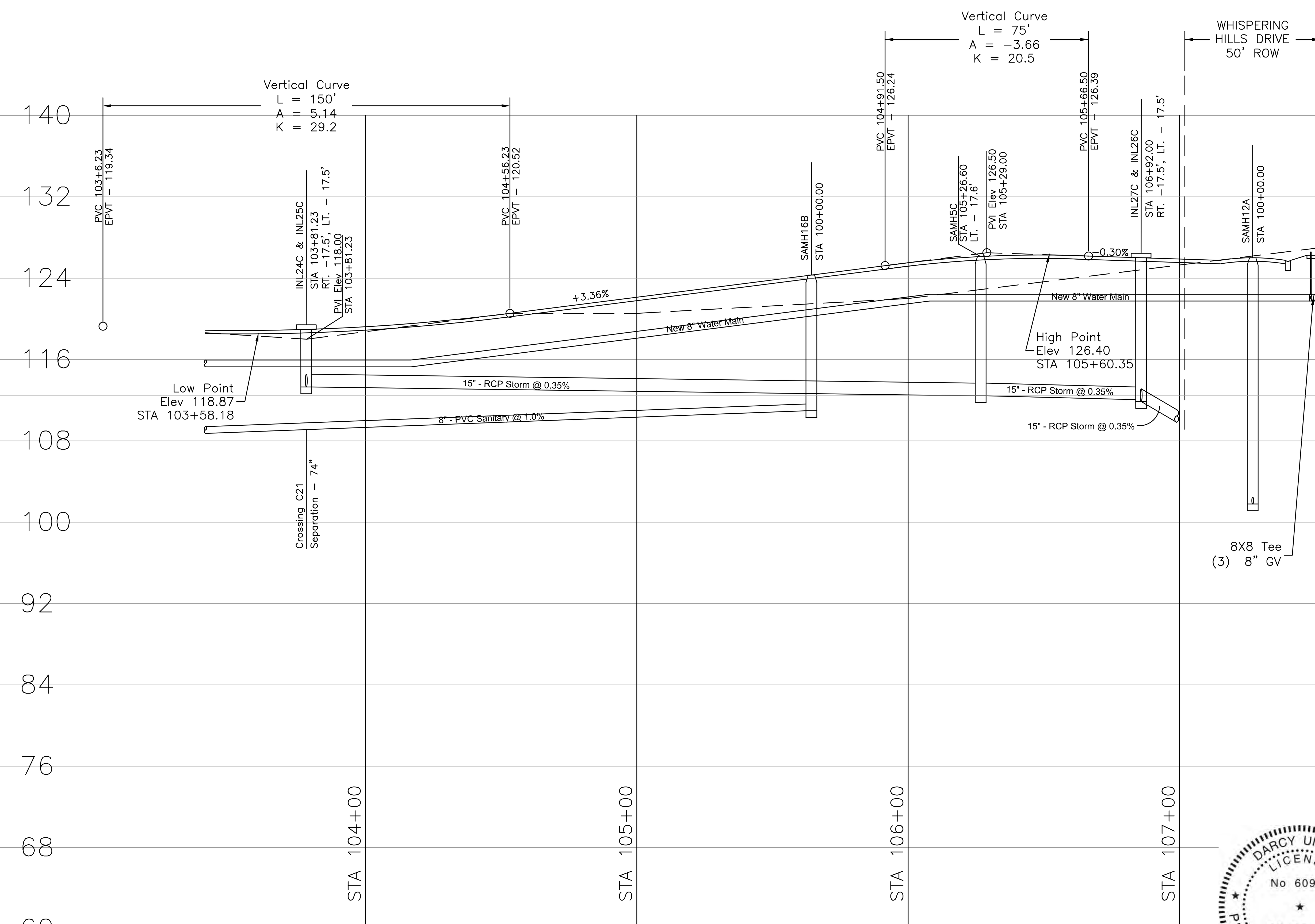


Plan View
Scale: 1"=30"





Profile View
Scale: 1/8"=1'



Profile View
Scale: 1/8"=1'

#	Date	Description

Revisions

#	Date	Description

Revisions

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Plan - Profile Sheet 9

Whispering Hills Subdivision
Buckhill Road, Howey-in-the-Hills, Florida

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1"=30'	Scale
09-07-21	Date
WH2-PP9	File

Dwg. No.
PP9
26 of 58

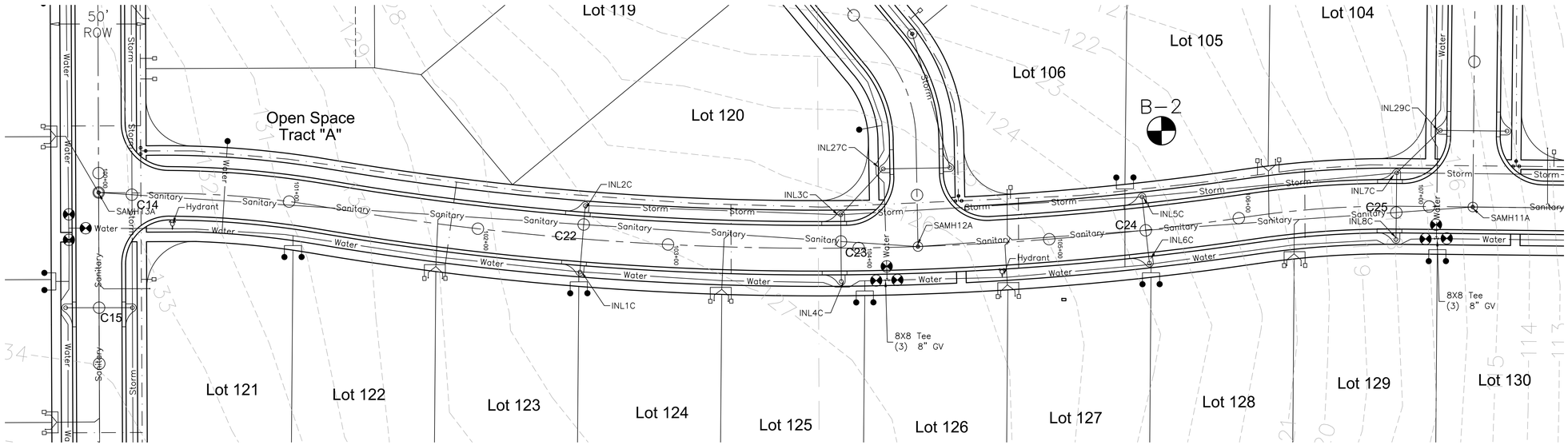
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Darcy Unroe PE 60929

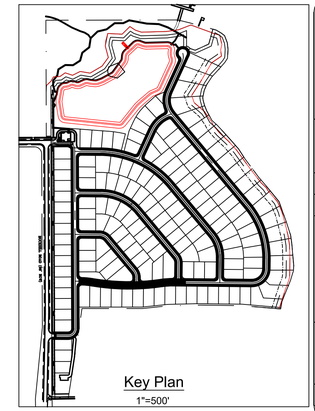
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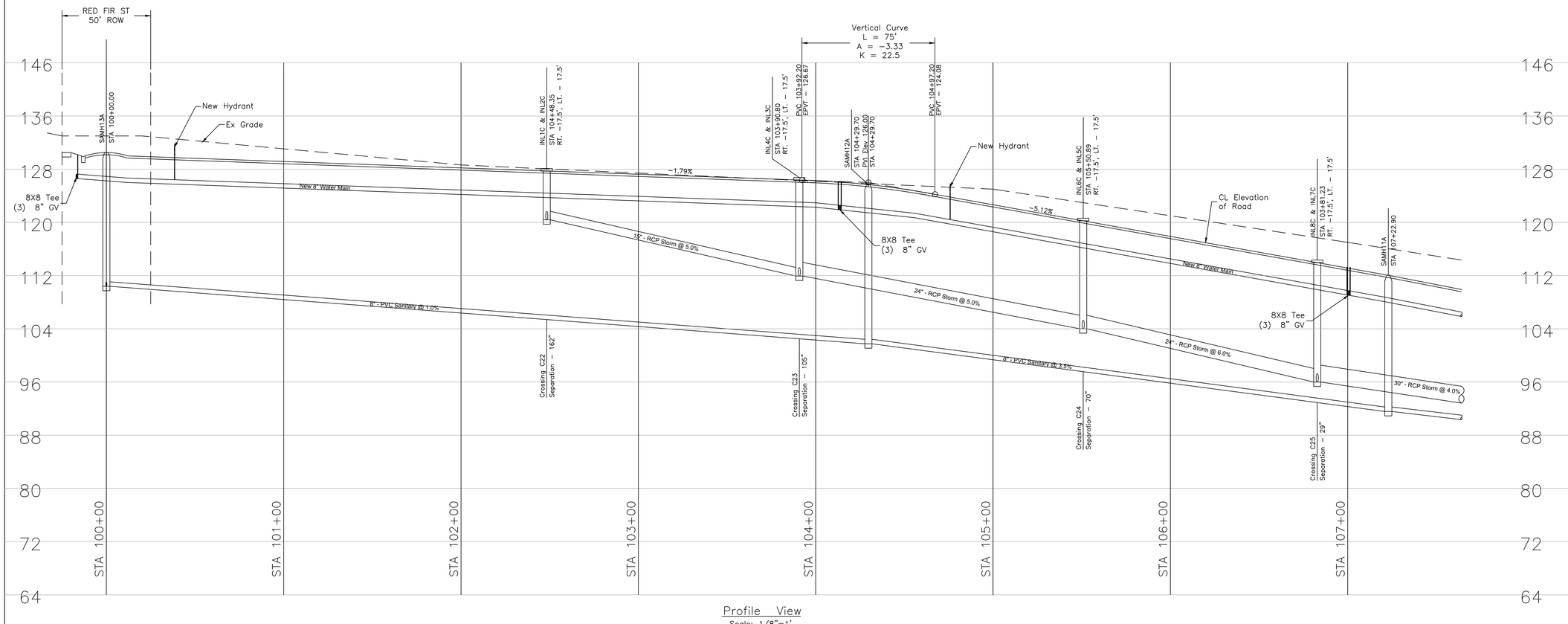
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Plan View
Scale: 1"=30'





Profile View
Scale: 1/8"=1'

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Plan - Profile Sheet 10

Whispering Hills Subdivision

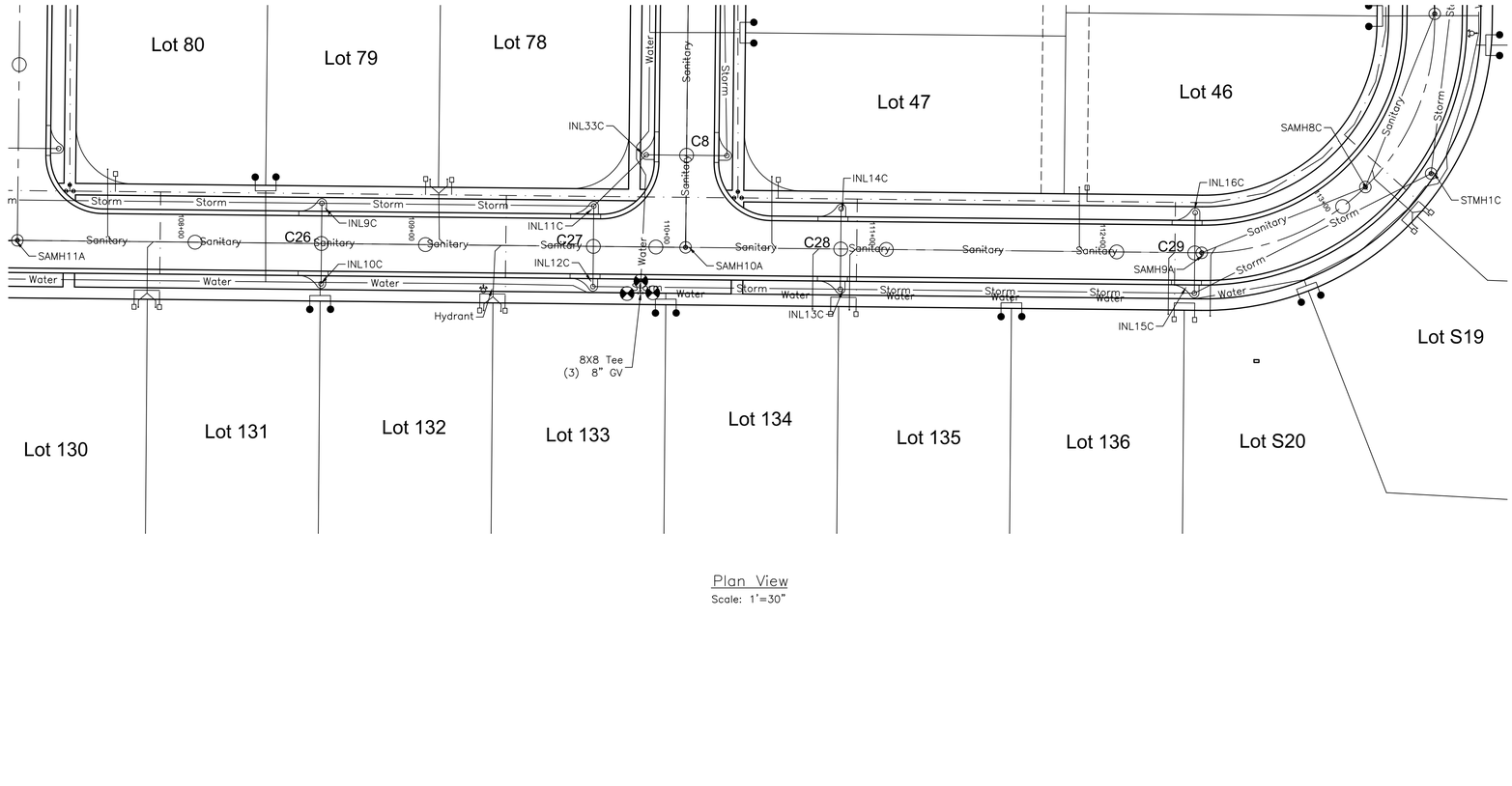
Buckhill Road, Howey-in-the-Hills, Florida

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09-07-21	Date
WH2-PP10	File

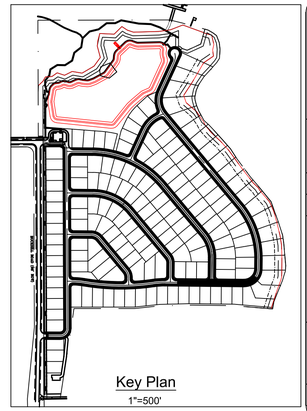
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27 of 59

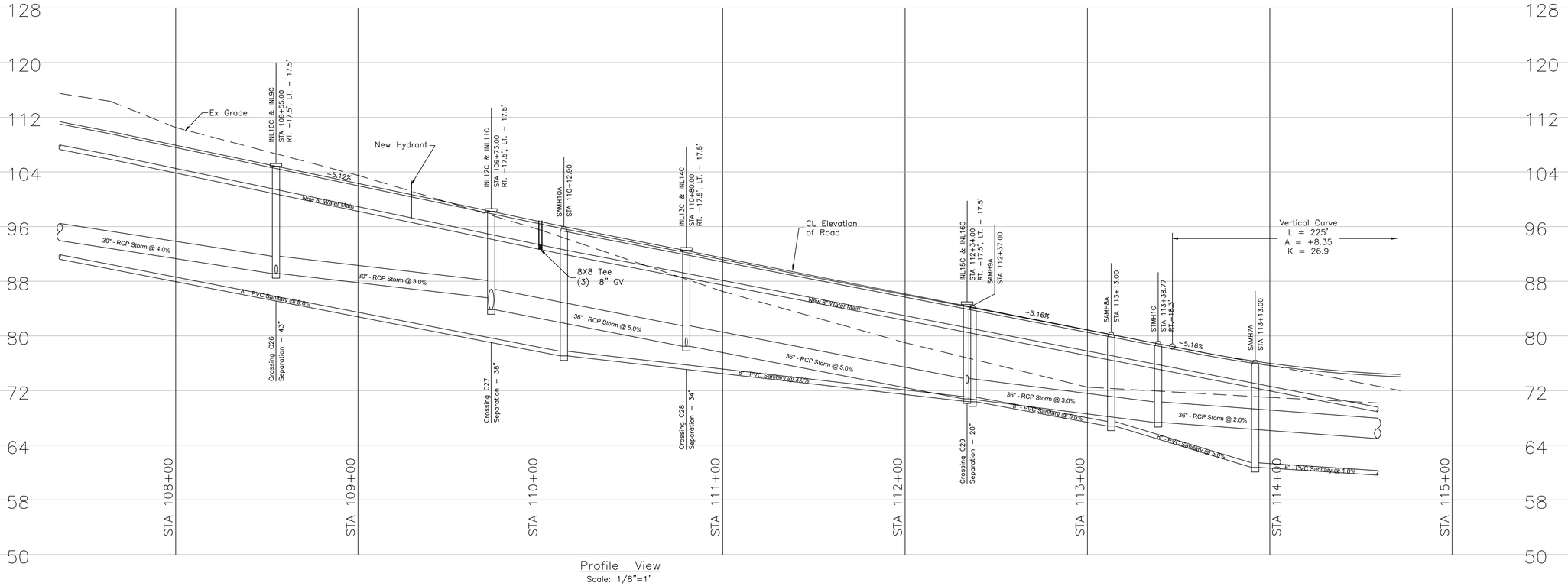
DARCY UNROE LICENSE No 60929 STATE OF FLORIDA PROFESSIONAL ENGINEER
Darcy Unroe PE 60929

#	Description	Date
Revisions		
#	Description	Date
Revisions		



Plan View
Scale: 1"=30'





Profile View
Scale: 1/8"=1'

Item 1.

#	Description	Date
	Revisions	
	Revisions	

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Plan - Profile Sheet 11

Whispering Hills Subdivision

Buckhill Road, Howey-in-the-Hills, Florida

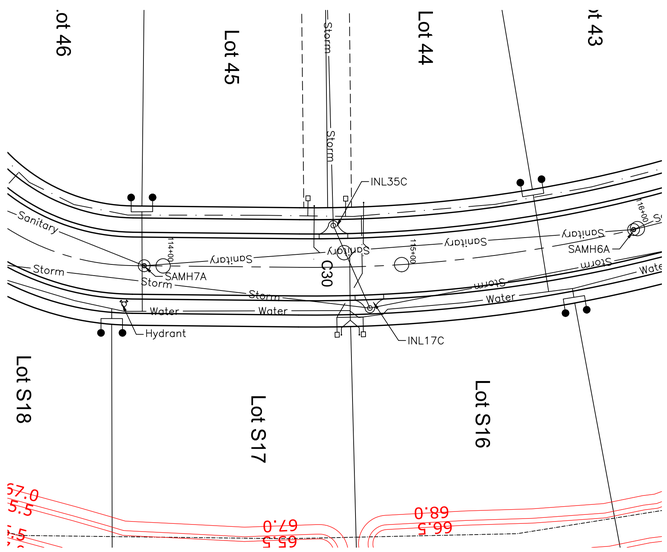
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09-07-21	Date
WH2-PP11	File

Dwg. No.
PP11

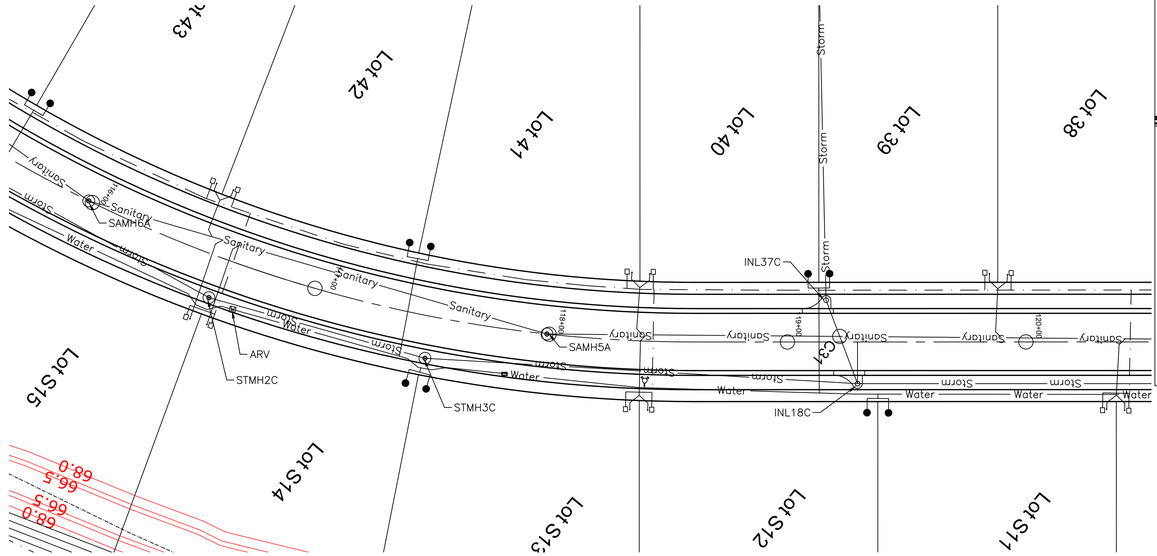
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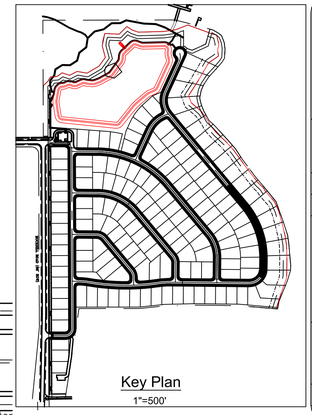
Darcy Unroe PE 60929



Plan View
Scale: 1"=30"



Plan View
Scale: 1"=30"

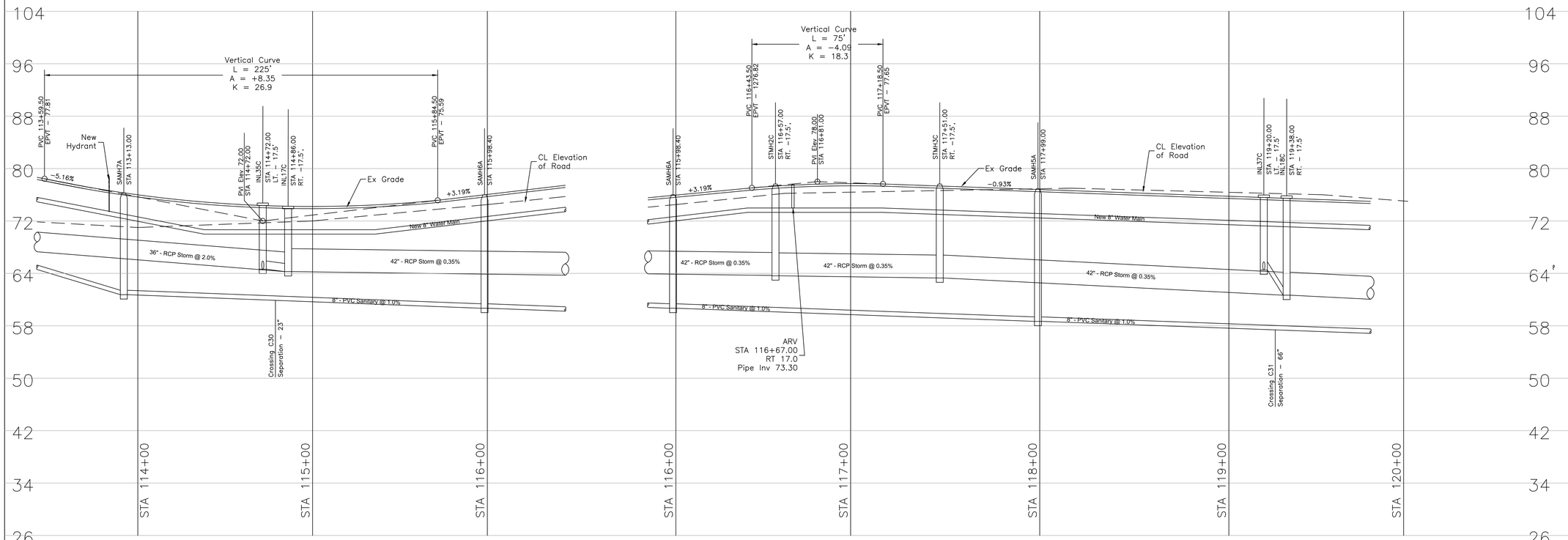


#	Revisions	Date
	Description	
#	Revisions	Date
	Description	

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Plan - Profile Sheet 12

Whispering Hills Subdivision
Buckhill Road, Howey-in-the-Hills, Florida



Profile View
Scale: 1/8"=1'

Profile View
Scale: 1/8"=1'

DP	Drawn
DP	Checked
1"=30'	Scale
09-07-21	Date
WH2-PP12	File

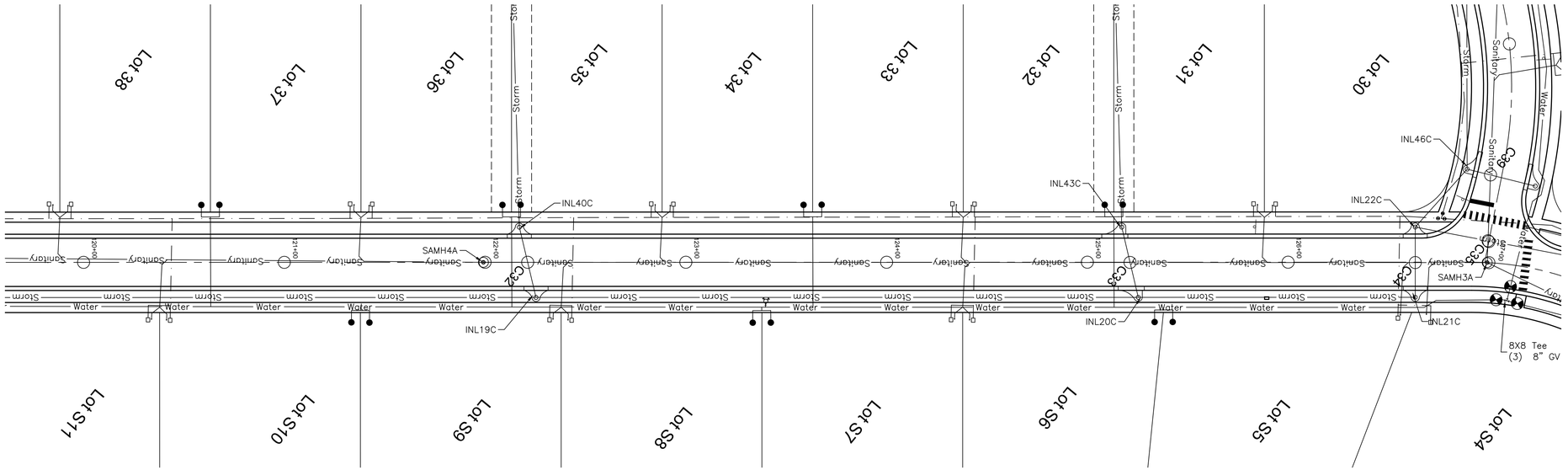
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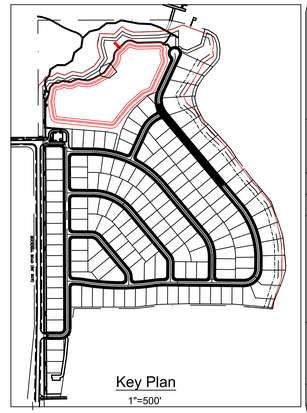
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Darcy Unroe PE 60929

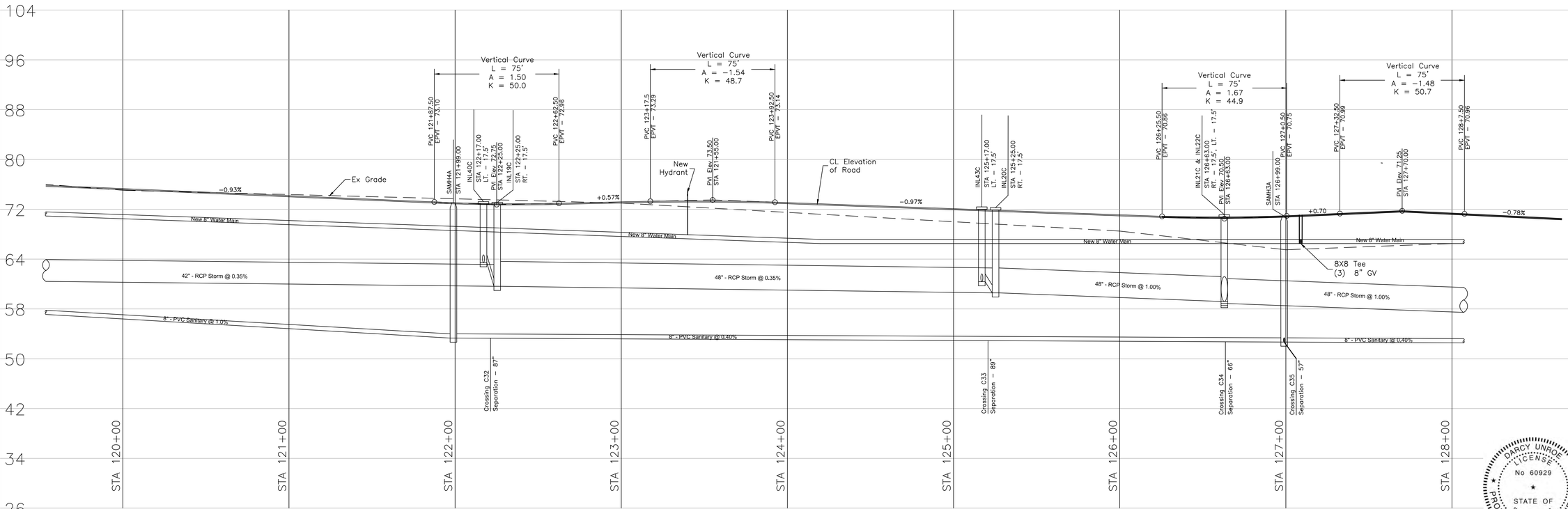


Plan View
Scale: 1"=30'



#	Revisions	Date	Description
	Revisions		
	Revisions		

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Profile View
Scale: 1/8"=1'

Plan - Profile Sheet 13

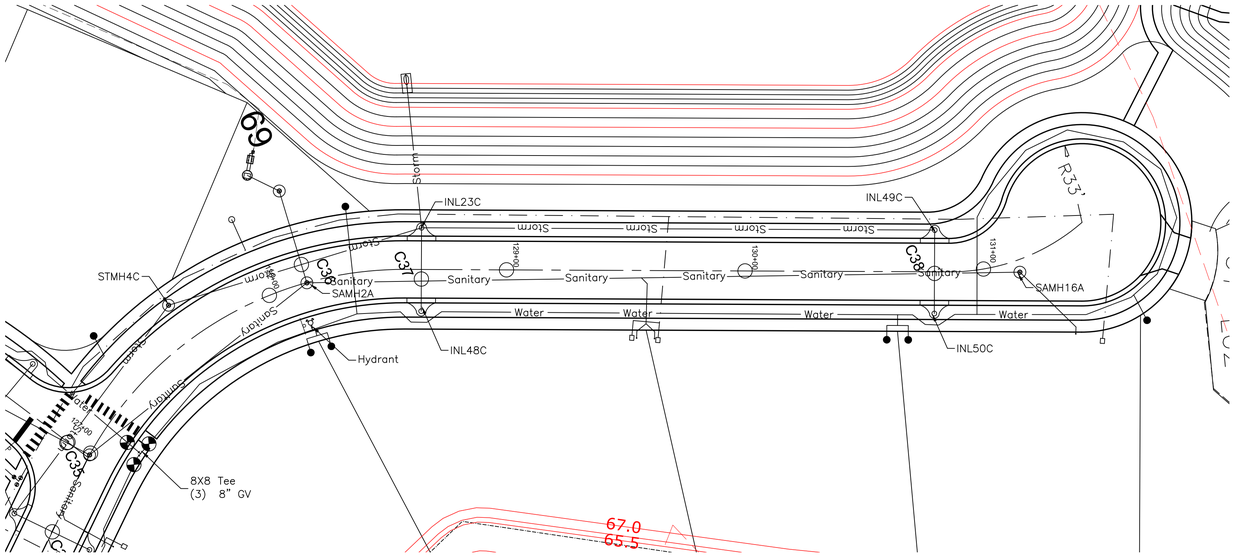
Whispering Hills Subdivision
Buckhill Road, Howey-in-the-Hills, Florida

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09-07-21	Date
WH2-PP13	File

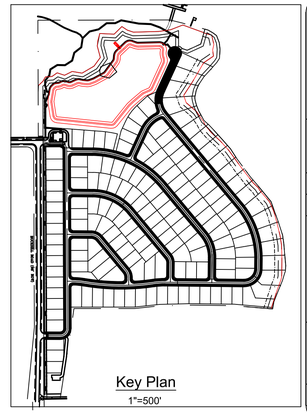
Dwg. No.
PP13
30 of 59

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Darcy Unroe PE 60929



Plan View
Scale: 1"=30"



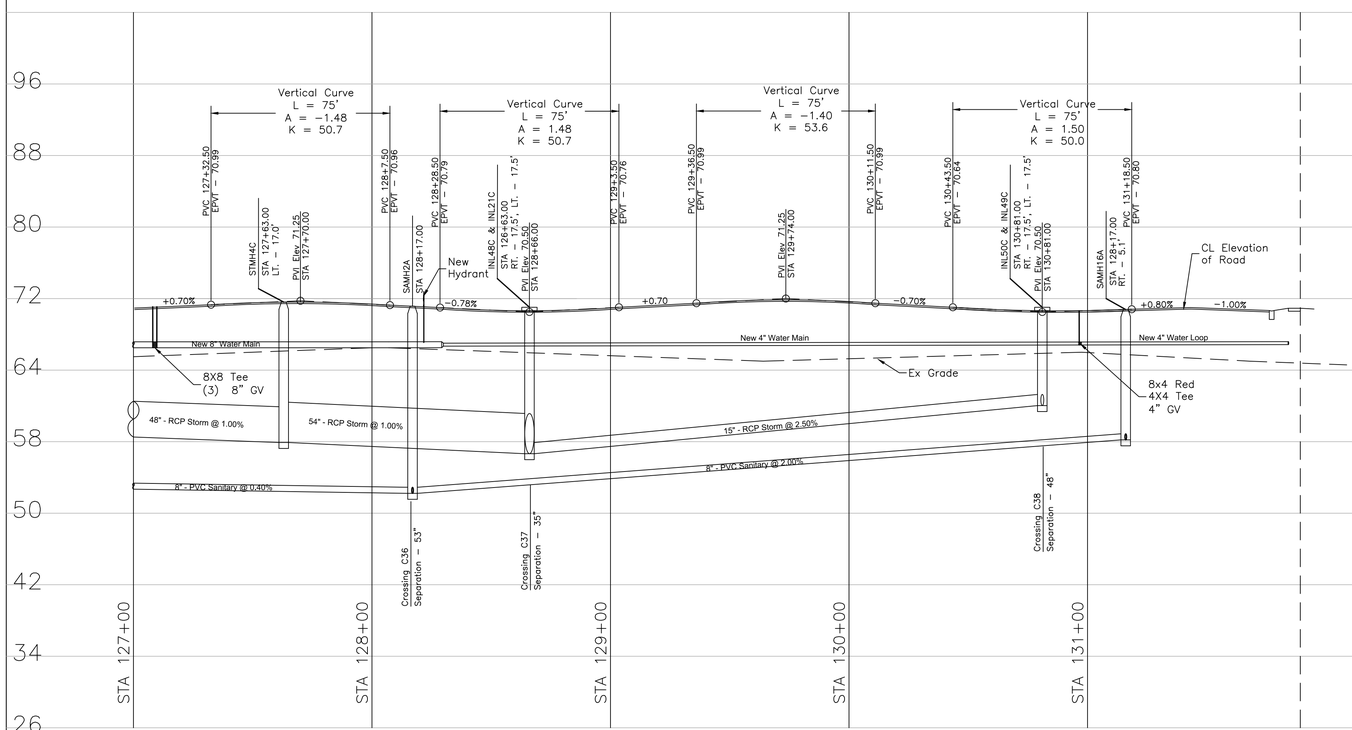
#	Description	Date
	Revisions	
	Revisions	

Unroe Engineering, Inc
Civil Engineering/Planning/Scientific Evaluation
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Plan - Profile Sheet 14

Whispering Hills Subdivision

Buckhill Road, Howey-in-the-Hills, Florida



Profile View
Scale: 1/8"=1'

DP	Drawn
DP	Checked
1"=30'	Scale
09-07-21	Date
WH2-PP14	File

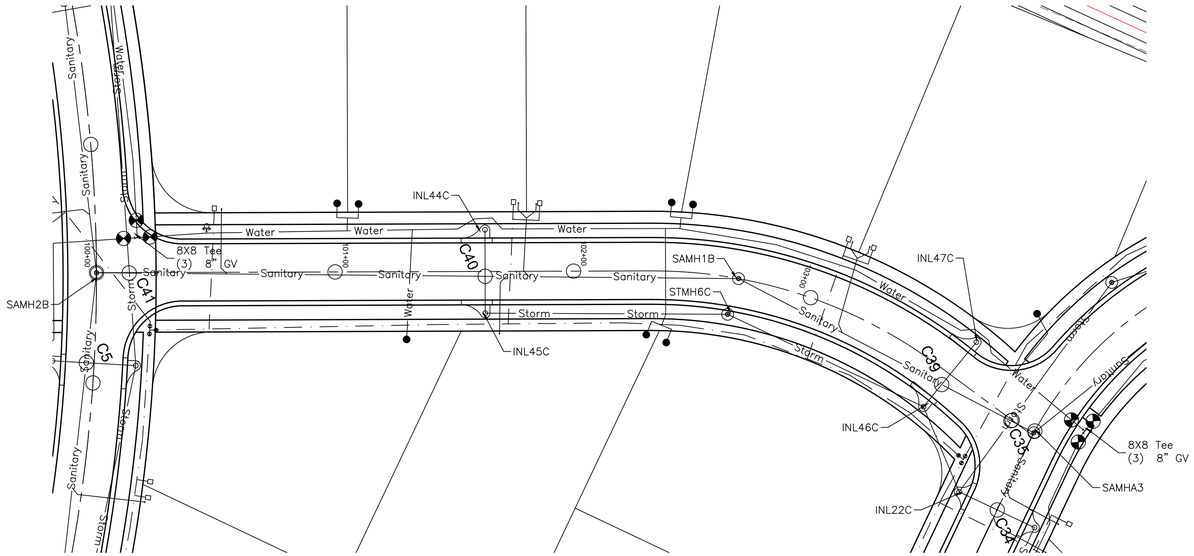
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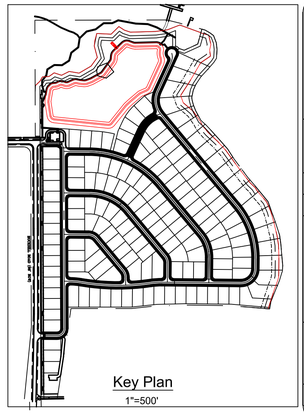
31 of 58

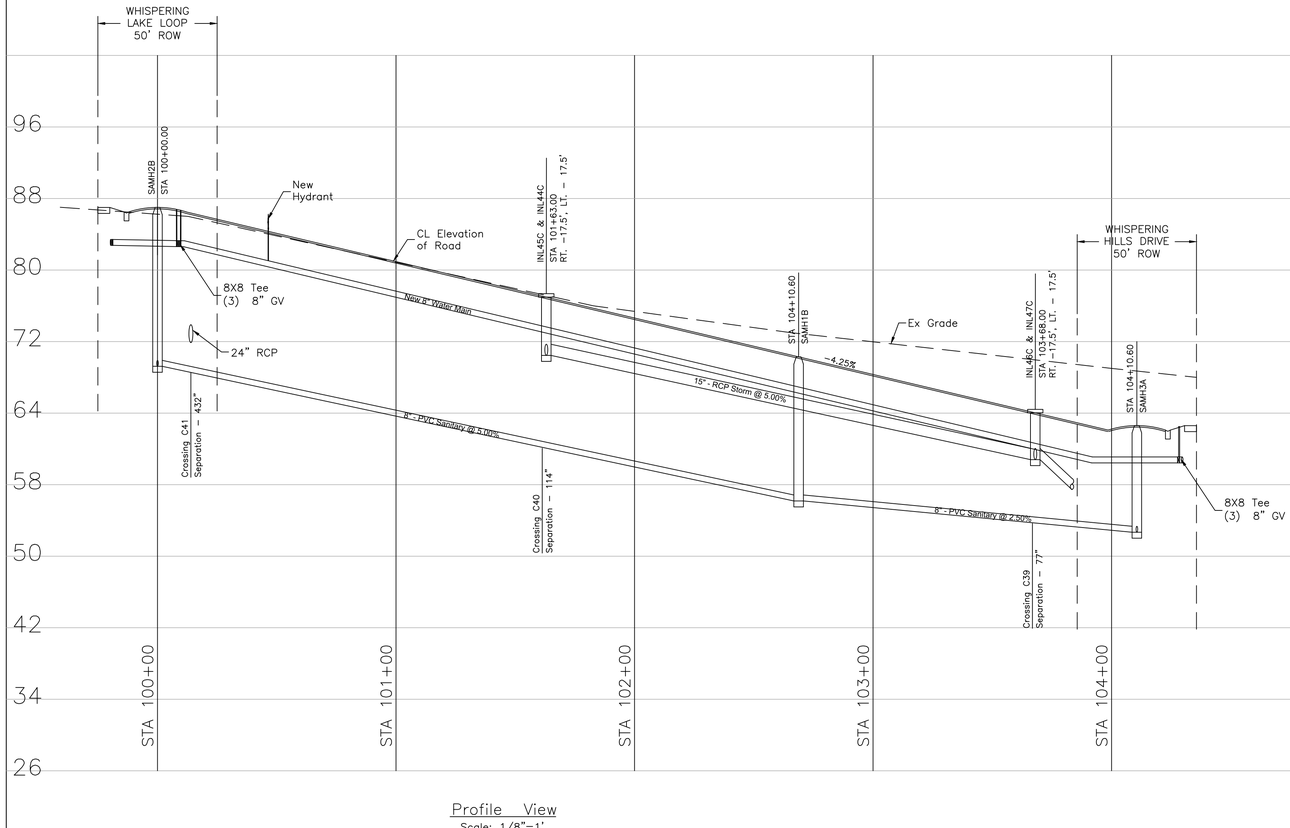
DARCY UNROE LICENSE No 60929 STATE OF FLORIDA PROFESSIONAL ENGINEER

Darcy Unroe PE 60929



Plan View
Scale: 1"=30"





Profile View
Scale: 1/8"=1'

Item 1.

#	Date	Description
		Revisions
#	Date	Description
		Revisions

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Plan - Profile Sheet 15

Whispering Hills Subdivision
Buckhill Road, Howey-in-the-Hills, Florida

DP	Drawn
DP	Checked
1"=30'	Scale
09-07-21	Date
WH2-PP15	File

Dwg. No.
PP15
25 of 59

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Darcy Unroe PE 60929

2/18/2022 1:11:25 PM

Scale: 1" = 200'

Ex 6" Forcemain
Existing Sanitary Lift Station
Existing Off-site Fire Hydrant #2
New 4" FM
See Sheet OS4
Ex 6" Water Main
New 4" FM
See Sheet OS3
See Sheet OS5
Connect to existing 6" Water Main w/ 6x10 Tapping Saddle & Valve
New 10" Water
New 4" FM
Whispering Hills Point of Sewer Connection
Whispering Hills Point of Water Connection #2
New 10" Water
New Off-site Hydrant #1
New 10" Water
Ex 8" Water Main
Connect to existing 8" Water Main w/ 8x10 Tapping Saddle & Valve
Ex 6" Water Main
East Revels Road
New 10" Water
Existing Off-site Fire Hydrant #1
See Sheet OS2
New 10x10 Tee
New Off-site Hydrant #2
Whispering Hills Point of Water Connection #2

Water
Lakeshore Dr
BUCKHILL ROAD (CR 3077) 66' ROW
BUCKHILL ROAD (66' ROW)
Whispering Hills Subdivision

#	Date	Description
		Revisions
#	Date	Description
		Revisions

Unroe Engineering, Inc
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Business Authorization Number - EB 0000657 9 ph (407) 299-0650

Overall Off-Site Utility Plan

Whispering Hills Subdivision
Buckhill Road, Howey-in-the-Hills, Florida

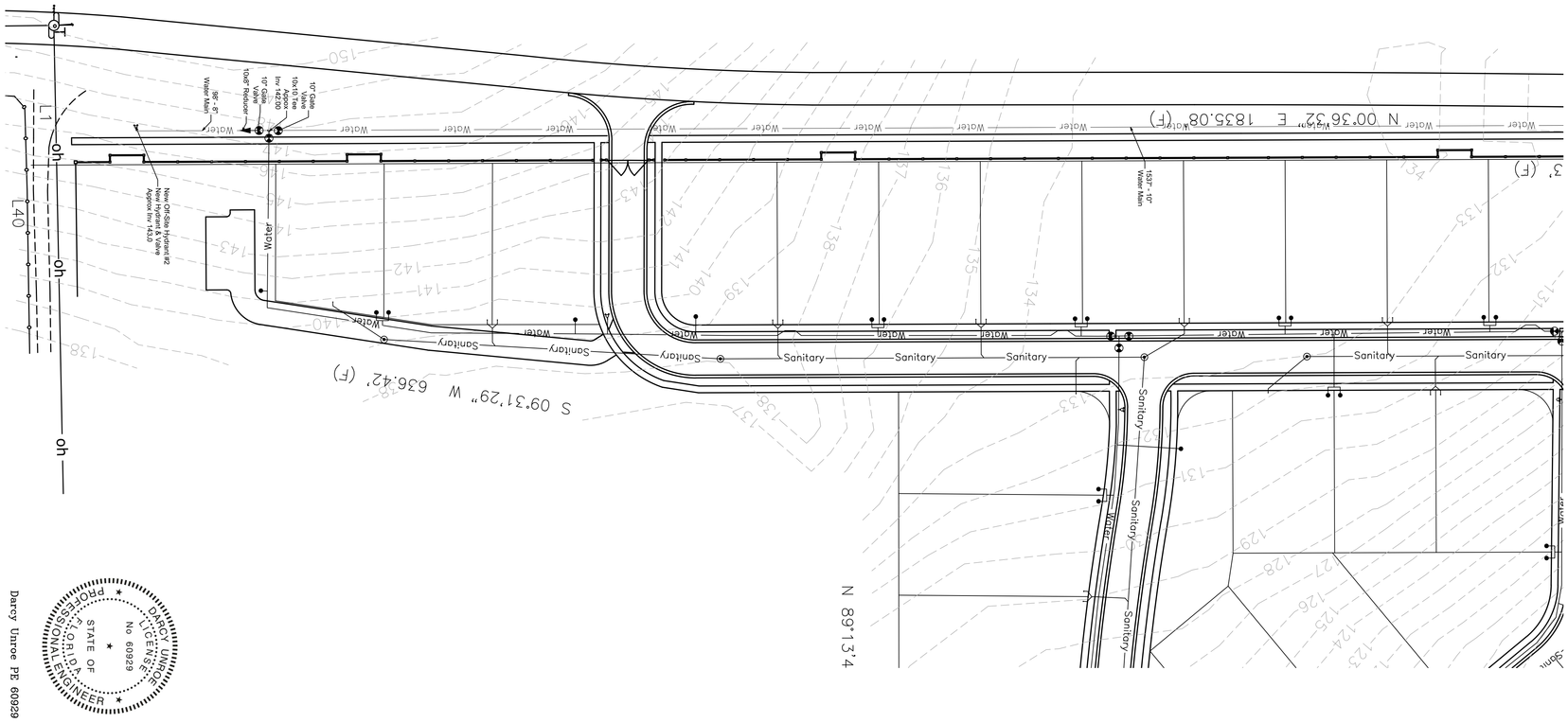
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1"=200'	Scale
09-07-21	Date
WH2-OS1	File

Dwg. No.
OS1
35 of 59

DARCY UNROE LICENSE No 60929 STATE OF FLORIDA PROFESSIONAL ENGINEER

Darcy Unroe PE 60929

2/21/2022 9:09:33 AM



DARCY LYNN UNROE
LICENSE
STATE OF FLORIDA
PROFESSIONAL ENGINEER
No 60929

Darcy Unroe PE 60929

Detailed Off-Site Utility Plan #1

Whispering Hills Subdivision

Buckhill Road, Howey-in-the-Hills, Florida

Drawn	DP
Checked	DP
Scale	1"=50'
Date	09-07-21
File	WH2-OS2
Dwg. No.	OS2

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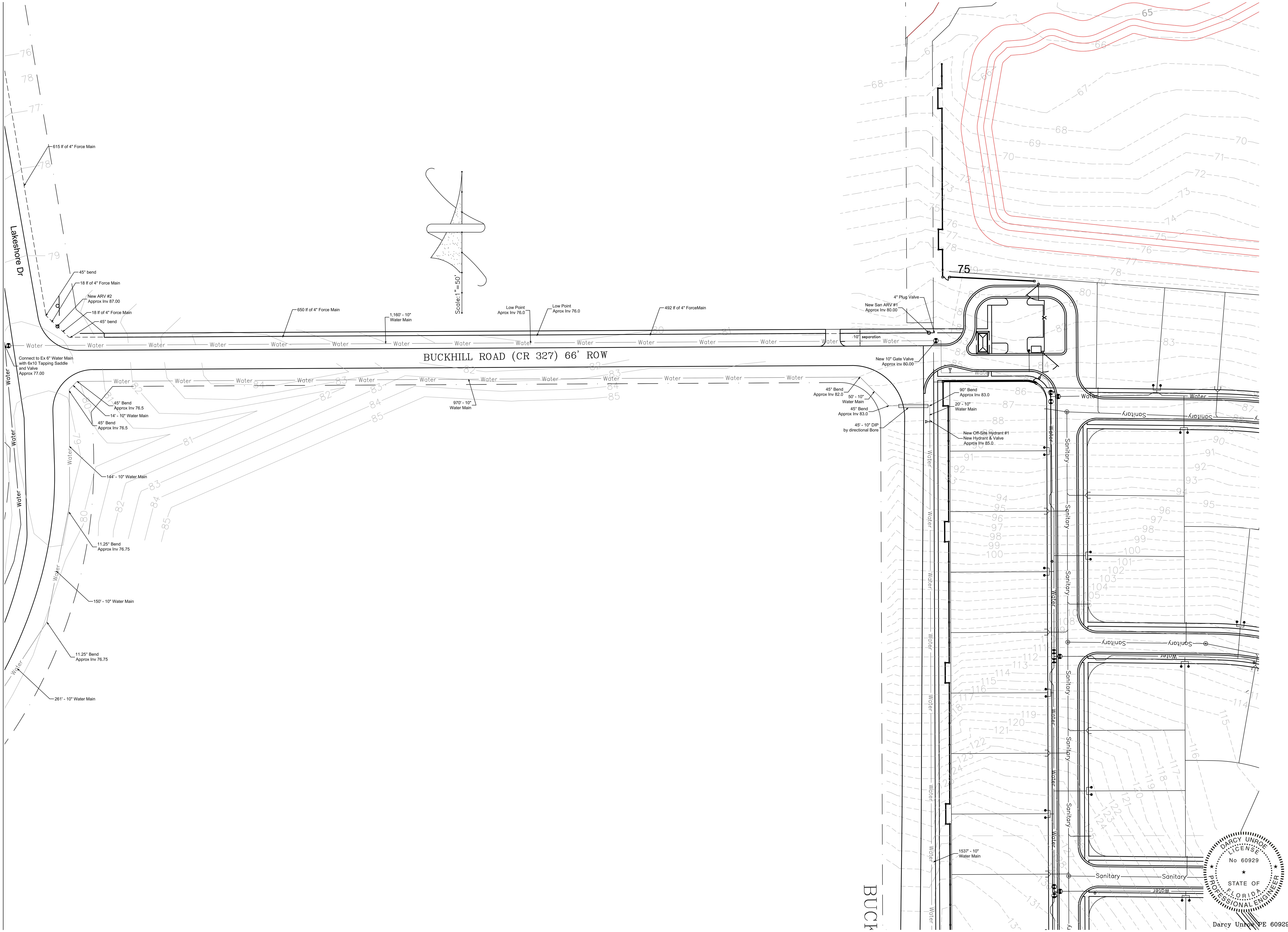
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Revisions				Revisions			
#	Date	Description		#	Date	Description	



#	Date	Description

Revisions

#	Date	Description

Revisions

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PO Box 690942, Orlando, Fl 32869-0942 ph (407) 299-0650
Business Authorization Number - EB 00006579

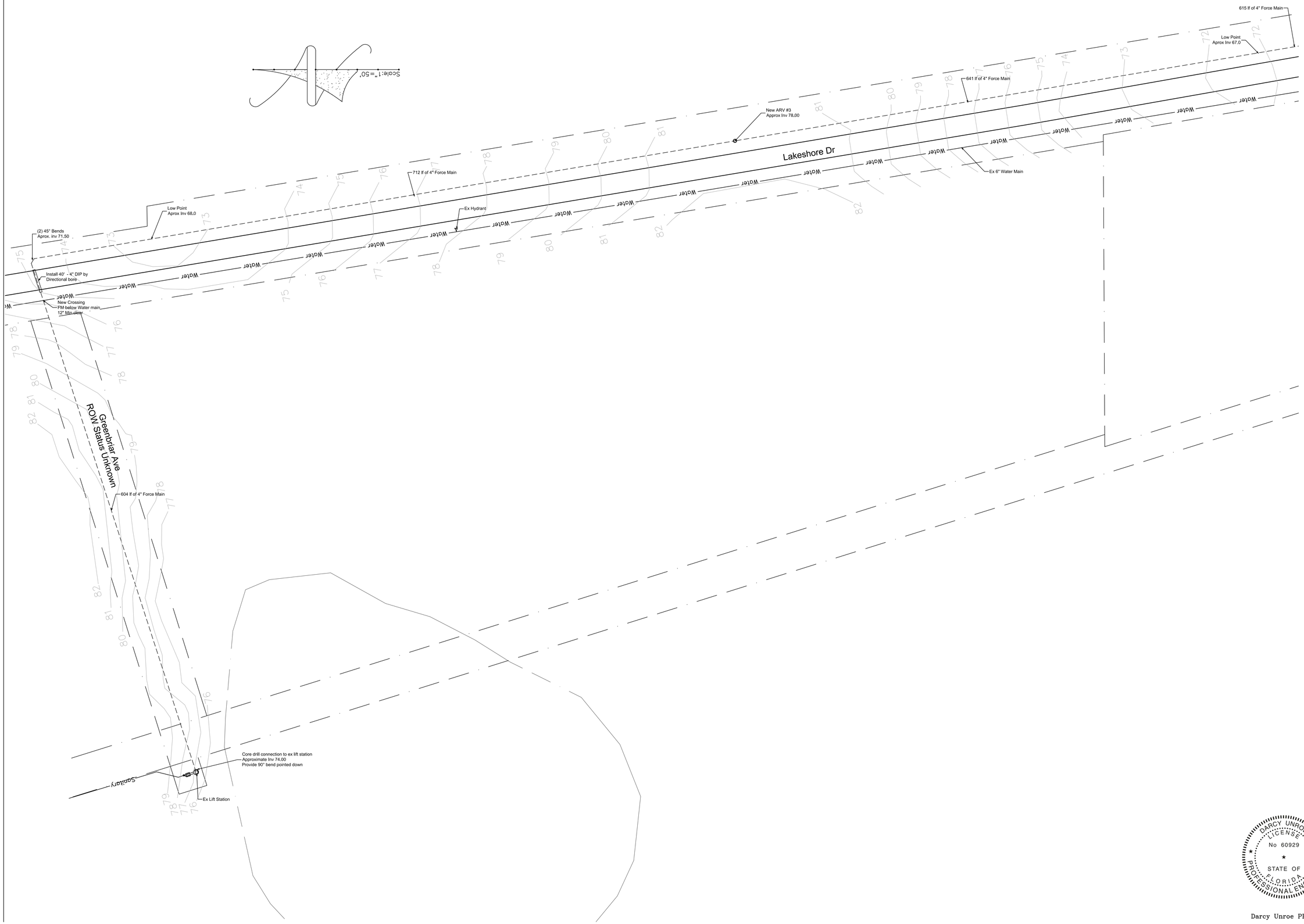
Detailed Off-Site Utility Plan #2

Whispering Hills Subdivision
Buckhill Road, Howey-in-the-Hills, Florida

DP	Drawn
DP	Checked
1"=50'	Scale
09-07-21	Date
WH2-OS3	File

Dwg. No.
OS3
37 of 59

2/21/2022 9:09:34 AM



#	Date	Description
		Revisions
#	Date	Description
		Revisions

Unroe Engineering, Inc
Civil Engineering/Planning/Scientific Evaluation
PO Box 690942, Orlando, Fl 32869-0942
Business Authorization Number - EB 00006579 ph (407) 299-0650

Detailed Off-Site Utility Plan #1

Whispering Hills Subdivision

Buckhill Road, Howey-in-the-Hills, Florida

DP	Drawn
DP	Checked
1"=50'	Scale
09-07-21	Date
WH2-OS4	File

Dwg. No.

