

STARKEY RANCH CUNNINGHAM PARK CENTRAL NEIGHBORHOOD

Prepared For:
WS-TSR, LLC
(WHELOCK STREET CAPITAL)
1217 Kentucky Ave
St Cloud, FL 34769
Phone: (321) 805-4830



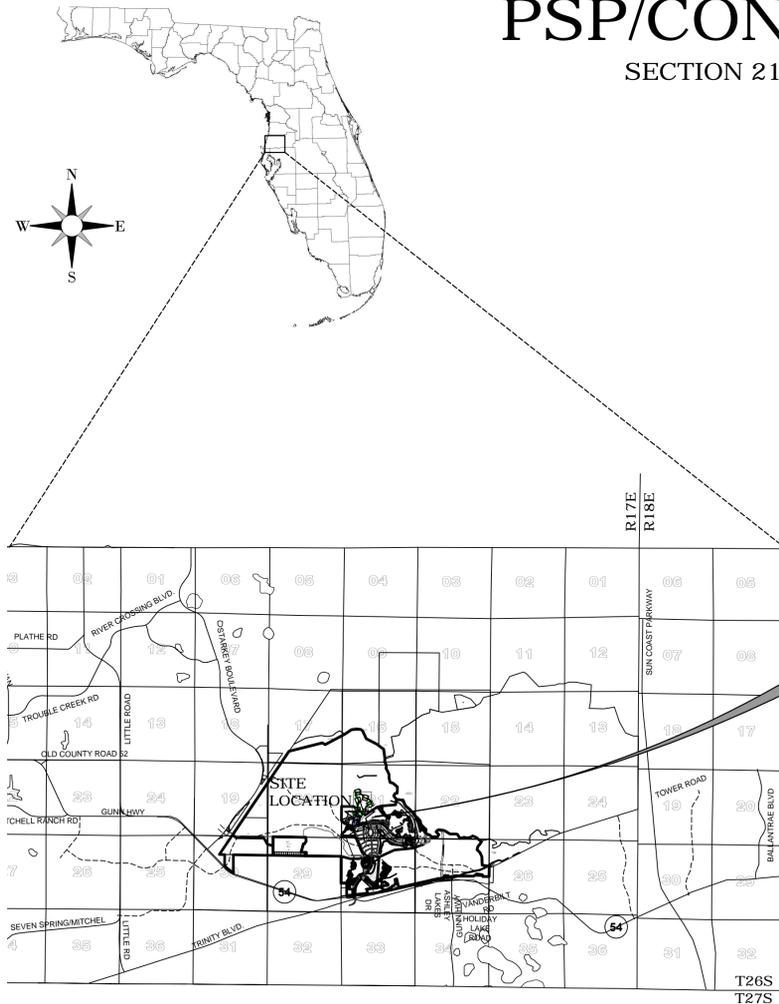
PSP/CONSTRUCTION PLANS

SECTION 21, TOWNSHIP 26 SOUTH, RANGE 17 EAST
PASCO COUNTY, FLORIDA

CALL 48 HOURS BEFORE YOU DIG



1-800-432-4770



LOCATION MAP
(NOT TO SCALE)



SITE MAP
(NOT TO SCALE)

OWNER/DEVELOPER:

WS-TSR, LLC
1217 KENTUCKY AVENUE
ST CLOUD, FL 34769
PHONE: (321) 805-4830
ATTN: REED BERLINSKY
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SURVEYOR:

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(407) 667-1777
KSMITH@DIXHITE.COM

DESCRIPTION: A PARCEL OF LAND LYING IN SECTION 21, TOWNSHIP 26 SOUTH, RANGE 17 EAST, PASCO COUNTY, FLORIDA, SAID PARCEL BEING A PORTION OF TRACT C-3 OF STARKEY RANCH VILLAGE 1 PHASES 1-5 ACCORDING TO THE PLAT THEREOF AS RECORDED IN PLAT BOOK 70, PAGE 60 OF THE PUBLIC RECORDS OF PASCO COUNTY, FLORIDA. CONTAINING 59.019 ACRES, MORE OR LESS.