OS4

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DARCY UNROE LICENSE No 60929 STATE OF FLORIDA PROFESSIONAL ENGINEER

Darcy Unroe PE 60929

2/21/2022 9:09:34 AM

45° bend
18 lf of 4" Force Main
New ARV #2
Approx Inv 87.00
18 lf of 4" Force Main
45° bend
615 lf of 4" Force Main
1,160' - 10" Water Main
Connect to Ex 6" Water Main with 6x10 Tapping Saddle and Valve Approx 77.00
45° Bend Approx Inv 76.5
144' - 10" Water Main
11.25° Bend Approx Inv 76.75
150' - 10" Water Main
11.25° Bend Approx Inv 76.75
261' - 10" Water Main
LAKE SHORE BOULEVARD
11.25° Bend Approx Inv 76.75
70' - 10" DIP by directional Bore
11.25° Bend Approx Inv 77.00
192' - 10" Water Main
11.25° Bend Approx Inv 77.25
100' - 10" Water Main
22.5° Bend Approx Inv 77.50
350' - 10" Water Main
90° Bend Approx Inv 81.00
90° Bend Approx Inv 81.00
40' - 10" DIP by directional Bore
Connect to Ex 8" Water Main with 8x10 Tapping Saddle and Valve
East Revels Road
Scale: 1"=50'

#	Description	Date
	Revisions	

#	Description	Date
	Revisions	

Unroe Engineering, Inc
Civil Engineering/Planning/Scientific Evaluation
PO Box 690942, Orlando, Fl 32869-0942
Business Authorization Number - EB 00006579 ph (407) 299-0650

Detailed Off-Site Utility Plan #5

Whispering Hills Subdivision
Buckhill Road, Howey-in-the-Hills, Florida

DP	Drawn
DP	Checked
1"=50'	Scale
09-07-21	Date
WH2-OS5	File

Dwg. No.
OS5
39 of 59

DARCY UNROE LICENSE No 60929 STATE OF FLORIDA PROFESSIONAL ENGINEER
Darcy Unroe PE 60929

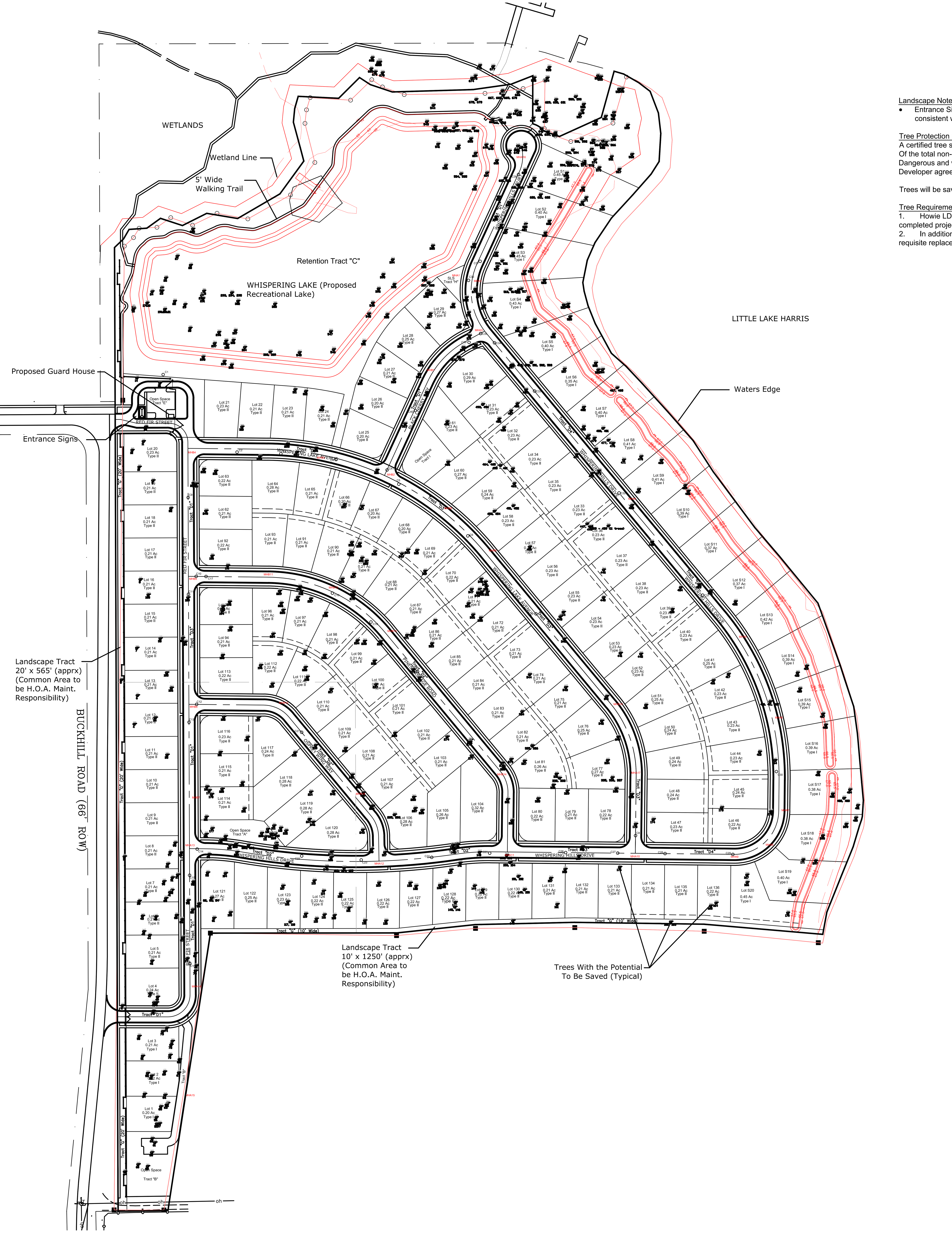
2/21/2022 9:09:34 AM

Tree Save Table

Tree#	Save	Diameter (inches)	Species	Condition	Comments
10	1	10	Quercus virginiana	65	
14	1	17	Quercus laurifolia	50	leaning
32	1	8	Quercus laurifolia	65	
36	1	10&11	Quercus laurifolia	50	
39	1	18	Quercus laurifolia	50	
44	1	6	Quercus laurifolia	60	
45	1	6	Quercus laurifolia	50	
46	1	6	Quercus laurifolia	55	
48	1	8	Quercus laurifolia	60	
51	1	7	Quercus laurifolia	50	
54	1	7	Quercus laurifolia	60	
59	1	7	Quercus laurifolia	60	
60	1	7	Quercus laurifolia	60	
66	1	7	Prunus serotina	55	
70	1	7	Quercus laurifolia	50	Remove "Y"
73	1	11	Prunus serotina	45	
74	1	20	Quercus laurifolia	35	Check voids
76	1	9	Quercus laurifolia	40	Remove codominent stem and lower branches
81	1	8	Quercus laurifolia	65	
89	1	8	Quercus laurifolia	55	
95	1	6,6 &6	Quercus laurifolia	45	
100	1	7	Prunus serotina	60	
101	1	6	Prunus serotina	65	
105	1	6, 6, & 3	Quercus laurifolia	50	Remove 3" stem
109	1	10	Quercus laurifolia	65	
110	1	6	Quercus laurifolia	50	
111	1	6	Quercus laurifolia	60	
112	1	10&10	Prunus serotina	50	
117	1	7	Quercus laurifolia	50	Remove " tree between
118	1	7	Quercus laurifolia	50	
122	1	8	Quercus laurifolia	65	
130	1	6	Prunus serotina	55	
131	1	6	Fraxinus americana	65	
137	1	8	Quercus laurifolia	55	Remove lower limbs
148	1	9&13	Prunus serotina	50	
156	1	8	Prunus serotina	60	
162	1	36	Quercus virginiana	55	
163	1	10	Quercus virginiana	60	
170	1	7	Quercus laurifolia	50	
171	1	8	Prunus serotina	55	
173	1	12	Quercus virginiana	55	
176	1	20	Quercus laurifolia	60	
177	1	6	Prunus serotina	65	
178	1	8	Quercus laurifolia	65	
179	1	7	Prunus serotina	55	
180	1	10	Prunus serotina	50	
181	1	6	Quercus laurifolia	55	
183	1	7	Quercus laurifolia	60	
190	1	14&15	Quercus laurifolia	40	Remove northern limb
195	1	8&10	Quercus laurifolia	50	Remove 8 stem
199	1	11&12	Prunus serotina	55	
200	1	6	Quercus laurifolia	60	Remove two stem Prunus serotina
201	1	6	Quercus laurifolia	65	
202	1	10	Quercus laurifolia	65	
207	1	8	Quercus laurifolia	65	
208	1	7	Quercus laurifolia	65	
209	1	6	Quercus laurifolia	55	
210	1	6	Quercus laurifolia	60	
211	1	6	Quercus laurifolia	50	Remove codomenent stem
212	1	11 &12	Prunus serotina	50	
216	1	6	Quercus laurifolia	60	Codomenent leader at 30"
221	1	14, 22 &13	Quercus laurifolia	50	
222	1	16	Quercus laurifolia	65	
224	1	20	Quercus laurifolia	65	
228	1	8	Quercus laurifolia	45	
229	1	21&15	Quercus laurifolia	45	
232	1	6&6	Quercus laurifolia	50	
236	1	10& 16	Prunus serotina	50	
238	1	15	Prunus serotina	55	
243	1	8	Quercus laurifolia	50	
246	1	7	Prunus serotina	60	
247	1	9, 10&12	Prunus serotina	50	
248	1	9 &15	Quercus laurifolia	55	
252	1	8& 13	Prunus serotina	50	
263	1	9	Prunus serotina	45	
264	1	9	Prunus serotina	55	
271	1	7, 11&5	Quercus laurifolia	50	
274	1	13 &14	Quercus laurifolia	50	
283	1	15	Quercus laurifolia	55	
310	1	20	Quercus virginiana	50	
311	1	14	Prunus serotina	55	
312	1	17	Quercus laurifolia	50	
317	1	13	Quercus laurifolia	50	
318	1	17	Quercus laurifolia	55	
319	1	13, 8 &6	Prunus serotina	45	
320	1	9, 9 & 10	Prunus serotina	45	
321	1	7&7	Prunus serotina	55	
322	1	8	Prunus serotina	60	
324	1	9&8	Prunus serotina	55	
325	1	11	Quercus laurifolia	45	
326	1	12	Quercus laurifolia	50	
328	1	6	Prunus serotina	50	
338	1	12&11	Quercus virginiana	55	Remove lower limbs
342	1	10& 12	Quercus laurifolia	50	
347	1	9&4	Quercus virginiana	55	Remove 4" stem
348	1	10& 10	Quercus virginiana	55	
358	1	7	Quercus laurifolia	50	Remove nearby stem tree
359	1	13	Quercus laurifolia	55	
366	1	12	Prunus serotina	60	
380	1	7&3	Quercus laurifolia	50	Remove " and lower limb
381	1	16	Quercus laurifolia	60	
399	1	14	Fraxinus americana	55	
400	1	9	Quercus laurifolia	55	
401	1	16	Prunus serotina	60	
402	1	10	Fraxinus americana	55	
403	1	9	Fraxinus americana	55	
404	1	12	Prunus serotina	50	
408	1	9	Prunus serotina	60	
409	1	15	Prunus serotina	50	
413	1	8	Prunus serotina	50	
416	1	7	Prunus serotina	60	
417	1	10	Prunus serotina	65	
418	1	7&8	Prunus serotina	55	
422	1	9&14	Quercus laurifolia	50	
427	1	10	Prunus serotina	50	
442	1	13	Prunus serotina	60	
446	1	27	Quercus laurifolia	50	
451	1	10&4	Quercus laurifolia	50	
452	1	15	Quercus laurifolia	50	
453	1	9	Quercus laurifolia	50	
454	1	7	Quercus laurifolia	50	
462	1	8	Quercus laurifolia	50	
466	1	10&6	Quercus laurifolia	50	Remove 6" stem
469	1	12	Prunus serotina	50	
470	1	11, 10& 10	Prunus serotina	50	
476	1	15	Prunus serotina	60	
477	1	11	Quercus laurifolia	55	Remove lower limb
478	1	16	Quercus laurifolia	60	
480	1	9&12	Quercus laurifolia	50	Remove lower limbs
481	1	7&9	Quercus laurifolia	50	Remove lower limbs
488	1	8&13	Quercus laurifolia	50	
489	1	6&9	Quercus laurifolia	50	
492	1	30	Prunus serotina	50	Raise crown
495	1	12& 7	Prunus serotina	50	Remove 7" stem
496	1	11 & 10	Prunus serotina	50	Raise crown
500	1	9	Prunus serotina	50	
501	1	10	Prunus serotina	50	
502	1	8	Prunus serotina	50	
503	1	7	Prunus serotina	50	
507	1	11	Quercus laurifolia	50	
509	1	6	Quercus laurifolia	50	
510	1	11&6	Prunus serotina	50	Remove 6" stem
511	1	9	Quercus laurifolia	55	
512	1	22	Prunus serotina	55	
519	1	10&6	Prunus serotina	50	Remove 6" stem
520	1	15	Quercus laurifolia	50	
521	1	11	Quercus laurifolia	50	
522	1	8	Quercus laurifolia	50	
523	1	9 &13	Quercus laurifolia	50	Remove 9" stem
544	1	20	Prunus serotina	50	
557	1	14	Quercus virginiana	55	Remove two 4" stems
558	1	8	Quercus virginiana	50	
559	1	17	Prunus serotina	65	
560	1	20	Quercus virginiana	60	Remove lower stems
561	1	13&12	Quercus virginiana	50	Remove lower limbs
562	1	16 & 10	Quercus virginiana	50	Remove 10" stem
563	1	7	Quercus virginiana	60	
564	1	14&14	Quercus virginiana	55	
565	1	8	Quercus virginiana	55	
566	1	8	Quercus virginiana	55	
567	1	19	Quercus virginiana	60	
568	1	30	Quercus virginiana	65	
569	1	19	Quercus virginiana	60	
570	1	11	Quercus virginiana	60	
571	1	11	Quercus virginiana	60	
573	1	10&16	Quercus virginiana	50	
574	1	15&8	Quercus virginiana	50	
575	1	8&9	Prunus serotina	50	
576	1	10	Quercus virginiana	50	
577	1	9	Quercus virginiana	50	
578	1	10	Quercus virginiana	50	
579	1	12	Quercus virginiana	50	Remove three nearby trees
580	1	13	Quercus virginiana	55	
581	1	10	Quercus virginiana	60	
582	1	14& 13	Quercus virginiana	55	
583	1	13& 14	Quercus virginiana	55	
584	1	11&13	Quercus virginiana	50	
586	1	14	Quercus virginiana	60	
591	1	11	Quercus virginiana	50	
592	1	13	Quercus virginiana	50	
593	1	9	Quercus virginiana	50	
594	1	12	Quercus virginiana	50	Remove lower stems
595	1	11&11	Quercus virginiana	50	
596	1	9	Quercus virginiana	60	
597	1	12	Quercus virginiana	60	
601	1	7&13	Quercus virginiana	50	
602	1	19	Quercus virginiana	50	
603	1	10&15	Quercus virginiana	50	
660	1	9	Quercus virginiana	55	
661	1	11 & 14	Quercus virginiana	55	
662	1	11	Quercus virginiana	55	
663	1	12 & 14	Prunus serotina	50	
664	1	11, 12 & 10	Quercus virginiana	50	
665	1	21 & 12	Quercus virginiana	50	
666	1	14	Quercus virginiana	55	
667	1	10	Quercus virginiana	60	
668	1	10	Quercus virginiana	50	
669	1	9	Quercus virginiana	55	Remove dead stem
670	1	9,9&3	Quercus virginiana	50	Remove 3" stem
671	1	11	Quercus virginiana	55	
672	1	10	Quercus virginiana	50	
673	1	12	Quercus virginiana	50	
Total	202				

Note:
This table refers to trees that can potentially be saved as depicted on sheet TM2 & TM3

Scale:1" = 120'

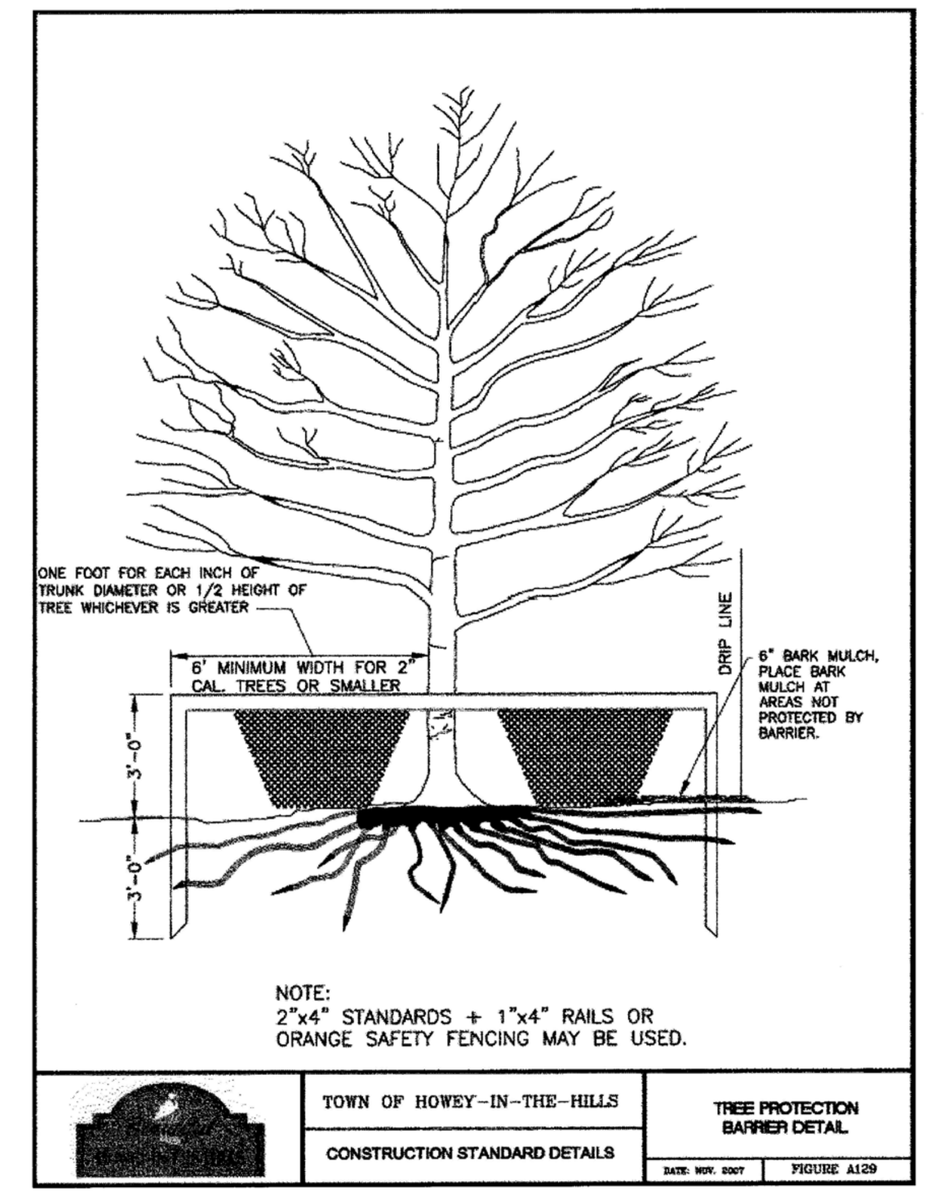


Landscape Notes:
- Entrance Signs may be located In the Landscape Easements. Such Landscape Buffers and Screens will be consistent with COHH LDR's.

Tree Protection Notes
A certified tree survey has been conducted by Ellis Surveying, Inc.
Of the total non-Pines located within the Parcel, the majority have ,been Identified as Diseased, Decayed, Dying, or Dangerous and will be removed. Of the remaining healthy non-Pines, many are in the way of construction. The Developer agree to maximize the number of healthy non-Pine trees .

Trees will be saved in accordance with COHH Tree Protection Barrier Details.

Tree Requirements:
1. Howie LDR's require 3 trees per lot therefore a total of no less than 468 trees will be provided on the completed project. For any Lots having less than 3 trees homebuilders will be required to cure the deficiency.
2. In addition, to satisfy the replacement plantings requirement homebuilders will be required to provide the requisite replacement trees.



Item 1.

#	Date	Description

Revisions

#	Date	City Comments Description
1	7/2/20	City Comments

Revisions

Unroe Engineering, Inc
Civil Engineering/Planning/Scientific Evaluation
PO Box 690942, Orlando, Fl 32869-0942 ph (407) 299-0650
Business Authorization Number - EB 00006579

Tree Mitigation Plan - Overall
Whispering Hills Subdivision
Buckhill Road, Howey-in-the-Hills, Florida

DP	Drawn
DP	Checked
1"=130'	Scale
09-07-21	Date
WH2-CTM	File

Dwg. No.
TM1
40 of 59

DARCY UNROE LICENSE No 60929 STATE OF FLORIDA PROFESSIONAL ENGINEER

Darcy Unroe PE 60929

2/18/2022 1:11:29 PM

New 48 slip marina by others

Retention Tract "C"

Open Space Tract "E"

Open Space Dog walk Tract I

SLS Tract "H"

Lot S1
Lot S2
Lot S4
Lot S5
Lot S6
Lot S7
Lot S8
Lot S9
Lot S10

Lot 18
Lot 19
Lot 20
Lot 21
Lot 22
Lot 23
Lot 24
Lot 25
Lot 26
Lot 27
Lot 28
Lot 29
Lot 30
Lot 31
Lot 32
Lot 33
Lot 34
Lot 35
Lot 58
Lot 59
Lot 60
Lot 61
Lot 62
Lot 63
Lot 64
Lot 65
Lot 66
Lot 67
Lot 68

Typical Potential tree to save Install Tree Protection Per Detail on TM1

Scale: 1" = 60'

#	Date	Revisions

#	Date	City Comments Description
1	7/2/20	

Revisions

Unroe Engineering, Inc
Civil Engineering/Planning/Scientific Evaluation
PO Box 690942, Orlando, Fl 32869-0942
Business Authorization Number - EB 0000657 9 ph (407) 299-0650

Tree Mitigation Plan - North

Whispering Hills Subdivision

Buckhill Road, Howey-in-the-Hills, Florida

DP	Drawn
DP	Checked
1"=60'	Scale
09-07-21	Date
WH2-TM2	File

Dwg. No.

TM2

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DARCY UNROE LICENSE No 60929 STATE OF FLORIDA PROFESSIONAL ENGINEER

Darcy Unroe PE 60929

2/18/2022 1:11:31 PM

BUCKHILL ROAD (66' ROW)

Tract "G"

Tract "C"

Open Space Tract "A"

Tract "G"

Typical Potential tree to save Install Tree Protection Per Detail on TM1

Hydrant (typ)

Tract "C"

Tract "G"

Open Space Tract "B"

Scale: 1" = 60'

#	Description	Date
Revisions		
1	City Comments	7/2/20
Revisions		

Unroe Engineering, Inc
Civil Engineering/Planning/Scientific Evaluation
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Business Authorization Number - EB 00006579 ph (407) 299-0650

Tree Mitigation Plan - South

Whispering Hills Subdivision

Buckhill Road, Howey-in-the-Hills, Florida

DP	Drawn
DP	Checked
1"=60'	Scale
09-07-21	Date
WH2-TM3	File

Dwg. No.

TM3

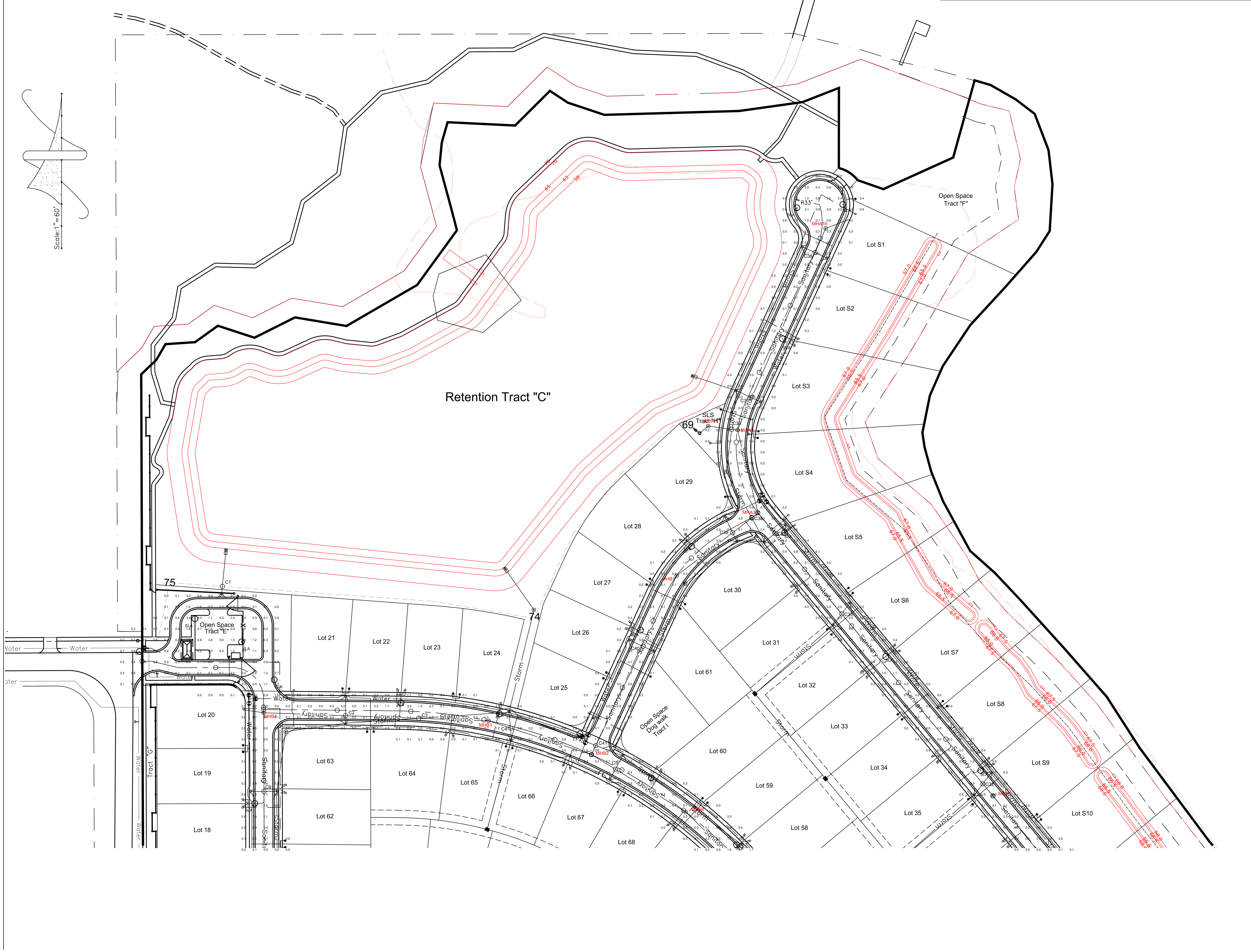
42 of 59

DARCY UNROE LICENSE No 60929 STATE OF FLORIDA PROFESSIONAL ENGINEER

Darcy Unroe PE 60929

2/18/2022 1:11:32 PM

Landreth Lighting Luminaire Schedule									
Symbol	[MANUFAC]	Qty	Label	Arrangement	Description	LLF	Lum. Watts	Lum. Lumens	BUG Rating
	NLS LIGHTING	57	SLA	SINGLE	CAL-S-TP1-S6-T2-32L-53-30K-UNV-AM-FINISH-10K; MOUNTED ON A4-S-SGL-3R-FINISH ARM & DBRSAP 14' 5 188 FINISH HH T3R POLE	1.000	54	5508	B2-U0-G2
	BEGA	7	SLB	SINGLE	77263 K3 BLK	1.000	3	131	B0-U1-G0



Revisions

#	Date	Description

Revisions

#	Date	Description

Unroe Engineering, Inc
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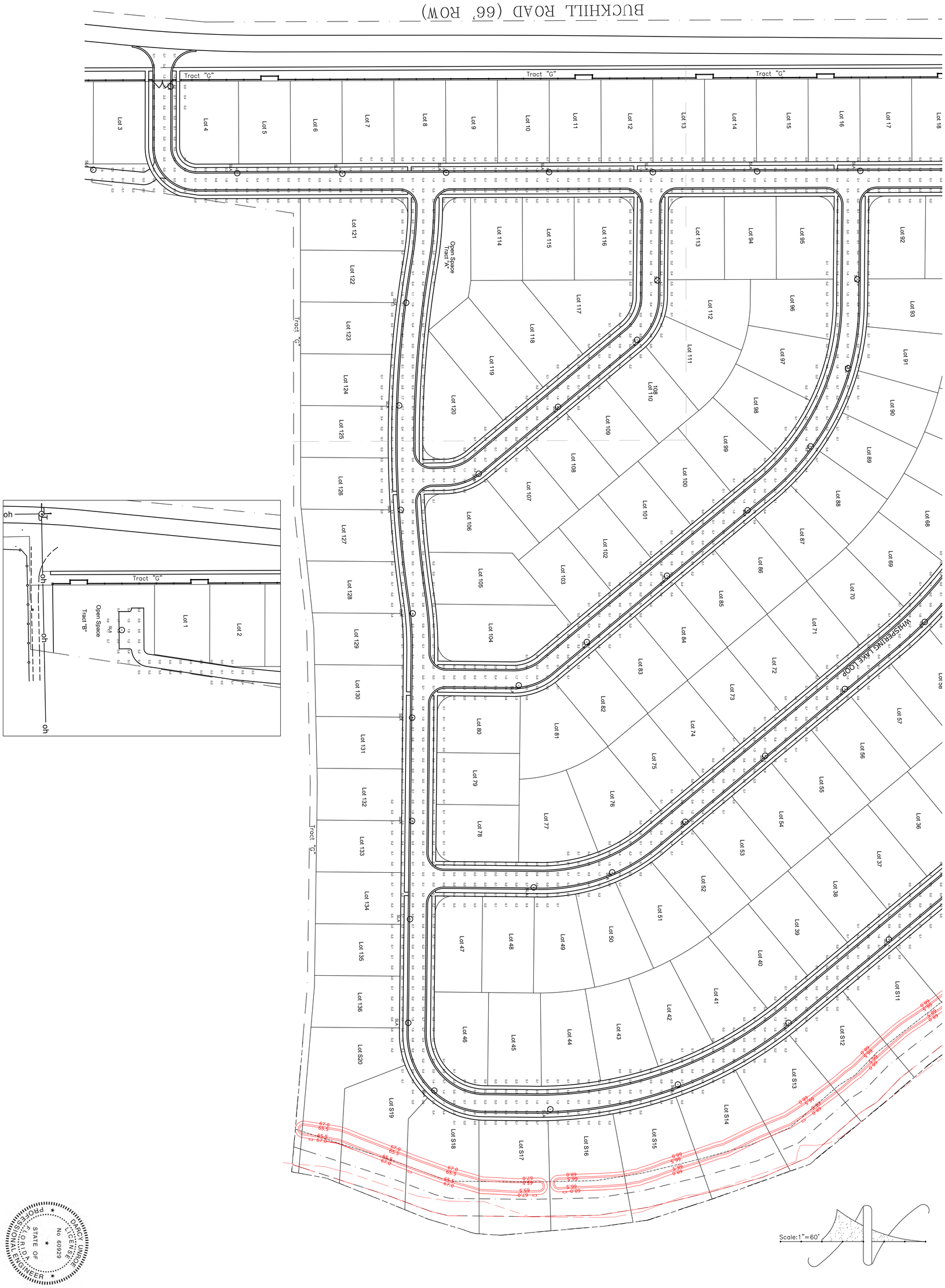
Site Lighting Photometrics - North
Whispering Hills Subdivision
Bucktail Road, Howey-in-the-Hills, Florida

DP	Drawn
DP	Checked
1"=60'	Scale
09-07-21	Date
WH2-SL1	File

Dwg. No.
SL1
45 of 59

DARCY UNROE LICENSE No 60929 STATE OF FLORIDA PROFESSIONAL ENGINEER

Darcy Unroe PE 60929



DARCY UNROE
No 60929
STATE OF FLORIDA
REGISTERED PROFESSIONAL ENGINEER

Darcy Unroe PE 60929

Site Lighting - South

Whispering Hills Subdivision

Buckhill Road, Howey-in-the-Hills, Florida

Drawn	DP
Checked	DP
Scale	1"=60'
Date	09-07-21
File	WH2-SL2
Dwg. No.	SL2
	44 of 59

Unroe Engineering, Inc

Civil Engineering/Planning/Scientific Evaluation

PO Box 690942, Orlando, Fl 32869-0942

Business Authorization Number - EB 00006579 ph (407) 299-0650

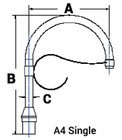
Revisions				Revisions			
#	Date	Description		#	Date	Description	

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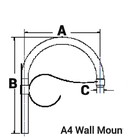
ARCHITECTURAL ARM 4

ARMS

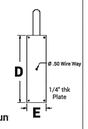

A4 Single



A4 Single



A4 Wall Moun




A4 Double 180

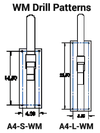

A4 Wall Mount

MODEL	A	B	C	D	E	EPA SGL	EPA DBL	EPA WM
A4-S	17 in.	30 in.	1 7/8" Ø (1-1/2 in. SCH40)	N/A	N/A	1.8	3.0	1.2
A4-S-WM	17 in.	25 in.	1 7/8" Ø (1-1/2 in. SCH40)	16 in.	6 in.	-	-	-
A4-L	26 in.	38 in.	1 7/8" Ø (1-1/2 in. SCH40)	N/A	N/A	1.5	2.7	1.0
A4-L-WM	26 in.	33 in.	1 7/8" Ø (1-1/2 in. SCH40)	24 in.	7 in.	-	-	-

Architectural Arm 4 is constructed of extruded aluminum tubing. Integrates with poles or tenons of 3-1/2", 4", 4-1/2", or 5" OD and is secured with 3/8" stainless steel Allen set screws.

Contact NLS for custom configuration or others mounting options. Arms are designed, tooled, fabricated and assembled in the USA.

WM Drill Patterns



A4-S-WM

A4-L-WM

Project Name: | Type:

Cat #	Mounting	Pole or Tenon Diameter	Color
Architectural Arm 4 Small **(A4-S)**	Single **(SGL)**	3" Round **(3R)**	Bronze **(BRZ)**
	Double 180° **(D180)**	4" Round **(4R)**	White **(WHT)**
Architectural Arm 4 Large **(A4-L)**	Wall Mount **(WM)**	4 ½" Round **(412R)**	Silver **(SVR)**
		5" Round **(5R)**	Black **(BLK)**
			Hunter Green **(HGN)**
			Graphite **(GPH)**
			Grey **(GRY)**
			Custom **(CS)**

CALIFORNIA SMALL

SITE + ARCHITECTURAL LIGHTING

The beautiful and simple California Series LED Pedestrian Luminaires depict not only the California lifestyle, but the architecture of California as well. This ornamental piece is a delightful sight to see and a great model to illuminate any urban, rural, retail, or park, or campus setting.

The different caps and shades depict different California styles and a touch of California's historic Spanish mission era. The California Series is the perfect selection to combine both design and efficiency in light performance. Designed, tooled, manufactured and assembled in the USA.


* Using Architectural Arm 4 (AA4)

STAR POWER OPTICAL SYSTEM

The Star Power reflector is an excellent system which provides great value and performance.

LED WATTAGE CHART

	16L	32L
350 milliamps	18w	33w
530 milliamps	28w	54w
700 milliamps	36w	71w
1050 milliamps	56w	106w

Project Name: | Type:

Cat #	Top	Shade	Light Dist.	# of LEDs	Milliamps	Kelvin	Volts	Mount	Color	Options
California Small 18" Diameter **(CAL-S)**	Top 1 **(TP1)**	Shade 1 **(S1)**	Type 2 **(T2)**	16 **(16L)**	350 **(35)**	3000K **(30K)**	120-277 **(UNV)**	Arm Mount **(AM)**	Bronze **(BRZ)**	House Side Shield **(HSS)**
	Top 2 **(TP2)**	Shade 6 **(S6)**	Type 3 **(T3)**	32 **(32L)**	530 **(53)**	4000K **(40K)**	347-480 **(HV)**	***For Arm Mount, please select an Architectural Arm: (AA) separately.***	White **(WHT)**	Bird Spikes **(BS)**
	Top 3 **(TP3)**	Shade 7 **(S7)**	Type 4 **(T4)**		700 **(7)**	5000K **(50K)**			Silver **(SVR)**	Marine Grade Finish **(MGF)**
		Shade 8 **(S8)**	Type 5 **(T5)**		1050 **(1)**				Hunter Green **(HGN)**	Photocell **(PC)** **Universal Voltage 120-277*
									Black **(BLK)**	FSP-211 with Motion Sensor (Universal Voltage) **(FSP-8)** ****For 8' + Below*** **(FSP-20)** ****For 9' to 20'*** **(FSP-40)** ****For 21' to 40'***
									Graphite **(GPH)**	Surge Protector **(10K)**
									Grey **(GRY)**	
									Custom **(CS)**	

PRODUCT SPECIFICATIONS

Housing: Heavy Duty Marine Grade Cast and Spun Aluminum with 4 shade options and 3 cap options
LED: Lumileds Luxeon MX, CRI 70
Optics: Star Power T2, T3, T4 and T5
Watts: 18-106
L70 Depreciation: 483,000 Hours (@77°F/ 25°C)
L90: 70,000
Listings: UL 1598 Listed
Driver: 0-10V Dimming driver as standard by Philips Advance
THD @ Max Load < 15%
Power Factor @ Max Load < 0.95
Kelvin: 3000, 4000, or 5000
Finish: 5 mils Powder Coat
Warranty: Standard Warranty is 5 years for Driver and LEDs

PRODUCT DIMENSIONS

TOPS

TOP 1
Smooth



TOP 2
Alum. Rings

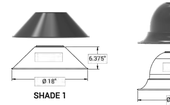


TOP 3



PART NUMBER	T2 LUMENS	LM/W	T3 LUMENS	LM/W	T4 LUMENS	LM/W	T5 LUMENS	LM/W	Watts
CAL-S-16L-35-30K	1826	102	1854	103	1872	104	1800	100	18
CAL-S-16L-35-40K	1926	107	1908	106	1926	107	1854	103	18
CAL-S-16L-35-50K	2034	113	1998	111	2016	112	1908	106	18
CAL-S-16L-53-30K	2856	102	2884	103	2912	104	2800	100	28
CAL-S-16L-53-40K	2968	106	2968	106	2996	107	2884	103	28
CAL-S-16L-53-50K	3136	112	3108	111	3136	112	2968	106	28
CAL-S-16L-7-30K	3672	102	3708	103	3744	104	3600	100	36
CAL-S-16L-7-40K	3816	106	3816	106	3852	107	3708	103	36
CAL-S-16L-7-50K	4032	112	3996	111	4032	112	3816	106	36
CAL-S-16L-1-30K	5712	102	5768	103	5824	104	5600	100	56
CAL-S-16L-1-40K	5936	106	5936	106	5992	107	5768	103	56
CAL-S-16L-1-50K	6272	112	6216	111	6272	112	5936	106	56
CAL-S-32L-35-30K	3366	102	3399	103	3432	104	3300	100	33
CAL-S-32L-35-40K	3498	106	3498	106	3531	107	3399	103	33
CAL-S-32L-35-50K	3696	112	3663	111	3696	112	3498	106	33
CAL-S-32L-53-30K	5508	102	5562	103	5616	104	5400	100	54
CAL-S-32L-53-40K	5724	106	5724	106	5778	107	5562	103	54
CAL-S-32L-53-50K	6048	112	5994	111	6048	112	5724	106	54
CAL-S-32L-7-30K	7242	102	7313	103	7384	104	7100	100	71
CAL-S-32L-7-40K	7526	106	7597	107	7597	107	7313	103	71
CAL-S-32L-7-50K	7952	112	7881	111	7952	112	7526	106	71
CAL-S-32L-1-30K	10812	102	10918	103	11024	104	10600	100	106
CAL-S-32L-1-40K	11236	106	11342	107	11342	107	10918	103	106
CAL-S-32L-1-50K	11872	112	11766	111	11872	112	11236	106	106

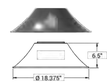
SHADES



SHADE 1



SHADE 6



SHADE 7


SHADE 8

EPA	CAL-S
Single	0.82

DIRECT BURIAL POLE

STEEL, ALUM., SQUARE, ROUND, TAPERED

POLES + BASES

SHAFT
Shall be Grade B straight steel with yield strength of 46,000 PSI conforming to ASTM A500 Standards. All poles with hand hole have a welded ground lug.

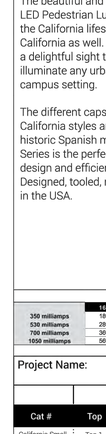
Direct Burial poles can be ordered with optional coupling (specify height), optional hand hole (specify height), or optional Slot for conduit ingress and egress (specify height) . When poles are ordered with a three-way combination of Coupling, Hand Hole and Ground Lug, then the Ground Lug is positioned at 90 degrees to the Hand Hole and the Coupling is opposite the Hand Hole. When the pole is ordered with Hand Hole only, the Ground Lug is at 180 to the Hand Hole.

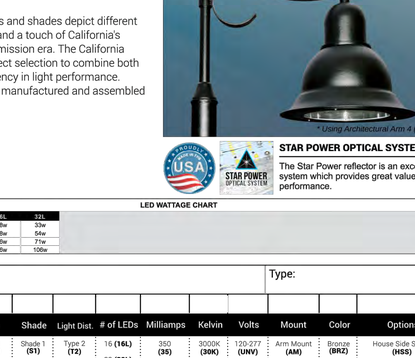
HAND HOLE COVER AND POLE CAP
Pole caps are injection molded snap-in caps in black finish. Optional hand hole covers are provided with internal bridge support. For added strength, constructed of 3" x 5" rectangular steel tubing, is welded to pole shaft.

FINISH
All poles are finished with 3 to 5 mils of powder coat. All poles are sandblasted prior to powder coat application.

Project Name: | Type:

Cat #	Height (Above Grade)	Pole Dim.	Size	Orient	Color	Options
STEEL Direct Burial Round Straight Steel Pole **(DBRSSP)**	10' **(10)**	**ROUND** 3" OD **(3R)**	**STEEL** 120 in **(11G)**	Single **(SGL)**	Bronze **(BRZ)**	Slot **(S)**
	12' **(12)**	4" OD **(4R)**			White **(WHT)**	
Direct Burial Square Straight Steel Pole **(DBSSSP)**	14' **(14)**	5" OD **(5R)**	180 in **(7G)**	Double **(D-90) (D-180)**	Silver **(SVR)**	Coupling **(COUP)** **Standard location is opposite of HH. See next page for details. Consult Factory for Custom Height Above Finished Floor (AFF)*
	15' **(15)**	**SQUARE** 4" SQ **(4S)**	250 in **(2S)**		Green **(GRN)**	
	16' **(16)**	5" SQ **(5S)**		Triple **(T-90)**	Black **(BLK)**	Hand Hole **(HH)**
ALUMINUM Direct Burial Round Straight Alum. Pole **(DBRSAP)**	18' **(18)**		**ALUMINUM** 188 in **(18E)**	Quad **(QD)**	Graphite **(GPH)**	Galvanized **(GLV)**
	20' **(20)**				Grey **(GRY)**	**Tenon** 2 ⅜" Round **(T2R)** 3" Round **(T3R)** 3 ½" Round **(T312R)** 4 ½" Round **(T412R)**
Direct Burial Square Straight Alum. Pole **(DBSSAP)**	21' **(21)**		250 in **(25D)**	No Drill **(ND)** **Tenon Option*	Custom **(CS)**	
	22' **(22)**					
	24' **(24)**					





Unroe Engineering, Inc
Civil Engineering/Planning/Scientific Evaluation
PO Box 690942, Orlando, Fl 32869-0942
Business Authorization Number - EB 00006579 ph (407) 299-0650

Item 1.

#	Description	Date
	Revisions	
	Revisions	

Site Lighting - South
Whispering Hills Subdivision
Buckhill Road, Howey-in-the-Hills, Florida

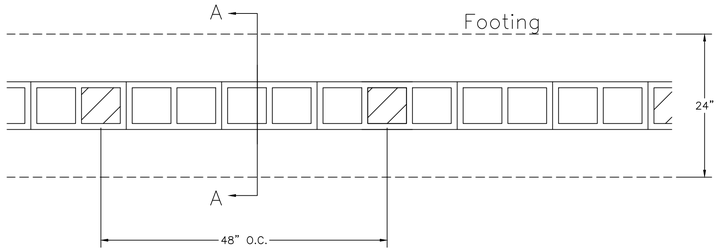
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SL3
45 of 59

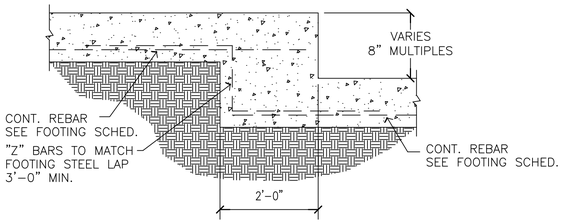
DARCY UNROE LICENSE No 60929 STATE OF FLORIDA PROFESSIONAL ENGINEER

Darcy Unroe PE 60929

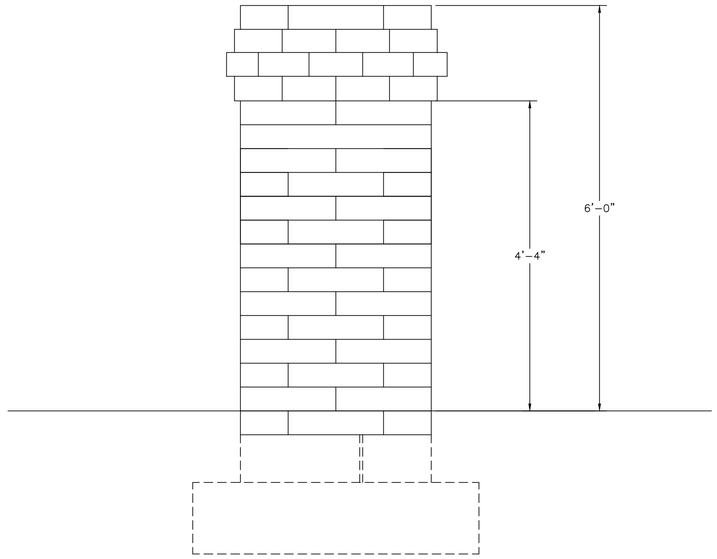
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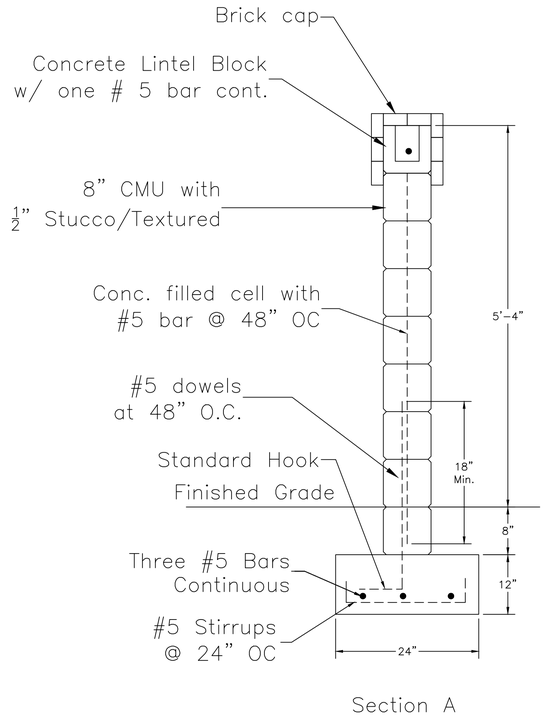
Plan View



TYPICAL STEP FOOTING DETAIL

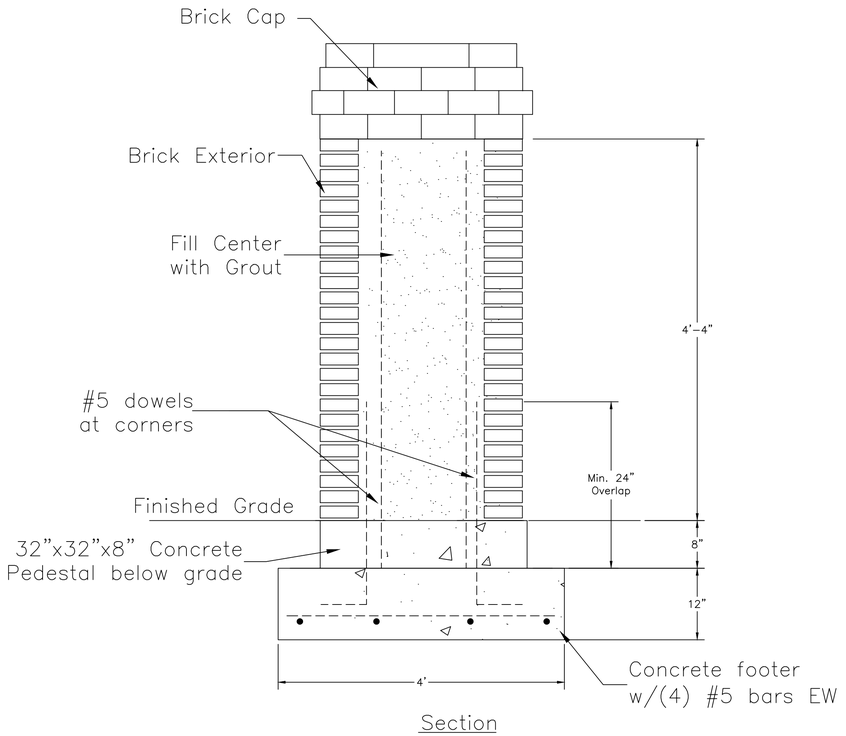


Side View



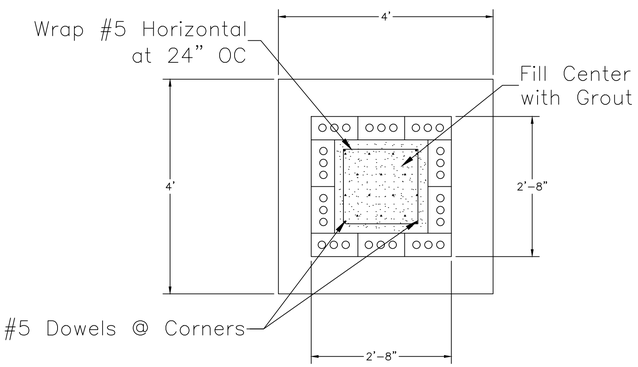
Section A

Block Wall Detail



Section

Brick Column Detail



Top View

Color and Finish Notes:
1. Block Wall Finish: ½" Textured Stucco with a 4x8 brick cap per detail.
2. Block Wall Color: Wall will be painted Off-White/Ash. The Brick Cap Color – Grey Mist
3. Brick Column Finish: 4x8 brick exterior
4. Brick Column Color: Brick Cap & Field Color – Grey Mist

Construction Notes
1. All work shall be in strict accordance with the 2020 Florida Building Codes.
2. A concrete work shall be in accordance with ACI 318-08.
3. All concrete 28 day strength shall be 3,000 psi
4. Footing design is based on the minimum soil bearing pressure of 2,000 psi
5. If footing elevation occurs in unsuitable soils, the engineer shall be notified immediately.

Engineering Notes
Basic Wind Speed - 130 MPH
Wind importance factor - 1
Building Category - 2
Wind exposure - C
Design wind pressure - 29.4 PSF

FOUNDATIONS:

SPREAD FOOTINGS SHALL BEAR ON SOIL COMPACTED TO DENSITY OF AT LEAST 95% OF MODIFIED PROCTOR MAXIMUM DENSITY (ASTM D1557) THE SOIL SHALL BE COMPACTED TO THIS DENSITY TO A DEPTH OF AT LEAST TWO (2) FEET BELOW TO BOTTOM OF FOOTING.

FILL UNDER FLOOR SLABS SHALL SHALL BE COMPACTED TO DENSITY OF AT LEAST 95% OF MODIFIED PROCTOR MAXIMUM DENSITY (ASTM).

IT SHALL BE OWNER'S RESPONSIBILITY TO VERIFY SOIL BEARING CAPACITY AND SUB SURFACE CONDITIONS, PRIOR TO START OF CONSTRUCTION. OWNERS GEOTECHNICAL CONSULTANT MAY RECOMMEND SITE PREPARATION . CONTRACTOR SHALL COORDINATE SOIL INVESTIGATION FINDINGS AND REQUIREMENTS OTHER THAN LISTED ABOVE WITH OWNER AND HIS GEOTECHNICAL CONSULTANTS SUBSEQUENT RECOMMENDATIONS

CONCRETE:

DESIGN OF REINFORCED CONCRETE CONFORMS WITH BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE- AC1 318, LATEST EDITION.

CONCRETE SHALL HAVE AN UNCONFINED COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.

REINFORCING STEEL SHALL BE ASTM A-615 GRADE 60 DEFORMED NEW BILLET STEEL CONFORMING TO ACI 301, ACI315, AVI 318 AND CRSI MANUAL OF STANDARD PRACTICE, LATEST EDITION.

ALL CONTINUOUS VERTICAL AND HORIZONTAL REINFORCING STEEL IN FOOTINGS, BEAMS, AND COLUMN SHALL BE LAP SPLICED A MINIMUM OF 36 BAR DIAMETERS OR 18", WHATEVER IS GREATER.

CONCRETE PROTECTION FOR REINFORCING BARS SHALL BE AS FOLLOWS:

FOOTING	3" CLEAR, BOTTOM AND SIDES, 2" CLEAR , TOP
SLABS	3/4" CLEAR, U.N.O.
PIERS	1-1/2" CLEAR TO STIRRUPS
COLUMNS	1-1/2" CLEAR TO TIES

Item 1.

#	Date	Description
		Revisions
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		Revisions

Unroe Engineering, Inc
Civil Engineering/Planning/Scientific Evaluation
PO Box 690942, Orlando, Fl 32869-0942
Business Authorization Number - EB 00006579 ph (407) 299-0650

Block Wall & Brick Column Details
For Whispering Hills
Buckhill Road, Howey-in-the-Hills, Florida

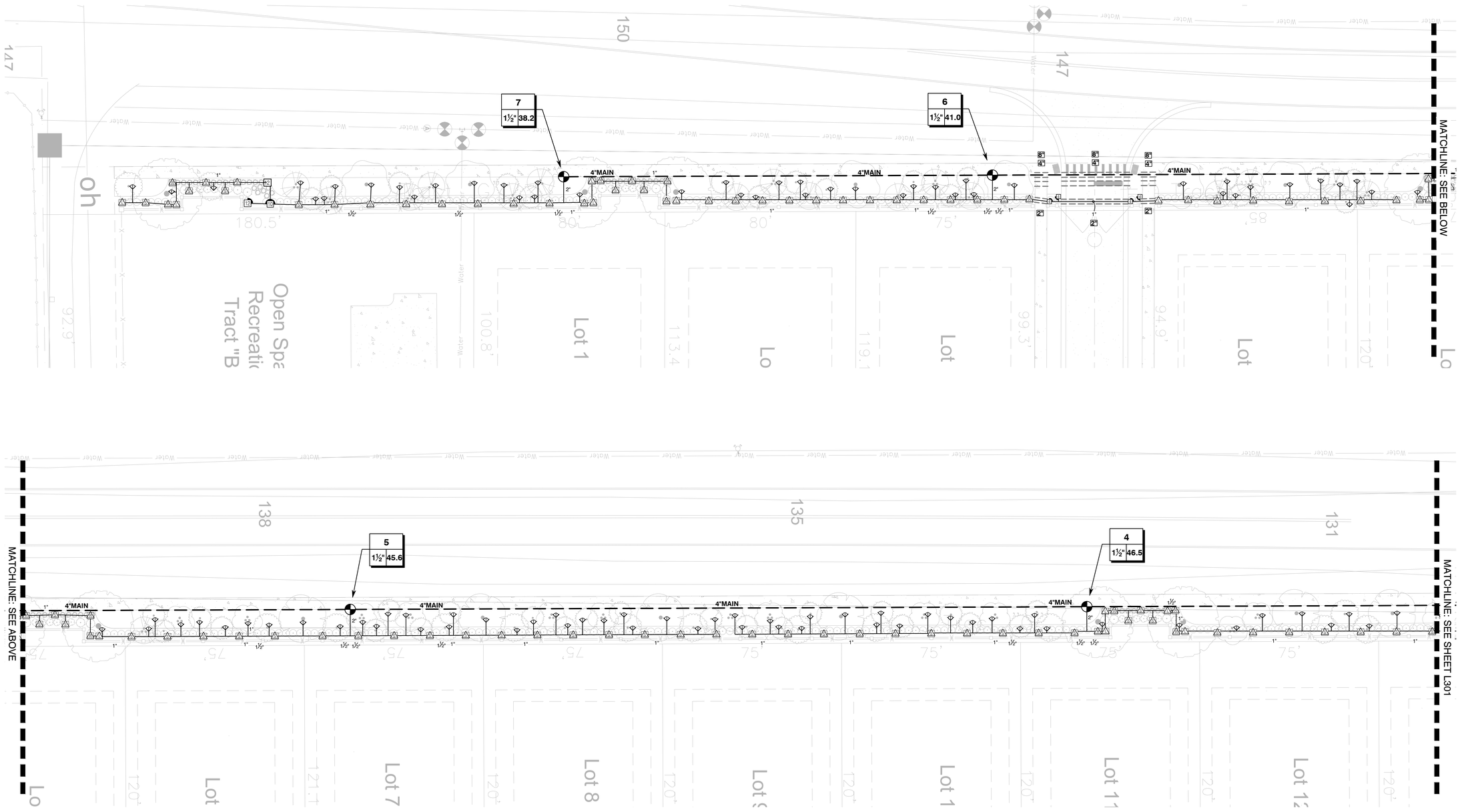
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09-07-21	Date
WH2-W1	File

Dwg. No.
W1
46 of 58

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UNDERGROUND SERVICE ALERT

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floravie design
Contact: KALEY DUNLAP
916 VASSAR STREET
ORLANDO, FL 32804
TEL | 321-277-0826
kaley@floraviedesign.com

PREPARED FOR:
RED JACKET DEVELOPMENT
CONTACT: CLAY FRANKEL
625 WALTHAM AVENUE
ORLANDO, FLORIDA 32409
PHONE: 407-855-1136

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No.	Date	Comment

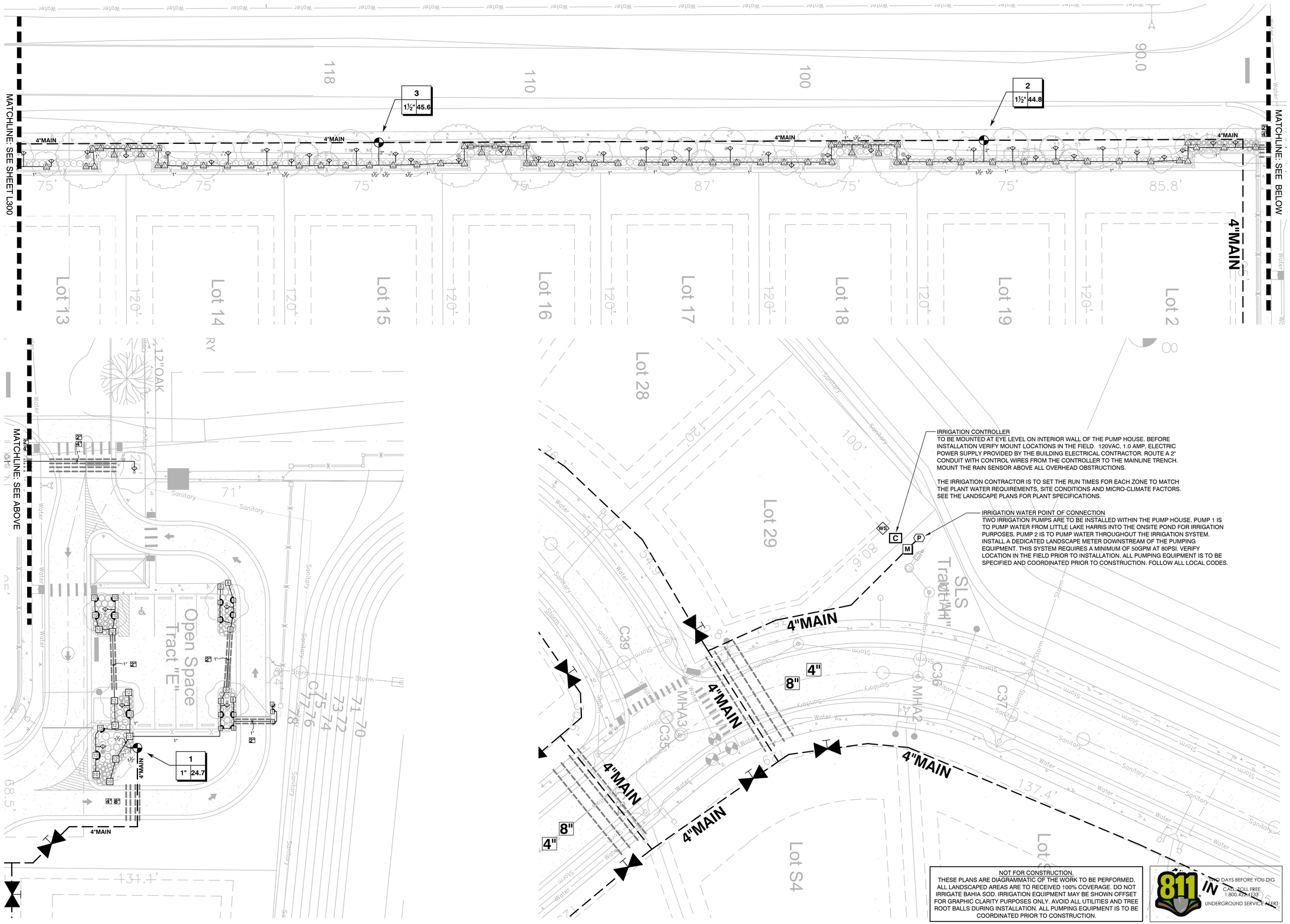
Professional Landscape Architect of Record:
REGISTERED LANDSCAPE ARCHITECT
KALEY M. DUNLAP
LA 6667256
STATE OF FLORIDA

Kaley M. Dunlap, PLA — LA6667256
Landscape Architect — Certificate No.

Project No.: 22-001
Project Phase: CITY SUBMITTAL
Project Title: WHISPERING HILLS SUBDIVISION HOWEY-IN-THE-HILLS, LAKE COUNTY, FLORIDA
Sheet Title: IRRIGATION PLAN

Designed:	IDS
Drawn:	CAZ
Checked:	KMD
Date:	01/12/22

Sheet No.: L300



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WHISPERING HILLS SUBDIVISION
HOWEY-IN-THE-HILLS, LAKE COUNTY, FLORIDA

Sheet Title:

IRRIGATION PLAN

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0 50 100 feet
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Project Phase: CITY SUBMITTAL

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HOWEY-IN-THE-HILLS, LAKE COUNTY, FLORIDA

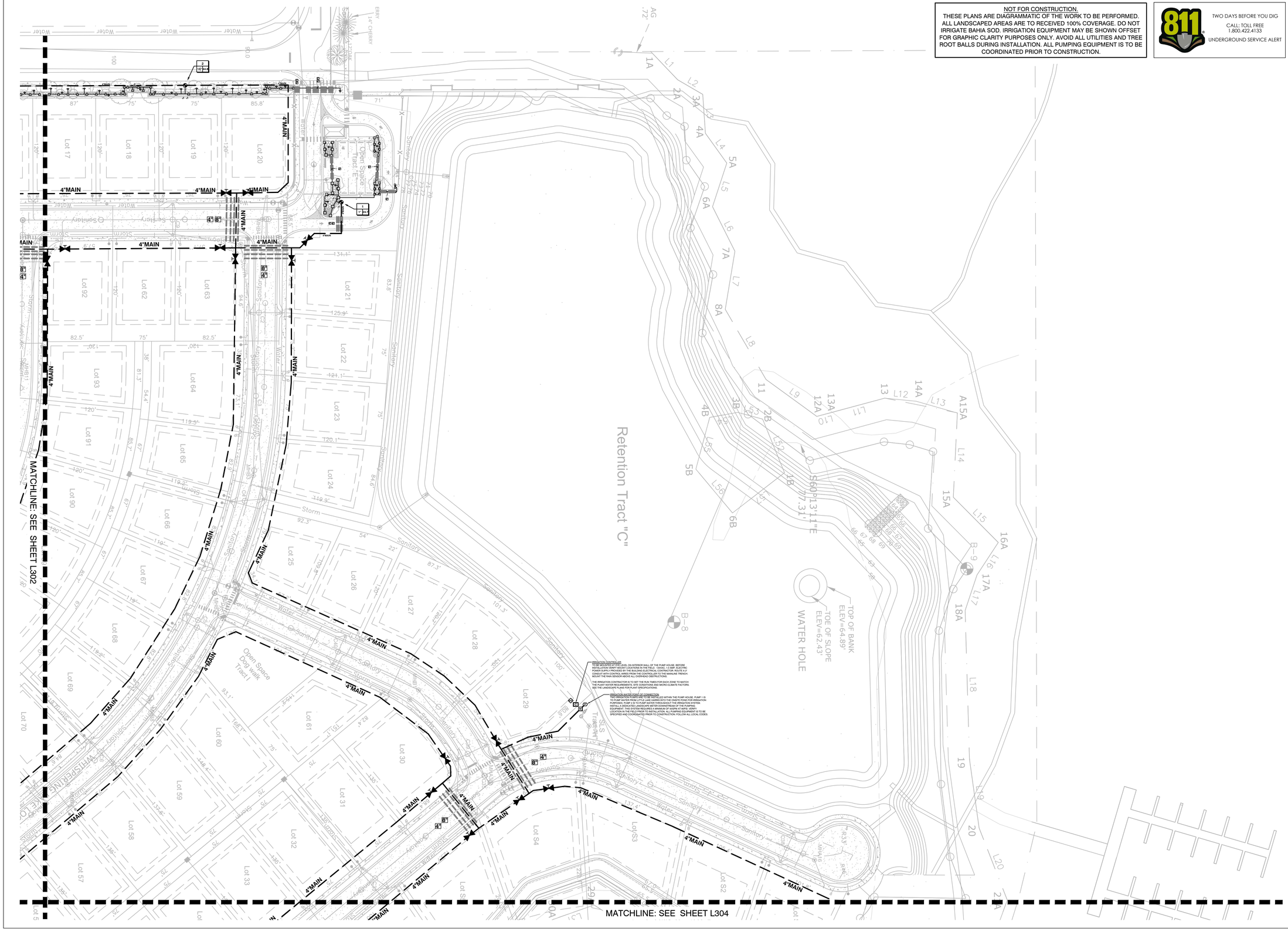
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LA 6667256
STATE OF FLORIDA

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Project No.: 22-001

Project Phase: CITY SUBMITTAL

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WHISPERING HILLS SUBDIVISION
HOWEY-IN-THE-HILLS, LAKE COUNTY, FLORIDA

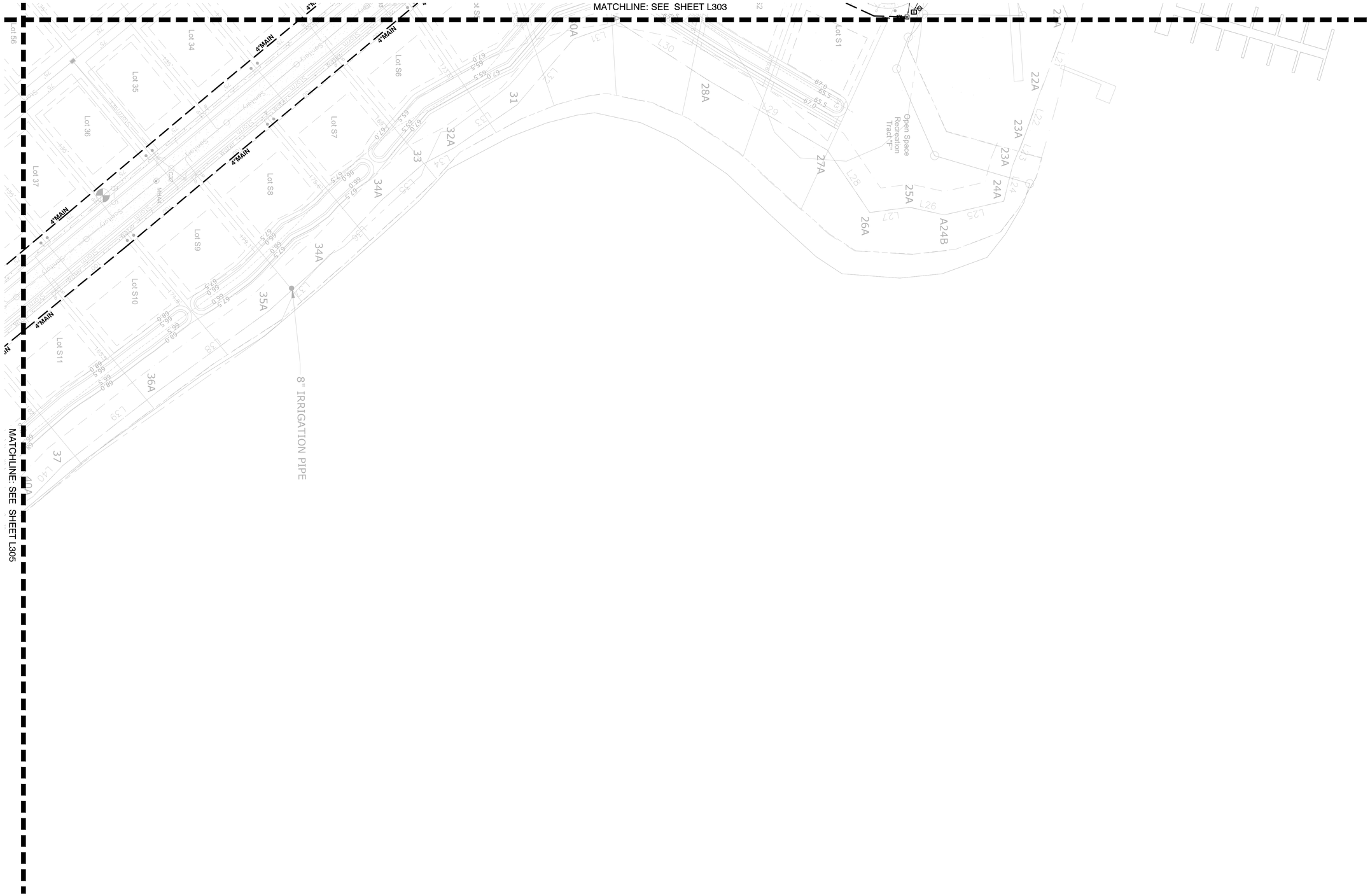
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Date: 01/12/22

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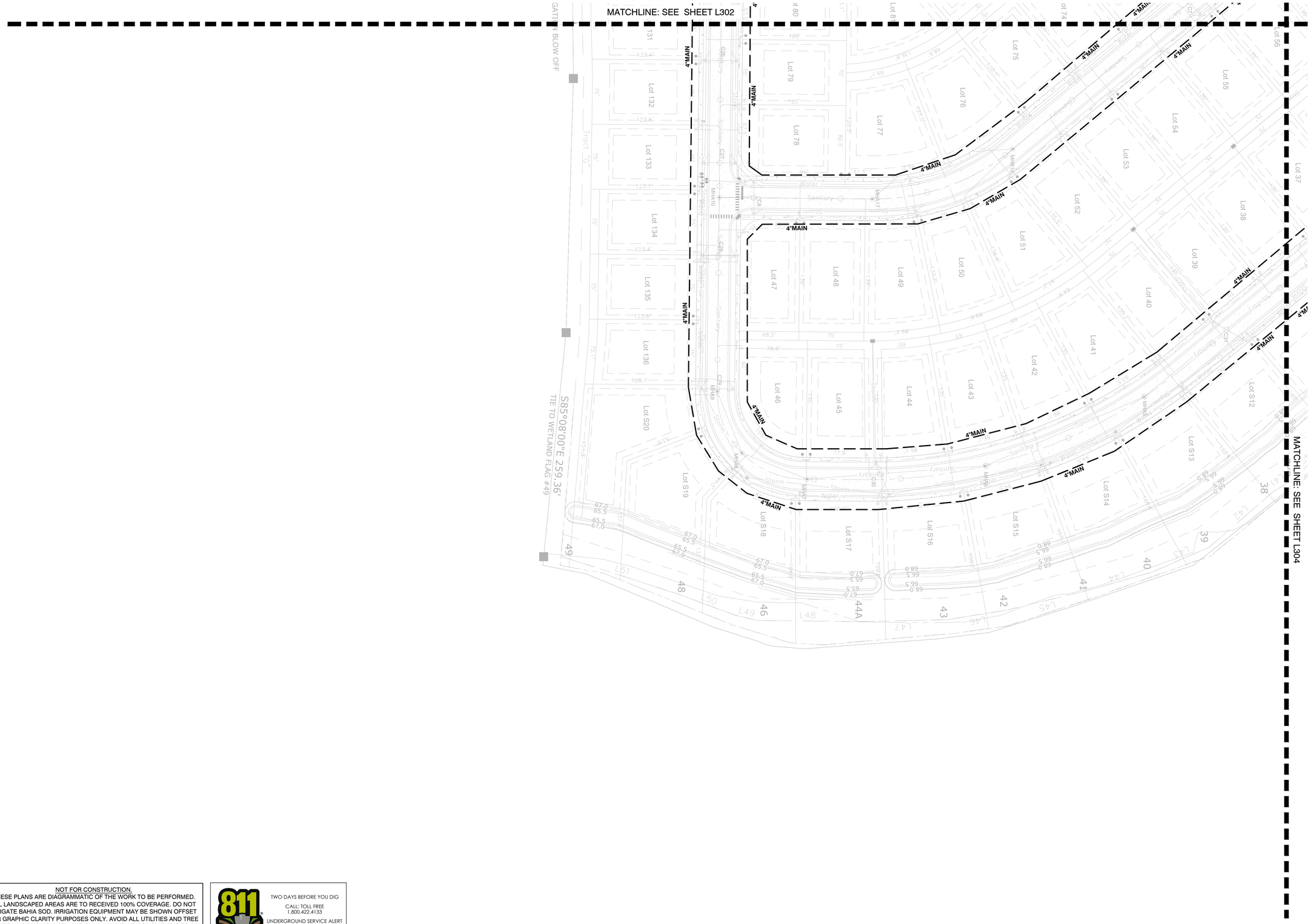
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Sheet No.: L304



NOT FOR CONSTRUCTION.

THESE PLANS ARE DIAGRAMMATIC OF THE WORK TO BE PERFORMED. ALL LANDSCAPED AREAS ARE TO RECEIVED 100% COVERAGE. DO NOT IRRIGATE BAHIA SOD. IRRIGATION EQUIPMENT MAY BE SHOWN OFFSET FOR GRAPHIC CLARITY PURPOSES ONLY. AVOID ALL UTILITIES AND TREE ROOT BALLS DURING INSTALLATION. ALL PUMPING EQUIPMENT IS TO BE COORDINATED PRIOR TO CONSTRUCTION.

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PREPARED BY:
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kaley@floraviedesign.com

PREPARED FOR:

RED JACKET DEVELOPMENT
CONTACT: CLAY FRANKEL
625 WALTHAM AVENUE
ORLANDO, FLORIDA 32409
PHONE: 407-855-1136

0 50 100 feet
SCALE: 1:50

No.	Date	Comment

Professional Landscape Architect of Record:

REGISTERED LANDSCAPE ARCHITECT
KALEY M. DUNLAP
LA 6667256
STATE OF FLORIDA

Kaley M. Dunlap, PLA — LA6667256
Landscape Architect — Certificate No.

Project No.: 22-001

Project Phase: CITY SUBMITTAL

Project Title:

WHISPERING HILLS SUBDIVISION HOWEY-IN-THE-HILLS, LAKE COUNTY, FLORIDA

Sheet Title:

IRRIGATION MAINLINE PLAN

Designed:	IDS
Drawn:	CAZ
Checked:	KMD
Date:	01/12/22

Sheet No.: L305

IRRIGATION NOTES

1. THE PLANS AND DRAWINGS ARE DIAGRAMMATIC OF THE WORK TO BE PERFORMED. SOME COMPONENTS MAY BE SHOWN OUTSIDE THE WORK AREA FOR CLARITY. THE WORK SHALL BE EXECUTED IN A MANNER TO AVOID CONFLICTS WITH UTILITIES AND OTHER ELEMENTS OF CONSTRUCTION, INCLUDING LANDSCAPE MATERIALS. ALL DEVIATIONS FROM THE PLANS SHALL BE APPROVED BY THE OWNER'S REPRESENTATIVE BEFORE BEING INSTALLED.

2. THE CONTRACTOR SHALL COMPLY WITH ALL CURRENT LOCAL CODES, ORDINANCES, AND REGULATIONS.

3. ALL IRRIGATION MAINLINE AND LATERAL LINES ARE TO NOT EXCEED A VELOCITY OF 5FPS.

4. THE CONTRACTOR SHALL NOT WILLFULLY INSTALL ANY ASPECT OF THE IRRIGATION SYSTEM AS SHOWN ON THE PLANS AND DRAWINGS, WHEN IT IS OBVIOUS IN THE FIELD THAT OBSTRUCTIONS, GRADE DIFFERENCES, OR DISCREPANCIES EXIST THAT MIGHT NOT HAVE BEEN KNOWN DURING THE DESIGN OF THE IRRIGATION SYSTEM. IN THE EVENT THAT NOTIFICATION OF THE CONFLICT IS NOT APPROVED BY THE OWNER'S REPRESENTATIVE, THE CONTRACTOR WILL ASSUME FULL RESPONSIBILITY FOR ALL REVISIONS.

5. REFER TO THE LANDSCAPE PLANS WHEN TRENCHING TO AVOID TREE ROOT BALLS WHEN INSTALLING IRRIGATION EQUIPMENT. CALL 811 AND REFER TO UTILITY PLANS PRIOR TO TRENCHING.

6. IRRIGATION CONTRACTOR SHALL VERIFY ALL SITE CONDITIONS, INCLUDING UTILITY LOCATIONS BEFORE INSTALLATION OF THE IRRIGATION SYSTEM. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING INSTALLATION WITH ALL OTHER CONSTRUCTION ON SITE, ESPECIALLY LANDSCAPE INSTALLATION. THE IRRIGATION SYSTEM SHALL BE RELOCATED AT NO ADDITIONAL COST FOR ANY CONFLICT WITH LANDSCAPE INSTALLATION OR ANY OTHER SITE CONSTRUCTION OR EXISTING CONDITIONS.

7. VERIFY THE REQUIRED MINIMUM STATIC WATER PRESSURE IS AVAILABLE AT THE PROJECT SITE PRIOR TO BEGINNING THE IRRIGATION INSTALLATION. NOTIFY THE IRRIGATION DESIGN CONSULTANT AND LANDSCAPE ARCHITECT IN WRITING IF THE MINIMUM STATIC WATER PRESSURE OR WATER VOLUME IS NOT AVAILABLE. SEE PLAN SHEET FOR REQUIREMENTS.

8. WHERE EXISTING OR NEW TREES, LIGHT FIXTURES, SIGNS, ELECTRONIC CONTROLLERS AND/OR OTHER OBJECTS ARE AN OBSTRUCTION TO AN IRRIGATION SPRINKLER'S PATTERN, THE COMPONENT AND PIPING SHALL BE RELOCATED AS NECESSARY TO OBTAIN PROPER COVERAGE OF AN IRRIGATION SPRINKLER'S PATTERN WITHOUT DAMAGING THE OBSTRUCTION.

9. 100% HEAD TO HEAD COVERAGE IS REQUIRED. ASSURE THAT ANY MODIFIED SPACING DOES NOT EXCEED THE SPACING SHOWN IN THE PLANS.

10. THE IRRIGATION CONTRACTOR SHALL ADJUST ALL SPRINKLERS TO AVOID OVER SPRAY ONTO IMPERVIOUS AREAS.

11. ALL MATERIALS AND EQUIPMENT SHOWN SHALL BE NEW. IF THE DRAWINGS DO NOT THOROUGHLY DESCRIBE THE TECHNIQUES TO BE USED, THE INSTALLER SHALL FOLLOW THE INSTALLATION METHODS AND INSTRUCTIONS RECOMMENDED BY THE PRODUCT MANUFACTURER.

12. THE LOCATION OF THE IRRIGATION MAINLINE SHALL BE IDENTIFIED IN THE FIELD AND APPROVED BY THE OWNER'S REPRESENTATIVE BEFORE INSTALLATION.

13. THE IRRIGATION CONTRACTOR IS TO SUBMIT PRODUCT SPECIFICATION SHEETS FOR ALL IRRIGATION EQUIPMENT TO BE USED FOR APPROVAL BY THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.

14. THE QUANTITIES SHOWN IN THE LEGEND SHEETS SHALL NOT BE USED FOR BIDDING PURPOSES. THE CONTRACTOR WILL BE RESPONSIBLE FOR CONDUCTING A COMPREHENSIVE MATERIALS TAKEOFF TO DETERMINE THE ACTUAL QUANTITIES OF MATERIAL NECESSARY TO EXECUTE THE WORK DESCRIBED IN THE DOCUMENTS.

15. ALL TRENCHES SHALL BE BACKFILLED WITH CLEAN DEBRIS-FREE MATERIALS.

16. IRRIGATION CONTRACTOR IS TO INSTALL CHRISTY ZONE TAGS WITH THE CORRESPONDING CONTROLLER ZONE NUMBER AT EACH CONTROL VALVE.

17. WHEN THE IRRIGATION MAINLINE IS 3" OR LARGER, ALL CHANGES OF DIRECTION SHALL BE ACCOMPLISHED WITH THE USE OF DUCTILE IRON ELBOWS AND TEES W/ PROPER THRUST BLOCKING. INSTALL JOINT RESTRAINT FITTINGS AS NECESSARY.

18. AS BUILT DOCUMENTS ARE TO BE PROVIDED TO THE OWNER UPON COMPLETION OF THE PROJECT. THE MAINLINE, CONTROL VALVES, ISOLATION VALVES, GROUND RODS AND SPLICE BOXES SHALL BE LOCATED WITH A MEASUREMENT FROM TWO FIXED POINTS.

19. THE IRRIGATION CONTRACTOR SHALL SECURE ANY AND ALL NECESSARY PERMITS FOR THE WORK PRIOR TO COMMENCEMENT OF ON-SITE OPERATIONS.

20. A MAINLINE PRESSURE TEST IS TO BE CONDUCTED BEFORE BACKFILLING. ALL FINDINGS ARE TO BE REPORTED TO THE LANDSCAPE ARCHITECT WITHIN TWENTY FOUR HOURS POST TEST.

21. ALL SLEEVES ARE TO BE TWO TIMES THE SIZE OF THE PIPE AND TO BE COORDINATED WITH THE HARDSCAPE CONTRACTORS PRIOR TO CONSTRUCTION.

22. PROVIDE ALL NECESSARY EQUIPMENT FOR THE TWO-WIRE SYSTEM TO OPERATE EFFICIENTLY. SEE THE TWO-WIRE NOTES.

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TWO-WIRE NOTES

DECODERS

CONTROLLER SHALL INTERFACE WITH HUNTER ICD DECODERS, EACH CAPABLE OF CONTROLLING 1, 2, 4, OR 6 VALVES (ICD-100, ICD-200, ICD-400, AND ICD-600)

PROVIDE AN ICD-SEN SENSOR DECODER FOR FLOW SENSOR(S) AND/OR CLIK SENSOR(S) ON TWO WIRE PATH

WIRE CONNECTIONS FROM DECODER OUTPUT TO SOLENOID SHALL BE 14 AWG, TYPE PE

WIRE DISTANCE FROM DECODER OUTPUT TO SOLENOID UNDER NORMAL CONDITIONS SHALL NOT EXCEED 150-FT [45-M]

INSTALL IN VALVE BOX ON DECODER STAKE KIT (DECSTAKE-10) WITH BOTTOM OF DECODER FACING UP

CONTRACTOR SHALL INDICATE ASSOCIATED VALVE NUMBER(S) ON MANUFACTURER PROVIDED LABEL ON DECODER WITH PERMANENT MARKER

WIRES

WIRE FOR TWO-WIRE PATH SHALL BE TWISTED AND JACKETED HUNTER IDWIRE, OR APPROVED EQUAL (PAIGE ELECTRIC P7354D); COATED WIRE SHALL NOT BE ACCEPTED AS AN EQUAL: ACCEPTABLE EQUAL PRODUCTS MUST CONSIST OF TWO SEPARATELY PE JACKETED WIRE TWISTED INSIDE OF A PE JACKET

CONTRACTOR SHALL INSTALL IDWIRE1 (14 AWG) FOR WIRE PATH LENGTH UP TO 10,000-FT [3,048-M] AND IDWIRE2 (12 AWG) FOR WIRE PATH LENGTH UP TO 15,000-FT [4,572-M], WIRE PATH LENGHTS DECREASE WITH SUBSTITUTED WIRE

WIRE JACKET COLORS SHALL BE SUCH TO FACILITATE THE IDENTIFICATION OF VARIOUS WIRE PATH ZONES; SEE WIRE JACKET CHART FOR WIRE TYPE, COLOR AND ASSOCIATED VALVES

THE CONTROLLER ALLOWS UP TO THREE (3) TWO-WIRE PATHS PER OUTPUT MODULE, CONTRACTOR SHALL NOT CONNECT ANY TWO-WIRE PATH FROM ONE OUTPUT MODULE TO ANOTHER OUTPUT MODULE

WIRE CONNECTION FROM DECODER OUTPUT TO SOLENOID SHALL BE COLORED TO MATCH THE ASSOCIATED DECODER OUTPUT STATION COLOR; RED AND BLUE COLORED WIRES SHALL NOT BE USED FOR CONNECTION BETWEEN DECODER OUTPUT AND SOLENOID

SPLICES

ALL CONNECTIONS AND SPLICES IN THE RED/BLUE TWO-WIRE PATH MUST BE MADE WITH 3M DBR/Y-6 WATERPROOF CONNECTORS INSTALLED PER MANUFACTURERS INSTRUCTIONS IN VALVE BOX WITH OPEN END OF CONNECTOR FACING DOWN

CONTRACTOR SHALL PROVIDE 36-IN [1-M] LOOP OF SLACK WIRE, MEASURED FROM TOP OF VALVE BOX, NEATLY COILED INSIDE ALL SPLICE BOXES AND VALVE BOXES

ANY SPLICES IN THE TWO-WIRE PATH NOT ASSOCIATED WITH A DECODER SHALL BE HOUSED IN SEPARATE VALVE BOXES WITH 36-IN [1-M] LOOP OF SLACK WIRE

CONTRACTOR SHALL INDICATE TWO-WIRE PATH DIRECTIONS IN PERMANENT MARKER WITHIN 6-IN [2.5-CM] OF TWO-WIRE SPLICE ON WIRE JACKET OR ID TAG ZIP TIED TO WIRE: INCOMING WIRE SHALL BE MARKED "CONTROLLER" ON WIRE JACKET OR ID TAG AND MUST INCLUDE ZIP-TIE ATTACHED TO WIRE JACKET EACH OUTGOING TWO-WIRE PATH SHALL BE MARKED WITH CONNECTED VALVES ON WIRE JACKET

CONTRACTOR SHALL ENSURE ALL CONNECTIONS TO BE WATERTIGHT WITH NO ELECTRICAL LEAKAGE TO GROUND OR SHORTING BETWEEN CONDUCTORS

GROUNDING

ALL GROUNDING AND INSTALLATION OF EQUIPMENT SPECIFIED SHALL BE INSTALLED IN STRICT COMPLIANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REQUIREMENTS

BOTH THE CONTROLLER AND THE DECODERS SHALL BE GROUNDED TO GROUND RODS OR PLATES WITH LESS THAN 10 OHMS RESISTANCE

IRRIGATION CONTROLLER AND PAD SHALL NOT FALL WITHIN THE SPHERE OF INFLEUNCE OF A GROUND ROD OR PLATE

AT A MINIMUM, EARTH GROUND SHALL BE CONNECTED AT THE FIRST DECODER OF EACH WIRE PATH LEAVING THE CONTROLLER, AND EVERY 12TH VALVE/DECODER OR 1,000-FT [304-M] OF TWO-WIRE RUN (WHICHEVER IS SHORTER), AND AT THE LAST VALVE/DECODER IN ANY WIRE RUN EXCEEDING 50' FROM MAIN WIRE PATH

FOR USE OF GROUNDING PLATE:

SOLID COPPER GROUNDING PLATE SHALL HAVE A PRE-WELDED #6 AWG INSULATED GREEN-YELLOW WIRE

GROUND PLATES ARE TO BE INSTALLED TO A MINIMUM DEPTH OF 30-IN [76-CM]

GROUND PLATES SHALL BE MADE OF A COPPER ALLOY INTENDED FOR GROUNDING APPLICATIONS AND HAVE MINIMUM DIMENSIONS AS FOLLOWS:

A. FOR GROUNDING CONTROLLERS - 4-IN [10-CM] X 8-FT [1.2-M] X 0.0625-IN [1.5-MM] SOLID COPPER GROUNDING PLATE, WITH 25-FT [7.6-M] CONTINUOUS LENGTH OF 6 AWG, GREEN INSULATED, WITH EXTRUDED YELLOW STRIPE, SOLID BARE COPPER WIRE WELDED TO THE PLATE (PAIGE ELECTRIC 182199IC) AND TWO 50-LB [22.6-KG] BAGS OF POWERSET EARTH CONTACT MATERIAL (PAIGE ELECTRIC 1820058) FOR POROUS SOILS OR TWO 50-LB [22.6-KG] BAGS OF POWERFILL EARTH CONTACT MATERIAL (PAIGE ELECTRIC 1820059) FOR NON-POROUS SOILS

B. FOR GROUNDING DECODERS - 4-IN [10-CM] X 3-FT [1-M] X 0.0625-IN [1.5-MM] SOLID COPPER GROUNDING PLATE, WITH 15-FT [4.5-M] CONTINUOUS LENGTH OF 10 AWG, GREEN INSULATED, WITH EXTRUDED YELLOW STRIPE, SOLID BARE COPPER WIRE IS WELDED TO THE PLATE (PAIGE ELECTRIC 182201IC) AND ONE 50-LB [22.6-KG] BAG OF POWERSET EARTH CONTACT MATERIAL (PAIGE ELECTRIC 1820058) FOR POROUS SOILS OR ONE 50-LB [22.6-KG] BAG OF POWERFILL EARTH CONTACT MATERIAL (PAIGE ELECTRIC 1820059) FOR NON-POROUS SOILS FOR USE OF GROUNDING ROD: GROUND ROD SHALL BE 5/8-IN [15-MM] DIAMETER X 8-FT [1.2-M] LONG COPPER CLAD STEEL GROUND RODS WITH 15-FT [4.5-M] PRE-WELDED #6 AWG INSULATED GREEN-YELLOW WIRE (PAIGE ELECTRIC PART # 182000IC6)

GROUND ROD SHALL BE DRIVEN INTO THE GROUND IN A VERTICAL POSITION OR AN OBLIQUE ANGLE NOT TO EXCEED 45 DEGREES AT A LOCATION 10-FT [3-M] FROM THE ELECTRONIC EQUIPMENT, THE GROUND PLATE, OR THE WIRES AND CABLES CONNECTED TO EQUIPMENT BEING GROUNDED

ADDITIONAL GROUND ROD IN DAISY CHAIN INSTALLATION SHALL BE 5/8-IN [15-MM] DIAMETER X 8-FT [1.2-M] LONG COPPER CLAD STEEL GROUND RODS WITH 25-FT [4.5-M] PRE-WELDED #6 AWG INSULATED GREEN-YELLOW WIRE (PAIGE ELECTRIC PART # 182007IC6)

GROUND RODS SHALL BE COVERED BY A VALVE BOX

ALL CIRCUIT COMPONENTS SHALL BE INSTALLED IN STRAIGHT LINES

GROUND ROD AND PLATE LOCATION

CONTRACTOR SHALL LOCATE AND INSTALL GROUND ROD AND/OR PLATE IN AREA OF MOIST SOIL TO MAXIMIZE ELECTRICAL CONDUCTIVITY

SURGE PROTECTION (LIGHTING ARRESTOR)

CONTRACTOR SHALL INSTALL PAIGE ELECTRIC 250090LED LIGHTENING ARRESTOR PER MANUFACTURERS SPECIFICATIONS AS CLOSE TO CONTROLLER POWER SOURCE AS POSSIBLE TO PROTECT THE IRRIGATION CONTROLLER FROM SURGES THROUGH 120 OR 240 VAC WIRES

TURN OVER ITEMS

CONTRACTOR SHALL PROVIDE PROJECT OWNER WITH THE FOLLOWING AT PROJECT COMPLETION AND TURN OVER: A2C-D SD CARD WITH SAVED STATION AND IRRIGATION PROGRAM INFORMATION

PRODUCT MANUALS

IN ADDITION TO IRRIGATION AS-BUILT REQUIREMENTS, THE CONTRACTOR SHALL INCLUDE IN THE AS-BUILT DRAWINGS OF IRRIGATION SYSTEM GRAPHICALLY DEPICTING LOCATION OF TWO-WIRE PATH(S), GROUNDING LOCATION AND TYPE, DECODERS, NON-DECODER WIRE SPLICES, INDICATION OF TWO-WIRE SPLICE TYPES (1-WAY, 2-WAY, 3-WAY, ETC), AND TERMINATION OF TWO-WIRE PATHS ICD-HP HANDHELD PROGRAMMER AND DIAGNOSTIC TOOL ROAM XL HANDHELD REMOTE AND RECEIVER

MANUFACTURER TRAINING

PRIOR TO INSTALLATION THE CONTRACTOR SHALL HAVE COMPLETED AND RECEIVED CERTIFICATION FOR THE FOLLOWING TRAINING MODULES PROVIDED BY HUNTER INDUSTRIES:

DECODER SPECIALIST PROGRAM

MULTIMETER BASICS COURSE

EXPERT PROGRAM

PRE-CONSTRUCTION MEETING

PRIOR TO INSTALLATION OF TWO-WIRE IRRIGATION SYSTEM, A PRE-CONSTRUCTION MEETING SHALL BE CONDUCTED WITH PROJECT OWNER'S REPRESENTATIVE, INSTALLING CONTRACTOR, AND IRRIGATION TWO-WIRE MANUFACTURER AT NO ADDITIONAL COST FROM MANUFACTURER

TECHNICAL SUPPORT

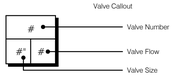
HUNTER INDUSTRIES (800) 733-2823

IRRIGATION SCHEDULE

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY	PSI
2Q 2H 4Q 4H 6Q 6H	HUNTER PROS-12-PRS30-CV-F-R SHORT RADIUS NOZZLES SHRUB SPRAY, 30 PSI REGULATED 12" POP-UP. WITH FACTORY INSTALLED DRAIN CHECK VALVE, FLOGUARD AND RECLAIMED PURPLE BODY CAP. CO-MOLDED WIPER SEAL WITH UV RESISTANT MATERIAL.	7	30
ES LCS RCS CS SS	HUNTER PROS-12-PRS30-CV-F-R 5` STRIP SPRAY SHRUB SPRAY, 30 PSI REGULATED 12" POP-UP. WITH FACTORY INSTALLED DRAIN CHECK VALVE, FLOGUARD AND RECLAIMED PURPLE BODY CAP. CO-MOLDED WIPER SEAL WITH UV RESISTANT MATERIAL.	171	30
Q T H F	HUNTER PROS-12-PRS30-CV-F-R 8` RADIUS SHRUB SPRAY, 30 PSI REGULATED 12" POP-UP. WITH FACTORY INSTALLED DRAIN CHECK VALVE, FLOGUARD AND RECLAIMED PURPLE BODY CAP. CO-MOLDED WIPER SEAL WITH UV RESISTANT MATERIAL.	8	30
Q T H F	HUNTER PROS-12-PRS30-CV-F-R 10` RADIUS SHRUB SPRAY, 30 PSI REGULATED 12" POP-UP. WITH FACTORY INSTALLED DRAIN CHECK VALVE, FLOGUARD AND RECLAIMED PURPLE BODY CAP. CO-MOLDED WIPER SEAL WITH UV RESISTANT MATERIAL.	5	30
Q T H TQ F	HUNTER PROS-12-PRS30-CV-F-R 12` RADIUS SHRUB SPRAY, 30 PSI REGULATED 12" POP-UP. WITH FACTORY INSTALLED DRAIN CHECK VALVE, FLOGUARD AND RECLAIMED PURPLE BODY CAP. CO-MOLDED WIPER SEAL WITH UV RESISTANT MATERIAL.	3	30
Q T H TQ F	HUNTER PROS-12-PRS30-CV-F-R 15` RADIUS SHRUB SPRAY, 30 PSI REGULATED 12" POP-UP. WITH FACTORY INSTALLED DRAIN CHECK VALVE, FLOGUARD AND RECLAIMED PURPLE BODY CAP. CO-MOLDED WIPER SEAL WITH UV RESISTANT MATERIAL.	1	30
4 6 8 10 12 15 17	HUNTER PROS-12-PRS30-CV-F-R ADJUSTABLE ARC SHRUB SPRAY, 30 PSI REGULATED 12" POP-UP. WITH FACTORY INSTALLED DRAIN CHECK VALVE, FLOGUARD AND RECLAIMED PURPLE BODY CAP. CO-MOLDED WIPER SEAL WITH UV RESISTANT MATERIAL.	16	30
25 50 10 20	HUNTER PCB-R FLOOD BUBBLER, 1/2" FIPT. WITH PURPLE CAP FOR RECLAIMED WATER USE.	146	30

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY
	HUNTER ICV-G-R 1", 1-1/2", 2", AND 3" PLASTIC ELECTRIC REMOTE CONTROL VALVES, GLOBE CONFIGURATION, WITH NPT THREADED INLET/OUTLET, FOR COMMERCIAL/MUNICIPAL USE. WITH RECLAIMED WATER ID, PURPLE HANDLE.	7
	LEEMCO LMV-44BB 4" X 4" LMV-BB SERIES MAINLINE GATE VALVE. THE BELL X BELL VERSION PROVIDES IN-LINE ISOLATION WHERE THE LOCATION IS NOT NEAR A MAINLINE DUCTILE IRON FITTING.	25
C	HUNTER A2C-225D-P 225-STATION DECODER CONTROLLER WITH ONE (2) A2C-D75 MODULE IN AN OUTDOOR PLASTIC WALL MOUNT ENCLOSURE.	1
WS	HUNTER MWS WEATHER STATION WITH RAIN SENSOR, WIND SENSOR, 120 VAC, 5 AMP. 5 YEAR WARRANTY.	1
P	LAKE PUMP	1
M	WATER METER 2"	1
	IRRIGATION LATERAL LINE: PVC CLASS 200 SDR 21-NP	3,242 L.F.
	IRRIGATION MAINLINE: PVC CLASS 200 SDR 21-NP	16,939 L.F.
	PIPE SLEEVE: PVC SCHEDULE 40	1,236 L.F.

Valve Callout



*THE QUANTITIES SHOWN IN THE LEGEND SHEETS SHALL NOT BE USED FOR BIDDING PURPOSES. THE CONTRACTOR WILL BE RESPONSIBLE FOR CONDUCTING A COMPREHENSIVE MATERIALS TAKEOFF TO DETERMINE THE ACTUAL QUANTITIES OF MATERIAL NECESSARY TO EXECUTE THE WORK DESCRIBED IN THE DOCUMENTS. ALL PUMPING EQUIPMENT IS YET TO BE SPECIFIED AND COORDINATED.

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No.	Date	Comment

Professional Landscape Architect of Record:
REGISTERED LANDSCAPE ARCHITECT
KALEY M. DUNLAP
LA 6667256
STATE OF FLORIDA

Kaley M. Dunlap, PLA — LA6667256
Landscape Architect — Certificate No.

Project No.: 22-001

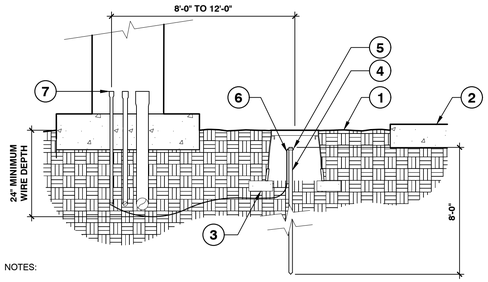
Project Phase: CITY SUBMITTAL

Project Title:
WHISPERING HILLS SUBDIVISION
HOWEY-IN-THE-HILLS, LAKE COUNTY, FLORIDA

Sheet Title:
IRRIGATION NOTES & LEGEND

Designed:	IDS
Drawn:	CAZ
Checked:	KMD
Date:	01/12/22

Sheet No.: L306



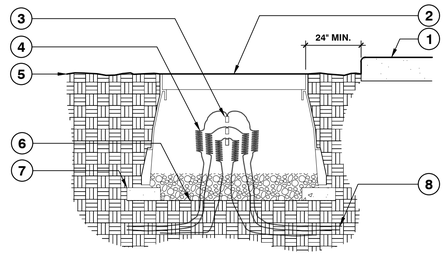
NOTES:

1. ALL GROUNDING REQUIREMENTS FOR CONTROLLERS SHALL CONFORM TO LOCAL ELECTRIC CODES.
2. GROUNDING ROD SHALL NOT BE LOCATED IN THE SAME TRENCH AS IRRIGATION MAINLINES OR LATERAL LINES.
3. VALVE BOX SHALL BE WRAPPED WITH A MINIMUM 3 MIL THICK PLASTIC AND SECURED TO THE VALVE BOX USING DUCT TAPE OR ELECTRICAL TAPE.
4. INSTALL GROUNDING ROD PER THE CONTROLLER MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.

1. FINISH GRADE
2. PAVEMENT
3. THREE (3) 4" x 8" BRICKS
4. 5/8" x 8'-0" COPPER GROUNDING ROD
5. GROUNDING ROD CLAMP
6. #6 AWG BARE COPPER WIRE
7. 1/2" PVC ELECTRICAL CONDUIT AND SWEEP FOR EARTH GROUND

1 GROUNDING ROD

1" = 1'-0" FX-IR-FX-AUXEQ-01



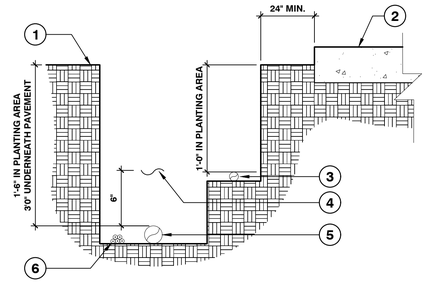
NOTES:

1. VALVE BOXES SHALL BE LOCATED IN PLANTING AREAS.
2. SPLICES SHALL ONLY BE MADE AT ELECTRICAL PULL BOXES.
3. LOW VOLTAGE WIRES UNDER ROADWAYS MUST BE IN CONTINUOUS CONDUIT WITH 90° SCH. 40 PVC SWEEPS TERMINATING IN PULL BOXES.
4. ALL WIRE CONNECTIONS SHALL BE MADE USING DBR/Y-6 CONNECTORS OR APPROVED EQUAL.
5. VALVE BOX SHALL BE WRAPPED WITH MINIMUM 3 MIL THICK PLASTIC AND SECURE IT USING DUCT TAPE OR ELECTRICAL TAPE.