THESE PLANS HAVE BEEN PREPARED IN ACCORDANCE WITH THE MANUAL OF UNIFORM MINIMUM STANDARDS FOR DESIGN, CONSTRUCTION AND MAINTENANCE FOR STREETS AND HIGHWAYS, STATE OF FLORIDA IN EFFECT AT THE TIME OF PASCO COUNTY APPROVAL, AND ARE IN COMPLIANCE WITH THE STANDARDS THEREIN.

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PASCO COUNTY SUBMITTAL DATE:
JULY 13, 2016

STARKEY RANCH CUNNINGHAM PARK
CENTRAL NEIGHBORHOOD

WS-TSR, LLC
(WHELOCK STREET CAPITAL)

DATE	DESCRIPTION	DATE	DESCRIPTION
1 07/13/2016	INITIAL COUNTY REVIEW SUBMITTAL		
PLAN REVISIONS		PLAN REVISIONS	

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ELEVATIONS BASED ON: NORTH AMERICAN VERTICAL DATUM 1988 CONVERSION: NAVD 88 TO NGVD 29 = +0.85	
ADDRESS CONTROL NUMBER	
WATER COMMITMENT	PASCO COUNTY
SEWER COMMITMENT	PASCO COUNTY
SWFWMD	
WATER DEP	
SEWER DEP	
FOLIO	21 26 17 0000 00200 0000
PERMIT / FILE NUMBERS	

FLORIDA PROFESSIONAL ENGINEER		FILE:	COVER
		PROJECT NO:	TSR-SR-1093
		GRADING & DRAINAGE	
		DESIGN BY:	CARSON
		DRAWN BY:	GAULT
		UTILITIES	
		DESIGN BY:	CARSON
		DRAWN BY:	GAULT
		COVER SHEET	
		C-100	
		GARY D. MILLER	
		DATE: _____	
		REGISTRATION NO. 52717	