1. PAVEMENT
2. RECTANGULAR VALVE BOX WITH LOCKING LID
3. WATERPROOF WIRE CONNECTORS
4. CONTROLLER WIRES WITH MIN. 24" EXPANSION CURLS
5. FINISHED GRADE
6. 3/8" WELDED WIRE MESH
7. FOUR (4) 4" x 8" BRICKS
8. DIRECT BURIAL (LOW VOLTAGE) IRRIGATION CONTROLLER WIRES

2 ELECTRICAL PULL BOX (LOW VOLTAGE)

1 1/2" = 1'-0" FX-IR-FX-AUXEQ-02



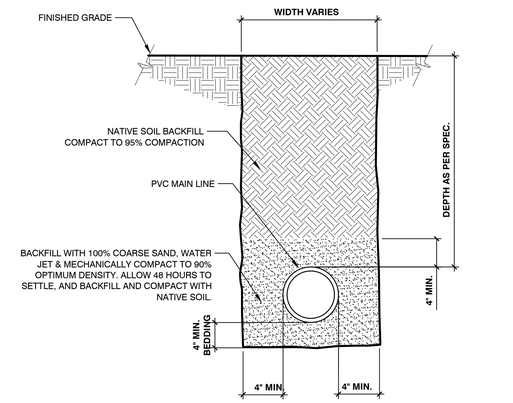
NOTES:

1. SEE IRRIGATION LEGEND FOR MAINLINE AND LATERAL LINE PIPE SIZE AND TYPE.
2. DIRECT BURIAL CONTROL WIRES SHALL BE INSTALLED IN SCH. 40 PVC ELECTRICAL CONDUIT IF REQUIRED.
3. 2-WIRE IRRIGATION WIRE SHALL BE INSTALLED IN SCH. 40 PVC ELECTRICAL CONDUIT.
4. DETECTABLE LOCATOR TAPE SHALL BE LOCATED SIX INCHES (6") ABOVE THE ENTIRE MAINLINE RUN.

1. FINISHED GRADE
2. PAVEMENT
3. NON-PRESSURIZED LINE (LATERAL LINE)
4. DETECTABLE LOCATOR TAPE
5. PRESSURIZED LINE (MAINLINE)
6. DIRECT BURIAL LOW VOLTAGE CONTROL WIRES

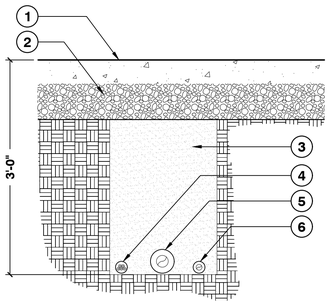
3 IRRIGATION TRENCHING

1 1/2" = 1'-0" FX-IR-FX-AUXEQ-08



4 SLEEVE AT ROAD

1 1/2" = 1'-0" FX-IR-FX-AUXEQ-15



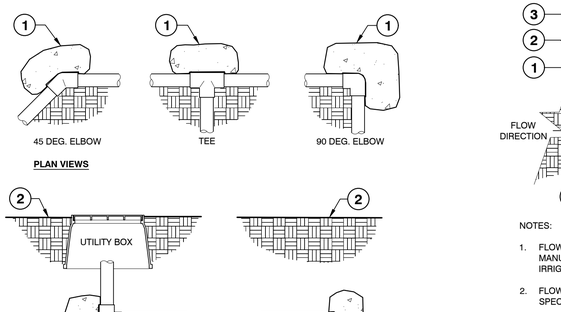
NOTES:

1. SEE IRRIGATION LEGEND FOR MAINLINE SIZE AND TYPE.
2. ALL SLEEVES SHALL BE SCH. 40 PVC PIPE.
3. ALL SLEEVES SHALL EXTEND 12" BEYOND THE EDGE OF PAVEMENT.
4. END OF SLEEVES SHALL BE LOCATED WITH A WOODEN STAKE OR PVC PIPE. LOCATORS SHALL RUN CONTINUOUSLY FROM THE END OF THE SLEEVE TO FINISHED GRADE.

1. PAVEMENT
2. BASE ROCK
3. CLEAN BACKFILL, 95% RELATIVE COMPACTION UNDER PAVING OR PER CIVIL ENGINEER'S PLANS
4. CONTROL WIRES, SLEEVE UNDER PAVING. INSTALL ADJACENT TO PRESSURIZED MAINLINE. BUNDLE SHALL BE NO MORE THAN 50% OF PIPE DIAMETER
5. MAINLINE, SLEEVE UNDER PAVING TO BE TWO TIMES THE DIAMETER OF THE PRESSURIZED MAINLINE PIPE
6. NON-PRESSURIZED LINE, SLEEVE UNDER PAVING TO BE BE TWO TIMES THE DIAMETER OF THE LATERAL LINE

5 PIPE BENEATH PAVEMENT

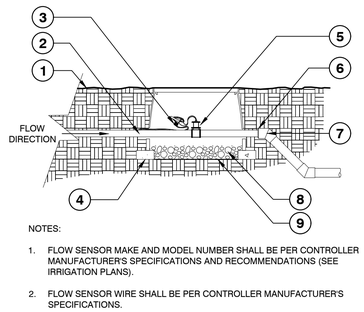
1" = 1'-0" FX-IR-FX-AUXEQ-05



1. POURED IN-PLACE CONCRETE, 120 LBS. MINIMUM, TYPICAL
2. FINISHED GRADE

6 THRUST BLOCKING

3/4" = 1'-0" FX-IR-FX-AUXEQ-11



NOTES:

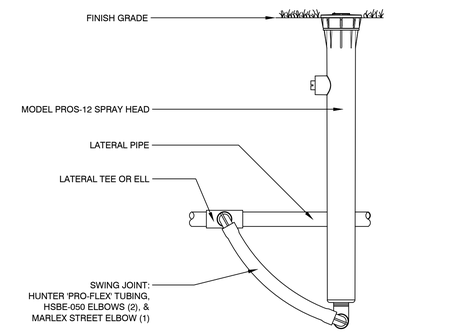
1. FLOW SENSOR MAKE AND MODEL NUMBER SHALL BE PER CONTROLLER MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS (SEE IRRIGATION PLANS).
2. FLOW SENSOR WIRE SHALL BE PER CONTROLLER MANUFACTURER'S SPECIFICATIONS.
3. INSTALL FLOW SENSOR PER MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.
4. ALL WIRE RUNS SHALL BE CONTINUOUS WITHOUT ANY SPLICES. WIRE CONNECTIONS SHALL BE MADE USING DBR/Y-6 CONNECTORS OR APPROVED SUBSTITUTE.
5. VALVE BOX SHALL BE WRAPPED WITH A MIN. OF THREE (3) MIL THICK PLASTIC AND SECURE IT TO THE VALVE BOX USING DUCT TAPE OR ELECTRICAL TAPE.
6. SEE MASTER VALVE/FLOW SENSOR DETAIL FOR LINEAR DIMENSIONS.

1. FINISH GRADE
2. MAINLINE PIPE FROM MASTER VALVE (SEE MASTER VALVE/FLOW SENSOR DETAIL FOR MAINLINE PIPE SIZE)
3. IRRIGATION VALVE WIRES WITH 12" MIN. EXPANSION COIL
4. FOUR (4) 4" x 8" BRICKS
5. FLOW SENSOR (SEE IRRIGATION PLANS FOR MAKE AND MODEL)
6. SCH. 40 PVC REDUCER BUSHING
7. SCH. 40 PVC 45 DEG. ELBOW
8. 3" THICK LAYER OF PEA GRAVEL OR APPROVED SUBSTITUTE
9. 3/8" WELDED WIRE MESH

7 FLOW SENSOR

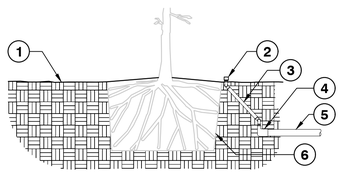
3/4" = 1'-0" FX-IR-FX-AUXEQ-03

Hunter®

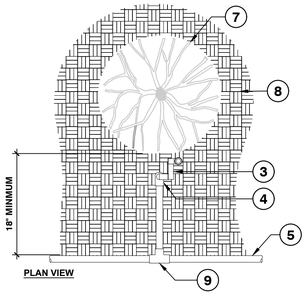


8 PROS-12 SPRAY HEAD WITH PRO-FLEX TUBING

3" = 1'-0" FX-IR-HUNT-SPRA-48



1. FINISHED GRADE
2. PRESSURE COMPENSATING BUBBLER SHALL BE SET 1" ABOVE FINISHED GRADE (SEE IRRIGATION SCHEDULE FOR MAKE AND MODEL)
3. SWING JOINT, SEE DETAIL
4. SCH. 40 PVC 90° ELBOW SLIP TO THREAD
5. LATERAL LINE IRRIGATION (SEE IRRIGATION PLANS FOR SIZING)
6. EDGE OF ROOT BALL. SETTLE BACKFILL SO IRRIGATION FLOWS THROUGH ROOT BALL
7. EDGE OF ROOT BALL
8. EXISTING OR MODIFIED SOIL (SEE SPECIFICATIONS FOR SOIL MODIFICATION)
9. SCH. 40 PVC TEE OR 90° ELBOW

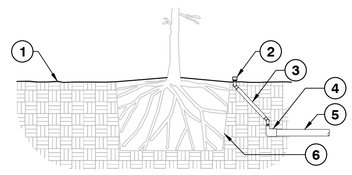


NOTES:

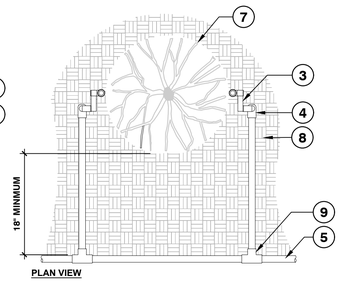
1. ALL IRRIGATION FITTINGS SHALL BE SCH. 40 PVC UNLESS SPECIFIED OTHERWISE.
2. ALL THREADED CONNECTIONS FROM SCH. 40 TO SCH. 80 PVC SHALL BE MADE USING TEFLON TAPE.
3. CONTRACTOR SHALL SETTLE THE AREA AROUND THE BUBBLER AND EDGE OF THE ROOT BALL SO THAT ALL IRRIGATION FLOWS THROUGH THE ROOT BALL.

9 IRRIGATION BUBBLER W/ LAYOUT

3/4" = 1'-0" FX-IR-FX-BUBB-04



1. FINISHED GRADE
2. PRESSURE COMPENSATING BUBBLER SHALL BE SET 1" ABOVE FINISHED GRADE (SEE IRRIGATION SCHEDULE FOR MAKE AND MODEL)
3. SWING JOINT, SEE DETAIL
4. SCH. 40 PVC 90° ELBOW SLIP TO THREAD
5. LATERAL LINE IRRIGATION (SEE IRRIGATION PLANS FOR SIZING)
6. EDGE OF ROOT BALL. SETTLE BACKFILL SO IRRIGATION FLOWS THROUGH ROOT BALL
7. EDGE OF ROOT BALL
8. EXISTING OR MODIFIED SOIL (SEE SPECIFICATIONS FOR SOIL MODIFICATION)
9. SCH. 40 PVC TEE OR 90° ELBOW

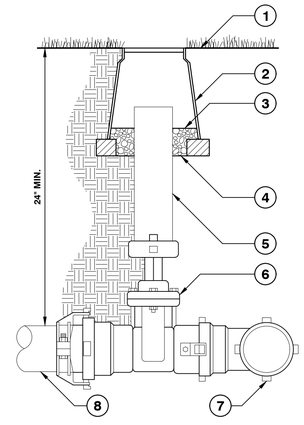


NOTES:

1. ALL IRRIGATION FITTINGS SHALL BE SCH. 40 PVC UNLESS SPECIFIED OTHERWISE.
2. ALL THREADED CONNECTIONS FROM SCH. 40 TO SCH. 80 PVC SHALL BE MADE USING TEFLON TAPE.
3. CONTRACTOR SHALL SETTLE THE AREA AROUND THE BUBBLER AND EDGE OF THE ROOT BALL SO THAT ALL IRRIGATION FLOWS THROUGH THE ROOT BALL.

10 IRRIGATION BUBBLER (2) W/ LAYOUT

3/4" = 1'-0" FX-IR-FX-BUBB-01



1. FINISHED GRADE
2. 10" DIAMETER ROUND VALVE BOX
3. FILTER FABRIC BARRIER
4. 6" DEEP PEA GRAVEL SUMP
5. 6" ADS, LENGTH AS REQUIRED
6. LEEMCO LMV-SB SPIGOT x BELL SELF-RESTRAINED, RESILIENT WEDGE GATE VALVE (SIZED PER MAINLINE)
7. LEEMCO SB SERIES GASKET TEE
8. PVC MAINLINE

11 LMV-SB-SERIES GATE VALVE

NTS FX-IR-LEEM-ISOL-05

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TEL | 321-277-0826
kaley@floraviedesign.com

PREPARED FOR:

RED JACKET DEVELOPMENT
CONTACT: CLAY FRANKEL
625 WALTHAM AVENUE
ORLANDO, FLORIDA 32409
PHONE: 407-855-1136

No.	Date	Comment

Professional Landscape Architect of Record:

REGISTERED LANDSCAPE ARCHITECT
KALEY M. DUNLAP
LA 6667256
STATE OF FLORIDA

Kaley M. Dunlap, PLA — LA6667256
Landscape Architect — Certificate No.

Project No.: 22-001

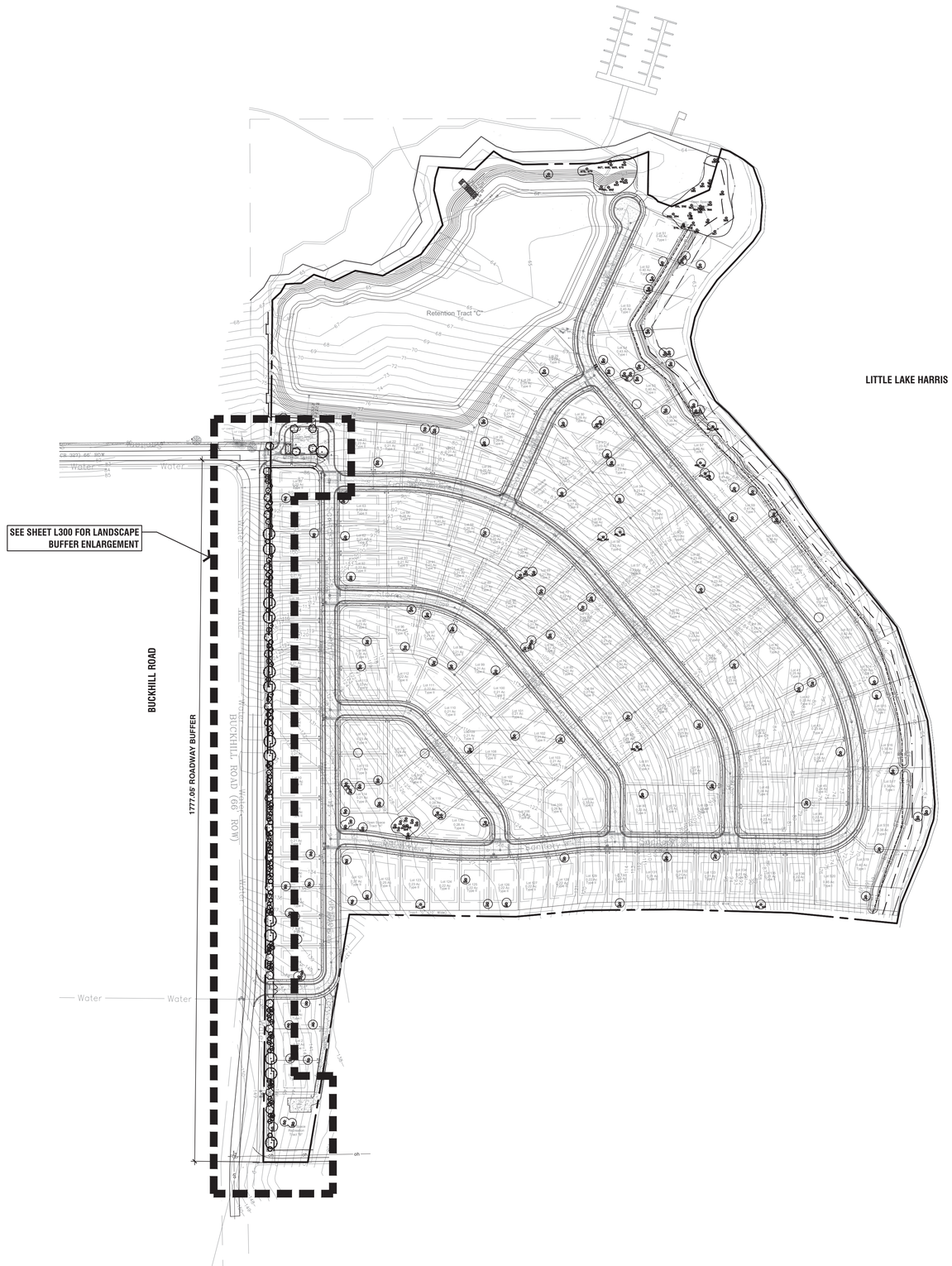
Project Phase: CITY SUBMITTAL

Project Title: WHISPERING HILLS SUBDIVISION HOWEY-IN-THE-HILLS, LAKE COUNTY, FLORIDA

Sheet Title: IRRIGATION DETAILS

Designed:	IDS
Drawn:	CAZ
Checked:	KMD
Date:	01/12/22

Sheet No.: L307



OVERALL NOTES: per sheet TM1 of Unroe Engineering, Inc. Whispering Hills Subdivision Plan Set dated 7/2/2020

Tree Protection Notes

A certified tree survey has been conducted by Ellis Surveying, Inc.
Of the total non-Pines located within the Parcel, the majority have ,been Identified as Diseased, Decayed, Dying, or Dangerous and will be removed. Of the remaining healthy non-Pines, many are in the way of construction. The Developer agree to maximize the number of healthy non-Pine trees .
Trees will be saved in accordance with COHH Tree Protection Barrier Details.

Tree Requirements:
1. Howie LDR's require 3 trees per lot therefore a total of no less than 468 trees will be provided on the completed project. For any Lots having less than 3 trees homebuilders will be required to cure the deficiency.
2. In addition, to satisfy the replacement plantings requirement homebuilders will be required to provide the requisite replacement trees.

PLANT SCHEDULE

CANOPY TREES	CODE	QTY	BOTANICAL / COMMON NAME	SIZE	NOTES
	AR	12	Acer rubrum / Red Maple Florida Fancy #1	4` Ht.	10` Ht.
	MG	12	Magnolia grandiflora / Southern Magnolia Florida Fancy #1, 30 gallon container or greater.	4" Cal.	10` Ht.
	PE	39	Pinus elliottii / Slash Pine Florida Fancy #1	4" Cal.	10` Ht.
	QR	14	Quercus virginiana 'Cathedral' / Cathedral Southern Live Oak Florida Fancy #1	4" Cal.	10` Ht.

ORNAMENTAL TREES	CODE	QTY	BOTANICAL / COMMON NAME	SIZE	NOTES
	IC	26	Ilex cassine / Dahoon Holly Florida Fancy #1	2.5" Cal.	8` Ht.
	LR	26	Lagerstroemia indica x fauriei 'Tuscarora' / Tuscarora Crape Myrtle Multi-Trunk Florida Fancy #1	1.5" Cal. Canes	8` Ht.
	PA	19	Prunus angustifolia / Chickasaw Plum Florida Fancy #1	2.5" Cal.	8` Ht.

SHRUBS	CODE	QTY	BOTANICAL / COMMON NAME	SIZE	NOTES
	HP	50	Hamelia patens 'Firefly' / Firefly Firebush	3 gal.	18"x18", Full
	MC	220	Muhlenbergia capillaris / Pink Muhly Grass	3 gal.	18" ht. min.
	SC	48	Serenoa repens 'Cinerea' / Silver Saw Palmetto	7 gal.	24"x24", Full
	VO	50	Viburnum obovatum 'Densa' / Dwarf Walter's Viburnum	3 gal.	18"x18", Full
	VS	471	Viburnum suspensum / Sandankwa Viburnum	3 gal.	30" Ht. Min.

SOD NOTE:
All sod areas to be non-irrigated Bahia Sod

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kaley@floraviedesign.com

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RED JACKET DEVELOPMENT
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625 WALTHAM AVENUE
ORLANDO, FLORIDA 32409
PHONE: 407-855-1136

0 150 300 feet
SCALE: 1:150

No.	Date	Comment

Professional Landscape Architect of Record:
REGISTERED LANDSCAPE ARCHITECT KALEY M. DUNLAP LA 6667256 STATE OF FLORIDA
Kaley Dunlap
Digitally signed by Kaley Dunlap
Date: 2022.01.17 17:07:47 -05'00'
Kaley M. Dunlap, PLA — Landscape Architect
LA6667256 — Certificate No.

Project No.: 22-001
Project Phase: CITY SUBMITTAL
Project Title: WHISPERING HILLS SUBDIVISION HOWEY-IN-THE-HILLS, LAKE COUNTY, FLORIDA
Sheet Title: OVERALL PLAN

Designed:	KMD
Drawn:	ZRR
Checked:	KMD
Date:	01/12/2022

Sheet No.: L100

LANDSCAPE REQUIREMENTS

PER HOWEY-IN-THE-HILLS LAND DEVELOPMENT CODE

7.02.00 BUFFERS

2. A landscaped wall buffer with a minimum depth of 15 feet. The wall shall maintain a height of six feet from grade on highest side and all walls shall have a decorative exterior (no exposed block). Acceptable materials for wall faces are brick, stucco or stone or a combination of those materials. Wall columns shall have a maximum spacing of thirty feet (30') on walls up to two hundred feet (200') in length and forty feet (40') on walls more than two hundred feet (200') in length. Wall columns may extend up to two feet (2') above the height of the wall. Within each fifty-foot (50') increment along the wall, two (2) canopy trees, two (2) understory trees, and 30 linear feet of shrubs shall be planted. The trees shall not be closer than five feet (5') to a walk or wall. The shrubs shall be at least 30" in height at time of planting. For single family subdivisions, these buffers shall be on common property and dedicated to the homeowners' association for ownership and maintenance responsibilities. For multi-family sites, the buffer will be either owned by the property owner, or in the event of multiple owners, a condominium association or other common entity will own and maintain the buffer.

PROVIDED: 6' HEIGHT FINISHED WALL WITH LANDSCAPE BUFFER (SEE CHART BELOW)
REQUIREMENT SATISFIED.

7.04.01 Florida Water Star Program/Florida Friendly Landscaping

A. All required landscaping and irrigation shall be installed and maintained to be consistent with the water-efficient landscaping requirements established herein. Landowners are additionally encouraged to follow Waterwise Florida Landscapes, Florida Water Star Program, and Florida Irrigation Society Standards.
B. Landscape plants shall be selected based on appropriateness to the site considering conditions such as soil type, moisture, and sunlight using the principal of "right plant – right place," as described by the Florida Friendly Landscaping program. The plants shall be grouped and irrigated by hydrozone in accordance with their respective water needs. A list of appropriate plants and plant resources is contained in The Plant List for Lake County.
C. Synthetic Lawns and Plants: Synthetic or artificial turf, trees and plants shall be prohibited from use in lieu of required live plantings.
D. Limit irrigated lawn areas. Irrigation is not mandated by the Town. The use, type and location of irrigated lawn area in the landscape shall be selected in a planned manner and used as a fill-in material. Since most lawn varieties used in landscape require supplemental watering more frequently than other types of landscape plants, turf shall be placed so that it can be irrigated separately. The installation of turf grass shall be subject to the following:

1. Irrigated turf grasses may be installed on a maximum of sixty (60) percent of the pervious (landscape) area of any lot or parcel as follows:

TURF GRASS TABLE

Site Size	Irrigated Turf Area
< 5 Acres	60% of the pervious landscaped areas
5 to 10 Acres	60% of the pervious landscaped area, not to exceed 5 acres, whichever is less.
>10 acres	60% of the pervious landscaped area, not to exceed 10 acres, whichever is less

2. Exemptions:
(a) Unirrigated turf having an excellent drought tolerance rating, such as Bahia grass, may be used on the entire site and is not subject to this limitation.
(b) Agricultural uses, commercial golf courses greens and fairways, cemeteries, and public or private active recreation fields such as ball fields are exempt from this limitation.
(c) Existing Development: Property owners shall be encouraged to replace lawns and plants with Florida-Friendly Landscaping and drought tolerant turf for development existing as of June 14, 2021.
(d) The percentage of micro irrigation and/or non-irrigated areas shall be no less than 40 percent of the total irrigable area.

PROVIDED: BAHIA SOD AND FLORIDA FRIENDLY LANDSCAPING
REQUIREMENT SATISFIED.

7.05.01 Parking Lots

A. Terminal islands. Each row of parking spaces shall be terminated by landscaped islands to separate parking from adjacent drive aisles. Terminal islands shall measure a minimum of ten feet (10') in width and 20 feet (20') in length. Each terminal island shall include a canopy tree which is at least 4 inches DBH at time of planting, and ground cover. Shrubs may also be included.
B. Interior islands. Interior islands shall be used to shade parking lots. Interior islands are required every ten (10) parking spaces and shall be, at a minimum, the same size of a parking space (10 feet by 20 feet). Each interior island shall include a canopy tree which is at least 4 inches DBH at time of planting, and ground cover. Shrubs may also be included.
C. Divider medians. Landscaped divider medians shall form a continuous landscaped strip between abutting rows of parking. The minimum width of a divider median shall be 10 feet. Canopy trees at least 4 inches DBH at time of planting shall be spaced no fewer than one tree every 40 feet. Ground cover, shrubs, and understory trees shall also be included in divider medians.
D. All parking lot landscaping shall be designed with an irrigation system.

PARKING AREA LOCATED AT MAIL KIOSK AND ENTRY GATES
PROVIDED: (1) CANOPY TREE PER TERMINAL ISLAND AND GROUNDCOVER
REQUIREMENT SATISFIED.

SURVEY NOTES:

1. SEE CIVIL DRAWINGS FOR EXISTING CONDITIONS SURVEY.
2. SEE CIVIL DRAWINGS FOR EROSION AND SEDIMENTATION CONTROL PLAN.
3. THE CONTRACTOR SHALL MAKE A FULL REVIEW OF ALL EXISTING CONDITIONS OF THE SITE AND SHALL REPORT DISCREPANCIES TO THE LANDSCAPE ARCHITECT BEFORE STARTING WORK. THE CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR ACTUAL CONDITIONS AS THEY EXIST ON SITE.
4. EXISTING TREE CANOPIES WERE NOT SURVEYED. ALL TREE CANOPIES INDICATED ARE BASED ON SATELLITE IMAGERY AND AVERAGE CANOPY SIZE PER SURVEYED D.B.H. AND SPECIES.
5. EXISTING AND PROPOSED UTILITY LOCATIONS SHOWN ARE APPROXIMATE UNLESS SPECIFICALLY NOTED OTHERWISE IN THE DRAWINGS. SEE CIVIL PLANS FOR LOCATION OF BOTH PROPOSED AND EXISTING UTILITIES.
6. VERIFY LOCATIONS AND DEPTHS OF ALL UTILITIES IN THE FIELD AND NOTIFY LANDSCAPE ARCHITECT OF ANY CONFLICTS BETWEEN LAYOUT/GRADING AND SITE UTILITIES PRIOR TO THE START OF CONSTRUCTION.

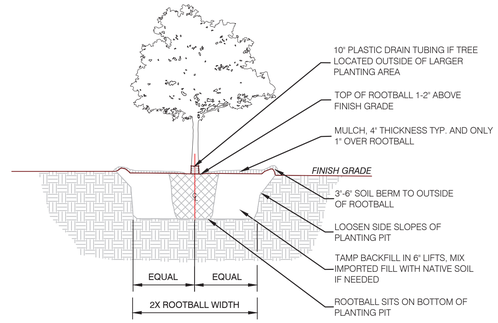
GENERAL NOTES:

1. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO REVIEW THE SITE CONDITIONS AND INFORM THE LANDSCAPE ARCHITECT AND OWNER OF ANY DISCREPANCIES IN SITE CONDITIONS OR EXISTING GRADES THAT ARE NOT DESCRIBED ON THE PLANS BEFORE COMMENCING WORK.
2. LANDSCAPE PLANTING CONTRACTOR SHALL CONTACT THE LANDSCAPE ARCHITECT TO REVIEW PLANS BEFORE COMMENCING WORK IN ORDER TO ASSURE CLOSE COORDINATION.
3. PRIOR TO PROJECT COMPLETION THE SITE IS TO BE THOROUGHLY CLEANED OF ALL CONSTRUCTION DEBRIS, SIGNS, ETC. AND REVIEWED BY THE LANDSCAPE ARCHITECT AND OWNER.
4. NO CONSTRUCTION ACTIVITY INCLUDING GRADE CHANGES, SURFACE TREATMENTS OR EXCAVATIONS OF ANY KIND IS PERMITTED WITHIN THE AREA IDENTIFIED AS A TREE PROTECTION ZONE (TPZ). IN ADDITION, NO ROOT CUTTING, NO STORAGE OF MATERIALS OR FILL, NO MOVEMENT OR STORAGE OF VEHICLES OR EQUIPMENT IS PERMITTED WITHIN THESE AREAS. THE AREAS IDENTIFIED AS A TPZ MUST REMAIN UNDISTURBED AT ALL TIMES.
5. ARBORICULTURAL WORK: ANY ROOTS OR BRANCHES WHICH EXTEND BEYOND THE TREE PROTECTION ZONE WHICH REQUIRE PRUNING, MUST BE PRUNED BY A QUALIFIED ARBORIST OR OTHER TREE PROFESSIONAL AS APPROVED BY THE OWNER OR OWNER'S REP. ALL PRUNING OF TREE ROOTS AND BRANCHES MUST BE IN ACCORDANCE WITH APPROPRIATE ARBORICULTURAL STANDARDS.
6. CONTRACTORS MUST CLEAN UP ALL TRASH AND DEBRIS ON THE CONSTRUCTION SITE AT THE END OF EACH DAY. LIGHTWEIGHT MATERIAL, PACKAGING, AND OTHER ITEMS MUST BE COVERED OR WEIGHTED DOWN TO PREVENT WIND FROM BLOWING SUCH MATERIALS OFF OF THE CONSTRUCTION SITE. DURING THE CONSTRUCTION PERIOD, THE CONSTRUCTION SITE MUST BE KEPT NEAT AND TIDY, DIRT, MUD OR OTHER DEBRIS RESULTING FROM ACTIVITY ON SITE MUST BE PROMPTLY REMOVED FROM SURROUNDING ROADS/PARKING AREAS.
7. CONTRACTOR TO CALL 1-800-432-4770 (CALL 811) TWO WEEKS PRIOR TO VERIFY LOCATION OF UNDERGROUND LINES, PIPES AND CABLES.

PLANTING INSTALLATION NOTES:

1. PLANT MATERIAL TO BE FLORIDA FANCY OR FLORIDA #1 OR BETTER. ALL PLANT MATERIALS SHALL CONFORM TO THE MINIMUM GUIDELINES ESTABLISHED BY THE AMERICAN STANDARD FOR NURSERY STOCK PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN, INC.
2. ALL PLANTS SHALL BE HEALTHY, VIGOROUS, FREE OF DISEASE, INSECTS AND PESTS.
3. THE LANDSCAPE ARCHITECT RESERVES THE RIGHT TO REJECT PLANT MATERIAL AT THE NURSERY OR AT THE SITE.
4. THE LANDSCAPE CONTRACTOR SHALL STAKE THE LOCATION OF ALL PROPOSED PLANT MATERIAL FOR APPROVAL BY THE LANDSCAPE ARCHITECT PRIOR TO PLANTING. NO PLANTS SHALL BE PLANTED BEFORE THE ACCEPTANCE OF ROUGH GRADING. THE TRUNK FLARE (AT THE BASE OF THE TREE) SHALL BE PROPERLY EXPOSED FOR ALL PLANTINGS.
5. KEEP ROOTBALLS INTACT PRIOR TO AND DURING PLANTING OPERATIONS. PLANTS WITH BROKEN OR DAMAGED ROOT BALLS SHALL BE REJECTED AND IMMEDIATELY REMOVED FROM THE SITE. KEEP ROOT BALLS DAMP AND PROTECTED FROM DAMAGE DUE TO SUN AND WIND.
6. PLANTING PIT EXCAVATION: EXCAVATE FOR TREES WITH SLIGHTLY VERTICAL SIDES AND WITH BOTTOM OF EXCAVATION SLIGHTLY CROWNED TO PROMOTE DRAINAGE. SOIL EXCAVATED FROM PITS WILL BE USED TO BACKFILL THE PLANTING PITS.
7. ALL PLANTED AREAS WITHIN OR OUTSIDE THE LIMIT OF WORK WHICH ARE DISTURBED DURING CONSTRUCTION (INCLUDING PLANTING OPERATIONS) SHALL BE RETURNED TO ORIGINAL GRADE, LOAMED AND SEEDED OR MULCHED (AS APPROPRIATE) BY THE CONTRACTOR AT NO ADDITIONAL EXPENSE TO THE OWNER.
8. TREE PLANTING: SEE DETAILS HEREIN FOR ADDITIONAL INFORMATION RELATED TO PLANTING PIT DIMENSIONS, PLANTING OPERATIONS, BACKFILLING, AND STAKING OF TREES.
9. CONTAINER STOCK PLANTING: PLANT CONTAINER GROWN STOCK THE SAME AS SPECIFIED FOR BALLED AND BURLAPPED STOCK, BUT REMOVE CONTAINERS COMPLETELY.
10. OBSTRUCTIONS: IF OBSTRUCTIONS OR OTHER CONDITIONS DETRIMENTAL TO HEALTHY PLANT GROWTH ARE ENCOUNTERED, NOTIFY LANDSCAPE ARCHITECT IMMEDIATELY AND REQUEST ADDITIONAL INSTRUCTIONS.
11. WATERING AND DRAINAGE: FILL EXCAVATIONS WITH WATER AND ALLOW WATER TO PERCOLATE OUT BEFORE PLANTING. IF PLANTING PITS DO NOT PERCOLATE OR DRAIN PROPERLY, NOTIFY LANDSCAPE ARCHITECT AND REQUEST ADDITIONAL INSTRUCTIONS PRIOR TO PLANTING. DO NOT PLANT INTO POORLY DRAINING PITS; POORLY DRAINING PLANTING PITS MAY HOLD WATER AND DROWN PLANTS.
12. WATERING: FLOOD ALL PLANTS WITH WATER TWICE WITHIN THE FIRST 24 HOURS AFTER PLANTING.
13. 13. ALL PLANT MATERIAL SHALL BE MULCHED AFTER PLANTING. BACKFILL TO ALLOW ROOM FOR 3" THICKNESS OF MULCH AFTER SETTLING, AND PLACE MULCH IN DISH AFTER FIRST WATERING AND WITHIN ONE WEEK OF PLANTING.
14. PRUNING AND SHAPING: PRUNE, THIN OUT AND SHAPE PLANTS IN COMPLIANCE WITH AMERICAN ASSOCIATION OF NURSERYMEN, HORTICULTURAL STANDARDS TO PRESERVE THE NATURAL CHARACTER AND ONLY AS APPROVED BY THE LANDSCAPE ARCHITECT. RETAIN REQUIRED HEIGHT AND SPREAD. DO NOT ALTER SHAPE AND DO NOT CUT LEADERS. REMOVE ALL DEAD WOOD, SUCKERS, BROKEN OR BRUISED BRANCHES, AND CROSSING BRANCHES.

LOCATION AND BUFFER TYPE	REQUIREMENT	PROVIDED
NORTH Timber S I 70 Land Use Code: 5400	not required	***not required***
WEST Government Submerged Land Land Use Code 8095 Little Lake Harris Wetland Area	not required	***not required***
SOUTH Single Family Lakefront Land Use Code: 0103	not required	***not required***
EAST Public R.O.W TYPE A BUFFER 1,777 linear feet	20' WIDTH per 50 linear feet 1,777 LF/50 LF = 35.54 (2) CANOPY TREES = 35.54*2 = 71 CANOPY TREES (2) ORNAMENTAL TREES = 35.54*2 = 71 ORNAMENTAL TREES (1) SINGLE ROW OF SHRUBS	***SOLID WALL*** ***(71) CANOPY TREES*** ***(71) ORNAMENTAL TREES*** ***(1) HEDGE ROW***

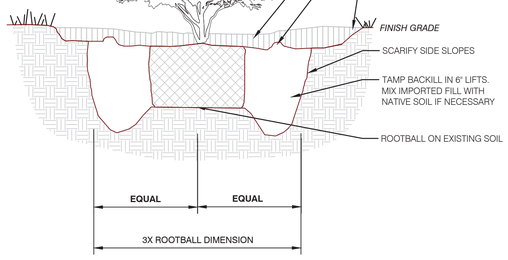


NOTES:

1. ENSURE PLANTING PIT DRAINS WELL PRIOR TO INSTALLATION.
2. REMOVE TREE FROM CONTAINER OR REMOVE UPPER ⅓ OF BURLAP AND WIRE MESH FOR B&B TREES.
3. SLICE ROOTBALL VERTICALLY ON OUTSIDE EDGES OF AND AROUND ROOTBALL.
4. TREE TO BE PLUMB. STAKE TREE, SUBMIT TREE STAKING DETAILS AND LAYOUT FOR APPROVAL.

1 TREE PLANTING DETAIL

SCALE: N.T.S. P-ED-01



2 SHRUB PLANTING DETAIL

SCALE: N.T.S. P-ED-04

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

PREPARED BY:
floravie design
Contact: KALEY DUNLAP
916 VASSAR STREET
ORLANDO, FL 32804
TEL | 321-277-0826
kaley@floraviedesign.com

PREPARED FOR:
RED JACKET DEVELOPMENT
CONTACT: CLAY FRANKEL
625 WALTHAM AVENUE
ORLANDO, FLORIDA 32409
PHONE: 407-855-1136

No.	Date	Comment

Professional Landscape Architect of Record:

REGISTERED LANDSCAPE ARCHITECT KALEY M. DUNLAP LA 6667256 STATE OF FLORIDA

Kaley Dunlap
Digitally signed by Kaley Dunlap
Date: 2022.01.17 17:08:00 -05'00'

Kaley M. Dunlap, PLA — LA6667256
Landscape Architect — Certificate No.

Project No.: 22-001

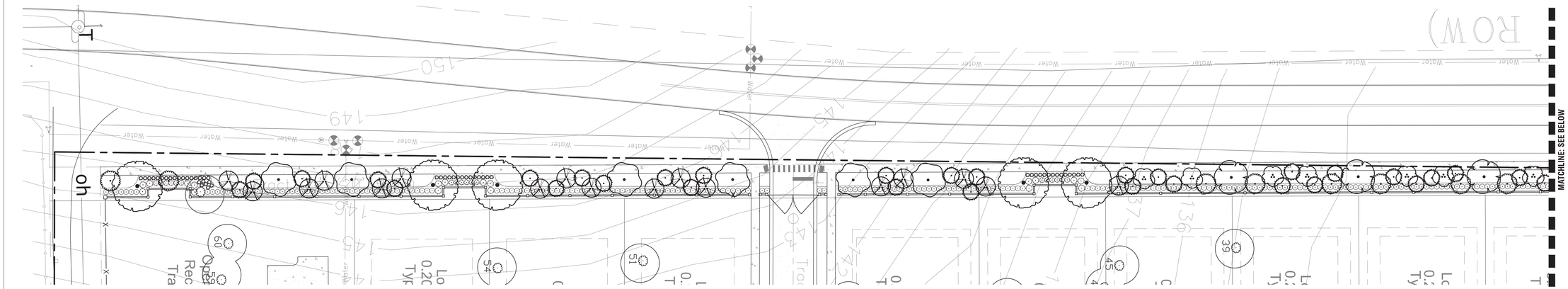
Project Phase: CITY SUBMITTAL

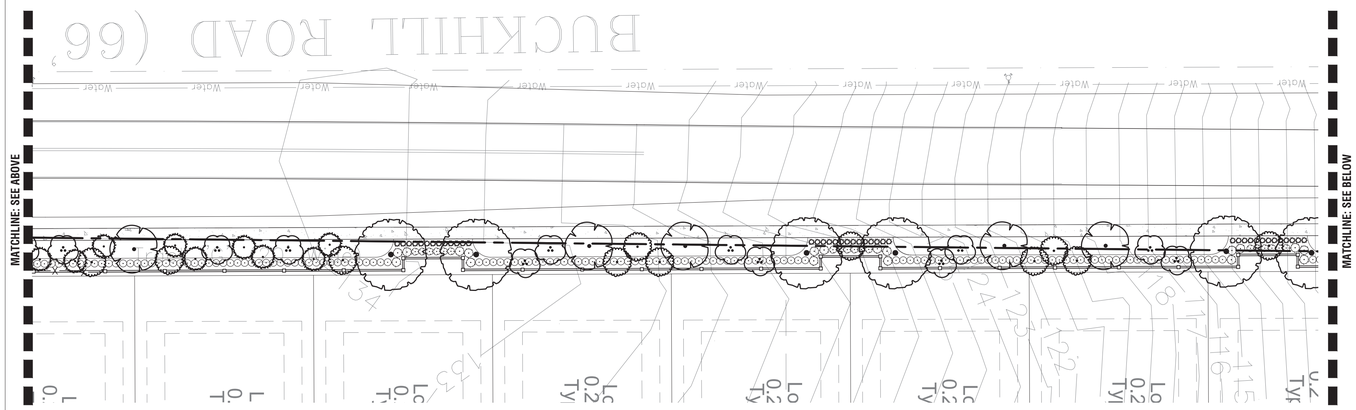
Project Title: WHISPERING HILLS SUBDIVISION HOWEY-IN-THE-HILLS, LAKE COUNTY, FLORIDA

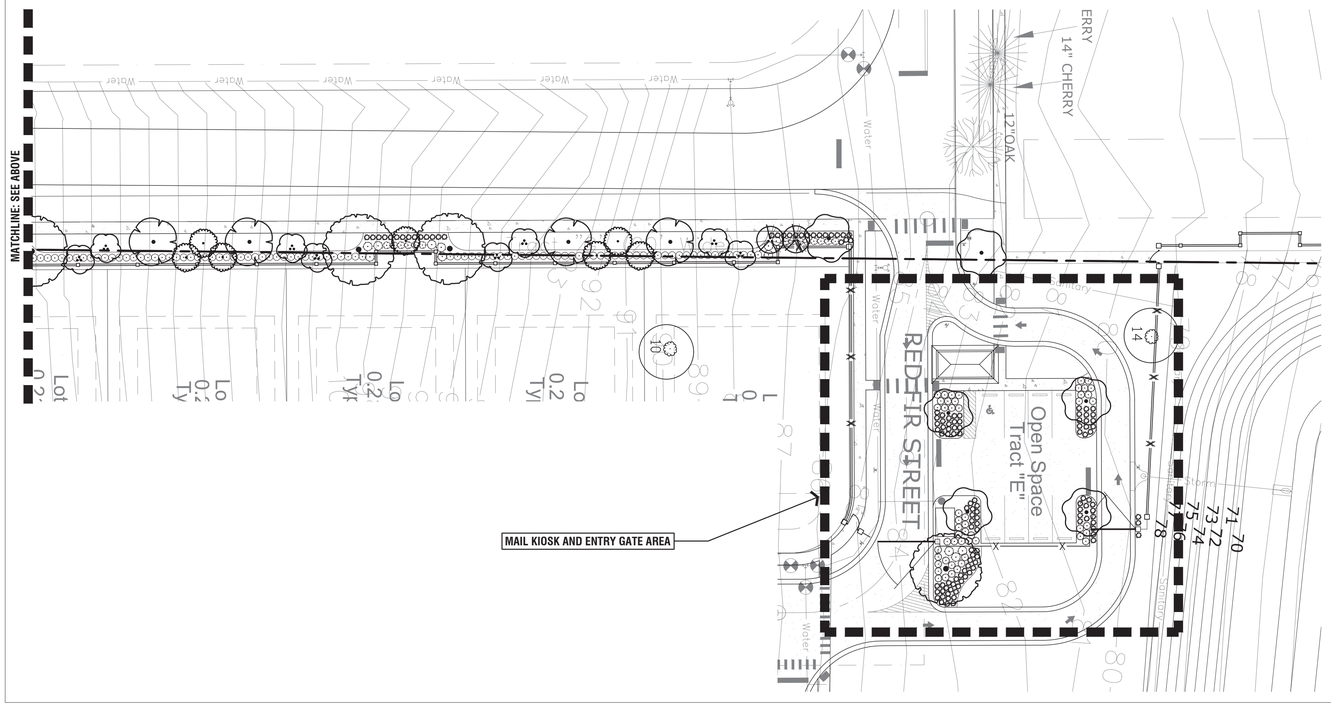
Sheet Title: LANDSCAPE CALCULATIONS, NOTES, AND DETAILS

Designed:	KMD
Drawn:	ZRR
Checked:	KMD
Date:	01/12/2022

Sheet No.: L200







PLANT SCHEDULE ROADWAY BUFFER

CANOPY TREES	CODE	QTY	BOTANICAL / COMMON NAME	SIZE	NOTES
	AR	7	Acer rubrum / Red Maple Florida Fancy #1	4` Ht.	10` Ht.
	MG	12	Magnolia grandiflora / Southern Magnolia Florida Fancy #1, 30 gallon container or greater.	4" Cal.	10` Ht.
	PE	39	Pinus elliottii / Slash Pine Florida Fancy #1	4" Cal.	10` Ht.
	QR	13	Quercus virginiana 'Cathedral' / Cathedral Southern Live Oak Florida Fancy #1	4" Cal.	10` Ht.
ORNAMENTAL TREES	**CODE**	**QTY**	**BOTANICAL / COMMON NAME**	**SIZE**	**NOTES**
	IC	26	Ilex cassine / Dahoon Holly Florida Fancy #1	2.5" Cal.	8` Ht.
	LR	26	Lagerstroemia indica x fauriei 'Tuscarora' / Tuscarora Crape Myrtle Multi-Trunk Florida Fancy #1	1.5" Cal. Canes	8` Ht.
	PA	19	Prunus angustifolia / Chickasaw Plum Florida Fancy #1	2.5" Cal.	8` Ht.
SHRUBS	**CODE**	**QTY**	**BOTANICAL / COMMON NAME**	**SIZE**	**NOTES**
	HP	50	Hamelia patens 'Firefly' / Firefly Firebush	3 gal.	18"x18", Full
	MC	123	Muhlenbergia capillaris / Pink Muhly Grass	3 gal.	18" ht. min.
	SC	45	Serenoa repens 'Cinerea' / Silver Saw Palmetto	7 gal.	24"x24", Full
	VS	471	Viburnum suspensum / Sandankwa Viburnum	3 gal.	30" Ht. Min.

PLANT SCHEDULE MAIL KIOSK AND ENTRY GATE AREA

CANOPY TREES	CODE	QTY	BOTANICAL / COMMON NAME	SIZE	NOTES	REMARKS
	AR	4	Acer rubrum / Red Maple	4` Ht.	10` Ht.	Florida Fancy #1
	QR	1	Quercus virginiana 'Cathedral' / Cathedral Southern Live Oak	4" Cal.	10` Ht.	Florida Fancy #1
SHRUBS	**CODE**	**QTY**	**BOTANICAL / COMMON NAME**	**SIZE**	**NOTES**	**REMARKS**
	MC	97	Muhlenbergia capillaris / Pink Muhly Grass	3 gal.	18" ht. min.	
	SC	3	Serenoa repens 'Cinerea' / Silver Saw Palmetto	7 gal.	24"x24", Full	
	VO	50	Viburnum obovatum 'Densa' / Dwarf Walter's Viburnum	3 gal.	18"x18", Full	

PREPARED BY:
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PREPARED FOR:
RED JACKET DEVELOPMENT
CONTACT: CLAY FRANKEL
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ORLANDO, FLORIDA 32409
PHONE: 407-855-1136

0 60 30 feet
SCALE: 1:30

No.	Date	Comment

Professional Landscape Architect of Record:
REGISTERED LANDSCAPE ARCHITECT KALEY M. DUNLAP LA 6667256 STATE OF FLORIDA
Kaley Dunlap
Digitally signed by Kaley Dunlap
Date: 2022.01.17 17:08:37 -05'00'

Kaley M. Dunlap, PLA — LA6667256
Landscape Architect — Certificate No.

Project No.: 22-001
Project Phase: CITY SUBMITTAL
Project Title: WHISPERING HILLS SUBDIVISION HOWEY-IN-THE-HILLS, LAKE COUNTY, FLORIDA
Sheet Title: LANDSCAPE PLAN

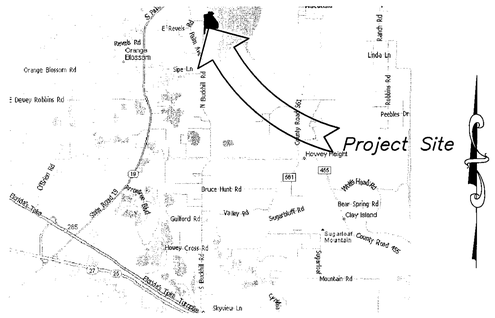
Designed:	KMD	Sheet No.:	L201
Drawn:	ZRR		
Checked:	KMD		
Date:	01/12/2022		

Boundary Survey
Section 36, Township 20 South, Range 25 East
Lake County, Florida
Whispering Hills

Legend & Abbreviations

● Found Iron Rod or Pipe	Power Pole
■ Found Concrete Monument	Guy Wire
◉ Found P.K. Nail & Disk	Fence
× Found X-Cut	Overhead Utility Lines
○ Set 5/8" Capped Iron Rod	Well
◎ Set P.K. Nail & Disk	
(F) Field Measurement	
(D) Deed Reference	
(P) Plat Reference	

Vicinity Map



Description: Project Limits
A portion of Government Lots 5 and 6, in Section 36, Township 20 South, Range 25 East, Lake County, Florida,

more particularly described as follows:

Commence at the Southwest corner of the Southeast ¼ of Section 36, Township 20 South, Range 25 East, Lake County, Florida; thence coincident with the South Boundary of said Southeast ¼, S 89°50'08" E a distance of 32.76 feet to a point on the East Right-of-way Boundary of Buckhill Road per OSPREY HEIGHTS-PHASE 1A, as recorded in Plat Book 33, Page 66 of the public records of Lake County, Florida, said point being the POINT OF BEGINNING; thence departing said South Boundary, coincident with said East Right-of-way Boundary and the Northerly extension thereof, N 00°36'32" E a distance of 2184.33 feet; thence N 47°09'43" E a distance of 28.30 feet; thence N 31°02'11" E a distance of 24.81 feet; thence N 86°55'48" E a distance of 40.31 feet; thence N 55°05'08" E a distance of 38.19 feet; thence S 71°01'20" E a distance of 52.29 feet; thence N 64°09'46" E a distance of 61.62 feet; thence S 79°41'54" E a distance of 70.94 feet; thence N 60°39'33" E a distance of 110.96 feet; thence N 36°52'01" E a distance of 91.94 feet; thence N 13°52'52" W a distance of 29.71 feet; thence N 14°17'52" W a distance of 61.64 feet; thence N 06°23'22" E a distance of 30.93 feet; thence N 16°45'59" E a distance of 28.88 feet; thence S 86°22'27" E a distance of 91.79 feet; thence N 45°57'51" E a distance of 66.74 feet; thence S 55°54'12" E a distance of 29.18 feet; thence S 70°43'29" E a distance of 52.36 feet; thence N 89°10'11" E a distance of 183.00 feet; thence N 82°49'33" E a distance of 87.24 feet; thence N 69°29'41" E a distance of 52.88 feet; thence S 00°53'22" W a distance of 108.93 feet to a point coincident with a non-tangent curve concave to the Southwest, said curve having a radius of 46.00 feet, a delta angle of 38°39'48" and being subtended by a chord bearing S 56°23'48" E for a distance of 30.46 feet; thence coincident with the arc of said curve a distance of 31.04 feet; thence S 70°02'13" E a distance of 36.99 feet; thence N 66°26'02" E a distance of 104.12 feet; thence N 16°19'52 E a distance of 108.8 feet, more or less, to the waters edge of Little Lake Harris; thence Southerly coincident with the waters edge of Little Lake Harris to the Northeast corner of the lands described in Official Records Book 1775, Page 275 of the Public Records of Lake County, Florida; thence departing said waters edge, coincident with the North Boundary of said lands for the following five (5) courses: 1.) N 84°17'12" W a distance of 269.90 feet; 2.) thence N 88°21'36" W a distance of 293.43 feet; 3.) thence S 89°30'46" W a distance of 224.96 feet; 4.) thence S 84°47'04" W a distance of 179.68 feet; 5.) thence N 89°13'45" W a distance of 421.93 feet to a point on the West Boundary of said lands; thence departing said North Boundary, coincident with said West Boundary, S 09°31'29" W a distance of 636.42 feet to a point on the aforementioned South Boundary of the Southeast ¼ of said Section 36; thence coincident with said South Boundary, N 89°51'03" W a distance of 112.96 feet to the POINT OF BEGINNING.

Containing an area of 2651920.89 square feet, 60.880 acres more or less.

Curve Information: Field

CURVE	RADIUS	ARC LENGTH	CHORD BEARING	CHORD LENGTH	DELTA ANGLE	TANGENT
C1	46.00'	31.04'	S 56°23'48" E	30.46'	38°39'48"	16.14'

Line Information: Field

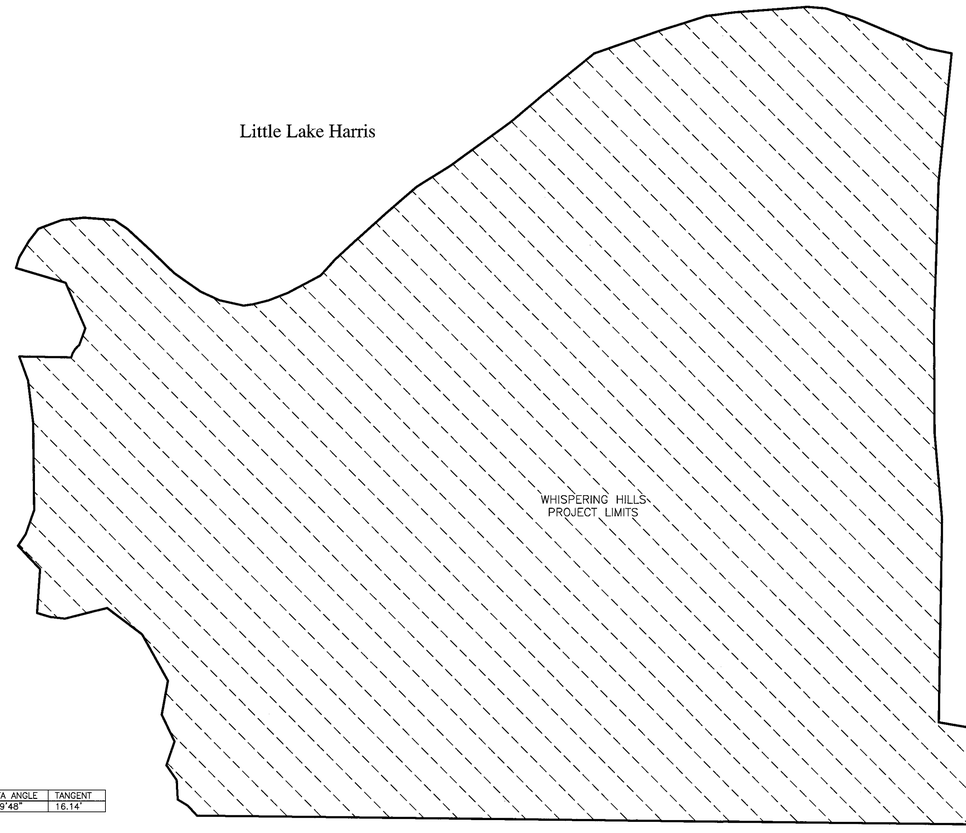
LINE	BEARING	DISTANCE
L1	S 89°50'08" E	32.76'
L2	N 89°36'12" W	33.26'
L3	S 59°21'44" E	39.46'
L4	S 51°48'39" E	32.32'
L5	S 20°06'30" E	52.66'
L6	S 05°48'50" E	46.69'
L7	S 04°14'38" W	63.65'
L8	S 33°26'19" W	33.87'
L9	S 42°12'38" W	63.00'
L10	S 43°27'07" W	70.97'
L11	S 34°38'41" W	66.78'
L12	S 24°34'08" W	43.64'
L13	S 12°12'12" W	51.72'
L14	S 07°48'34" E	19.89'
L15	S 14°19'43" E	34.15'
L16	S 21°00'25" E	43.53'
L17	S 27°45'01" E	76.71'
L18	S 47°28'28" E	45.18'
L19	S 42°26'57" E	51.56'
L20	S 41°22'02" E	87.92'
L21	S 40°24'32" E	86.99'
L22	S 32°00'05" E	82.70'
L23	S 35°51'18" E	158.38'
L24	S 39°44'36" E	86.83'
L25	S 38°30'16" E	48.41'
L26	S 38°37'19" E	88.55'
L27	S 18°50'58" E	150.83'
L28	S 17°00'24" E	31.36'
L29	S 17°24'59" E	66.00'
L30	S 06°59'58" E	62.36'
L31	S 04°11'13" E	110.04'
L32	S 04°23'45" E	41.16'
L33	S 04°33'28" W	36.78'
L34	S 14°23'11" W	7.18'
L35	S 20°10'10" W	13.99'
L36	S 17°31'58" W	50.58'
L37	S 22°56'32" W	68.25'
L38	S 22°36'49" W	91.03'
L39	S 11°13'03" W	51.32'

Line Information: Field

LINE	BEARING	DISTANCE
L40	N 89°51'03" W	112.96'
L41	N 47°09'43" E	28.30'
L42	N 31°02'11" E	24.81'
L43	N 86°55'48" E	40.31'
L44	N 55°05'08" E	38.19'
L45	S 71°01'20" E	52.29'
L46	N 64°09'46" E	61.62'
L47	S 79°41'54" E	70.94'
L48	N 60°39'33" E	110.96'
L49	N 36°52'01" E	91.94'
L50	N 13°52'52" W	29.71'
L51	N 14°17'52" W	61.64'
L52	N 06°23'22" E	30.93'
L53	N 16°45'59" E	28.88'
L54	S 86°22'27" E	91.79'
L55	N 45°57'51" E	66.74'
L56	S 55°54'12" E	29.18'
L57	S 70°43'29" E	52.36'
L58	N 89°10'11" E	183.00'
L59	N 82°49'33" E	87.24'
L60	N 69°29'41" E	52.88'
L61	S 00°53'22" W	108.93'
L62	S 70°02'13" E	36.99'
L63	N 66°26'02" E	104.12'
L64	N 16°19'52" E	108.8'±
L65	S 72°51'43" E	22.57'

Line Information: Deed

LINE	BEARING	DISTANCE
L66	N 89°17'20" E	146.00'



0' 150' 300' 450'
Scale: 1" = 150'

PROJECT LIMITS
2651920.89 Square Feet
60.880 Acres

Project Limits Ownership

WHISPERING HILLS UNIFIED LAND TRUST
AND IT'S BENEFICIARIES:
WHISPERING HILLS FLORIDA, LLC &
WHISPERING SHORES FLORIDA, LLC
& BREDCO DEVELOPMENT GROUP
EACH IN IT'S CAPACITY AS TRUSTEE

Surveyor's Notes

1.) Not valid without the signature and original raised seal of a Florida Licensed Surveyor and Mapper.
2.) The coordinate and bearing structure for this survey is based on Florida State Plane Coordinate System, East zone, North American Datum of 1983 (NAD83), 1990 adjustment. Horizontal control station utilized was National Geodetic Survey (NGS) first (1st) order control station "LC 06".
3.) All utilities depicted hereon are from visible evidence only. Surveyor did not contact subsurface utility locator service.
4.) No underground foundations or footers were excavated or located for this survey.
5.) Boundary Survey has been performed without benefit of title policy or abstract. Therefore surveyor can make no guarantees to ownership or encumbrances.

Stacy L. Brown P.S.M. No. 6516
SurvTech Solutions, Inc. L.B. No. 7340

Project Name: Whispering Hills	PROJECT NO.: 20060189
Address: North Buckhill Road	City: Howey-in-the-Hills State: Florida

REVISION	DATE	INITIALS
Revised parent parcel & project limits boundaries.	11/18/08	T.M.
Added wetland line.	5/14/09	S.B.
Added Army Corp of Engineers wetland areas.	9/9/10	S.B.
Added information for Parcels C, F, S & T.	3/31/11	T.M.
Revised legal descriptions.	12/12/11	T.M.
Removed all internal parcels	5/16/12	S.B.

SURVEYING TODAY WITH TOMORROWS TECHNOLOGY

Drafted By: S. Brown
Date Drafted: 7/07/07
Approved By: S. Brown
Date Approved: 7/09/07
Field Date: 3/28/07
Phase: 6
Revision Date: 5/16/12
Drawing Name: 20060189_6PL
Scale: 1" = 100'
Field Book/Page: 27-09/7

SURVTECH SOLUTIONS, INC.
10220 U.S. Highway 92 East
Tampa, FL 33610
phone: (813)-621-4929
fax: (813)-621-7194
Licensed Business #7340
email: sbrown@survtechsolutions.com
http://www.survtechsolutions.com

Project Limits Boundary Detail Sheet
Whispering Hills

0' 100' 200' 300'

Scale: 1" = 100'

Little Lake Harris

Little Lake Harris

Survey Closure Line

Safe Upland Line 62.10' (NAVD 1988) per Richard Malloy, Bureau of State Lands, Tallahassee, Florida (As Supplied to SurvTech by Client)

Parent Parcel

Wetland Line per Land Planning Group (As Supplied)

Wetland Line per Land Planning Group (As Supplied)

Note: An ordinary high water elevation has not been determined for Lake Harris, therefore, the safe upland line is depicted hereon for constraint purposes as well as for a survey closure line.

Project Limits

Found 4x4 Concrete Monument "LB #4709"
LAT:28°42'10.3575"
LON:-81°45'39.7139"

10' Witness Corner
Found 4"x4" Concrete Monument "L.B. #4709"
LAT:28°41'50.3072"
LON:-81°45'31.9325"

Southerly (D)

259.90' (F) S 85°08'00" E 270.5' (D) **N 84°17'12" W 269.90' (F)**

Found 6" Concrete Monument "L.S. #1916"

North Boundary of lands described in O.R. Book 1775, Page 275 of the Public Records of Lake County, Florida

S 89°10'40" E 283.40' (D) **N 88°21'36" W 283.43' (F)**

Found 6" Concrete Monument "L.S. #1916"

N 88°40'20" E 224.98' (D) **S 89°30'46" W 224.96' (F)**

Found 6" Concrete Monument "L.S. #1916"

N 83°58'40" E 179.74' (D) **S 84°47'04" W 179.85' (F)**

Found 6" Concrete Monument "L.S. #1916"

N 89°57'20" E 421.77' (D) **N 89°13'45" W 421.93' (F)**

Found 4"x4" Concrete Monument (No Id.)
LAT:28°41'50.4351"
LON:-81°45'47.4034"

S 89°17'20" W 1310.00' (D)

GOVERNMENT LOT 6

GOVERNMENT LOT 5

Total Project Acreage
2651920.89 Square Feet
60.880 Acres

LESS OUT PARCEL

South Boundary of Government Lot 5, also being the North Boundary of Government Lot 6

Project Limits

South Boundary of the S.E. ¼ of Section 36-20S-25E

Wetland Line per Army Corps of Engineers

Wetland Line per Land Planning Group (As Supplied)

North Boundary of the S.E. ¼ of Section 36-20S-25E

10' Dirt Drive

North Boundary of Government Lot 5 per Township Plat Dated March 13, 1850 and Original Conveyances Out of U.S. Government and the State of Florida

N 89°19'07" W 921.33' (F)

Point of Beginning
LESS OUT PARCEL
Found 4"x4" Concrete Monument (No Id.)
LAT:28°41'44.2146"
LON:-81°45'48.5407"

S 09°31'29" W 636.42' (F)
N 08°42'20" E 636.35' (D)

West Boundary of lands described in O.R. Book 1775, Page 275 of the Public Records of Lake County, Florida

Point of Beginning
Project Limits
Found 4"x4" Concrete Monument "L.B. #4709"

30' Ingress/Egress Easement per O.R. Book 282, Page 579

10' Dirt Drive

LAT:28°42'02.3786"
LON:-81°45'49.7220"
Found 4"x4" Concrete Monument "L.B. #4709"

Possible Encroachment

2184.33' (F)

East Right-of-way Boundary of Buckhill Road per OSPREY HEIGHTS-PHASE 1A, as recorded in Plat Book 33, Page 66

Clay Road

N 00°36'32" E 1835.08' (F)
N 00°35'36" E 1835.25' (F)

Clay Road

West Boundary of Government Lot 5 per Township Plat Dated March 21, 1850 on File at the Bureau of Land Management and Has Been Distributed by Lake County

298.28' (F)

N 00°35'36" E 1109.18' (F)

810.90' (F)

Northwest Corner of the SE ¼ of Section 36-20S-25E
Found 3" Pipe (No Id.)
LAT:28°42'10.4077"
LON:-81°45'50.0595"

Found 4"x4" Concrete Monument "L.B. #4709"
LAT:28°42'02.3795"
LON:-81°45'50.0955"

West Boundary of the S.E. ¼ of Section 36-20S-25E

Buckhill Road
Public Right-of-way width varies
Clay Road (width varies)

Point of Commencement
Southwest Corner of the SE ¼ of Section 36-20S-25E
Found 4"x4" Concrete Monument (No Id.)
LAT:28°41'44.2092"
LON:-81°45'50.1769"

Boundary Survey
PREPARED FOR:
Whispering Hills

SURVTECH SOLUTIONS, INC.
10220 U.S. Highway 92 East
Tampa, FL 33610
Licensed Business #7340
phone: (813)-621-4929
fax: (813)-621-7194
email: sbrown@survtechsolutions.com
http://www.survtechsolutions.com

Topographic Detail Sheet

0' 100' 200' 300'

Scale: 1" = 100'



Note: Topographic data shown hereon is for informational purposes only.

Stacy L. Brown P.S.M. No. 6516
SurvTech Solutions, Inc. L.B. No. 7340

Boundary Survey
PREPARED FOR:
Whispering Hills

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http://www.survtechsolutions.com

Sanitary Sewage Lift Station Calculations

Prepared by: Darcy Unroe PE 60292 Date: February 10, 2022

Project Name: Whispering Hill Subdivision

Flow Calculations

Based on 156 Dwelling Units

Residential Connetions	156.00	ERC	
Total Flow @ 300 gpd/ERC	**46,800**	**gpd**	**32.50 gpm**
Peak Flow (Factor = 4.0 ADF)	187,200	gpd	**130.00 gpm**
Minimum Daily Flow (Factor = 0.3 ADF)	14,040	gpd	**9.75 gpm**

Pump Station Characteristics

Pump Capacity **150 gpm**

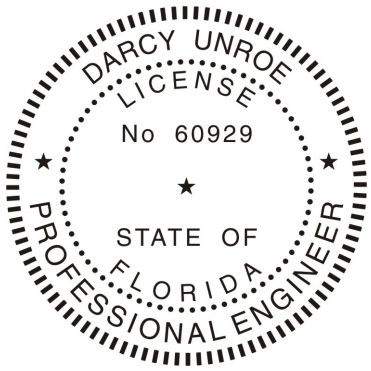
Head Calculation

Static Head		
Pumps Off	48.0	NAVD
Elevation of Connection Point	74.0	NAVD
Static Head	26.0	ft
Pumpline Friction Loss		
4832' of 4.0" PVC @ 150 gpm	77.4	ft
Connection Point Pressure	0.0	ft
Design Residual Pressure	0.0	ft
Other losses	0.7	ft
Total Design Head	**104.1**	**ft**

Cycle Time Calculation

72" Diameter Tank	212	gal/ft
Operating Range	12.0	in
Operating Volume	212	gal
Max Cycle Time (at ADF)		
Fill Time	6.5	min
Pump time	1.8	min
Total Cycle Time	8.3	min
Min Cycle Time (at Peak Flow)		
Fill Time	1.6	min
Pump time	10.6	min
Total Cycle Time	12.2	min

Prepared By:



Darcy Unroe PE 60929

Force Main Calcaulations - to ARV1

Project Whispering Hill Subdivision
Date February 10, 2022

"C" Factor= 130 D=Dia
Hazen - Williams Formula : hf = .002083 x L x (100 / C)^1.85 x (GPM^1.85 / D^4.8655)

One Pump On

	4		4					
Flow	4.0" PVC (onsite)		4.0" PVC (offsite)		Subtotal HL	Static Lift	Station Losses	Total HL
GPM	HL/ft	Length	HL/ft	Length	(ft)	(ft)	(ft)	(ft)
60	0.0029	974	0.0029	5	2.88	32	0.7	**35.6**
80	0.0050	974	0.0050	5	4.90	32	0.7	**37.6**
100	0.0076	974	0.0076	5	7.40	32	0.7	**40.1**
120	0.0106	974	0.0106	5	10.37	32	0.7	**43.1**
140	0.0141	974	0.0141	5	13.79	32	0.7	**46.5**
160	0.0180	974	0.0180	5	17.66	32	0.7	**50.4**

Static Lift: ARV1 inv - Pumps Off = 80-48 = 32 ft

NOTE: Station Losses consists of:

Fitting	Equivelant length
4- 90 deg bends	6.2 ft
(1) Tee Branch Flow	6.6 ft
4" Check & 4" Plug Valve	23.6 ft
34' of 4" PVC	8.0 ft
Total Equivalent Pipe Length	44.4 ft @ 150 gpm = 0.71 ft head loss

NOTE: VELOCITY = GPM DIVIDED BY PIPE DIA. SQ. DIVIDED BY 2.45

4.0 " PIPE 150 GPM 3.83 fps OK

Force Main Calcaulations - to ARV2

Project Whispering Hill Subdivision
Date February 10, 2022

"C" Factor= 130 D=Dia
Hazen - Williams Formula : hf = .002083 x L x (100 / C)^1.85 x (GPM^1.85 / D^4.8655)

One Pump On

	4		4					
Flow	4.0" PVC (onsite)		4.0" PVC (offsite)		Subtotal HL	Static Lift	Station Losses	Total HL
GPM	HL/ft	Length	HL/ft	Length	(ft)	(ft)	(ft)	(ft)
60	0.0029	974	0.0029	1,085	6.05	29	0.7	**35.8**
80	0.0050	974	0.0050	1,085	10.30	29	0.7	**40.0**
100	0.0076	974	0.0076	1,085	15.57	29	0.7	**45.3**
120	0.0106	974	0.0106	1,085	21.81	29	0.7	**51.5**
140	0.0141	974	0.0141	1,085	29.01	29	0.7	**58.7**
160	0.0180	974	0.0180	1,085	37.14	29	0.7	**66.9**

Static Lift: ARV2 inv - Pumps Off = 77-48 = 29 ft

NOTE: Station Losses consists of:

Fitting	Equivelant length
4- 90 deg bends	6.2 ft
(1) Tee Branch Flow	6.6 ft
4" Check & 4" Plug Valve	23.6 ft
34' of 4" PVC	8.0 ft
Total Equivalent Pipe Length	44.4 ft @ 150 gpm = 0.71 ft head loss

NOTE: VELOCITY = GPM DIVIDED BY PIPE DIA. SQ. DIVIDED BY 2.45

4.0 " PIPE 150 GPM 3.83 fps OK

Force Main Calcaulations - to ARV3

Project Whispering Hill Subdivision
Date February 10, 2022

"C" Factor= 130 D=Dia
Hazen - Williams Formula : hf = .002083 x L x (100 / C)^1.85 x (GPM^1.85 / D^4.8655)

One Pump On

	4		4					
Flow	4.0" PVC (onsite)		4.0" PVC (offsite)		Subtotal HL	Static Lift	Station Losses	Total HL
GPM	HL/ft	Length	HL/ft	Length	(ft)	(ft)	(ft)	(ft)
60	0.0029	974	0.0029	2,360	9.80	30	0.7	**40.5**
80	0.0050	974	0.0050	2,360	16.68	30	0.7	**47.4**
100	0.0076	974	0.0076	2,360	25.21	30	0.7	**55.9**
120	0.0106	974	0.0106	2,360	35.32	30	0.7	**66.0**
140	0.0141	974	0.0141	2,360	46.98	30	0.7	**77.7**
160	0.0180	974	0.0180	2,360	60.14	30	0.7	**90.9**

Static Lift: ARV2 inv - Pumps Off = 78-48 = 30 ft

NOTE: Station Losses consists of:

Fitting	Equivelant length				
4- 90 deg bends	6.2	ft			
(1) Tee Branch Flow	6.6	ft			
4" Check & 4" Plug Valve	23.6	ft			
34' of 4" PVC	8.0	ft			
Total Equivalent Pipe Length	44.4	ft @	150	gpm =	0.71 ft head loss

NOTE: VELOCITY = GPM DIVIDED BY PIPE DIA. SQ. DIVIDED BY 2.45

4.0 " PIPE	150 GPM	3.83 fps	OK

Force Main Calcaulations - to Outlet

Project Whispering Hill Subdivision
Date February 10, 2022

"C" Factor= 130 D=Dia
Hazen - Williams Formula : hf = .002083 x L x (100 / C)^1.85 x (GPM^1.85 / D^4.8655)

One Pump On

Flow	4.0" PVC (onsite)		4.0" PVC (offsite)		Subtotal HL	Static Lift	Station Losses	Total HL
GPM	HL/ft	Length	HL/ft	Length	(ft)	(ft)	(ft)	(ft)
60	0.0029	974	0.0029	3,858	14.20	26	0.7	**40.9**
80	0.0050	974	0.0050	3,858	24.18	26	0.7	**50.9**
100	0.0076	974	0.0076	3,858	36.53	26	0.7	**63.2**
120	0.0106	974	0.0106	3,858	51.19	26	0.7	**77.9**
140	0.0141	974	0.0141	3,858	68.08	26	0.7	**94.8**
160	0.0180	974	0.0180	3,858	87.16	26	0.7	**113.9**

NOTE: Station Losses consists of:

Fitting	Equivelant length					
4- 90 deg bends	6.2	ft				
(1) Tee Branch Flow	6.6	ft				
4" Check & 4" Plug Valve	23.6	ft				
34' of 4" PVC	8.0	ft				
Total Equivalent Pipe Length	44.4	ft	@	150	gpm =	0.71 ft head loss

NOTE: VELOCITY = GPM DIVIDED BY PIPE DIA. SQ. DIVIDED BY 2.45

4.0 " PIPE	150 GPM	3.83 fps	OK

I&O Manual

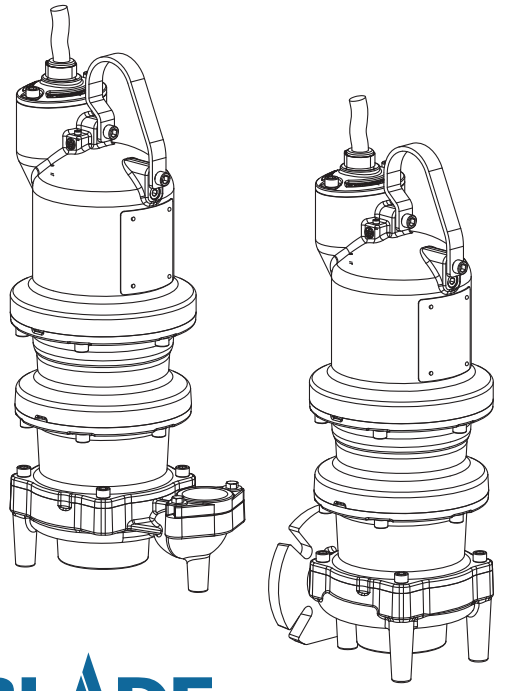
Submersible Grinder Pumps

Specifications:

DISCHARGE:		
	NGV Vertical	2" NPT
	NGVH Flange	2"/2.50"/3", Horizontal
	NGVHH Flange	2.50"/3", Horizontal
LIQUID TEMPERATURE		104°F (40°C) Continuous
VOLUTE		Cast Iron ASTM A-48, Class 30
MOTOR HOUSING		Cast Iron ASTM A-48, Class 30
SEAL PLATE		Cast Iron ASTM A-48, Class 30
IMPELLER:	*Design*	12 Vane,Vortex, With Pump Out Vanes On Back Side. Dynamically Balanced, ISO G6.3
	Material	Cast Iron ASTM A-48, Class 30
SHREDDING RING		Hardened 440C Stainless Steel, Rockwell® C-55
CUTTER		Hardened 440C Stainless Steel, Rockwell® C-55
SHAFT		416 Stainless Steel
SQUARE RINGS		Buna-N
HARDWARE		300 Series Stainless Steel
PAINT		Axalta™ Corlar® Epoxy, Two Coats
SEAL:	*Design*	Tandem Mechanical, Oil Filled Reservoir
	Material	Rotating Faces - Carbon Stationary Faces - Ceramic Elastomer - Buna-N Hardware -300 Series Stainless
CORD ENTRY		Custom Molded, Quick Connected for Sealing and Strain Relief
POWER CORD		CSA Certified Submersible Power Cable 2000V - Ordered Separately
UPPER BEARING:		
	Design	Single Row, Ball, Oil Lubrication
	Load	Radial
LOWER BEARING:		
	Design	Double Row, Ball, Oil Lubrication
	Load	Radial & Thrust
MOTOR:	*Design*	NEMA B Three Phase Torque Curve Oil-Filled, Squirrel Cage Induction, Inverter Duty rated per NEMA MG1
	Insulation	Class H Varnish & Magnet Wire
SINGLE PHASE		Requires overload protection to be included in control panel. Requires start components to be included in panel. Provided with pump
THREE PHASE		Requires overload protection to be included in control panel
MOISTURE SENSORS		Normally Open (N/O), Requires relay in control panel
TEMPERATURE SENSOR		Normally Closed (N/C) To be wired in series with control circuit
OPTIONAL EQUIPMENT		Seal Material, Impeller Trims, Cord Length, Leg Kit

C SP US
LR16567

SWPA MEMBER



BLADE

Series: NGV
3, 5 , 7.5 & 10HP,
3450RPM, 60Hz

Sample Specification

DESCRIPTION:

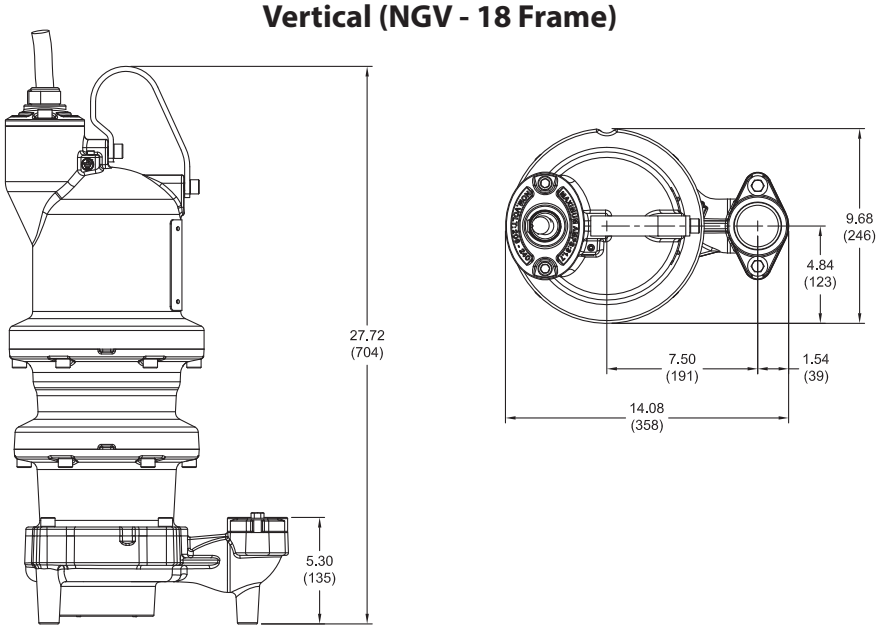
THE GRINDER PUMP IS DESIGNED TO **REDUCE** DOMESTIC, COMMERCIAL, INSTITUTIONAL AND LIGHT INDUSTRIAL SEWAGE TO A FINELY GROUND SLURRY.

WARNING:
CANCER AND REPRODUCTIVE HARM - WWW.P65WARNINGS.CA.GOV

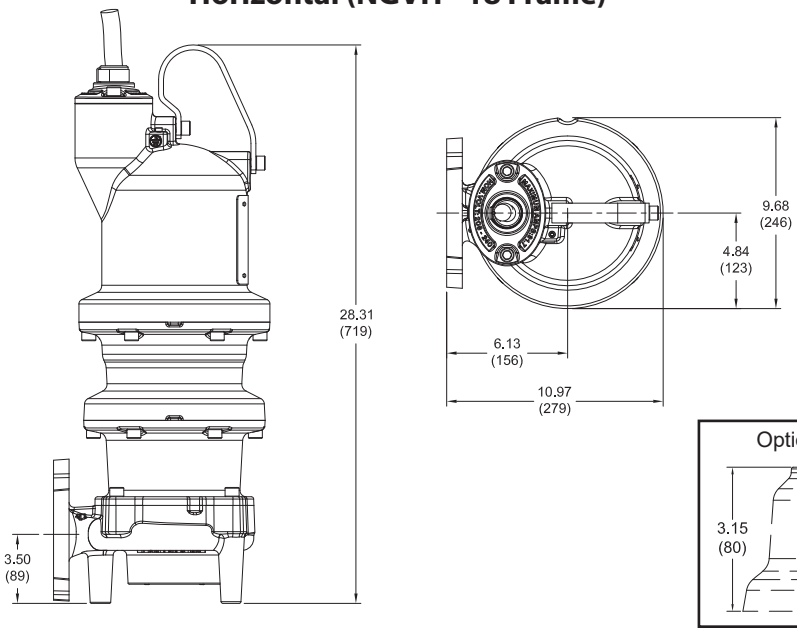
Submersible Grinder Pumps

Vertical (NGV - 18 Frame)

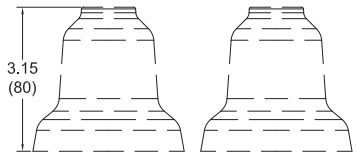
inches (mm)



Horizontal (NGVH - 18 Frame)



Optional Leg Kit - p/n 125506



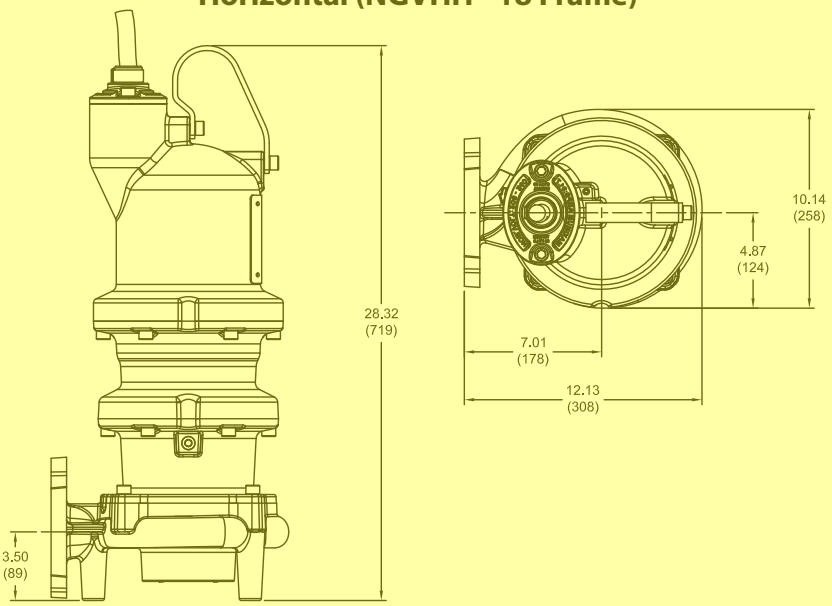
IMPORTANT !

1.) MOISTURE AND TEMPERATURE SENSORS MUST BE CONNECTED TO VALIDATE THE WARRANTY.
2.) A SPECIAL MOISTURE SENSOR RELAY IS REQUIRED IN THE CONTROL PANEL FOR PROPER OPERATION OF THE MOISTURE SENSORS. CONTACT BARNES PUMPS FOR INFORMATION CONCERNING MOISTURE SENSING RELAYS FOR CUSTOMER SUPPLIED CONTROL PANELS.
3.) THESE PUMPS ARE CSA LISTED FOR PUMPING WATER AND WASTEWATER. **DO NOT USE TO PUMP FLAMMABLE LIQUIDS**.
4.) INSTALLATIONS SUCH AS DECORATIVE FOUNTAINS OR WATER FEATURES PROVIDED FOR VISUAL ENJOYMENT MUST BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE ANSI/NFPA 70 AND/OR THE AUTHORITY HAVING JURISDICTION. THIS PUMP IS NOT INTENDED FOR USE IN SWIMMING POOLS, RECREATIONAL WATER PARKS, OR INSTALLATIONS IN WHICH HUMAN CONTACT WITH PUMPED MEDIA IS A COMMON OCCURRENCE.
5.) THIS PUMP IS NOT APPROPRIATE FOR THOSE APPLICATIONS SPECIFIED AS CLASS 1 DIVISION 1 HAZARDOUS LOCATIONS.

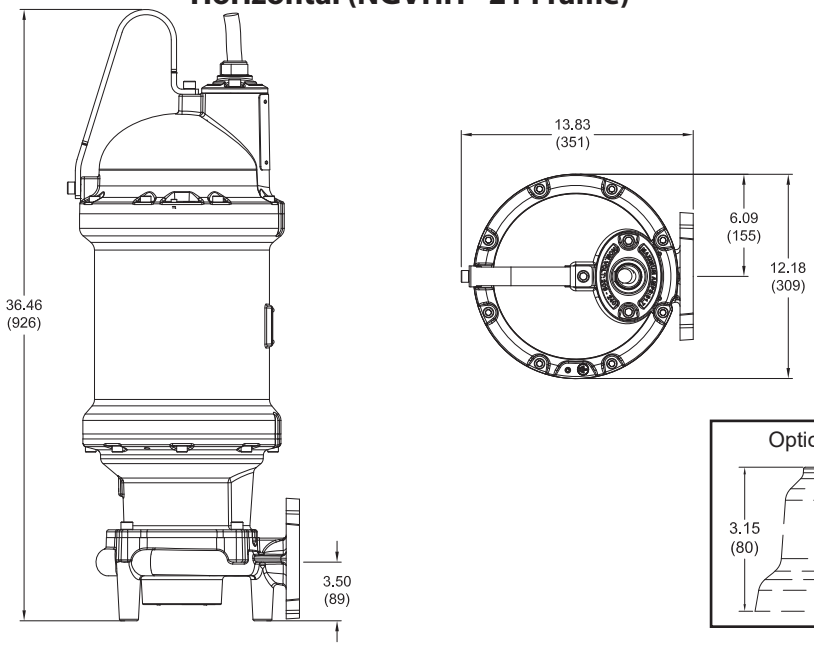
Submersible Grinder Pumps

Horizontal (NGVHH - 18 Frame)

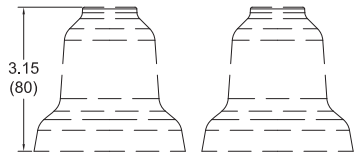
inches (mm)



Horizontal (NGVHH - 21 Frame)



Optional Leg Kit - p/n 125506



IMPORTANT !

1.) MOISTURE AND TEMPERATURE SENSORS MUST BE CONNECTED TO VALIDATE THE WARRANTY.
2.) A SPECIAL MOISTURE SENSOR RELAY IS REQUIRED IN THE CONTROL PANEL FOR PROPER OPERATION OF THE MOISTURE SENSORS. CONTACT BARNES PUMPS FOR INFORMATION CONCERNING MOISTURE SENSING RELAYS FOR CUSTOMER SUPPLIED CONTROL PANELS.
3.) THESE PUMPS ARE CSA LISTED FOR PUMPING WATER AND WASTEWATER. **DO NOT USE TO PUMP FLAMMABLE LIQUIDS**.
4.) INSTALLATIONS SUCH AS DECORATIVE FOUNTAINS OR WATER FEATURES PROVIDED FOR VISUAL ENJOYMENT MUST BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE ANSI/NFPA 70 AND/OR THE AUTHORITY HAVING JURISDICTION. THIS PUMP IS NOT INTENDED FOR USE IN SWIMMING POOLS, RECREATIONAL WATER PARKS, OR INSTALLATIONS IN WHICH HUMAN CONTACT WITH PUMPED MEDIA IS A COMMON OCCURRENCE.
5.) THIS PUMP IS NOT APPROPRIATE FOR THOSE APPLICATIONS SPECIFIED AS CLASS 1 DIVISION 1 HAZARDOUS LOCATIONS.

Submersible Grinder Pumps

	MODEL NO	PART NO	HP	VOLT	PH	Hz	RPM (Nom)	NEMA START CODE	FULL LOAD AMPS	SERVICE FACTOR	LOCKED ROTOR AMPS	DRIVER FRAME	CORD P/N ▲	CORD SIZE	CORD O.D.
BLADE NGV Pump - Vertical	NGV3072	141339N	3.0	208	1	60	3450	J	25.0	1.0	113.2	18	125496	12/4 - 18/4	.86 ± .02
				230				M	23.2		131.2				
	NGV30N2	141340N	3.0	208	3	60	3450	P	12.1	1.0	85.4	18	125496	12/4 - 18/4	.86 ± .02
				230					12.6		95.2				
				460					6.3		47.6		125497	12/4 - 18/4	.86 ± .02
	NGV3052	141342N	3.0	575	3	60	3450	P	5.0	1.0	38.1	18	125497	12/4 - 18/4	.86 ± .02
	NGV5072	141343N	5.0	208	1	60	3450	E	34.1	1.0	113.2	18	125498	8/4 - 18/4	1.12 ± .02
				230				G	29.9		131.2				
	NGV50N2	141344N	5.0	208	3	60	3450	J	17.8	1.0	85.4	18	125496	12/4 - 18/4	.86 ± .02
				230					16.0		95.2		125497	12/4 - 18/4	.86 ± .02
				460					8.0		47.6				
	NGV5052	141346N	5.0	575	3	60	3450	J	6.4	1.0	38.1	18	125497	12/4 - 18/4	.86 ± .02
	NGV75N2	141347N	7.5	208	3	60	3450	M	28.0	1.0	173.9	18	125496	12/4 - 18/4	.86 ± .02
				230					28.2		201.0		125497	12/4 - 18/4	.86 ± .02
				460					14.1		100.5				
	NGV7552	141349N	7.5	575	3	60	3450	M	11.3	1.0	80.4	18	125497	12/4 - 18/4	.86 ± .02

IMPORTANT !
Moisture and Temperature sensor leads are integral to power cord.
Pump rated for operation at ± 10% voltage at motor.
▲ Cord Suffix: XC - 30 Feet, XF - 50 Feet, XJ - 75 Feet, or XL - 100 Feet.
▲ Cord sold separately.
Single Phase pumpes require start components to be included in panel. Provided with pump.

Submersible Grinder Pumps

BLADE NGVH Pump - Horizontal														
MODEL NO	PART NO	HP	VOLT	PH	Hz	RPM (Nom)	NEMA START CODE	FULL LOAD AMPS	SERVICE FACTOR	LOCKED ROTOR AMPS	DRIVER FRAME	CORD P/N ▲	CORD SIZE	CORD O.D.
NGVH3072	141350N	3.0	208	1	60	3450	J	25.0	1.0	113.2	18	125496	12/4 - 18/4	.86 ± .02
			230				M	23.2		131.2				
NGVH30N2	141351N	3.0	208	3	60	3450	P	12.1	1.0	85.4	18	125496	12/4 - 18/4	.86 ± .02
			230					12.6		95.2				
			460					6.3		47.6		125497	12/4 - 18/4	.86 ± .02
NGVH3052	141353N	3.0	575	3	60	3450	P	5.0	1.0	38.1	18	125497	12/4 - 18/4	.86 ± .02
NGVH5072	141354N	5.0	208	1	60	3450	E	34.1	1.0	113.2	18	125498	8/4 - 18/4	1.12 ± .02
			230				G	29.9		131.2				
NGVH50N2	141355N	5.0	208	3	60	3450	J	17.8	1.0	85.4	18	125496	12/4 - 18/4	.86 ± .02
			230					16.0		95.2				
			460					8.0		47.6		125497	12/4 - 18/4	.86 ± .02
NGVH5052	141357N	5.0	575	3	60	3450	J	6.4	1.0	38.1	18	125497	12/4 - 18/4	.86 ± .02
NGVH75N2	141358N	7.5	208	3	60	3450	M	28.0	1.0	173.9	18	125496	12/4 - 18/4	.86 ± .02
			230					28.2		201.0				
			460					14.1		100.5		125497	12/4 - 18/4	.86 ± .02
NGVH7552	141360N	7.5	575	3	60	3450	M	11.3	1.0	80.4	18	125497	12/4 - 18/4	.86 ± .02

IMPORTANT !
Moisture and Temperature sensor leads are integral to power cord.
Pump rated for operation at ± 10% voltage at motor.
▲ Cord Suffix: XC - 30 Feet, XF - 50 Feet, XJ - 75 Feet, or XL - 100 Feet.
▲ Cord sold separately.
Single Phase pumpes require start components to be included in panel. Provided with pump.

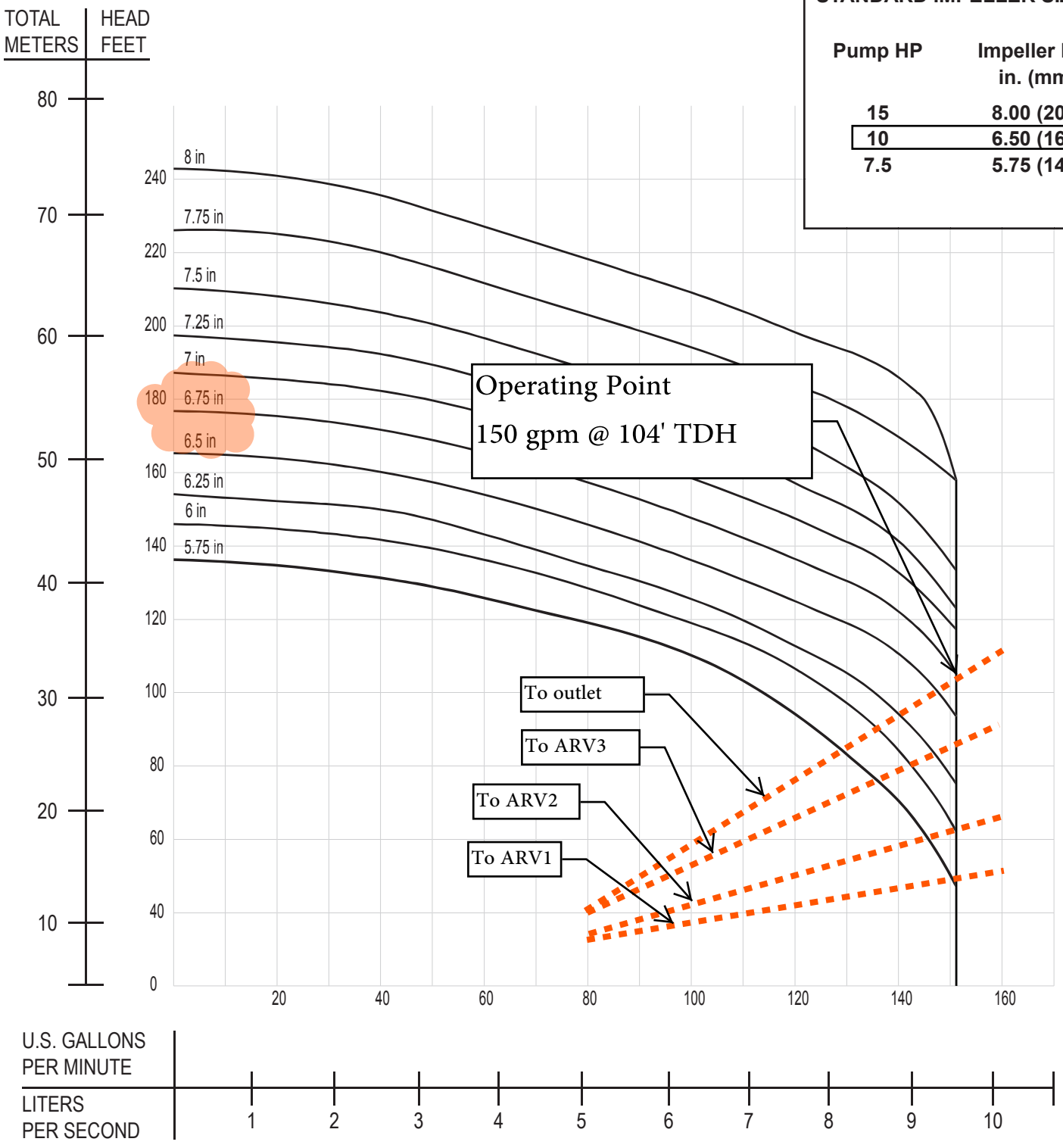
	MODEL NO	PART NO	HP	VOLT	PH	Hz	RPM (Nom)	NEMA START CODE	FULL LOAD AMPS	SERVICE FACTOR	LOCKED ROTOR AMPS	DRIVER FRAME	CORD P/N ▲	CORD SIZE	CORD O.D.
BLADE NGVHH Pump - Horizontal	NGVHH75N2	143385N	7.5	208	3	60	3450	M	28.0	1.0	173.9	18	125496	12/4 - 18/4	.86 ± .02
				230					28.2		201.0		125497	12/4 - 18/4	.86 ± .02
				460					14.1		100.5				
	NGVHH7552	143386N	7.5	575	3	60	3450	M	11.3	1.0	80.4	18	125497	12/4 - 18/4	.86 ± .02
	NGVHH100N2	143387N	10.0	208	3	60	3450	K	37.0	1.0	173.9	18	125498	8/4 - 18/4	1.12 ± .02
				230					34.8		201.0		125497	12/4 - 18/4	.86 ± .02
				460					17.4		100.5				
	NGVHH10052	143388N	10.0	575	3	60	3450	K	13.9	1.0	80.4	18	125497	12/4 - 18/4	.86 ± .02
	NGVHH150N2	141375N	15.0	208	3	60	3450	E	59.0	1.0	195.7	21	125498	8/4 - 18/4	1.12 ± .02
				230					57.1				125497	12/4 - 18/4	.86 ± .02
				460					28.5		88.5				
	NGVHH15052	141377N	15.0	575	3	60	3450	E	22.8	1.0	70.8	21	125497	12/4 - 18/4	.86 ± .02

IMPORTANT !
Moisture and Temperature sensor leads are integral to power cord.
Pump rated for operation at ± 10% voltage at motor.
▲ Cord Suffix: XC - 30 Feet, XF - 50 Feet, XJ - 75 Feet, or XL - 100 Feet.
▲ Cord sold separately.

Submersible Grinder Pumps

STANDARD IMPELLER SIZES

Pump HP	Impeller Dia. in. (mm)
15	8.00 (203)
10	6.50 (165)
7.5	5.75 (146)



Testing is performed with water, specific gravity 1.0 @ 68° F @ (20°C), other fluids may vary performance

Unroe Engineering, Inc

Civil Engineering/Planning/Scientific Evaluations
PO Box 690942, Orlando, Florida 32869
Ph (407) 299-0650 <> Darcy@UnroeEngineering.com

Water Distribution Calculations

January 13, 2022

Project: Whispering Hills Subdivision

Narrative

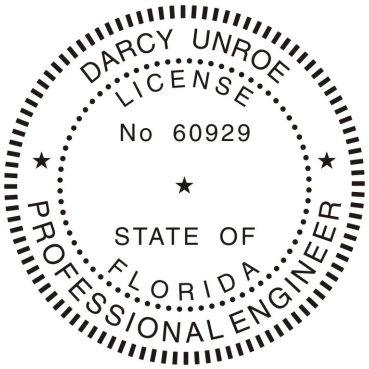
The purpose of these calculations is to analyze the proposed water distribution system capacity under the peak flow conditions for fire protection. The system will be considered with the peak flow in the two most critical fire hydrants. The system will be capable of delivering the peak fire flow of 1,000 gpm to the most distant hydrants with a minimum pressure of 24 psi.

Design Condition #1

Consider the peak fire flow flowing through the fire hydrant at the end of line on Buckhill Road. This hydrant is located at the highest point in the system.

Design Condition #1 - Node Table

Label	Invert Elevation [ft]	Total Demand [gpm]	Pressure [psi]
N-0	81.00	-618.79	134.59
N-1	77.50	-381.21	134.74
N-2	83.00	0.00	53.80
N-3	84.00	0.00	53.22
N-4	67.50	0.00	60.34
N-5	94.00	0.00	48.76
N-6	109.50	0.00	41.96
N-7	122.00	0.00	36.38
N-8	106.00	0.00	43.53
N-9	121.00	0.00	36.82
N-10	130.00	0.00	32.67
N-11	143.00	0.00	25.84
N-12	**143.00**	**1000.00**	**24.27**
N-13	68.00	0.00	60.12



Design Condition #1 - Pipe Table

Label	Length [ft]	Pipe Diameter [in]	Friction Headloss Coeff.	Flow [gpm]	Velocity [ft/s]	Total Headloss [ft]
N-0--N-1	1267.00	6	130	133.99	1.56	3.350
N-1--N-2	1356.00	10	130	515.20	2.45	4.930
N-2--N-3	471.00	8	130	119.66	0.89	0.341
N-3--N-4	398.00	8	130	49.68	0.37	0.057
N-4--N-13	91.00	6	130	0.00	0.00	0.000
N-4--N-5	1775.00	8	130	49.68	0.37	0.253
N-5--N-3	1152.00	8	130	-69.98	0.52	0.309
N-5--N-6	290.00	8	130	119.66	0.89	0.210
N-6--N-7	290.00	8	130	165.75	1.23	0.384
N-7--N-10	432.00	8	130	167.01	1.24	0.581
N-10--N-11	765.00	10	130	515.20	2.45	2.782
N-11--N-0	3967.00	10	130	-484.80	2.31	12.888
N-2--N-8	325.00	10	130	395.53	1.88	0.724
N-8--N-9	294.00	10	130	349.44	1.66	0.521
N-9--N-10	330.00	10	130	348.18	1.66	0.581
N-8--N-6	1103.00	8	130	46.09	0.34	0.137
N-9--N-7	648.00	8	130	1.26	0.01	0.000
N-11--N-12	**98.00**	**8**	**130**	**1000.00**	**7.44**	**3.623**

Design Condition #2

Consider the peak fire flow flowing through the fire hydrant# 13 on Whispering Hills Court. This hydrant is located at the furthest point in the system.

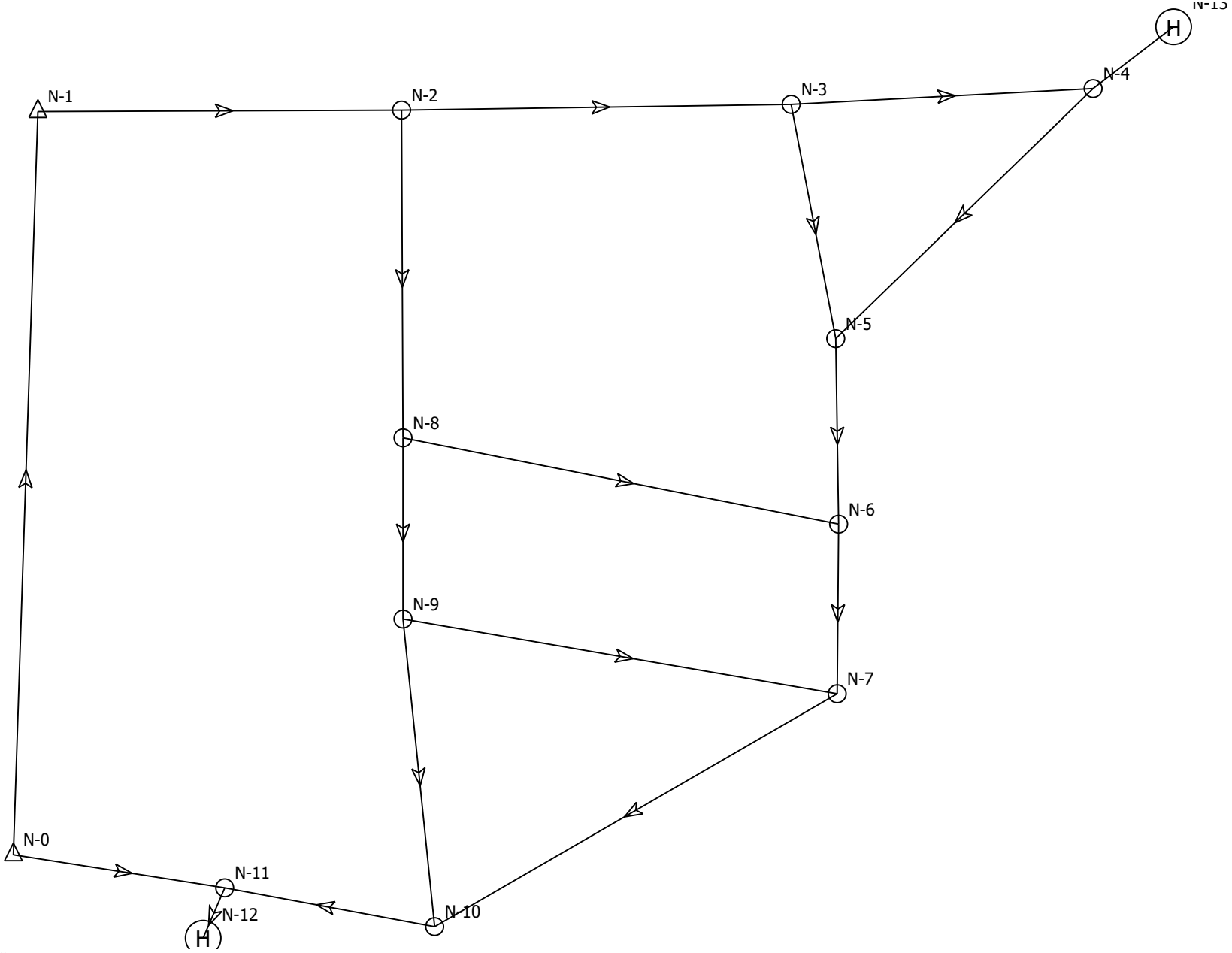
Design Condition #2 - Node Table

Label	Invert Elevation [ft]	Total Demand [gpm]	Pressure [psi]
N-0	81.00	-603.84	135.58
N-1	77.50	-396.16	133.08
N-2	83.00	0.00	52.56
N-3	84.00	0.00	49.81
N-4	67.50	0.00	53.89
N-5	94.00	0.00	45.99
N-6	109.50	0.00	40.43
N-7	122.00	0.00	35.52
N-8	106.00	0.00	42.60
N-9	121.00	0.00	36.14
N-10	130.00	0.00	32.37
N-11	143.00	0.00	27.56
N-12	143.00	0.00	27.56
N-13	**68.00**	**1000.00**	**49.36**

Design Condition #2 - Pipe Table

Label	Length [ft]	Pipe Diameter [in]	Friction Headloss Coeff.	Flow [gpm]	Velocity [ft/s]	Total Headloss [ft]
N-0--N-1	1267.00	6	130	183.54	2.13	6.000
N-1--N-2	1356.00	10	130	579.71	2.76	6.134
N-2--N-3	471.00	8	130	529.62	3.94	5.366
N-3--N-4	398.00	8	130	673.56	5.01	7.078
N-4--N-13	**91.00**	**6**	**130**	**1000.00**	**11.62**	**9.952**
N-4--N-5	1775.00	8	130	-326.44	2.43	8.254
N-5--N-3	1152.00	8	130	143.94	1.07	1.176
N-5--N-6	290.00	8	130	-470.38	3.50	2.653
N-6--N-7	290.00	8	130	-300.96	2.24	1.160
N-7--N-10	432.00	8	130	-186.38	1.39	0.711
N-10--N-11	765.00	10	130	-420.29	2.00	1.908
N-11--N-0	3967.00	10	130	-420.29	2.00	9.893
N-2--N-8	325.00	10	130	50.09	0.24	0.016
N-8--N-9	294.00	10	130	-119.33	0.57	0.071
N-9--N-10	330.00	10	130	-233.92	1.11	0.278
N-8--N-6	1103.00	8	130	169.42	1.26	1.522
N-9--N-7	648.00	8	130	114.58	0.85	0.433
N-11--N-12	98.00	8	130	0.00	0.00	0.000

Node Diagram



Per our conversation on Friday I have provided the flow rates for the two closest hydrants to Buckhill road.