GENERAL EROSION AND TURBIDITY CONTROL NOTES

- 1. The Site Subcontractor shall be responsible for installation and maintenance of all erosion and turbidity controls and the quality and quantity of offsite or wetland discharges.
2. Prior to construction, the Site Subcontractor is responsible for having his dewatering plan and turbidity control plan approved by the applicable reviewing agencies.
3. The appropriate turbidity and erosion control methodologies selected by the Site Subcontractor for this project should be made following assessment of the plans and project site specific factors and after consultations as needed with the project engineer and appropriate agencies.
4. At the onset of construction, the Site Subcontractor, as the party responsible for implementation of the erosion and sediment control plan, shall assess the above described conditions and factors with respect to relative cost effectiveness and select the appropriate methods of protection.
5. Discharges which exceed 29 N.T.U.'s over the background levels are in violation of state water quality standards.
6. The erosion and turbidity control measures shown hereon are the minimum required for agency approval.
7. Hay bales or silt screens shall be installed prior to land clearing to protect water quality and to identify areas to be protected from clearing activities.
8. Floating turbidity barriers shall be in place in flowing systems or in open water lake edges prior to initiation of earthwork and maintained for the duration of the project until all soil is stabilized.
9. No clay material shall be left exposed in any stormwater storage facility.
10. The installation of temporary erosion control barriers shall be coordinated with the construction of the permanent erosion control features to the extent necessary to assure effective and continuous control of erosion and water pollution throughout the life of the construction phase.
11. The type of erosion control barriers used shall be governed by the nature of the construction operation and soil type that will be exposed.
12. Where pumps are to be used to remove turbid waters from construction areas, the water shall be treated prior to discharge to the wetlands.
13. The Permittee shall schedule his operations such that the area of unprotected erodible earth exposed at any one time is not larger than the minimum area necessary for efficient construction operation, and the duration of exposed, uncompleted construction to the elements shall be as short as practicable.
14. Water derived from various dewatering methods should be passed through sufficiently wide areas of existing upland vegetation to filter out excess turbidity.
15. Water can be transported around the site by the use of internal swales or by pumps and pipes.
16. Sheet flow of newly filled or scraped areas may be controlled or contained by the use of brush barriers, diversion swales, interceptor ditches or low berms.
17. Exposed soils shall be stabilized as soon as possible, especially slopes leading to wetlands.
18. Energy dissipaters (such as rip rap, a gravel bed, hay bales, etc.) shall be installed at the discharge point of pipes or swales if scouring is observed.
19. Attempt to install roadway curb and gutters as soon as possible to reduce the surface area for erosion to occur.
20. Implement storm drain inlet protection (hay bales or gravel) to limit sedimentation within the stormwater system.
21. Water discharge velocities from impounded areas and temporary sedimentation basins shall be restricted to avoid scouring in receiving areas.
22. Water clarity does not reduce to state standards rapidly even in holding ponds, it may be possible to use chemical agents such as alum to flocculate or coagulate the sediment particles.
23. Hay bales, silt screens, or gravel beds can be added around the pipe or swale discharge points to help clarify discharges.
24. All fuel storage areas or other hazardous storage areas shall conform to accepted state or federal criteria for such containment areas.
25. Vehicle or equipment washdown areas will be sufficiently removed from wetlands or offsite areas.
26. Fugitive dust controls (primarily by using water spray trucks) shall be employed as needed to control windborn emissions.
27. If the above controls remain ineffective in precluding release of turbid water, especially during pond or utility line dewatering, then the contractor may be compelled to use a vertical dewatering system such as well points or sock drains to withdraw groundwater which may already be clear enough to allow direct discharge to wetlands.
28. Ongoing inspections and periodic maintenance by the Site Subcontractor shall occur throughout construction as necessary to insure the above methods are working suitably. This may be needed daily, if conditions so warrant. Site Subcontractors are encouraged to obtain and thoroughly review The Florida Development Manual: A Guide to Sound Land and Water Management, which was developed by the State of Florida Department of Environmental Protection in 1988. This provides fairly in-depth discussions of recommended techniques and also provides specific design and technical standards. A copy of this document is available for review at Heidt Design, LLC.

STREET & DRAINAGE CONSTRUCTION NOTES:

- 1. Prior to construction, the Contractor shall obtain from the Engineer or Owner a copy of all pertinent permits related to this project.
2. All construction, materials and workmanship are to be in accordance with Pasco County Land Development Code and DOT Specifications, latest editions.
3. Grass and mulch, or solid sod, all areas in existing rights-of-way disturbed by construction.
4. In accordance with the Underground Facility Damage Prevention and Safety Act (Chapter 556, F.S.) the Contractor shall call the Sunshine State One Call of Florida (SSCOF) at 1-800-432-4770 forty eight (48) hours in advance of any excavation.
5. (For Miami, Valley, Type "V", etc. Gutter Type Sections Only) Prior to curb inlet construction, the Engineer shall lay out the back of the curb in the vicinity of the respective inlet for alignment and grade, and the Contractor shall construct the inlet allowing for an 18" concrete throat between the back of the curb and the face of the inlet.
6. Suitable fill obtained through excavation of streets and retention ponds shall be placed on lots and adjacent land in accordance with the Master Drainage and Grading Plan as directed by the Engineer.
7. Sod/Seed & Mulch shall be placed in accordance with applicable City/County standards as well as in accordance with standard and specific conditions in the SWFWMD permit, if applicable.
8. Roadway underdrain has been located on these plans to ensure adequate base protection and/or proper drainage beneath structural improvements.
9. Site clearing shall be performed per the approved construction plans and in accordance with Pasco County Land Development Code.
10. Prior to beginning construction, Contractor shall expose all existing utility inverts to which a tie-in is proposed and have Engineer verify the elevation and adequacy of these inverts.
11. All subsurface construction shall comply with the "Trench Safety Act".
12. Siltation accumulations greater than the lesser of 12 inches or one-half the depth of the siltation barrier shall be immediately removed and placed in upland areas.
13. During land alteration and construction activities, it shall be unlawful to remove vegetation by grubbing or to place soil deposits, debris, solvents, construction material, machinery or other equipment of any kind within the dripline of a tree to remain on the site unless otherwise approved by the County.
14. All erosion control installation and installation coordination shall be the responsibility of the Contractor.
15. All organic debris burial areas in stormwater pond areas and floodplain mitigation pond areas will require adequate soil cover (with compaction) by the Contractor, meaning at least an adequate weight/thickness of soil material overtop the buried organic debris.
16. All organic debris burial areas in littoral shelf areas, wetland mitigation pond areas, and passive recreation/park areas, adequate soil/mulch mixing (with compaction) will be necessary by the Contractor, such that no significant future unacceptable settlement of a littoral shelf area, created wetland area, or park/grassland area will occur.
17. If any of these procedures are contemplated by the Contractor, then the Contractor shall notify the Owner/Geotechnical Consultant/Engineer in writing, at the start of construction, with some specific information, including the estimated quantity and types of materials, to which stormwater ponds, floodplain mitigation ponds, wetland mitigation ponds, or passive recreation/park areas they propose to use for this type of organic material disposal, and what approximate elevations will be the top and bottom of the organic debris.