In front of Lake Hills school
Static PSI 70
Residual PSI 40
GPM 960

East side of Revels road across from 11128 East Revels
Static PSI 70
Residual PSI 50
GPM 1080

If you need anything else please feel free to call.
Supervisor of Utilities
Howey In The Hills
JJ Southall

Unroe Engineering
Civil Engineering/Planning/Scientific Evaluations
PO Box 690942, Orlando, Florida 32869
wk(407) 229-0650 / Darcy@UnroeEngineering.com

Drainage Calculation Report

Whispering Hills Subdivision

Project Number: WH2

February 18, 2022

Unroe Engineering
Civil Engineering/Planning/Scientific Evaluations
PO Box 690942, Orlando, Florida 32869
wk(407) 229-0650 / Darcy@UnroeEngineering.com

Drainage Calculations

Whispering Hills Subdivision

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Attachments
Ardaman Geotech Report (2-22-2006)

Section 1 Site Description

Narrative

Discussion of Design

These calculations are intended to support a revision to the approved Whispering Hills Subdivision Design and Water Management District Permit (ERP102286-02). The original engineering and stormwater calculations were prepared by Denham Summit Engineering, LLC. The proposed development will use the same design approach with updated post-development conditions.

This subject property is a 50+ acre site located at the north end of Buckhill Road in Howey-in-the-Hills. The project will consist of 156 single-family residential homes with associated infrastructure. The site is bordered on the north and east by Little Lake Harris, on the west by Buckhill Road and on the south by undeveloped property which is currently being used as farmland.

The existing topography of the site falls from the southwest comer to the lake edge of the property. There is approximately 85' of elevation change across the property. The drainage design will be divided into two separate treatment systems. The main retention pond will be a lined wet pond sized to retain the runoff volume from the the 100 yr. 24 hr. storm. This retained volume will then be used to irrigate the lots and open space tracts to help maintain water quality for Little Lake Harris. The remaining part of the stormwater system consists of a small swale which will intercept discharge from the lakefront lots on the east side of the property and limit discharge to pre-development conditions. The main retention pond will have a broad-crested overflow weir which will allow for discharge of storm events in excess of the 100 year storm.

Pre-construction Site Conditions:

In the pre-development the site consists of one basin depicted on the pre-development basin map in the appendix section of this report. The basin consists of the site boundary and a small portion of offsite area southwest of the site. The entire basin slopes uniformly towards Little Lake Harris. There are no major storage or depressional areas located within the basin.

Based on a review of the NSRC soils map for Lake County, the site contains five different soil types. The majority of the site is covered by fine sands consisting of Chandler, Tavares, and two local Urban-Complex varieties of sands all of which have been classified as hydrologic group 'A' soils. The remaining soil type Pompano Sands is found along the lakeshore of the property and is classified as hydrologic group 'B/D' soil. A copy of the soils map for the site has been provided in the Appendix of the report.

A complete subsurface investigation for the site has been performed by Andreyev & Associates which is also included in the appendix. A summary of the results is tabulated below:

Main Retention Area - Design Parameters

Borings	Depth to Confining Layer (ft)	Depth to SHWT (ft)	Kh	Kv	Porosity
AB 3, AB 4, AB 5	15.5	5.5	20.0	13.3	0.25

Rearyard Swales - Design Parameters

Borings	Depth to Confining Layer (ft)	Depth to SHWT (ft)	Kh	Kv	Porosity
AB 6	7.0	2.0	10.0	6.7	0.2
AB 7	7.0	5.0	10.0	6.7	0.2
AB 8	7.0	1.0	10.0	6.7	0.2
Average	7.0	2.7	10.0	6.7	0.2

Post Development Site Conditions

The Post-Development site will be divided into two basins. The first basin is labeled Post-1 and contains 49.05 acres. This basin flows to the lined wet retention pond located along the north boundary of the site. This pond has been lined for both aesthetic reasons and that it will serve has the holding area for the irrigation water which will serve the project. The design of this stormwater reuse pond conforms with SJRWMD rule 40C-42 and is also designed to meet the nutrient loading criteria specified for direct discharges to impaired water-bodies. The reuse pond is sized to hold the runoff volume created by the 100yr/24hr storm event without direct discharge to Little Lake Harris. Reuse calculations have been provided to demonstrate the overall efficiency of the proposed system. In addition to the pond volume, the irrigation supply will be supplemented with water from Little Lake Harris when rainfall is insufficient to provide the required irrigation volume.

The second basin labeled Post-2 is a 5.88 ac. basin which contains the lakefront lots and is served by a small dry retention swale located adjacent the lake. The swale will provide storage for treatment volume and attenuation and will limit the discharge to the adjacent property to pre-development rates.

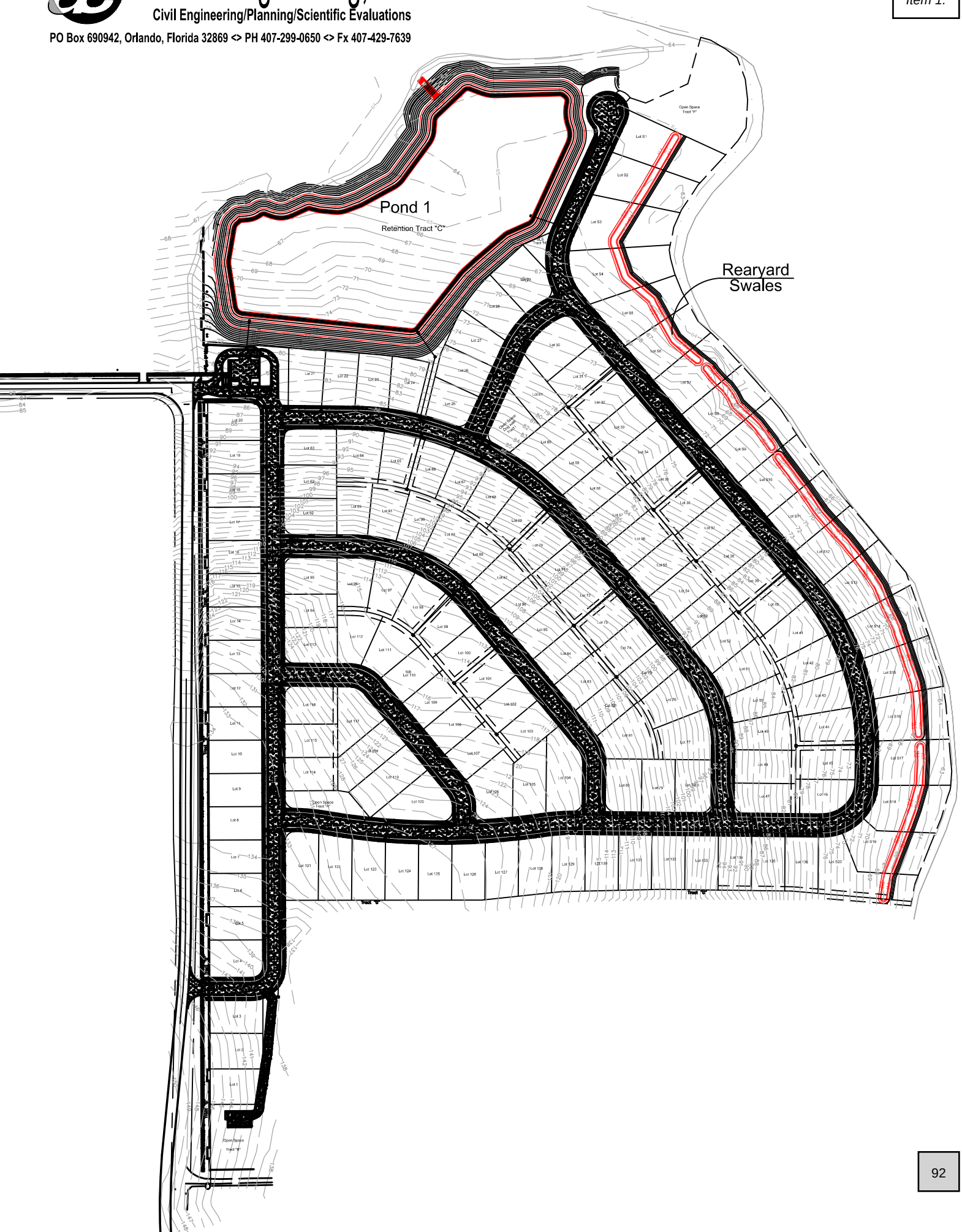
Flood Zone

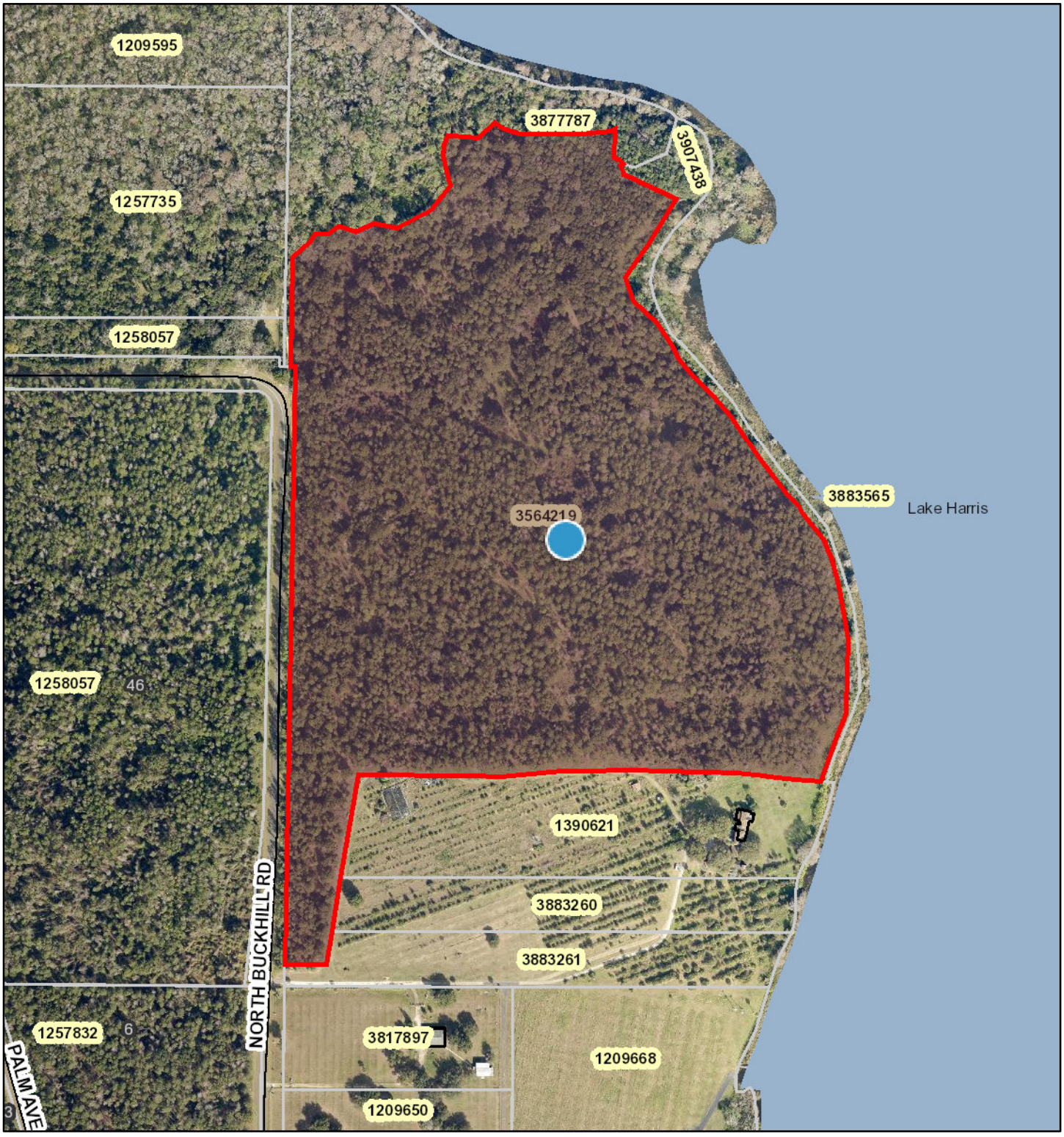
The subject property is in flood zone X & AE (FEMA l 2069C0460 D) with Base Flood Elevation is 64.00 NAVD. All proposed development will be upland of the 64 contour.



Location Plan	
STR – 36/20/25	Scale: N.T.S
Alt Key: 3564219	

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Civil Engineering/Planning/Scientific Evaluations
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February 18, 2022

1:5,000

0 0.0425 0.085 0.17 mi

0 0.05 0.1 0.2 km

pointLayer

Override 1

polygonLayer

Override 1

Street Names

Local Streets

Subdivision Lot Numbers

Building Footprints

Property Name

Tax Parcels Alternate Key

Tax Parcels

County Boundary

Surrounding Counties

Water Bodies

Lake Mack Flood Plain

Letter of Map Amendment

Letter of Map Revision

Elevation Certificates

Lake County Property Appraiser
Lake BCC

National Flood Hazard Layer FIRMette

FEMA



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR F UT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN — Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 — Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- 513 — Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 11/6/2018 at 11:23:16 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community ide FIRM panel number, and FIRM effective date. Map in unmapped and unmodernized areas cannot be used regulatory purposes.

Section 2 Drainage Calculations

Pre-Development

Appendix 6

PRE-DEVELOPMENT

A. Curve Number Calculation

B. Time of Concentration Calculation

C. Pre Basin Map

Whispering Hills
Pre-Development

Basin Pre-1

CURVE NUMBER	Soil Type	Area (AC)	% Land Used	Area Totals	% Area	C.N.	% Area x C.N.
Impervious							
Woods-Grass, Fair	A	0.00	0%	0.00	0%	98	0.00
Pervious							
Woods-Grass, Fair	A	57.28	100%	51.97	94%	39	36.73
Impervious							
Woods-Grass, Fair	B/D	0.00	0%	0.00	0%	98	0.00
Pervious							
Woods-Grass, Fair	B/D	3.21	100%	3.21	6%	72	4.19
			Total Area =	55.18		**CN**	**40.92**

Pre Time of Concentration (Tc)

Note: 1. See sheet 3 for TR-55 data used in these calculations.

Sheet Flow travel time calculator							Shallow Concetrated flow travel time calculator					Channel flow travel time calculator								
Basin #	Surface Desc.	Manning's n	Flow Length, ft.	2yr/24h rainfall **p2**	Land slope, **s**, ft./ft.	**Sheet Flow, min**	Surface Desc.(please enter **"paved"** or **"unpaved"**)	Flow Length, ft.	Water course slope, **s**, ft./ft.	Avg. V, fps	**Shallow Conc Flow, min**	Flow x-sec A, sf	Wetted Per. Ft.	Hyd rad, ft	Channel Slope, **s**, ft./ft.	Manning's n	Flow Length, ft	Avg V, fps	**Channel Flow, min.**	**Total Tc. Min.**
Pre-1	tree farm	0.50	300	4.5	0.022	**50.46**	unpaved	2200	0.040	3.23	**11.36**	3.14	6.28	0.5	0.002	0.013	0	3.23	**0.00**	**61.8**



PROJECT NO.\FILE NAME: Whispering	DSGN: GLS	SCALE 0 500'	**Whispering Hills**
DATE: June 07	DRWN: GLS	1 in = 500 ft.	Howey-In-The-Hills, Florida SEC.36, TWNSHP 20S, R 25E
	CHKD: GLS		
SHEET NO. 1 of 1	1		

Pre-Development Basin Map

Denham Summitt
Engineering, LLC.
3667 Simonton Place, Lake Mary, FL 32746
Ph. 407-323-0705, Fx. 407-264-6901

Appendix 7

PRE-DEVELOPMENT

A. ICPR Input Report

B. ICPR Basin Summary

Basins

Name: Pre-1 | Node: LKHarris | Status: Onsite
Group: Pre | Type: SCS Unit Hydrograph

Unit Hydrograph:	Uh484	Peaking Factor:	484.0
Rainfall File:	Flmod	Storm Duration(hrs):	24.00
Rainfall Amount(in):	8.600	Time of Conc(min):	61.80
Area(ac):	55.180	Time Shift(hrs):	0.00
Curve Number:	40.92	Max Allowable Q(cfs):	999999.000
DCIA(%):	0.00		

Nodes

Name: LKHarris | Base Flow(cfs): 0.000 | Init Stage(ft): 63.000
Group: BASE | Warn Stage(ft): 66.000
Type: Time/Stage

Time(hrs)	Stage(ft)
0.00	63.000
12.00	63.500
36.00	63.900
120.00	63.500

Pipes

Name: | From Node: | Length(ft): 0.00
Group: BASE | To Node: | Count: 1
Friction Equation: Average Conveyance
Solution Algorithm: Automatic
Flow: Both
Entrance Loss Coef: 0.00
Exit Loss Coef: 0.00
Bend Loss Coef: 0.00
Outlet Ctrl Spec: Use dc or tw
Inlet Ctrl Spec: Use dn
Stabilizer Option: None

	UPSTREAM	DOWNSTREAM
Geometry:	Circular	Circular
Span(in):	0.00	0.00
Rise(in):	0.00	0.00
Invert(ft):	0.000	0.000
Manning's N:	0.000000	0.000000
Top Clip(in):	0.000	0.000
Bot Clip(in):	0.000	0.000

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

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

Channels

Name: | From Node: | Length(ft): 0.00
Group: BASE | To Node: | Count: 1
Friction Equation: Average Conveyance
Solution Algorithm: Automatic
Flow: Both
Contraction Coef: 0.000
Expansion Coef: 0.000
Entrance Loss Coef: 0.000
Exit Loss Coef: 0.000
Outlet Ctrl Spec: Use dc or tw
Inlet Ctrl Spec: Use dn
Stabilizer Option: None

	UPSTREAM	DOWNSTREAM
Geometry:	Trapezoidal	Trapezoidal
Invert(ft):	0.000	0.000
TClpInitZ(ft):	9999.000	9999.000
Manning's N:	0.000000	0.000000
Top Clip(ft):	0.000	0.000
Bot Clip(ft):	0.000	0.000
Main XSec:		
AuxElev1(ft):		
Aux XSec1:		
AuxElev2(ft):		
Aux XSec2:		
Top Width(ft):		
Depth(ft):		
Bot Width(ft):	0.000	0.000
LtSdSlp(h/v):	0.00	0.00
RtSdSlp(h/v):	0.00	0.00

==== Drop Structures ==========

```
        Name:                       From Node:                    Length(ft): 0.00
       Group: BASE                    To Node:                         Count: 1

              UPSTREAM       DOWNSTREAM                Friction Equation: Average Conveyance
    Geometry: Circular       Circular                 Solution Algorithm: Automatic
    Span(in): 0.00           0.00                                   Flow: Both
    Rise(in): 0.00           0.00                  Entrance Loss Coef: 0.000
  Invert(ft): 0.000          0.000                     Exit Loss Coef: 0.000
 Manning's N: 0.000000       0.000000                Outlet Ctrl Spec: Use dc or tw
Top Clip(in): 0.000          0.000                    Inlet Ctrl Spec: Use dn
Bot Clip(in): 0.000          0.000                      Solution Incs: 10

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

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

==== Weirs ==========

```
        Name: Weir2              From Node: Swale2
       Group: BASE                 To Node: LKHarris
        Flow: Both                   Count: 1
        Type: Vertical: Fread     Geometry: Trapezoidal

           Bottom Width(ft): 160.00
      Left Side Slope(h/v): 10.00
     Right Side Slope(h/v): 10.00
                Invert(ft): 141.000
    Control Elevation(ft): 141.000
   Struct Opening Dim(ft): 9999.00
                                      TABLE
         Bottom Clip(ft): 0.000
            Top Clip(ft): 0.000
      Weir Discharge Coef: 3.200
   Orifice Discharge Coef: 0.600
```

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

```
        Name: 100yr24hr
    Filename: D:\Whispering Hills\ICPR\100yr24hr.R32

     Override Defaults: Yes
   Storm Duration(hrs): 24.00
         Rainfall File: Flmod
   Rainfall Amount(in): 10.60

Time(hrs)       Print Inc(min)
--------------- ---------------
24.000          15.00

-------------------------------------------------------------------------------------------------
        Name: 10yr24hr
    Filename: D:\Whispering Hills\ICPR\10yr24hr.R32

     Override Defaults: Yes
   Storm Duration(hrs): 24.00
         Rainfall File: Flmod
   Rainfall Amount(in): 7.40

Time(hrs)       Print Inc(min)
--------------- ---------------
24.000          15.00

-------------------------------------------------------------------------------------------------
        Name: 25yr24hr
    Filename: D:\Whispering Hills\ICPR\25yr24hr.R32

     Override Defaults: No

Time(hrs)       Print Inc(min)
--------------- ---------------
24.000          15.00

-------------------------------------------------------------------------------------------------
        Name: 25yr96hr
```

```
     Filename: D:\Whispering Hills\ICPR\25yr96hr.R32

      Override Defaults: Yes
    Storm Duration(hrs): 96.00
          Rainfall File: Sjrwmd96
    Rainfall Amount(in): 11.20

Time(hrs)       Print Inc(min)
--------------- ---------------
96.000          15.00

-------------------------------------------------------------------------------------------
         Name: mean annual
     Filename: D:\Whispering Hills\ICPR\mean annual.R32

      Override Defaults: Yes
    Storm Duration(hrs): 24.00
          Rainfall File: Flmod
    Rainfall Amount(in): 4.50

Time(hrs)       Print Inc(min)
--------------- ---------------
24.000          15.00

===========================================================================================
==== Routing Simulations ==================================================================
===========================================================================================

         Name: l00yr24hr           Hydrology Sim: l00yr24hr
     Filename: D:\Whispering Hills\ICPR\l00yr24hr.I32

      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 0.000
        Start Time(hrs): 0.000                    End Time(hrs): 30.00
     Min Calc Time(sec): 0.1000              Max Calc Time(sec): 150.0000
        Boundary Stages:                         Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
30.000          5.000

Group           Run
--------------- -----
BASE            Yes
Post            Yes
Pre             Yes


-------------------------------------------------------------------------------------------
         Name: l0yr24hr            Hydrology Sim: l0yr24hr
     Filename: D:\Whispering Hills\ICPR\l0yr24hr.I32

      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 0.000
        Start Time(hrs): 0.000                    End Time(hrs): 30.00
     Min Calc Time(sec): 0.1000              Max Calc Time(sec): 150.0000
        Boundary Stages:                         Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
30.000          5.000

Group           Run
--------------- -----
BASE            Yes
Post            Yes
Pre             Yes


-------------------------------------------------------------------------------------------
         Name: 25yr24hr            Hydrology Sim: 25yr24hr
     Filename: D:\Whispering Hills\ICPR\25yr24hr.I32

      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 0.000
```

Start Time(hrs): 0.000 End Time(hrs): 30.00
Min Calc Time(sec): 0.1000 Max Calc Time(sec): 150.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
30.000	5.000

Group	Run
BASE	Yes
Post	Yes
Pre	Yes

Name: 25yr96hr Hydrology Sim: 25yr96hr
Filename: D:\Whispering Hills\ICPR\25yr96hr.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 0.000
Start Time(hrs): 0.000 End Time(hrs): 120.00
Min Calc Time(sec): 0.1000 Max Calc Time(sec): 150.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
120.000	5.000

Group	Run
BASE	Yes
Post	Yes
Pre	Yes

Name: mean annual Hydrology Sim: mean annual
Filename: D:\Whispering Hills\ICPR\mean annual.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 0.000
Start Time(hrs): 0.000 End Time(hrs): 30.00
Min Calc Time(sec): 0.1000 Max Calc Time(sec): 150.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
30.000	5.000

Group	Run
BASE	Yes
Post	Yes
Pre	Yes

Boundary Conditions

Whispering Hills Pre Basin Summary

```
            Basin Name: Pre-1
            Group Name: Pre
            Simulation: 100yr24hr
             Node Name: LKHarris
            Basin Type: SCS Unit Hydrograph

        Unit Hydrograph: Uh484
          Peaking Fator: 484.0
   Spec Time Inc (min): 8.24
   Comp Time Inc (min): 8.24
         Rainfall File: Flmod
  Rainfall Amount (in): 10.600
  Storm Duration (hrs): 24.00
                Status: Onsite
    Time of Conc (min): 61.80
      Time Shift (hrs): 0.00
              Area (ac): 55.180
  Vol of Unit Hyd (in): 1.000
          Curve Number: 40.920
              DCIA (%): 0.000

        Time Max (hrs): 12.63
        Flow Max (cfs): 58.559
    Runoff Volume (in): 2.675
   Runoff Volume (ft3): 535894.016


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

            Basin Name: Pre-1
            Group Name: Pre
            Simulation: 10yr24hr
             Node Name: LKHarris
            Basin Type: SCS Unit Hydrograph

        Unit Hydrograph: Uh484
          Peaking Fator: 484.0
   Spec Time Inc (min): 8.24
   Comp Time Inc (min): 8.24
         Rainfall File: Flmod
  Rainfall Amount (in): 7.400
  Storm Duration (hrs): 24.00
                Status: Onsite
    Time of Conc (min): 61.80
      Time Shift (hrs): 0.00
              Area (ac): 55.180
  Vol of Unit Hyd (in): 1.000
          Curve Number: 40.920
              DCIA (%): 0.000

        Time Max (hrs): 12.77
        Flow Max (cfs): 18.782
    Runoff Volume (in): 1.070
   Runoff Volume (ft3): 214288.008


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

            Basin Name: Pre-1
            Group Name: Pre
            Simulation: 25yr24hr
             Node Name: LKHarris
            Basin Type: SCS Unit Hydrograph

        Unit Hydrograph: Uh484
          Peaking Fator: 484.0
   Spec Time Inc (min): 8.24
   Comp Time Inc (min): 8.24
         Rainfall File: Flmod
  Rainfall Amount (in): 8.600
  Storm Duration (hrs): 24.00
                Status: Onsite
    Time of Conc (min): 61.80
      Time Shift (hrs): 0.00
              Area (ac): 55.180
  Vol of Unit Hyd (in): 1.000
          Curve Number: 40.920
              DCIA (%): 0.000

        Time Max (hrs): 12.77
        Flow Max (cfs): 31.558
    Runoff Volume (in): 1.613
   Runoff Volume (ft3): 323067.152


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

            Basin Name: Pre-1
```

```
            Group Name: Pre
            Simulation: 25yr96hr
             Node Name: LKHarris
            Basin Type: SCS Unit Hydrograph

       Unit Hydrograph: Uh484
         Peaking Fator: 484.0
  Spec Time Inc (min): 8.24
  Comp Time Inc (min): 8.24
        Rainfall File: Sjrwmd96
Rainfall Amount (in): 11.200
Storm Duration (hrs): 96.00
              Status: Onsite
  Time of Conc (min): 61.80
    Time Shift (hrs): 0.00
           Area (ac): 55.180
Vol of Unit Hyd (in): 1.000
        Curve Number: 40.920
            DCIA (%): 0.000

      Time Max (hrs): 60.43
      Flow Max (cfs): 58.821
  Runoff Volume (in): 3.033
 Runoff Volume (ft3): 607506.272


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

            Basin Name: Pre-1
            Group Name: Pre
            Simulation: mean annual
             Node Name: LKHarris
            Basin Type: SCS Unit Hydrograph

       Unit Hydrograph: Uh484
         Peaking Fator: 484.0
  Spec Time Inc (min): 8.24
  Comp Time Inc (min): 8.24
        Rainfall File: Flmod
Rainfall Amount (in): 4.500
Storm Duration (hrs): 24.00
              Status: Onsite
  Time of Conc (min): 61.80
    Time Shift (hrs): 0.00
           Area (ac): 55.180
Vol of Unit Hyd (in): 1.000
        Curve Number: 40.920
            DCIA (%): 0.000

      Time Max (hrs): 14.01
      Flow Max (cfs): 1.025
  Runoff Volume (in): 0.161
 Runoff Volume (ft3): 32223.132
```

Section 2 Drainage Calculations

Post-Development

Basin & Impervious Areas

Project: Whispering Hills
Date: 2/17/2022

Basin Label	Areas (sf)	Area (Ac)
Post-1	2,160,893	49.61
Post-2	256,300	5.88
Total	2,417,193	55.49

Basin Post-1 Impervious Areas		
Lots (31.95 Ac @ 50%)	15.98	Ac
Pond Impervious	6.72	Ac
Sidewalks (15,333 lf @ 5')	1.76	Ac
Roadway (9,592 lf @ 24')	5.28	Ac
Tract "E"	0.33	Ac
Total Impervious	30.07	Ac
percent Impervious	61%	

.

Basin Post-2 Impervious Areas		
Lots (5.88 Ac @ 50%)	2.94	Ac
percent Impervious	50%	

Curve Number Calculations

Project: Whispering Hills
Date: 2/17/2022

Basin Post-1

Description	HGS Type	Area (Ac)	% Land Use	Areas Total (Ac)	Cn	CN*Area
Pond (imp)	A	48.79	12%	5.90	100	590.37
Residential (imp)	A	48.79	47%	22.93	98	2247.14
Residential (perv)	A	48.79	41%	19.95	39	778.19
Pond (imp)	B/D	0.82	100%	0.82	100	82.00
Residential (imp)	B/D	0.82	0%	0.00	98	0.00
Residential (perv)	B/D	0.82	0%	0.00	72	0.00
				Weighted Cn		74.54

Basin Post-2

Description	HGS Type	Area (Ac)	% Land Use	Areas Total (Ac)	Cn	CN*Area
Pond (imp)	A	5.75	0%	0.00	100	0.00
Residential (imp)	A	5.75	50%	2.88	98	281.94
Residential (perv)	A	5.75	50%	2.88	39	112.20
Pond (imp)	B/D	0.13	0%	0.00	100	0.00
Residential (imp)	B/D	0.13	50%	0.07	98	6.37
Residential (perv)	B/D	0.13	50%	0.07	72	4.68
				Weighted Cn		68.86

Time of Concentration

Project: Whispering Hills
Date: 2/17/2022

Basin	Sheet Flow Slope Ft/Ft	Sheet Flow Length (ft)	Man "n"	Sheet Flow Time (min)	Shall Conc Flow Slope (ft/ft)	Shall Conc Flow Length (ft)	P or U	Velocity (fps)	Shallow Conc Flow Time (min)	Pipe Flow (ft)	Pipe Flow Time (min)	Tc (min)
Post-1	0.0026	188	0.25	31.5	0.0072	276	P	8.21	0.6	1794	4.85	37
Post-2	0.07	300	0.25	15.5	0.074	109	U	0.73	2.5	0	0	18

Kinematic Wave Equation (Sheet Flow), Shallow Conc. Flow & Pipe Flow (SCS TR-55):

t = 0.93*L^0.6*n^0.6/I^0.4*s^0.3 + L/60*V + L/60*V

t = overland flow travel time (minutes)
L = overland flow length (ft.)
n = mannings roughness coefficient
I = rainfall intensity (4.50 in./hr.)
s = average slope (ft./ft.)
V = average velocity = 16.1345*(s)^0.5 (ft./sec.)
60=conversion factor from seconds to minutes

Pollution Abatement Volumes

Project: Whispering Hills
Date: 2/17/2022

Basin Post-1

Pollution abatement volume is based on dry detention with recovery through re-use

Use the larger of the two options

Option 1 (2.5"ximpervious area)	6.27 Ac/ft
Option 2 (0.5" x Basin Area)	2.07 Ac/ft

Use Storage required	**6.27 ac-ft required Storage**
Storage provided	9.33 Ac-ft

Basin Post-2

Pollution abatement volume is based on on-line dry retention

Use the larger of the two options

Option 1 (1.25"ximp area + 0.5" x Basin Area)	0.55 Ac/ft
Option 2 (0.5" x Basin Area + 0.5" x Basin Area)	0.49 Ac/ft

Use 0.55 ac-ft required Storage

Pond 1 - Calculations

Project: Whispering Hills
Date: 2/17/2022

Stage Storage Above Control Elevation

Elev (NAVD)	Area (Ac)	Volume (Ac-ft)	Description
70.00	6.72	30.95	Top Bank
69.00	6.51	24.33	
68.00	6.29	17.93	
67.00	6.08	11.74	
66.60	6.00	9.33	PAV
66.00	5.87	5.77	
65.00	5.66	0.00	Control Elevation

Stage Storage Below Control Elevation

Elev (NAVD)	Area (Ac)	Volume (Ac-ft)	Description
65.00	5.66	35.96	Control Elevation
64.00	5.46	30.40	
63.00	5.26	25.04	Grade Change
62.00	5.16	19.83	
61.00	5.06	14.73	
60.00	4.96	9.72	
59.00	4.86	4.81	
58.00	4.76	0.00	Bottom

Modified Permenant Pool Calcs

Project: Whispering Hills
Date: 2/17/2022

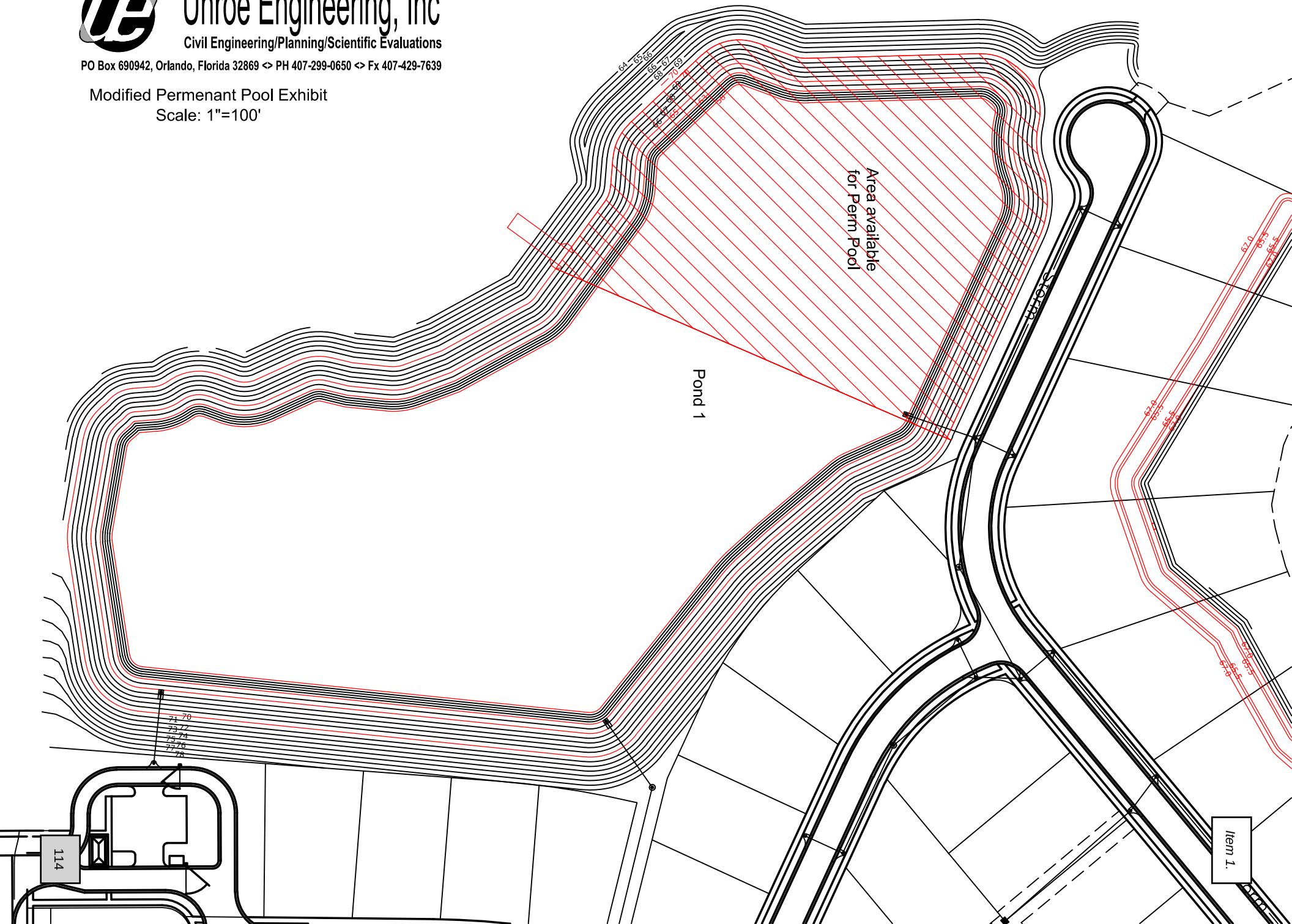
Stage Storage Below Control Elevation			
Elev (NAVD)	Area (Ac)	Volume (Ac-ft)	Description
65.00	1.78	11.19	Control Elevation
64.00	1.71	9.44	
63.00	1.64	7.77	Grade Change
62.00	1.61	6.15	
61.00	1.57	4.56	
60.00	1.54	3.01	
59.00	1.50	1.49	
58.00	1.47	0.00	Bottom

Wet Detention Pond Calculations

Wet Season Rainfall Depth	31	in
Required Residence Time	21	days
Required Permanent Pool	9.50	Ac-ft
Povided Permanent Pool	11.19	Ac-ft {OK}
Total Depth of Pond	12.00	ft (Less than or equal to 12 ft - {OK})
Mean Depth of Pond	6.28	ft (between 2 and 8 ft - {OK})

Unroe Engineering, Inc
Civil Engineering/Planning/Scientific Evaluations
PO Box 690942, Orlando, Florida 32869 <> PH 407-299-0650 <> Fx 407-429-7639

Modified Permenant Pool Exhibit
Scale: 1"=100'



Swale1- Calculations

Project: Whispering Hills
Date: 2/17/2022

Stage Storage

Elev (NAVD)	Area (Ac)	Volume (Ac-ft)	Description
67.00	0.35	0.39	Top Bank
66.30	0.26	0.17	PAV
66.00	0.23	0.10	
65.50	0.17	0.00	Bottom

Swale 1 Recovery Calculations

Project: Whispering Hills Subdivision
Date: February 18, 2022

Input Data

Fillable Porosity	0.20	
Unsaturated vertical hydraulic conductivity	10.00	ft/day
Saturated horizontal hydraulic conductivity	6.70	ft/day
Factor of safety	2.00	
Seasonal High Water Level	62.30	NGVD
Impervious Layer	55.00	NGVD
Average width of basin	24.00	ft
Recovered Volume	7,563	cf

Output

Stage One Flow

Design infiltration rate	5.00	ft/day
Stage One Flow Volume	0.11	ac-ft
Time to Saturate the basin	3.07	hours

Stage Two Flow

Saturated Lateral flow can be modelled using the modified MODRET method.
This method makes use of dimensionless curves with parameters Fx and Fy.

Fy is calculated to be	0.92	
This Corresponds to an Fx of	4.26	
Basin Width	24.00	
D	8.90	
The time required for stage two flow	6.39	hours
Total Recovery Time (Sum of Stage One & Stage Two)	**9.46**	**hours**

Swale2- Calculations

Project: Whispering Hills
Date: 2/17/2022

Stage Storage

Elev (NAVD)	Area (Ac)	Volume (Ac-ft)	Description
67.50	0.14	0.15	Top Bank
66.80	0.10	0.07	PAV
67.00	0.11	0.09	
66.00	0.07	0.00	Bottom

Swale 2 Recovery Calculations

Project: Whispering Hills Subdivision
Date: February 18, 2022

Input Data

Fillable Porosity	0.20	
Unsaturated vertical hydraulic conductivity	10.00	ft/day
Saturated horizontal hydraulic conductivity	6.70	ft/day
Factor of safety	2.00	
Seasonal High Water Level	63.30	NGVD
Impervious Layer	56.00	NGVD
Average width of basin	24.00	ft
Recovered Volume	2,976	cf

Output

Stage One Flow

Design infiltration rate	5.00	ft/day
Stage One Flow Volume	0.04	ac-ft
Time to Saturate the basin	2.59	hours

Stage Two Flow

Saturated Lateral flow can be modelled using the modified MODRET method. This method makes use of dimensionless curves with parameters Fx and Fy.

Fy is calculated to be	0.89	
This Corresponds to an Fx of	3.91	
Basin Width	24.00	
D	8.65	
The time required for stage two flow	7.81	hours
Total Recovery Time (Sum of Stage One & Stage Two)	**10.40**	**hours**

Swale3- Calculations

Project: Whispering Hills
Date: 2/17/2022

Stage Storage

Elev (NAVD)	Area (Ac)	Volume (Ac-ft)	Description
68.00	0.41	0.45	Top Bank
67.30	0.31	0.20	PAV
67.00	0.27	0.12	
66.50	0.20	0.00	Bottom

Swale 3 Recovery Calculations

Project: Whispering Hills Subdivision
Date: February 18, 2022

Input Data

Fillable Porosity	0.20	
Unsaturated vertical hydraulic conductivity	10.00	ft/day
Saturated horizontal hydraulic conductivity	6.70	ft/day
Factor of safety	2.00	
Seasonal High Water Level	64.80	NGVD
Impervious Layer	57.50	NGVD
Average width of basin	24.00	ft
Recovered Volume	8,863	cf

Output

Stage One Flow

Design infiltration rate	5.00	ft/day
Stage One Flow Volume	0.07	ac-ft
Time to Saturate the basin	1.63	hours

Stage Two Flow

Saturated Lateral flow can be modelled using the modified MODRET method.
This method makes use of dimensionless curves with parameters Fx and Fy.

Fy is calculated to be	0.78
This Corresponds to an Fx of	1.85
Basin Width	24.00
D	8.15
The time required for stage two flow	37.16 hours
Total Recovery Time (Sum of Stage One & Stage Two)	**38.80 hours**

Swale4- Calculations

Project: Whispering Hills
Date: 2/17/2022

Stage Storage

Elev (NAVD)	Area (Ac)	Volume (Ac-ft)	Description
67.00	0.21	0.23	Top Bank
66.30	0.16	0.10	PAV
66.00	0.13	0.06	
65.50	0.10	0.00	Bottom

Swale 4 Recovery Calculations

Project: Whispering Hills Subdivision
Date: February 18, 2022

Input Data

Fillable Porosity	0.20	
Unsaturated vertical hydraulic conductivity	10.00	ft/day
Saturated horizontal hydraulic conductivity	6.70	ft/day
Factor of safety	2.00	
Seasonal High Water Level	62.80	NGVD
Impervious Layer	55.50	NGVD
Average width of basin	24.00	ft
Recovered Volume	4,459	cf

Output

Stage One Flow

Design infiltration rate	5.00	ft/day
Stage One Flow Volume	0.05	ac-ft
Time to Saturate the basin	2.59	hours

Stage Two Flow

Saturated Lateral flow can be modelled using the modified MODRET method. This method makes use of dimensionless curves with parameters Fx and Fy.

Fy is calculated to be	0.88	
This Corresponds to an Fx of	3.31	
Basin Width	24.00	
D	8.65	
The time required for stage two flow	10.89	hours
Total Recovery Time (Sum of Stage One & Stage Two)	**13.48**	**hours**

Simple Basin: Post-1

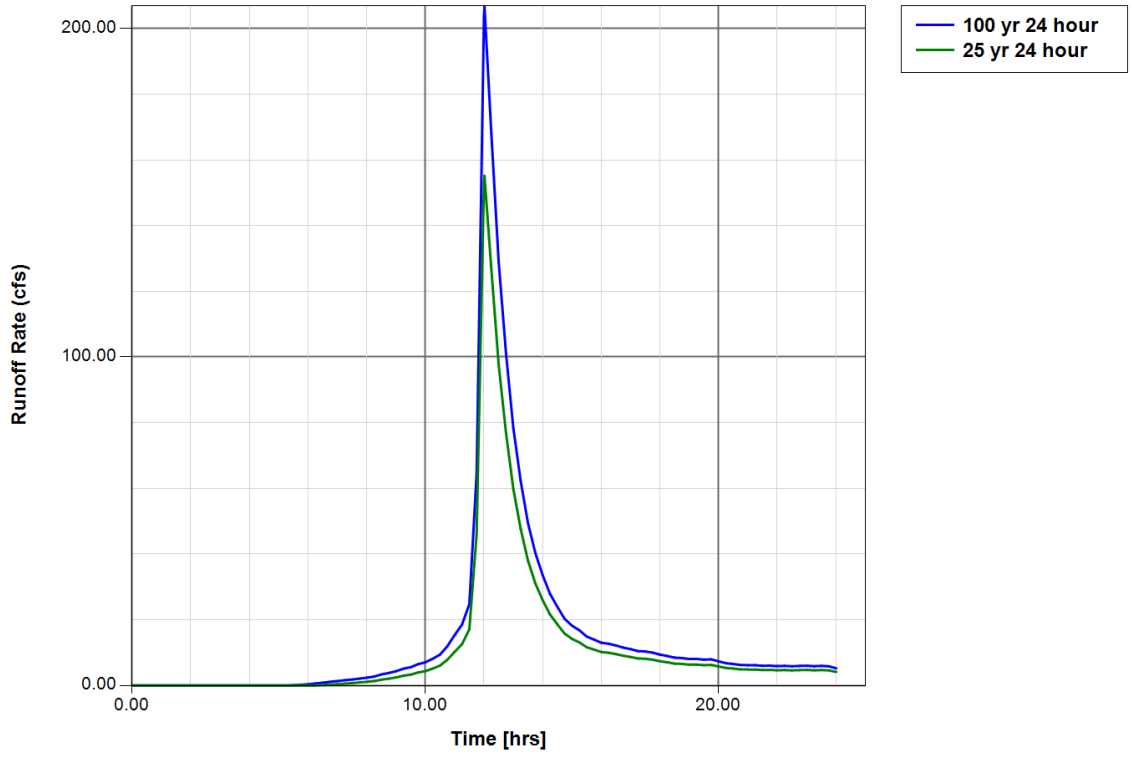
Scenario:	Scenario1
Node:	Pond1
Hydrograph Method:	Santa Barbara Urban Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	37.0000 min
Max Allowable Q:	9999.00 cfs
Time Shift:	0.0000 hr
Area:	49.6100 ac
Curve Number:	74.5
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

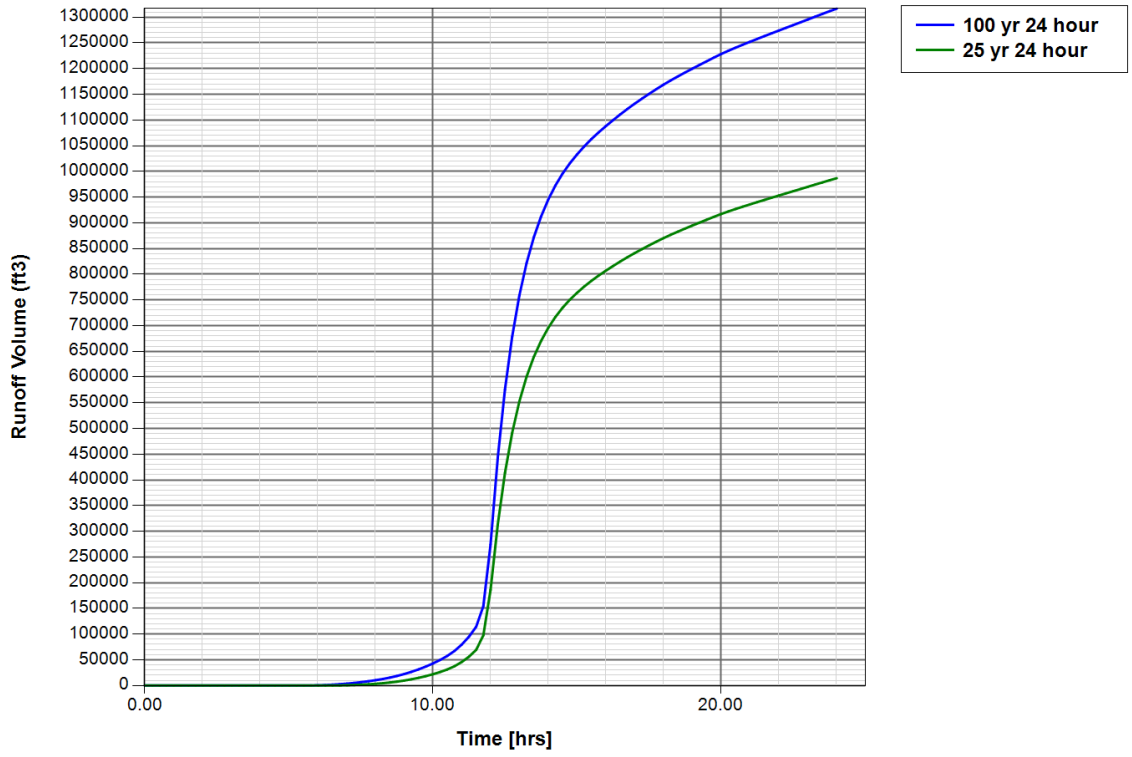
Simple Basin Runoff Summary [Scenario1]

Basin Name	Sim Name	Max Flow [cfs]	Time to Max Flow [hrs]	Total Rainfall [in]	Total Runoff [in]	Area [ac]	Equivalent Curve Number	% Imperv	% DCIA
Post-1	100 yr 24 hour	206.67	12.0167	10.60	7.31	49.6100	74.5	0.00	0.00
Post-1	25 yr 24 hour	155.17	12.0167	8.60	5.48	49.6100	74.5	0.00	0.00

Simple Basin Runoff Rate: Post-1 [Scenario1]



Simple Basin Runoff Volume: Post-1



Simple Basin: Post-2

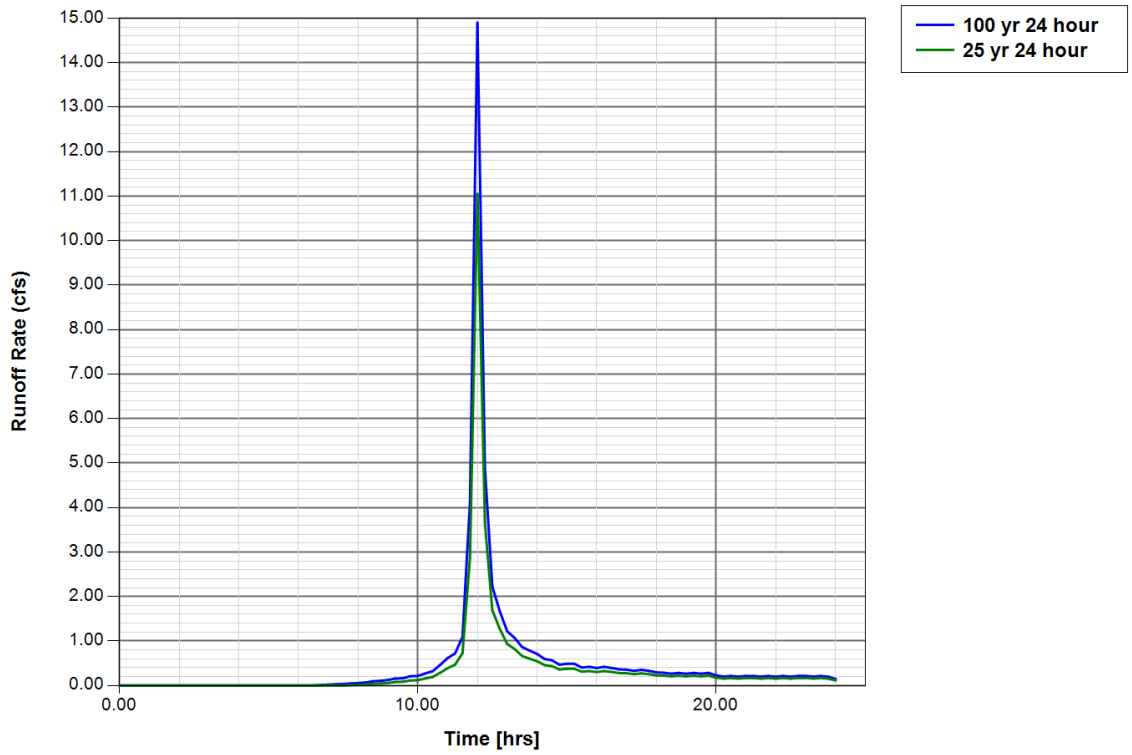
Scenario:	Scenario1
Node:	Swale1
Hydrograph Method:	Santa Barbara Urban Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	8.0000 min
Max Allowable Q:	9999.00 cfs
Time Shift:	0.0000 hr
Area:	1.8200 ac
Curve Number:	68.9
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

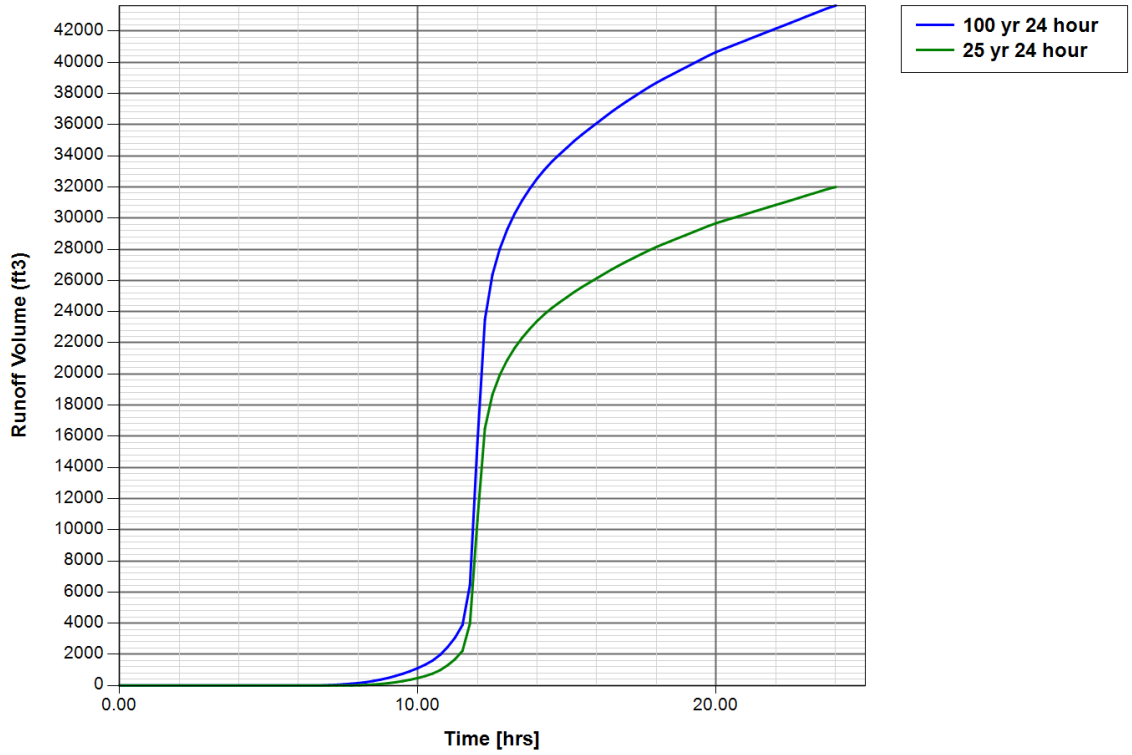
Simple Basin Runoff Summary [Scenario1]

Basin Name	Sim Name	Max Flow [cfs]	Time to Max Flow [hrs]	Total Rainfall [in]	Total Runoff [in]	Area [ac]	Equivalent Curve Number	% Imperv	% DCIA
Post-2	100 yr 24 hour	14.90	12.0000	10.60	6.61	1.8200	68.9	0.00	0.00
Post-2	25 yr 24 hour	11.05	12.0000	8.60	4.84	1.8200	68.9	0.00	0.00

Simple Basin Runoff Rate: Post-2 [Scenario1]



Simple Basin Runoff Volume: Post-2



Simple Basin: Post-3

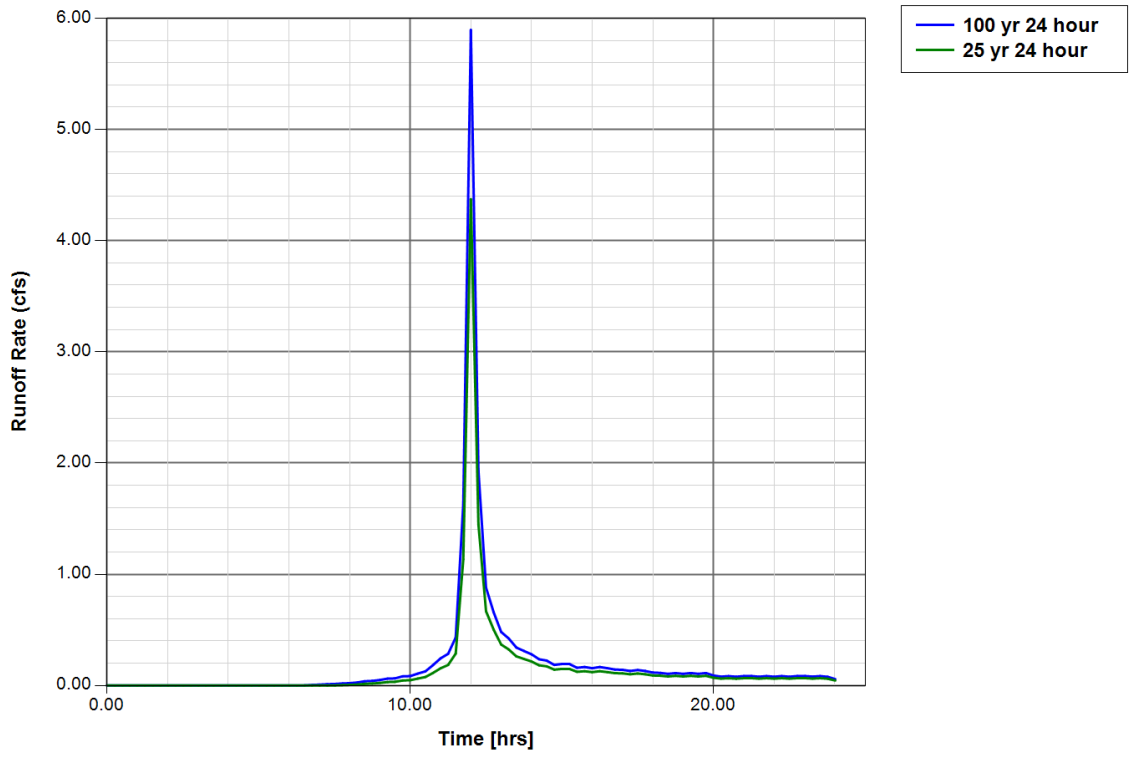
Scenario:	Scenario1
Node:	Swale2
Hydrograph Method:	Santa Barbara Urban Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	8.0000 min
Max Allowable Q:	9999.00 cfs
Time Shift:	0.0000 hr
Area:	0.7200 ac
Curve Number:	68.9
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

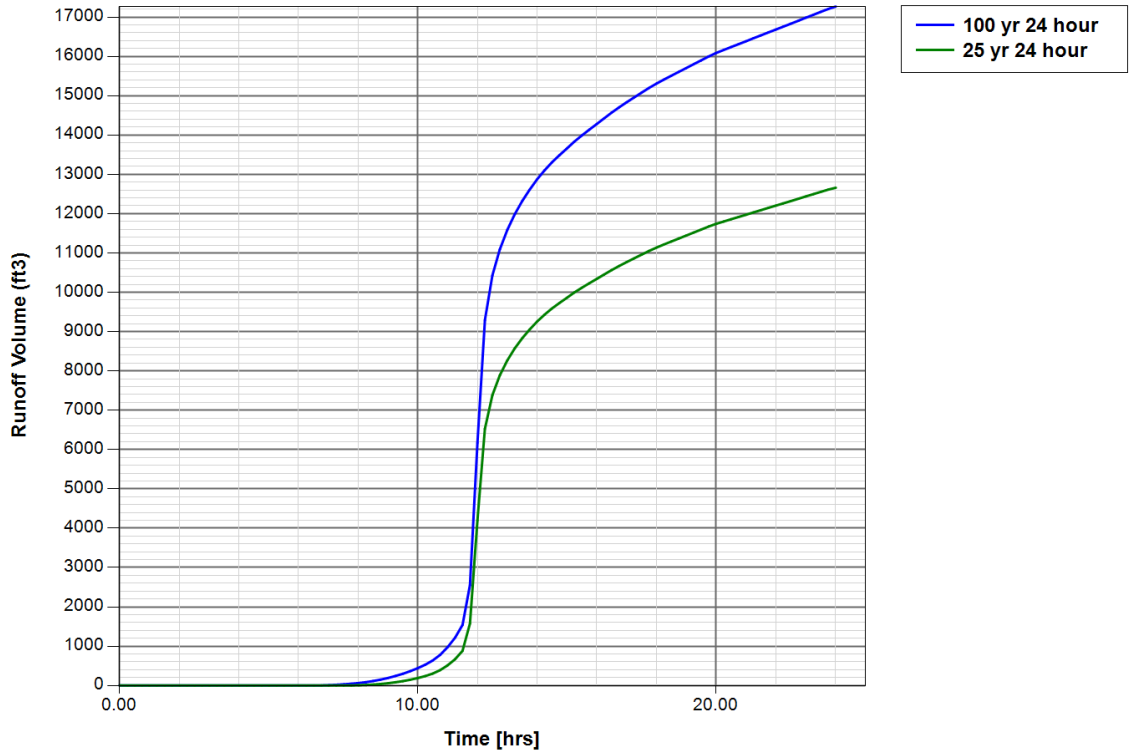
Simple Basin Runoff Summary [Scenario1]

Basin Name	Sim Name	Max Flow [cfs]	Time to Max Flow [hrs]	Total Rainfall [in]	Total Runoff [in]	Area [ac]	Equivalent Curve Number	% Imperv	% DCIA
Post-3	100 yr 24 hour	5.89	12.0000	10.60	6.61	0.7200	68.9	0.00	0.00
Post-3	25 yr 24 hour	4.37	12.0000	8.60	4.84	0.7200	68.9	0.00	0.00

Simple Basin Runoff Rate: Post-3 [Scenario1]



Simple Basin Runoff Volume: Post-3



Simple Basin: Post-4

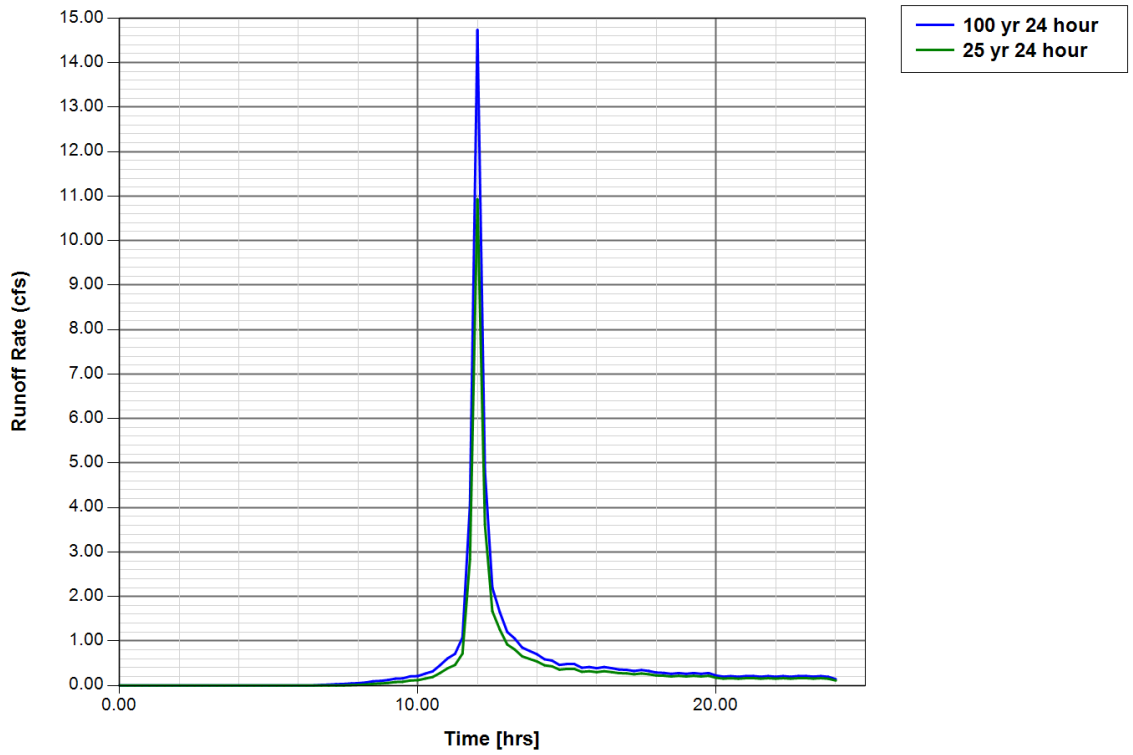
Scenario:	Scenario1
Node:	Swale3
Hydrograph Method:	Santa Barbara Urban Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	8.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Area:	1.8000 ac
Curve Number:	68.9
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

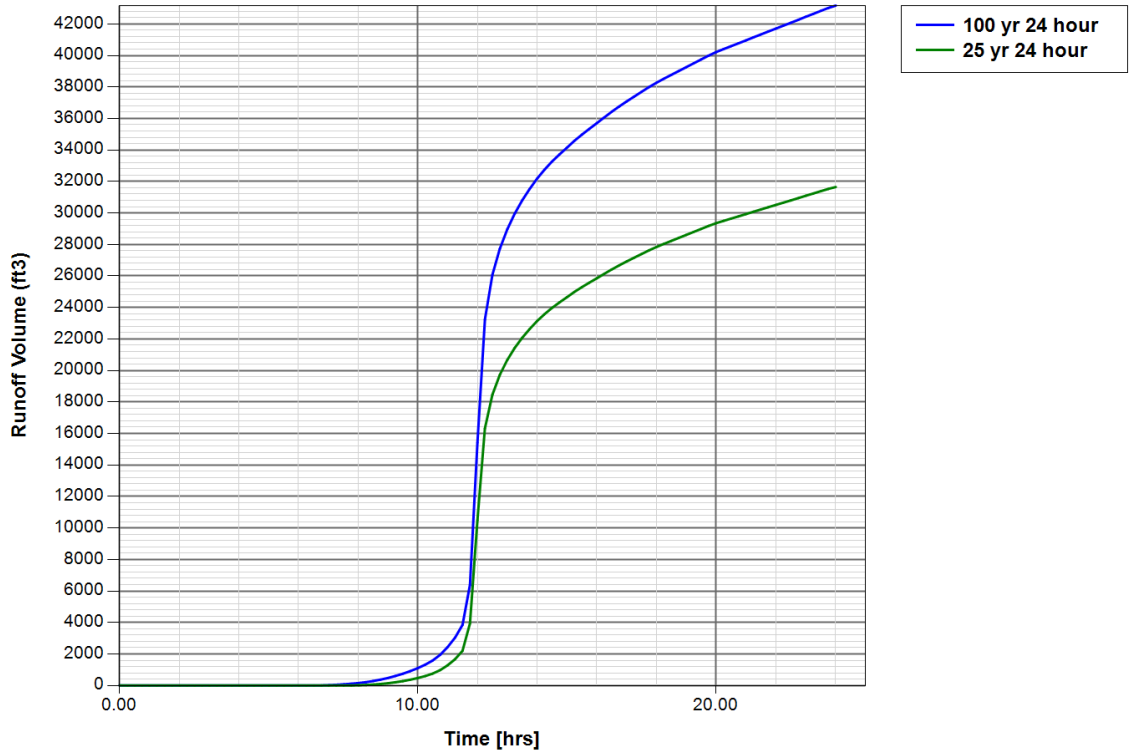
Simple Basin Runoff Summary [Scenario1]

Basin Name	Sim Name	Max Flow [cfs]	Time to Max Flow [hrs]	Total Rainfall [in]	Total Runoff [in]	Area [ac]	Equivalent Curve Number	% Imperv	% DCIA
Post-4	100 yr 24 hour	14.74	12.0000	10.60	6.61	1.8000	68.9	0.00	0.00
Post-4	25 yr 24 hour	10.93	12.0000	8.60	4.84	1.8000	68.9	0.00	0.00

Simple Basin Runoff Rate: Post-4 [Scenario1]



Simple Basin Runoff Volume: Post-4



Simple Basin: Post-5

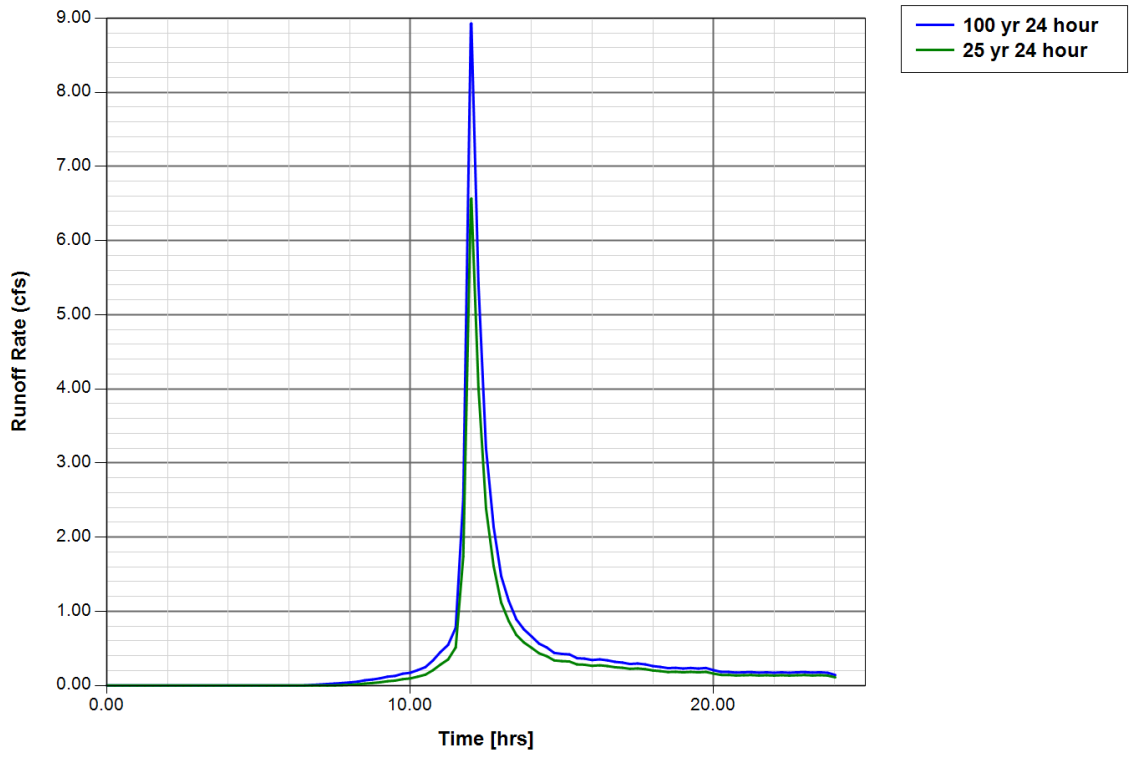
Scenario:	Scenario1
Node:	Swale4
Hydrograph Method:	Santa Barbara Urban Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	18.0000 min
Max Allowable Q:	9999.00 cfs
Time Shift:	0.0000 hr
Area:	1.5400 ac
Curve Number:	68.9
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

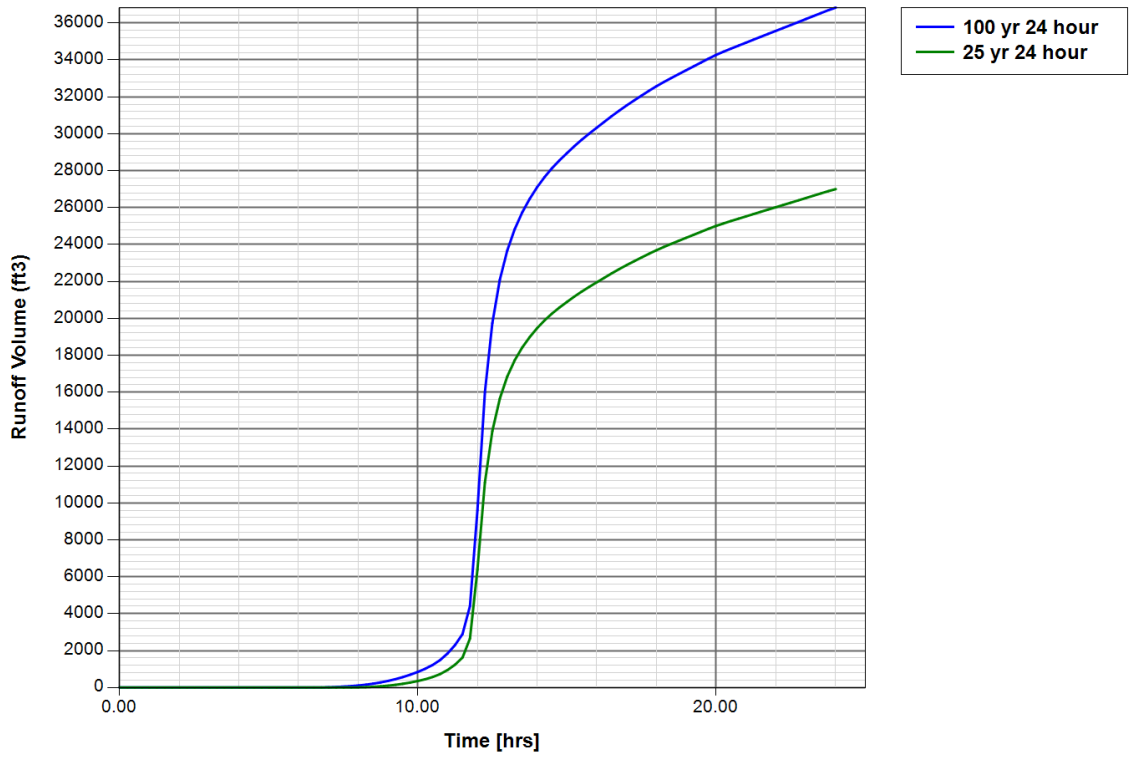
Simple Basin Runoff Summary [Scenario1]

Basin Name	Sim Name	Max Flow [cfs]	Time to Max Flow [hrs]	Total Rainfall [in]	Total Runoff [in]	Area [ac]	Equivalent Curve Number	% Imperv	% DCIA
Post-5	100 yr 24 hour	8.93	12.0167	10.60	6.59	1.5400	68.9	0.00	0.00
Post-5	25 yr 24 hour	6.57	12.0167	8.60	4.83	1.5400	68.9	0.00	0.00

Simple Basin Runoff Rate: Post-5 [Scenario1]



Simple Basin Runoff Volume: Post-5



Weir Link: Pond1 Overflow

Scenario:	Scenario1
From Node:	Pond1
To Node:	Lake Harris
Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Broad Crested Vertical
Geometry Type:	Trapezoidal
Invert:	69.75 ft
Control Elevation:	0.00 ft
Max Depth:	0.75 ft
Extrapolation Method:	Normal Projection
Bottom Width:	15.00 ft
Left Slope:	4.000 (h:v)
Right Slope:	4.000 (h:v)

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

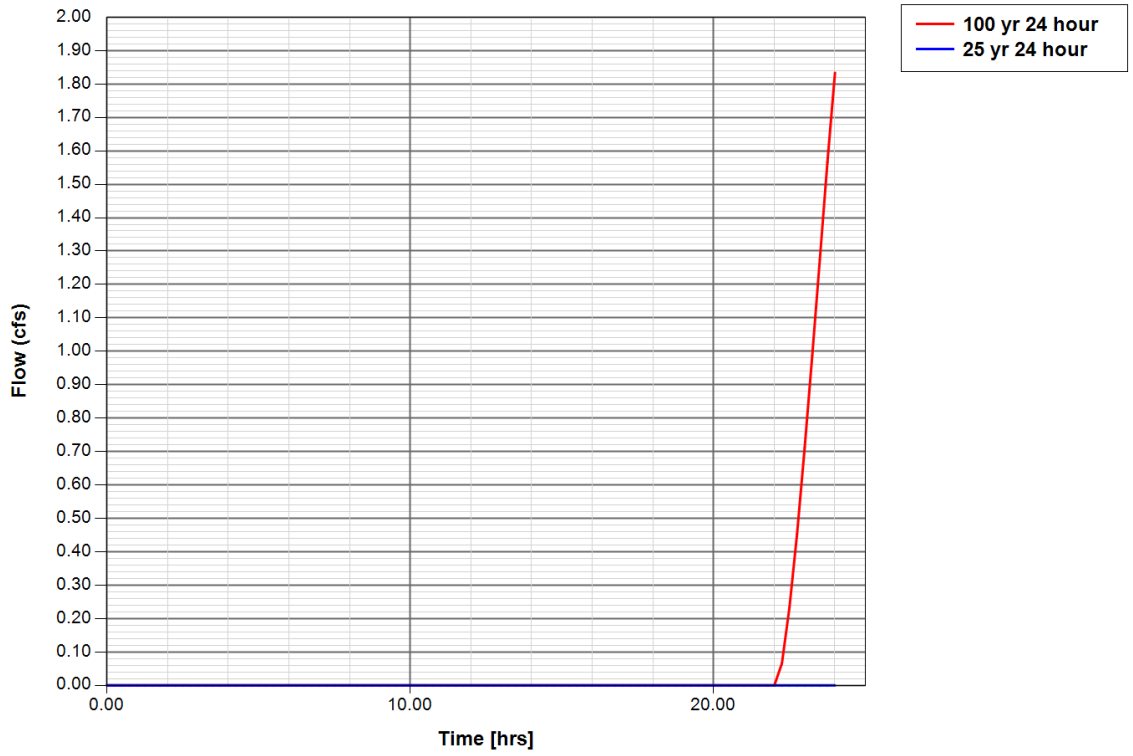
Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions with Times [Scenario1]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Time to Max Flow [hrs]	Time to Min Flow [hrs]	Time to Min/Max Delta Flow [hrs]	Time to Max Us Velocity [hrs]	Time to Max Ds Velocity [hrs]
Pond1 Overflow	100 yr 24 hour	1.83	0.00	0.01	0.97	0.97	24.0063	0.0000	23.5230	24.0063	24.0063
Pond1 Overflow	25 yr 24 hour	0.00	0.00	0.00	0.00	0.00	0.0000	0.0000	0.0000	0.0000	0.0000

Link Flow: Pond1 Overflow [Scenario1]



Weir Link: Swale1 Wier

Scenario: Scenario1
From Node: Swale1
To Node: Lake Harris

Bottom Clip
Default: 0.00 ft
Op Table:

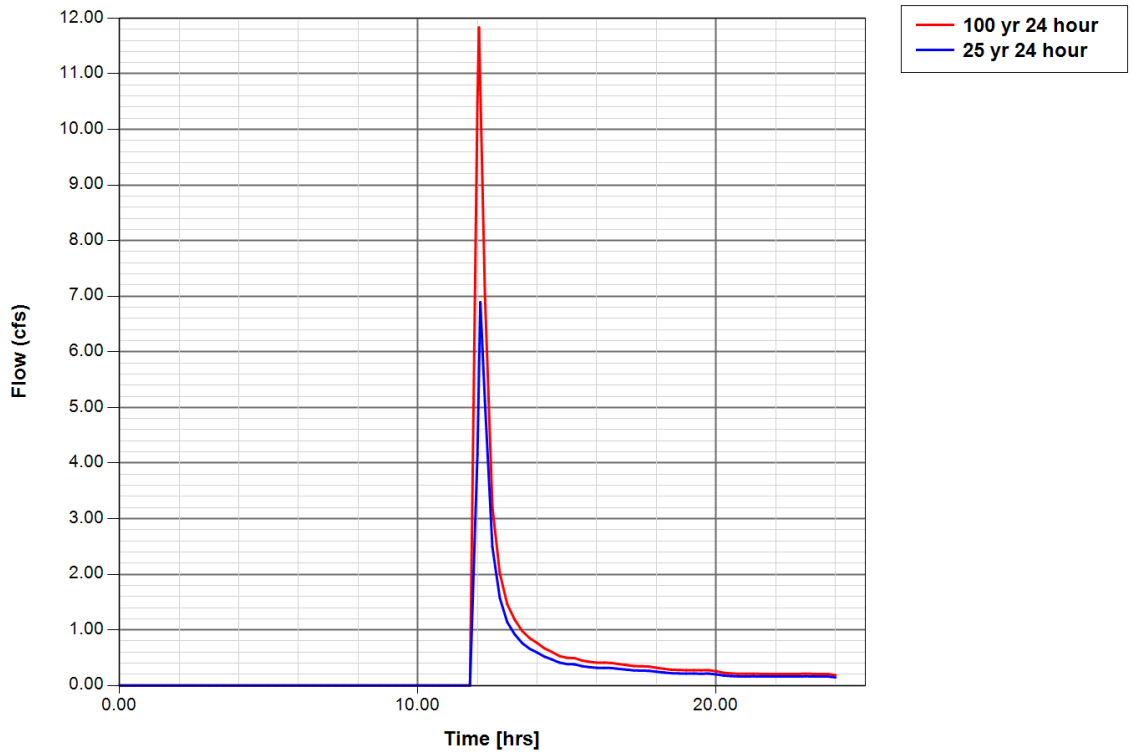
Link Count:	1		
Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Broad Crested Vertical	Default:	0.00 ft
Geometry Type:	Trapezoidal	Op Table:	
Invert:	66.30 ft	Ref Node:	
Control Elevation:	0.00 ft	Discharge Coefficients	
Max Depth:	0.75 ft	Weir Default:	2.800
Extrapolation Method:	Normal Projection	Weir Table:	
Bottom Width:	15.00 ft	Orifice Default:	0.600
Left Slope:	4.000 (h:v)	Orifice Table:	
Right Slope:	4.000 (h:v)		

Comment:

Link Min/Max Conditions with Times [Scenario1]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Time to Max Flow [hrs]	Time to Min Flow [hrs]	Time to Min/Max Delta Flow [hrs]	Time to Max Us Velocity [hrs]	Time to Max Ds Velocity [hrs]
Swale1 Wier	100 yr 24 hour	11.83	0.00	0.02	1.75	1.75	12.0504	0.0000	11.8896	12.0509	12.0509
Swale1 Wier	25 yr 24 hour	6.89	0.00	0.02	1.48	1.48	12.0963	0.0000	11.9684	12.0967	12.0967

Link Flow: Swale1 Wier [Scenario1]



Weir Link: Swale2 Wier

Scenario:	Scenario1
From Node:	Swale2
To Node:	Lake Harris
Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Broad Crested Vertical
Geometry Type:	Trapezoidal
Invert:	68.80 ft
Control Elevation:	0.00 ft
Max Depth:	0.75 ft
Extrapolation Method:	Normal Projection
Bottom Width:	15.00 ft
Left Slope:	4.000 (h:v)
Right Slope:	4.000 (h:v)

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

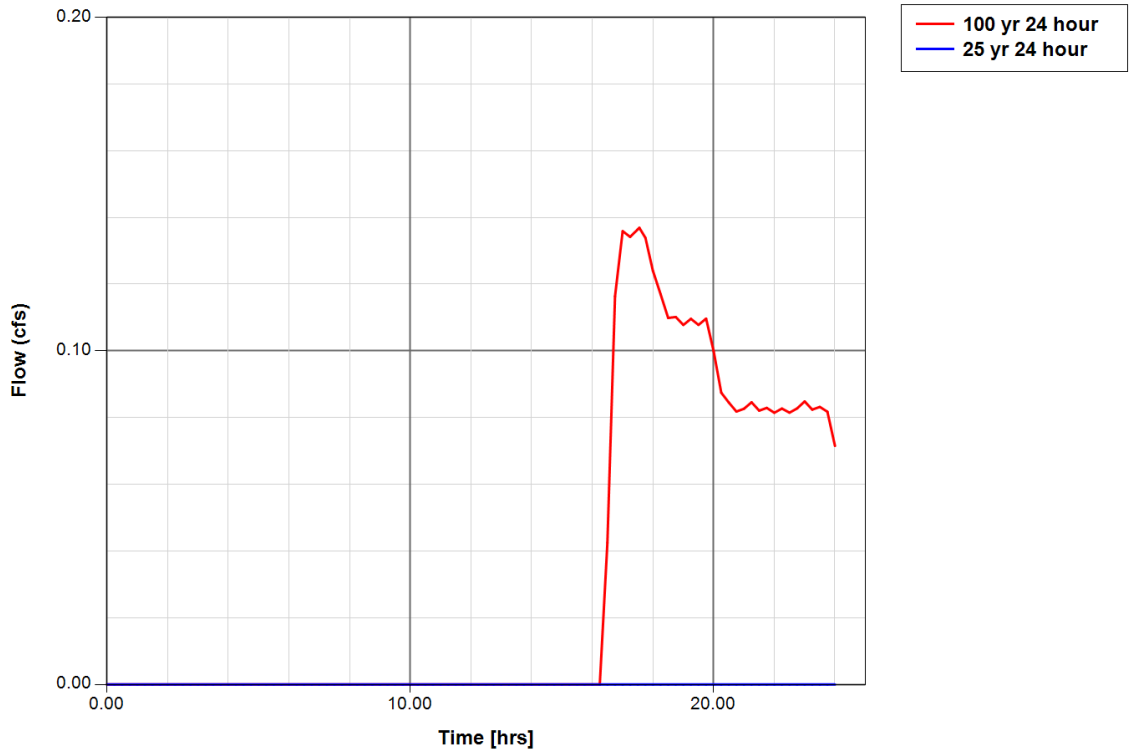
Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions with Times [Scenario1]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Time to Max Flow [hrs]	Time to Min Flow [hrs]	Time to Min/Max Delta Flow [hrs]	Time to Max Us Velocity [hrs]	Time to Max Ds Velocity [hrs]
Swale2 Wier	100 yr 24 hour	0.14	0.00	0.00	0.00	0.00	17.5555	0.0000	16.4957	0.0000	0.0000
Swale2 Wier	25 yr 24 hour	0.00	0.00	0.00	0.00	0.00	0.0000	0.0000	0.0000	0.0000	0.0000

Link Flow: Swale2 Wier [Scenario1]



Weir Link: Swale3 Wier

Scenario:	Scenario1
From Node:	Swale3
To Node:	Lake Harris
Link Count:	1
Flow Direction:	Both

Bottom Clip

Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip

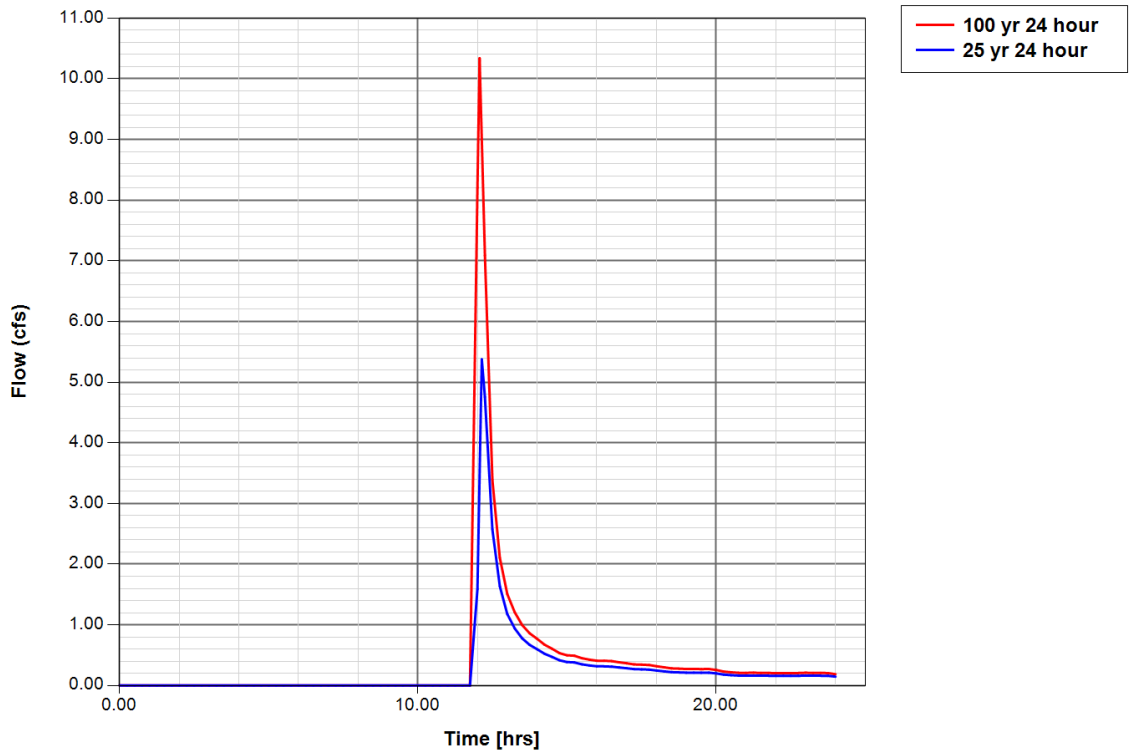
Damping:	0.0000 ft		
Weir Type:	Broad Crested Vertical	Default:	0.00 ft
Geometry Type:	Trapezoidal	Op Table:	
Invert:	67.30 ft	Ref Node:	
Control Elevation:	0.00 ft	Discharge Coefficients	
Max Depth:	0.75 ft	Weir Default:	2.800
Extrapolation Method:	Normal Projection	Weir Table:	
Bottom Width:	15.00 ft	Orifice Default:	0.600
Left Slope:	4.000 (h:v)	Orifice Table:	
Right Slope:	4.000 (h:v)		

Comment:

Link Min/Max Conditions with Times [Scenario1]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Time to Max Flow [hrs]	Time to Min Flow [hrs]	Time to Min/Max Delta Flow [hrs]	Time to Max Us Velocity [hrs]	Time to Max Ds Velocity [hrs]
Swale3 Wier	100 yr 24 hour	10.34	0.00	0.02	1.68	1.68	12.0730	0.0000	11.9481	12.0737	12.0737
Swale3 Wier	25 yr 24 hour	5.38	0.00	0.02	1.37	1.37	12.1466	0.0000	12.0160	12.1471	12.1471

Link Flow: Swale3 Wier [Scenario1]



Weir Link: swale4 weir

Scenario:	Scenario1
From Node:	Swale4
To Node:	Lake Harris
Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Sharp Crested Vertical
Geometry Type:	Trapezoidal
Invert:	66.30 ft
Control Elevation:	0.00 ft
Max Depth:	0.75 ft
Extrapolation Method:	Normal Projection
Bottom Width:	15.00 ft
Left Slope:	4.000 (h:v)
Right Slope:	4.000 (h:v)

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

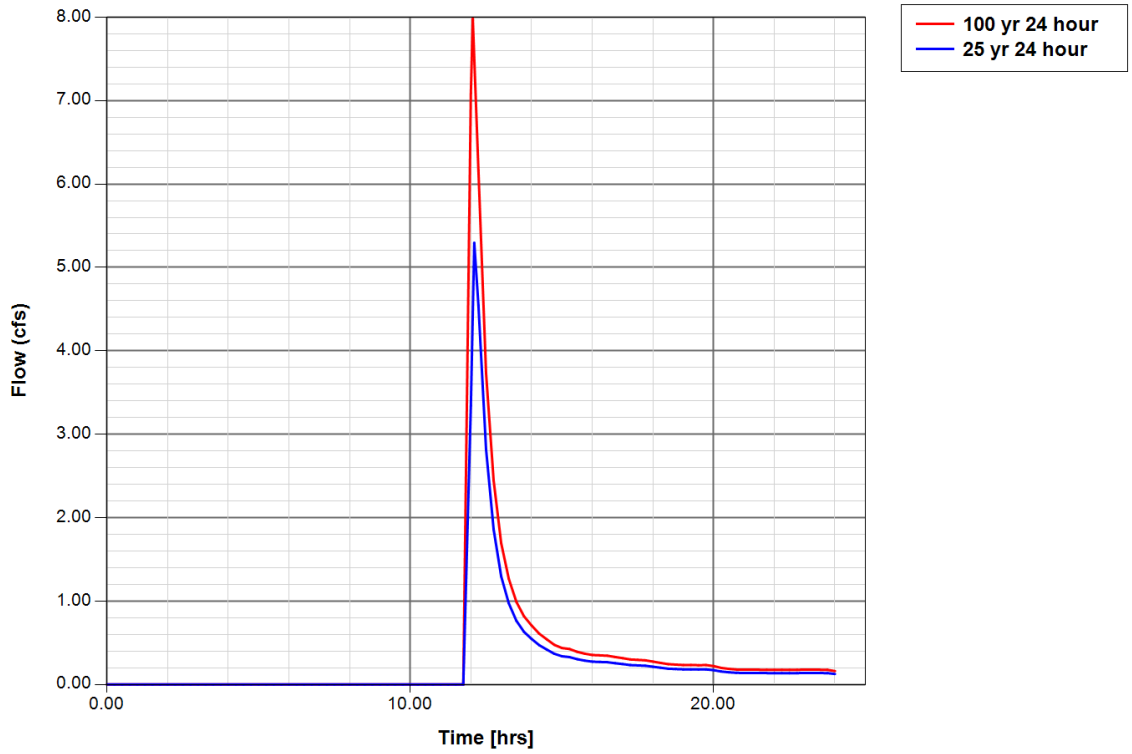
Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions with Times [Scenario1]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Time to Max Flow [hrs]	Time to Min Flow [hrs]	Time to Min/Max Delta Flow [hrs]	Time to Max Us Velocity [hrs]	Time to Max Ds Velocity [hrs]
swale4 weir	100 yr 24 hour	7.98	0.00	0.01	1.55	1.55	12.0644	0.0000	11.8306	12.0647	12.0647
swale4 weir	25 yr 24 hour	5.29	0.00	0.01	1.36	1.36	12.1122	0.0000	11.9684	12.1127	12.1127

Link Flow: swale4 weir [Scenario1]



Node: Lake Harris

Scenario: Scenario1
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 63.00 ft
Warning Stage: 66.00 ft

Boundary Stage:

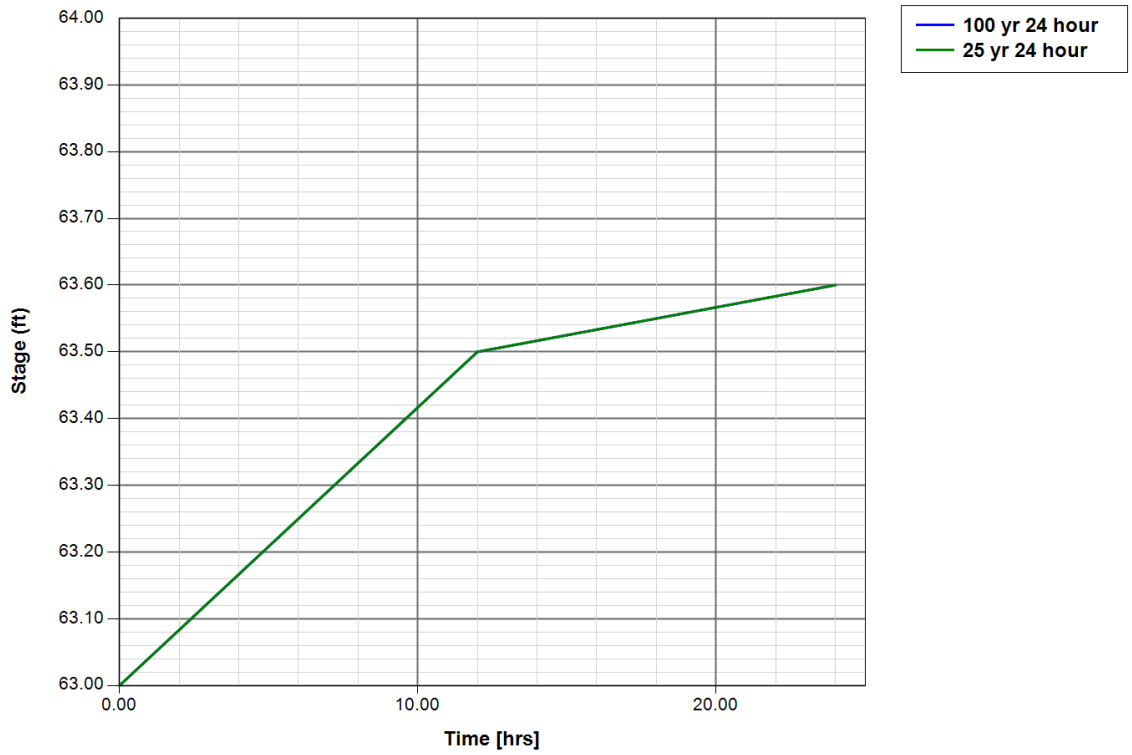
Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	63.00
0	0	0	12.0000	63.50
0	0	0	36.0000	63.70
0	0	0	120.0000	63.50

Comment:

Node Max Conditions w/ Times [Scenario1]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
Lake Harris	100 yr 24 hour	66.00	63.60	0.0003	30.07	0.00	0	24.0063	0.7277	12.0616	0.0000
Lake Harris	25 yr 24 hour	66.00	63.60	0.0003	17.40	0.00	0	24.0053	0.7277	12.1170	0.0000

Stage [Node: Lake Harris]



Node: Pond1

Scenario: Scenario1
Type: Stage/Volume
Base Flow: 0.00 cfs
Initial Stage: 65.00 ft
Warning Stage: 70.00 ft

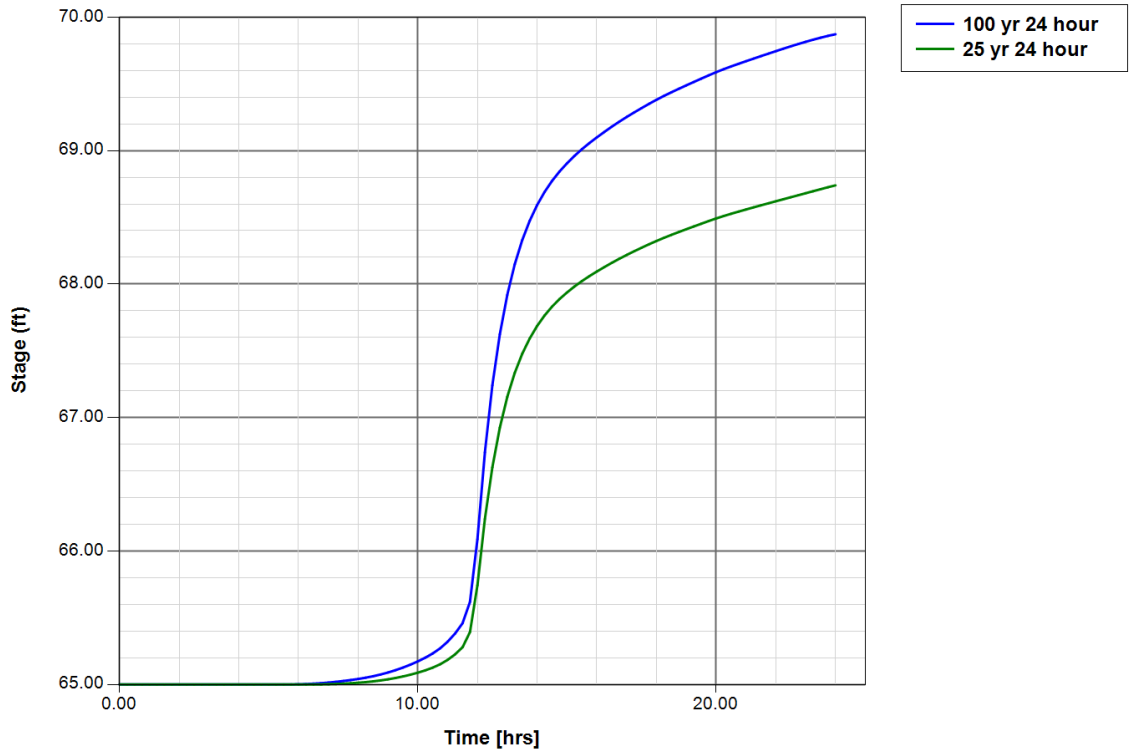
Stage [ft]	Volume [ac-ft]	Volume [ft3]
70.00	30.95	1348182
69.00	24.33	1059815
68.00	17.93	781031
67.00	11.74	511394
66.00	5.77	251341
65.00	0.00	0

Comment:

Node Max Conditions w/ Times [Scenario1]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
Pond1	100 yr 24 hour	70.00	69.87	0.0010	206.66	1.83	291933	24.0063	12.4040	12.0167	24.0063
Pond1	25 yr 24 hour	70.00	68.74	0.0010	155.17	0.00	281142	24.0053	15.7446	12.0166	0.0000

Stage [Node: Pond1]



Node: Swale1

Scenario: Scenario1
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 65.50 ft
Warning Stage: 67.00 ft

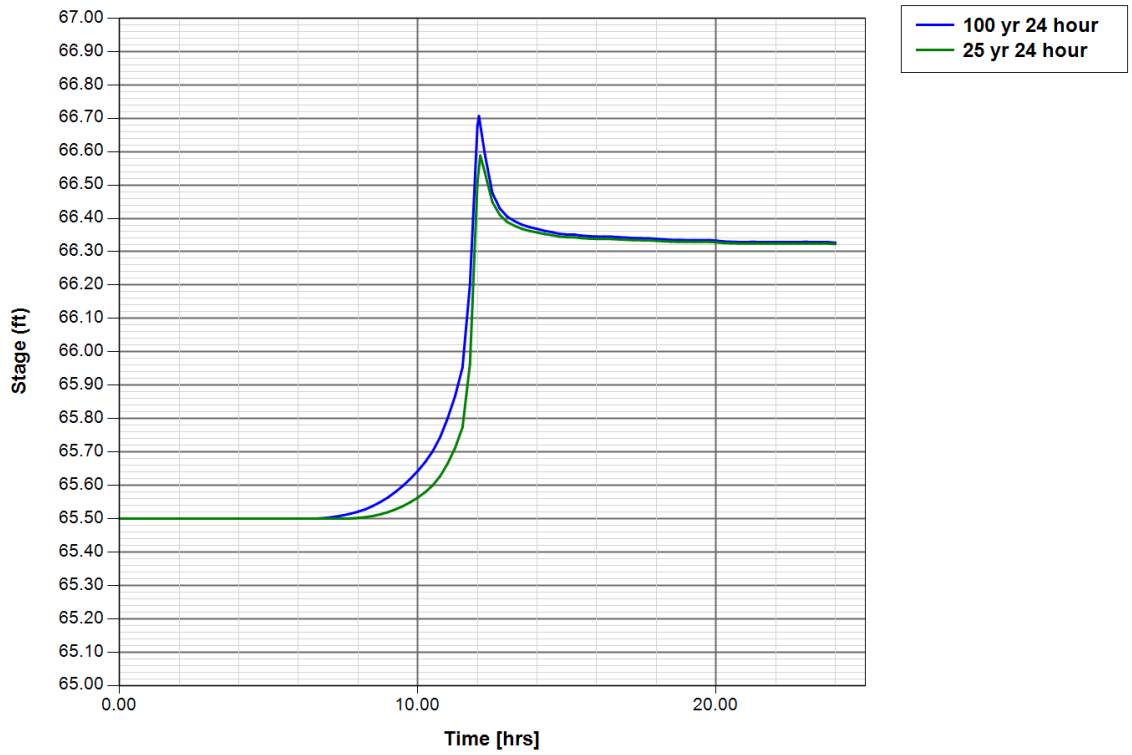
Stage [ft]	Area [ac]	Area [ft2]
67.00	0.3460	15072
66.00	0.2290	9975
65.50	0.1710	7449

Comment:

Node Max Conditions w/ Times [Scenario1]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
Swale1	100 yr 24 hour	67.00	66.71	0.0010	14.90	11.83	13577	12.0504	11.6481	12.0000	12.0504
Swale1	25 yr 24 hour	67.00	66.59	0.0010	11.05	6.89	12973	12.0963	11.8610	12.0000	12.0963

Stage [Node: Swale1]



Node: Swale2

Scenario: Scenario1
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 66.00 ft
Warning Stage: 67.50 ft

Stage [ft]	Area [ac]	Area [ft2]
67.50	0.1380	6011
67.00	0.1140	4966
66.00	0.0670	2919

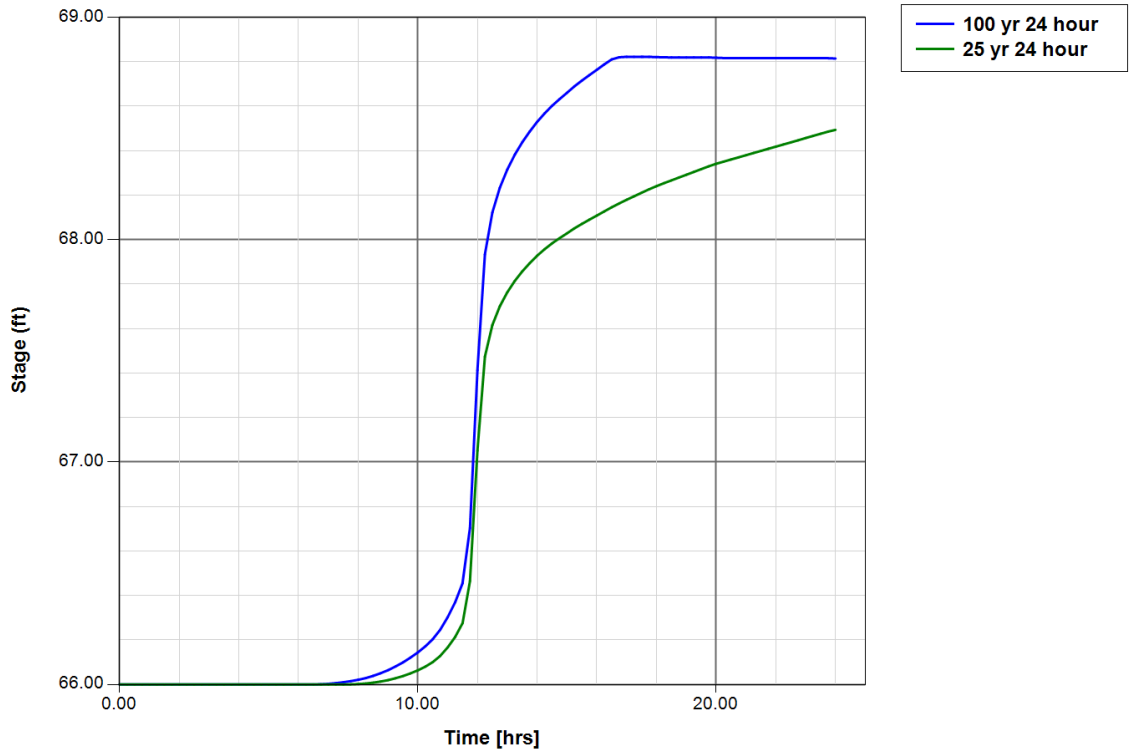
Comment:

Node Max Conditions w/ Times [Scenario1]

Node Name	Sim Name	Warning Stage	Max Stage	Min/Max Delta	Max Total	Max Total	Max Surface	Time to Max	Time to Min/Max	Time to Max	Time to Max

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
Swale2	100 yr 24 hour	67.50	68.82	0.0010	5.89	0.14	6011	17.5480	11.9481	12.0000	17.5555
Swale2	25 yr 24 hour	67.50	68.49	0.0010	4.37	0.00	6011	24.0053	12.0315	12.0000	0.0000

Stage [Node: Swale2]



Node: Swale3

Scenario: Scenario1
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 66.50 ft
Warning Stage: 68.00 ft

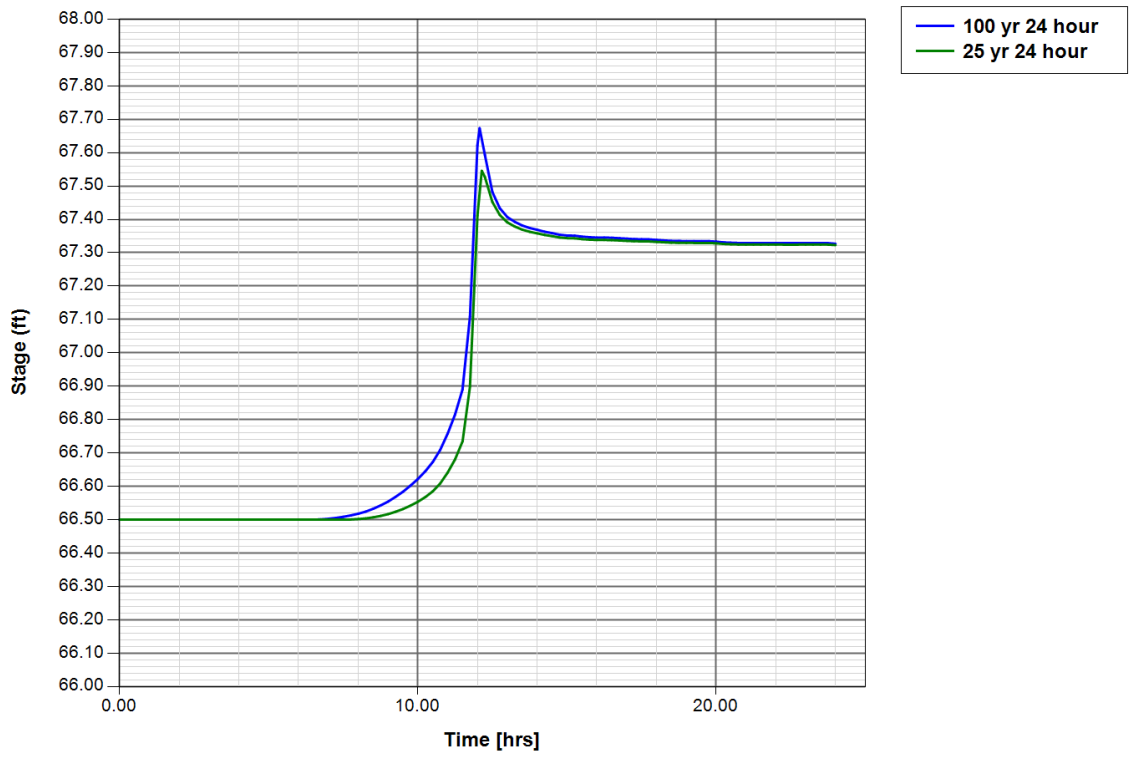
Stage [ft]	Area [ac]	Area [ft2]
68.00	0.4050	17642
67.00	0.2680	11674
66.50	0.2000	8712

Comment:

Node Max Conditions w/ Times [Scenario1]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
Swale3	100 yr 24 hour	68.00	67.67	0.0009	14.74	10.34	15692	12.0730	11.8162	12.0000	12.0730
Swale3	25 yr 24 hour	68.00	67.55	0.0009	10.93	5.38	14930	12.1461	11.9351	12.0000	12.1466

Stage [Node: Swale3]



Node: Swale4

Scenario: Scenario1
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 65.50 ft
Warning Stage: 67.00 ft

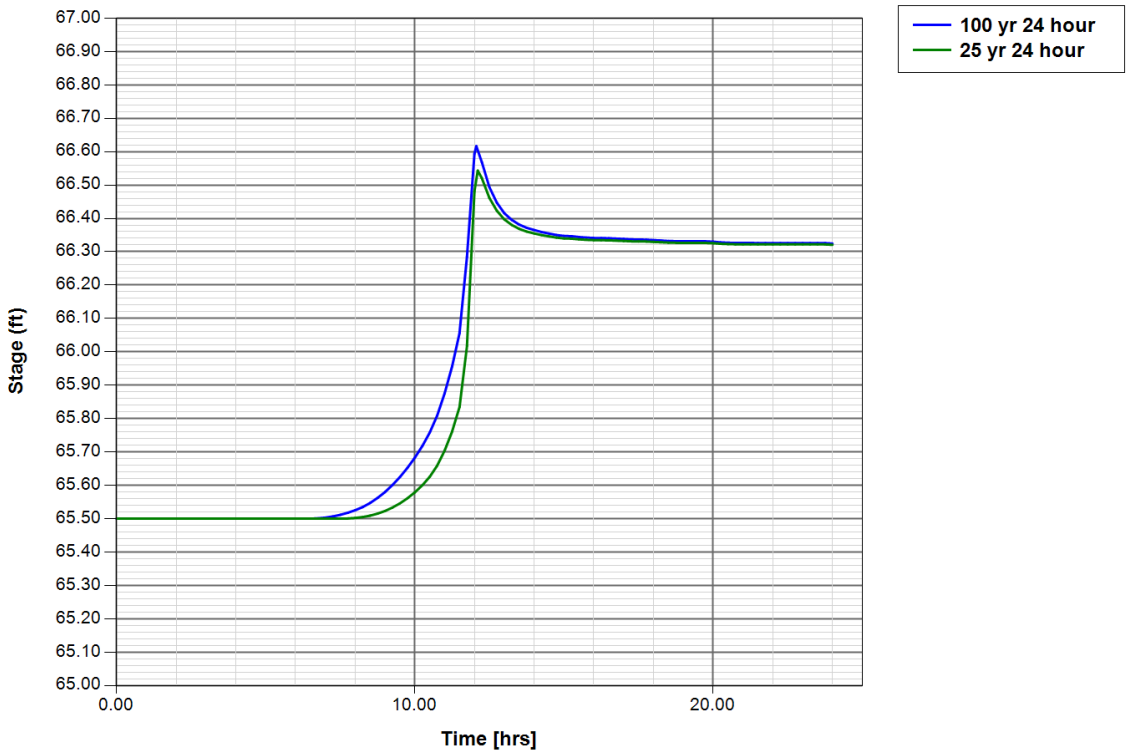
Stage [ft]	Area [ac]	Area [ft2]
67.00	0.2400	10454
66.00	0.1350	5881
65.50	0.1000	4356

Comment:

Node Max Conditions w/ Times [Scenario1]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
Swale4	100 yr 24 hour	67.00	66.62	0.0010	8.93	7.98	8701	12.0641	9.7694	12.0164	12.0644
Swale4	25 yr 24 hour	67.00	66.54	0.0010	6.57	5.29	8365	12.1118	11.3907	12.0166	12.1122

Stage [Node: Swale4]



Whispering Hills Stormwater Reuse Pond Calculations

Land Use Category		Phosphorus Loading
Pre-Development	Tree	0.004 kg/ac.-yr.
Post-Development	SFR 40% Impervious	0.25 kg/ac.-yr.

Phosphorus Reduction Required	Reduction Percentage
100% - (.0024/.25)	99%

Development Area (ac.)	53.71 ac.
Retention Volume Provided (ac.-ft.)	8.16 ac.-ft.
C Coefficient	0.51
EIA (C * Drainage Area)	27.52 ac.
Reuse Volume	3.56 in/EIA
Average Weekly Irrigation Rate	1.40 in./wk.
Irrigated Area (Pervious Area - Pond Berm)	28.30 ac.
Reuse Rate	0.206 in/EIA per day
Annual Runoff Reused (per Figure 31.7 handbook)	95%
Estimated Irrigation Phosphorus Removal Efficiency	97%
Estimated Pond Phosphorus Removal Efficiency	64.5%
System Phosphorus Remval Efficiency	97%
1-(((1-.645)x(1-.97))x(.95)+(1-.645)x(1-.95))	

Irrigation Pump Sizing

Irrigation Rate	1.40 in./wk.
Irrigated Area	28.30 ac.
# of Days per Week used for Irrigation	2 days
Daily Watering Window	12 hr.
Required Irrigation Rate (gpm)	747.07 gpm

Irrigation Pump must be able to pump at the specified rate above. Irrigation designer must account for this flow during the design of the irrigation system.

Complete Report (not including cost) Ver 3.0.0

Project: Whispering Hills
Date: 2/18/2022 12:34:32 PM

Site and Catchment Information

Analysis: Net Improvement

Catchment Name	Pond 1	Swales
Rainfall Zone	Florida Zone 2	Florida Zone 2
Annual Mean Rainfall	50.00	50.00

Pre-Condition Landuse Information

Landuse	SJRWMD Apopka Open Space/Recreation/Fallow Crop: TN=1.100 TP=0.050	SJRWMD Apopka Open Space/Recreation/Fallow Crop: TN=1.100 TP=0.050
Area (acres)	49.61	5.88
Rational Coefficient (0-1)	0.01	0.01
Non DCIA Curve Number	41.00	39.00
DCIA Percent (0-100)	0.00	0.00
Nitrogen EMC (mg/l)	1.100	1.100
Phosphorus EMC (mg/l)	0.050	0.050
Runoff Volume (ac-ft/yr)	1.571	0.157
Nitrogen Loading (kg/yr)	2.131	0.213
Phosphorus Loading (kg/yr)	0.097	0.010

Post-Condition Landuse Information

Landuse	Single-Family: TN=2.070 TP=0.327	Low-Density Residential: TN=1.645 TP= 0.27
Area (acres)	49.61	5.88
Rational Coefficient (0-1)	0.50	0.41
Non DCIA Curve Number	41.00	39.00

DCIA Percent (0-100)	61.00	50.00
Wet Pond Area (ac)	6.72	0.00
Nitrogen EMC (mg/l)	2.070	1.645
Phosphorus EMC (mg/l)	0.327	0.270
Runoff Volume (ac-ft/yr)	88.711	9.991
Nitrogen Loading (kg/yr)	226.418	20.265
Phosphorus Loading (kg/yr)	35.767	3.326

Catchment Number: 1 Name: Pond 1

Project: Whispering Hills
Date: 2/18/2022

Multiple BMP in Series Design Parameters

BMP in Series Number: 1
BMP Type: Wet Detention

Permanent Pool Volume (ac-ft)	11.190
Permanent Pool Volume (ac-ft) for 31 days residence	7.534
Annual Residence Time (days)	46
Littoral Zone Efficiency Credit	
Wetland Efficiency Credit	

BMP in Series Number: 2
BMP Type: Stormwater Harvesting

Total Contributing Area to Harvesting (ac)	42.890
Total Area Available for Irrigation (ac)	34.650
Available Harvest Volume (ac-ft)	9.330
Harvest Rate (0.1-4.0 in/week)	2.000

BMP in Series Number: 3
BMP Type: None

BMP in Series Number: 4
BMP Type: None

Watershed Characteristics

Catchment Area (acres)	49.61

Contributing Area (acres)	42.890
Non-DCIA Curve Number	41.00
DCIA Percent	61.00
Rainfall Zone	Florida Zone 2
Rainfall (in)	50.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	99
Provided TN Treatment Efficiency (%)	94
Required TP Treatment Efficiency (%)	100
Provided TP Treatment Efficiency (%)	97

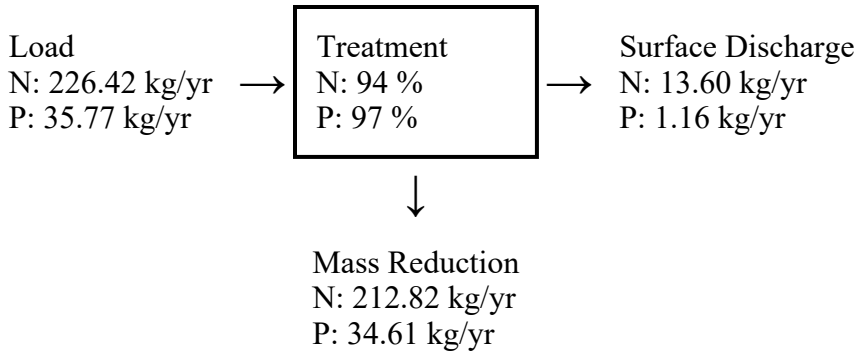
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

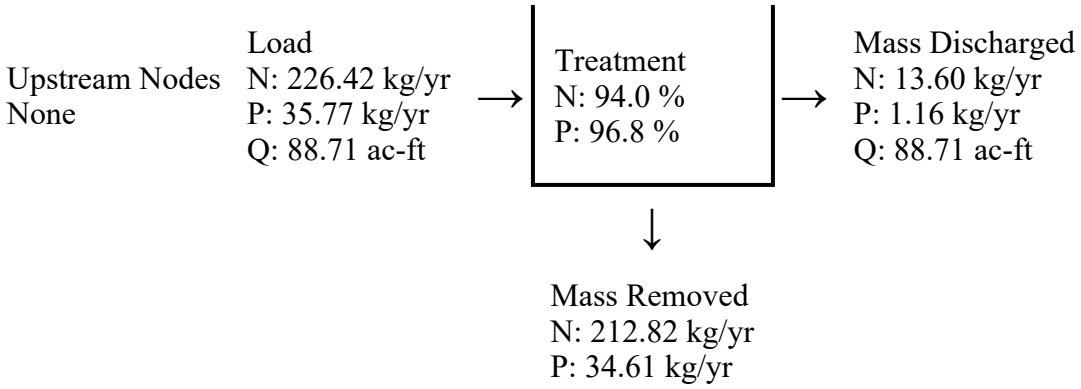
Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	0.000
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.000
TP Concentration (mg/L)	0.000

Load for Multiple BMP in Series



Load Diagram for Multiple BMP (As Used In Routing)



Catchment Number: 2 Name: Swales

Project: Whispering Hills
Date: 2/18/2022

Retention Design

Retention Depth (in)	1.120
Retention Volume (ac-ft)	0.549

Watershed Characteristics

Catchment Area (acres)	5.88
Contributing Area (acres)	5.880
Non-DCIA Curve Number	39.00
DCIA Percent	50.00
Rainfall Zone	Florida Zone 2
Rainfall (in)	50.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	99
Provided TN Treatment Efficiency (%)	90
Required TP Treatment Efficiency (%)	100
Provided TP Treatment Efficiency (%)	90

Media Mix Information

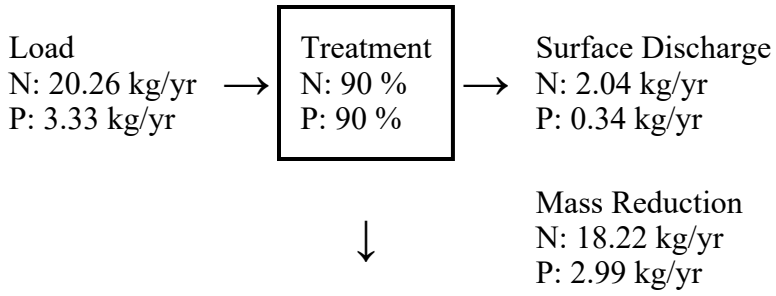
Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

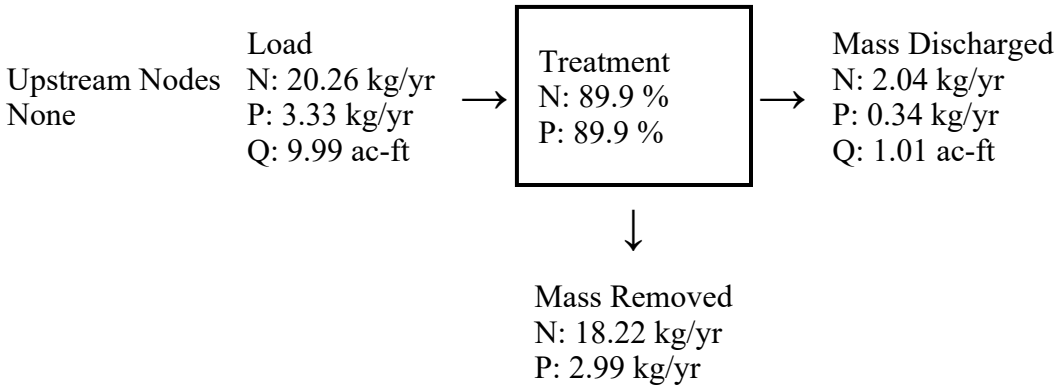
Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	18.224

TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	2.991
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Load Diagram for Retention (As Used In Routing)



Summary Treatment Report Version: 3.0.0

Project: Whispering Hills

Date:2/18/2022

Analysis Type: Net Improvement
BMP Types:
Catchment 1 - Multiple BMP
Catchment 2 - Retention

Routing Summary
Catchment 1 Routed to Outlet
Catchment 2 Routed to Outlet

Total nitrogen target removal met? **No**
Total phosphorus target removal met? **No**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	2.34 kg/yr	
Total N post load	246.68 kg/yr	
Target N load reduction	99 %	
Target N discharge load	2.34 kg/yr	
Percent N load reduction	94 %	
Provided N discharge load	15.64 kg/yr	34.48 lb/yr
Provided N load removed	231.04 kg/yr	509.45 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	.107 kg/yr	
Total P post load	39.094 kg/yr	
Target P load reduction	100 %	
Target P discharge load	.107 kg/yr	
Percent P load reduction	96 %	
Provided P discharge load	1.492 kg/yr	3.29 lb/yr
Provided P load removed	37.602 kg/yr	82.912 lb/yr

From Pre-Condition Loads

Existing N Discharge	2.34 (kg/yr)
Existing P Discharge	.107 (kg/yr)

Attachments

GEOTECHNICAL INVESTIGATION
WHISPERING PINES SUBDIVISION
NORTH BOCKHILL ROAD
HOWEY IN THE HILLS
LAKE COUNTY, FLORIDA

RECEIVED IN
ALTAMONTE SPRINGS
AUG 21 2009
122145-1
REGULATORY
INFORMATION MGT.

Andreyev Engineering, Inc.

CLERMONT OFFICE
1170 W. Minneola Avenue
Clermont, Florida 34711
352-241-0508
Fax: 352-241-0977

▼ Groundwater ▼ Environmental ▼ Geotechnical ▼ Construction Materials Testing

November 01, 2005
Revised February 22, 2006
Project No. CPGT-05-408

TO: **Red Jacket Development Group**
625 Waltham Avenue
Orlando, Florida 32809
Attention: Mr. Clay Frankel

SUBJECT: **Geotechnical Investigation,** Proposed Whispering Pines Subdivision Project, North Bockhill Road, Howey in the Hills, Lake County, Florida

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Dear Mr. Frankel:

As you requested, Andreyev Engineering, Inc. (AEI) has completed a geotechnical engineering study for the above referenced project. This engineering study was conducted in general accordance with our proposal dated October 12, 2005. The following report presents the findings of the study.

SITE LOCATION AND DESCRIPTION

The subject property currently consists of undeveloped vacant land mainly occupied by planted pine trees and overgrown vegetation, and is located immediately to the east of North Buckhill Road in Howey in the Hills, Lake County. The proposed project consists of a 103-lot subdivision, associated paved roadways, two (2) stormwater retention areas, and backyard retention swale. Little Lake Harris is located immediately to the east and north of the subject property. Based on the review of the U.S.G.S. Topographic Map "Howey in the Hills, Florida", the site is estimated to occur at elevations ranging from +150 feet above National Geodetic Vertical Datum (NGVD) in the southwest portion of the subject property to +65 ft-NGVD along the edge of Little Lake Harris. The topography within the subject site slopes from the southwest to the east-northeast portions of the site. The U.S.G.S. Topographic Map "Howey in the Hills, Florida" Quadrangle Map showing the approximate layout of the subject site is presented on the attached **Figure 1.**

PURPOSE AND SCOPE OF INVESTIGATION

The purpose of this investigation was to characterize the soil and groundwater conditions across the site for the design and construction of the proposed stormwater retention ponds and swale, and pavement section design. In order to characterize the soil and groundwater conditions across the site, the following investigation was conducted:

- Drilled five (5) auger borings to depths of 9 and 20 feet within the proposed stormwater retention ponds.

- Drilled five (5) auger borings to a depth of 7 feet within the proposed backyard retention swales.

- Drilled eight (8) auger borings to a depth of 7 feet within the proposed paved roadways.

- Collected five (5) undisturbed tube soil samples and conducted laboratory permeability tests in order to determine the vertical saturated hydraulic conductivity of the soil underlying the proposed ponds and swales.

- Conducted engineering evaluation of encountered soil conditions, identification of confining layers and any unsuitable soil conditions. Geotechnical recommendations are provided for water retention area and swale design and pavement section design.

- Prepared this geotechnical report including results of soils investigations in profile form, evaluation of encountered conditions, and geotechnical recommendations.

S.C.S. SOIL SURVEY

The "Soil Survey of Lake County, Florida" published by the U.S. Department of Agriculture Soil Conservation Service (S.C.S.) was reviewed. The shallow soil types identified at the site are as follows:

- Astatula sand, dark surface, 0 to 5 percent slopes, which is described as a nearly level to gently sloping, excessively drained sandy soil. The seasonal high groundwater table for this soil is at a depth of more than 120 inches. The hydrologic group for Astatula sand, dark surface, 0 to 5 percent slopes, is "A".

- Astatula sand, dark surface, 5 to 12 percent slopes. This is a sloping to strongly sloping, excessively drained sandy soil. The water table is at a depth of more than 120 inches. Permeability is very rapid throughout the profile. The hydrologic group for Astatula fine sand, dark surface, 5 to 12 percent slopes is "A".

- Lake sand, 0 to 5 percent slopes. This is a nearly level to gently sloping, well-drained to excessively drained sandy soil. The water table is at a depth of more than 120 inches. Permeability is very rapid throughout the profile. The hydrologic group for Lake fine sand, 0 to 5 percent slopes is "A".

- Tavares sand which is described as a nearly level to gently sloping, moderately well drained soil. The water table is at a depth of 40 to 60 inches for more than 6 months of the year, and it recedes to a depth greater than 60 inches during periods of drought. The hydrologic group for Tavares sand is "A".

- Pompano sand, acid. This soil unit is described as a nearly level, poorly drained soil. The water table is within a depth of 10 inches for 2 to 6 months and at a depth of 10 to 40 inches during the rest of the year. The hydrologic group for Pompano sand is "B/D".

The S.C.S. Soil Survey of Lake County showing the approximately layout of the subject property is presented on the attached **Figure 2**.

FIELD AND LABORATORY INVESTIGATIONS

Borings

Five (5) auger borings, AB-1 through AB-5, were drilled within the proposed water retention areas to depths of 9 and 13 feet below existing grade; five (5) auger borings, AB-6 through AB-10, were drilled within the proposed backyard swales to a depth of 7 feet; and eight (8) auger borings were drilled within the proposed paved roadways to a depth of 8 feet below existing grade. The boring locations were provided by Red Jacket Development Group. Representative soil samples were collected at each change of soil strata for visual classification. The approximate location of borings is presented on the site plan on **Figure 3.**

Laboratory Hydraulic Conductivity Tests

Five (5) undisturbed tube soil samples were collected from the proposed stormwater retention areas and swales and five (5) laboratory hydraulic conductivity tests were conducted in order to determine the vertical saturated hydraulic conductivity of the soils underlying the proposed water retention and swale areas. The tests were conducted using the falling head field permeability method.

Classification Tests

Following visual classification of the collected soil samples, four (4) laboratory classification tests were conducted in order to upgrade the visual classification. The tests included the moisture content and percent of fines passing the No. 200 sieve.

INVESTIGATION RESULTS

Soil Stratigraphy

The test borings were drilled on October 20, 2005. The approximate location of the borings is presented on **Figure 3**. The results of our field exploration program, including the stratification profiles and associated field test results, are graphically presented in the form of soil profiles on **Figure 4**. Soil stratification is based on review of recovered soil samples and interpretation of the field boring logs by a geotechnical engineer. The soil classification was performed using the Unified Soil Classification System. Horizontal lines designating the interface between different soils on the profiles represent approximate boundaries. The transition between layers is typically gradual.

The following 7 strata were identified in the borings:

STRATUM No.	SOIL DESCRIPTION	USCS GROUP
1	Light brown fine sand	SP
2	Brown to grayish-brown fine sand	SP
3	Orangish-brown fine sand	SP
4	Dark brown fine sand	SP
5	Orangish-brown slightly silty fine sand	SP-SM
6	Gray fine sand	SP
7	Dark brown slightly organic fine sand	SP

USCS = Unified Soil Classification System

In general, the soils encountered within the proposed stormwater retention and swale areas and paved roadways consisted of surficial layers of strata 1, 2, 4 and 6, fine sands extending from the ground surface to depths ranging between 1.5 and 15 feet followed by strata 3, 5 and 7, fine sand, slightly silty fine sand and slightly organic fine sand to the boring termination depths of 7 and 20 feet below existing grade.

Groundwater Conditions

The stabilized groundwater table was measured at depths ranging from 1.2 to 6.5 feet below existing grade in borings AB-5 through AB-10 and RB-4, and was not encountered to the boring termination depths in borings AB-1 through AB-4, RB-1 through RB-3 and RB-5 through RB-8. Based on the review of the S.C.S. Soil Survey of Lake County, the U.S.G.S. Topographic Map "Howey in the Hills, Florida", the encountered soil conditions, and the measured groundwater levels, the seasonal high groundwater table within the subject site is estimated to occur at an elevation of approximately +63.5 feet above National Geodetic Vertical Datum. The stabilized groundwater table measurements are shown adjacent to the soil profiles on **Figure 4**.

Hydraulic Conductivity Test Results

Based on the hydraulic conductivity test results, the vertical saturated hydraulic conductivity of the light brown fine sand (stratum 1) layer was measured at 10.4 feet per day in boring AB-2, the vertical saturated hydraulic conductivity of the brown to grayish-brown fine sand (stratum 2) layer was measured at 33.8 feet per day in boring AB-3, the vertical saturated hydraulic conductivity of the dark brown fine sand (stratum 4) layer was measured at 58.2 and 9.6 feet per day in borings AB-5 and AB-6, and the vertical saturated hydraulic conductivity of the gray fine sand (stratum 6) layer was measured at 0.6 feet per day in boring AB-9. The results of the hydraulic conductivity tests are presented adjacent to the soil profiles and at the tested depths on **Figure 4**.

Classification Tests

The results of the classification tests indicate that for the light brown fine sand (stratum 1) layer the moisture content is 4.0 percent and the percent of fines passing the No. 200 sieve is 3.3 percent, for the brown to grayish-brown fine sand (stratum 2) layer the moisture content is 22.0 percent and the percent of fines passing the No. 200 sieve is 2.2 percent, for the orangish-brown fine sand (stratum 3) layer the moisture content is 4.0 percent and the percent of fines passing the No. 200 sieve is 4.3 percent, and for the orangish-brown slightly silty fine sand (stratum 5) layer the moisture content is 4.3 percent and the percent of fines passing the No. 200 sieve is 8.0 percent. The results of the tests are presented adjacent to the soil profiles and at the tested depths on **Figure 4**.

EVALUATIONS AND RECOMMENDATIONS

Water Retention Areas and Swales

Based on the results of this investigation it is our opinion that the site soil and groundwater conditions are generally suitable for design of dry water retention areas and backyard swales as part of the stormwater management system for the proposed development. In general, the encountered soil conditions consisted of well drained sandy soils having a deep groundwater table in the uphill areas and a shallow groundwater table in the downhill areas adjacent to Little Lake Harris. Site filling may be required within the backyard swales in order to provide sufficient separation between the bottom of the swale and the seasonal high groundwater table.

Infiltration and recovery analysis must be performed for the proposed retention areas and swales as required by the St. John's River Water Management District. For this purpose we recommend utilizing the shallow aquifer soil and groundwater parameters presented in **Table 1**.

Pavement Section Design

In general, the existing shallow subsurface soils are considered suitable for support of a flexible (limerock) or semi-flexible (soil-cement) type pavement base after subgrade preparation for the proposed paved roadways. The use of one system over another is normally governed by the depth to the encountered and/or seasonal high groundwater table. Soil cement is typically used in areas where groundwater levels are within 1.5 feet of the proposed bottom of the base course.

Recommended section for semi-flexible (soil-cement) and flexible (limerock) pavements are as follows:

Soil-Cement Base

1-1/2" asphaltic concrete wearing surface
6" soil-cement base designed and constructed in accordance with current Portland Cement Association recommended methods. Minimum 7 day compressive strength of 300 psi.
12" subgrade consisting of free draining natural fine sand or fine sand fill. Subgrade to be compacted to a minimum density of 95 percent of the Modified Proctor Maximum Density (AASHTO T-180).

Limerock Base

1-1/2" asphaltic concrete wearing surface
8" limerock base course. Quality of limerock to be in accordance with current Florida Department of Transportation specifications and compacted to a minimum density equivalent to 95 percent of the Modified Proctor (AASHTO T-180).
6" stabilized subbase with minimum Florida Bearing Value (FBV) of 50 psi or (LBR) of 40 percent. The subbase should be compacted to a minimum density equivalent to 95 percent of the Modified Proctor Maximum Density (AASHTO T-180) for a depth of 1 foot below pavement subgrade.

Asphaltic wearing surface for the flexible and semi-flexible sections typically consists of Type S, meeting current Florida Department of Transportation specifications. The wearing surface should be compacted to a minimum density of 95 percent of the Laboratory Density as determined by the Marshall Stability Test method for the approved job mix formula.

The recommendations presented above are minimum assuming normal light passenger car and pick-up truck traffic with occasional garbage or delivery trucks. Traffic should not be allowed on the subgrade prior to placement of the base to avoid rutting. The final pavement thickness design should be checked by the project civil engineer using data contained in this report and anticipated traffic conditions.

LIMITATIONS

The recommendations regarding elevations of confining layers and seasonal high groundwater table were based on U.S.G.S. Topographic data with the exception of boring AB-9. It is strongly recommended that a site specific elevation survey be conducted and the results forwarded to our office for review. Adjustments to the parameters presented on **Table 1** will likely be made based on the site specific elevation survey.

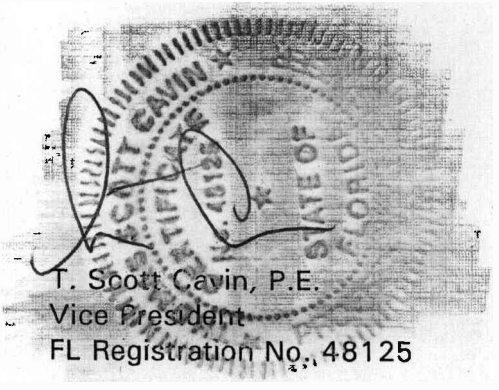
CLOSURE

We appreciate the opportunity to participate in this project and we trust that the information presented herein is sufficient for your immediate needs. Should you have any questions or comments concerning the contents of this attached report, please do not hesitate to contact the undersigned.

Sincerely,

ANDREYEV ENGINEERING, INC.

Pablo Colmenares, M.S.
Project Manager



cc: BREDCO

TABLE 1

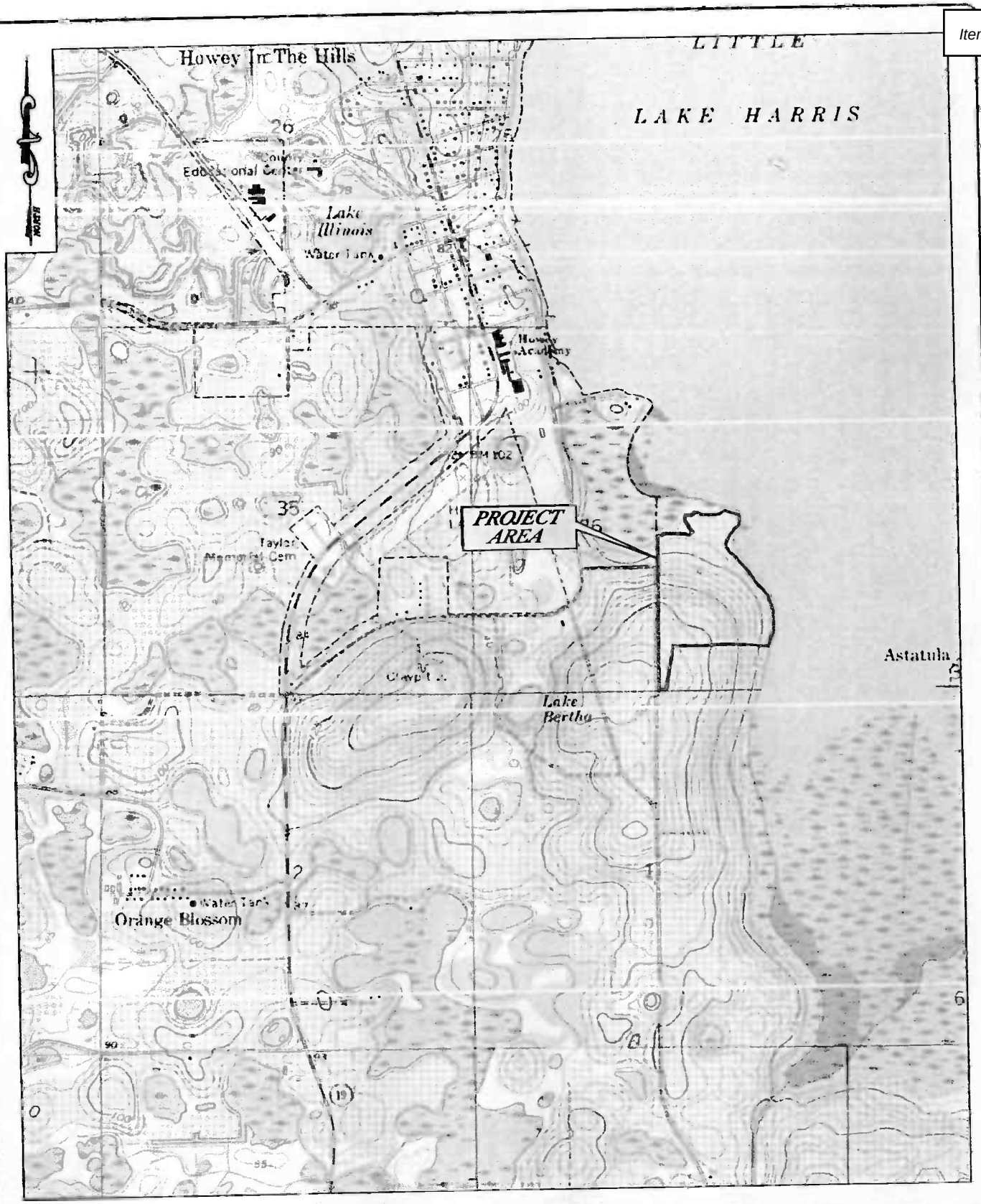
PROPOSED WHISPERING PINES SUBDIVISION PROJECT
SOIL AND GROUNDWATER PARAMETERS

Pond	Boring	Approximate Boring Elevation* (ft-NGVD)	Elevation of Confining Layer (ft-NGVD)	Elevation of Seasonal High Groundwater Table (ft-NGVD)	Horizontal Saturated Hydraulic Conductivity (Feet/Day)**	Vertical Unsaturated Hydraulic Conductivity (Feet/Day)**	Soil Storage Coefficient
WRA 1	AB-1 & AB-2	130.0	110.0	110.5	15.0	10.0	0.20
WRA 2	AB-3 thru AB5	75.5(1)	60.0(1)	70.0	20.0	13.3	0.25
SWALES	AB-6	67.0	60.0	65.0	10.0	6.7	0.20
	AB-7	70.0	63.0	65.0	10.0	6.7	0.20
	AB-8	66.0	59.0	65.0	10.0	6.7	0.20
	AB-9	63.5	58.0	63.5	10.0	6.7	0.20
	AB-10	65.0	58.0	65.0	10.0	6.7	0.18

* Boring elevation obtained from the U.S.G.S. Topographic Map "Howey in the Hills, Florida" with the exception of boring AB-9.

** Factors of safety have been assigned to the horizontal saturated and vertical unsaturated hydraulic conductivity values. Additional factors of safety are not required.

(1) Average of boring elevation and confining layer elevation of borings AB-3, AB-4 and AB-5.



REFERENCE:
U.S.G.S. HOWEY IN THE HILLS, FLA.
QUADRANGLE MAP
DATED 1969
SECTION 36
TOWNSHIP 20 SOUTH
RANGE 25 EAST

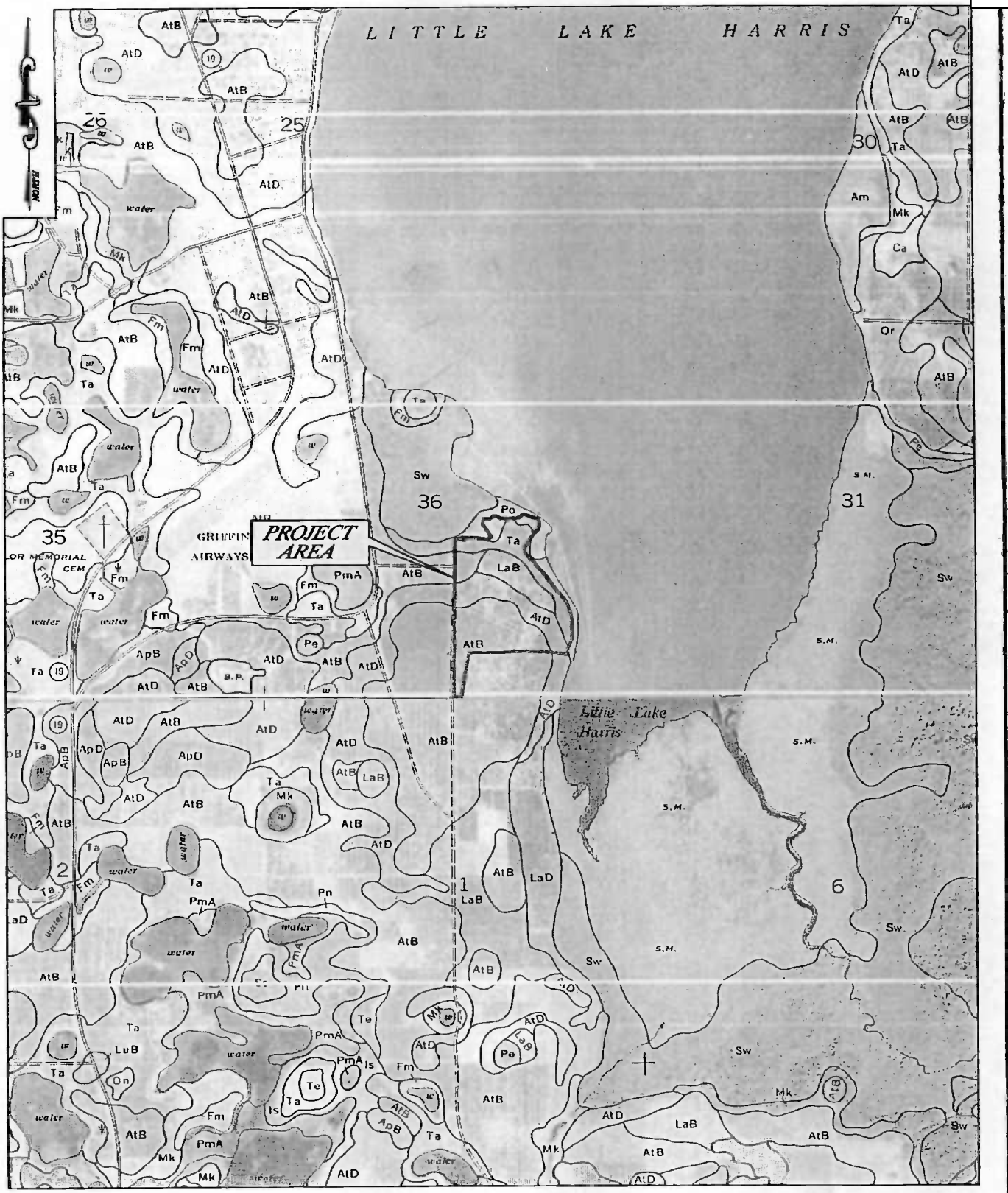
Andreyev Engineering, Inc.

GEOTECHNICAL INVESTIGATION
WHISPERING PINES SUBDIVISION PROJECT
LAKE COUNTY, FL.

U.S.G.S. TOPOGRAPHIC MAP

FIGURE 1

APPROXIMATE SCALE:	DATE: 02/22/06	ENGINEER: PC
1"=2000'	PN: CPGT-05-405	DRAWN BY: DS



REFERENCE:
SCS SOIL SURVEY LAKE COUNTY, FLORIDA
MAP SHEET NOs. 43 & 47

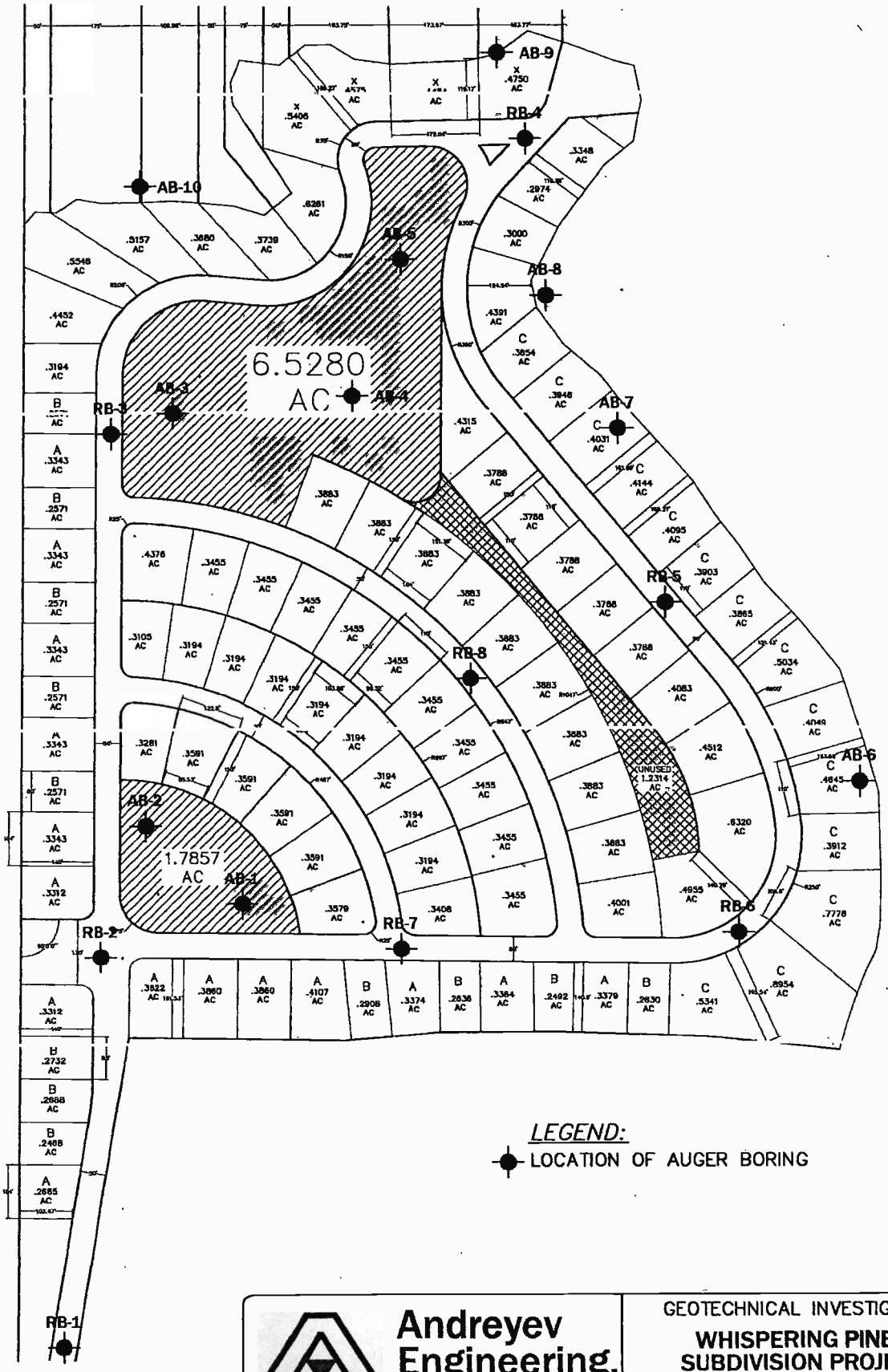
Andreyev Engineering, Inc.

APPROXIMATE SCALE:	DATE: 02/22/06	ENGINEER: PC
1"=2000'	PN: CPGT-05-405	DRAWN BY: DS

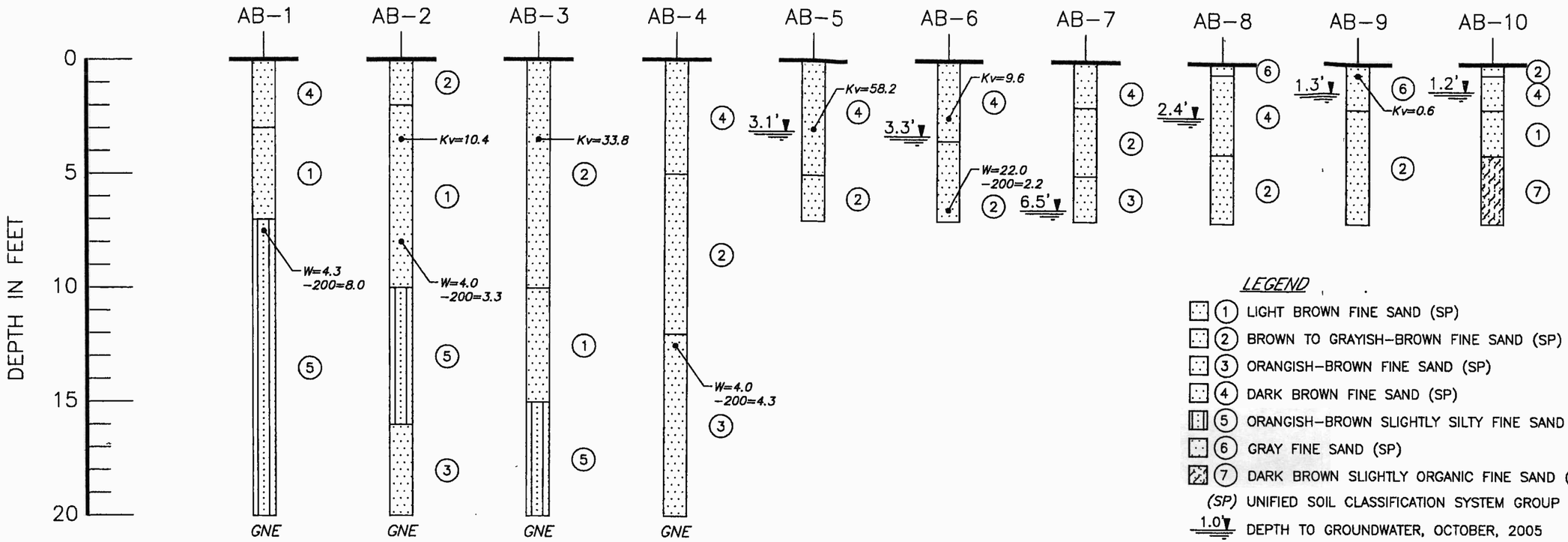
GEOTECHNICAL INVESTIGATION
WHISPERING PINES SUBDIVISION PROJECT
LAKE COUNTY, FL.

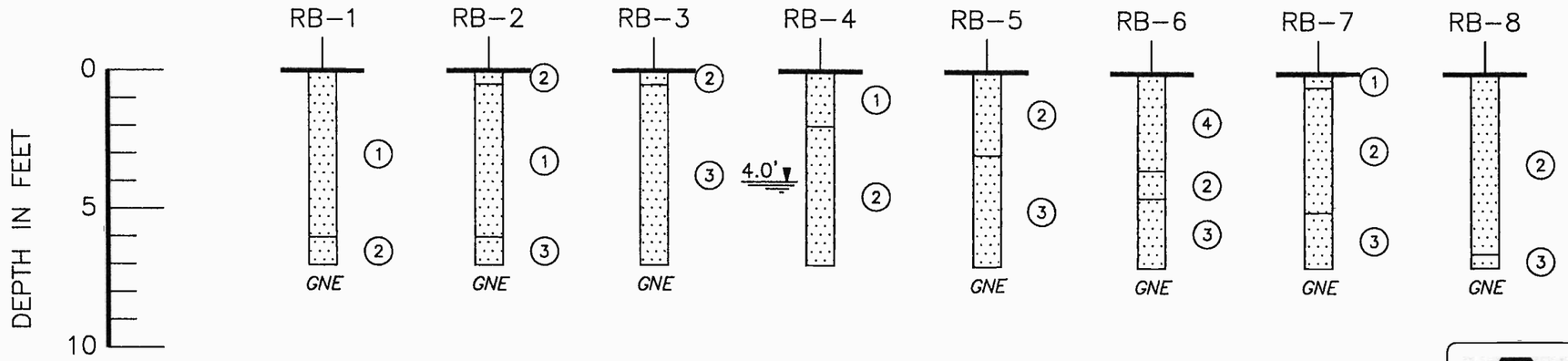
SCS SOIL SURVEY

FIGURE 2



Andreyev Engineering, Inc.		GEOTECHNICAL INVESTIGATION **WHISPERING PINES SUBDIVISION PROJECT** LAKE COUNTY, FL.
APPROXIMATE SCALE: 1"=300'	DATE: 02/22/06 ENGINEER: PC PN: CPGT-05-405 DRAWN BY: DS	SITE PLAN FIGURE 3





LEGEND

1. LIGHT BROWN FINE SAND (SP)
2. BROWN TO GRAYISH–BROWN FINE SAND (SP)
3. ORANGISH–BROWN FINE SAND (SP)
4. DARK BROWN FINE SAND (SP)
5. ORANGISH–BROWN SLIGHTLY SILTY FINE SAND (SP–SM)
6. GRAY FINE SAND (SP)
7. DARK BROWN SLIGHTLY ORGANIC FINE SAND (SP)

(SP) UNIFIED SOIL CLASSIFICATION SYSTEM GROUP SYMBOL

1.0' DEPTH TO GROUNDWATER, OCTOBER, 2005

GNE GROUNDWATER NOT ENCOUNTERED

W MOISTURE CONTENT, IN PERCENT

–200 PERCENT OF FINES PASSING THE U.S. No. 200 SIEVE

Kv VERTICAL COEFFICIENT OF PERMEABILITY, IN FEET PER DAY

Andreyev Engineering, Inc.

APPROXIMATE SCALE: 1"=5'

DATE: 02/22/06 | ENGINEER: PC

PN: CPGT–05–405 | DRAWN BY: DS

GEOTECHNICAL INVESTIGATION

WHISPERING PINES SUBDIVISION PROJECT

LAKE COUNTY, FL.

SOIL PROFILES

FIGURE 4