WETLANDS NOTE:

Proposed wetland impact and mitigation for the subject site was previously approved with Starkey Ranch Village 1 Plans.

Conservation Area designation is given to all protected wetlands per Pasco County requirements. They are not designated as "Conservation Easements" for SWFWMD compensation.

EARTHWORK NOTE:

Note that all fill dirt required for this project has already been placed from excess materials excavated from ponds within Starkey Ranch. No net excavation or backfill is required, except for de minimus quantities that might be required or generated from fine grading activities. Any surplus fill material will be maintained within the Starkey Ranch project.

Earthwork Calculation: CUT = 100 CY, FILL = 2,000 CY, NET = 1,900 CY

SOIL REUSE REQUIREMENTS

At least the following six (6) types of materials are present on site that require proper handling/management by the Contractor during the course of site development/construction activities, in accordance with the noted reuse requirements for each type.
1. Site Demolition Debris (Site demolition debris, not generally considered an environmental/contamination hazard, includes such items as wood pieces, concrete pieces, plastic pipe pieces, certain metal/steel pieces, or similar.
2. Clearing and Grubbing Debris (Site clearing and grubbing debris includes all larger organic materials, such items as trees, stumps, limbs, brush, vegetation, or similar; all such materials must be either "burned" or "mulched" by the Contractor prior to reuse or disposal onsite.)
3. Topsoil/Site Strippings (Typically generated from upland areas, after demolition/clearing/grubbing/discing operations; stripping of surficial organics/topsoils being a requirement over at least all structure, building, concrete slab and pavement areas prior to filling to accommodate development, includes topsoils and organic laden sands; those topsoil/organic sand materials whose presence, or placement by the Contractor, is unacceptable beneath any type of structure, pavement, roadway, house, building, pipeline, slab, etc.)
4. Topsoils/Organic Laden Sand Materials (Approved in writing first by the Owner/Geotechnical Consultant/Engineer, could be: a) placed as fill in new (larger) landscape/grass common areas or landscape berm areas (with adequate weight/thickness of soil material overtop the buried organic debris, such that there will be no future floating up of debris; and for all organic debris burial areas in littoral shelf areas, wetland mitigation pond areas, and passive recreation/park areas, adequate soil/mulch mixing (with compaction) will be necessary by the Contractor, such that no significant future unacceptable settlement of a littoral shelf area, created wetland area, or park/grassland area will occur.)

All Site Demolition Debris shall be removed from the site development and disposed of properly in accordance with all applicable governing environmental agency requirements.

2. Clearing and Grubbing Debris (Site clearing and grubbing debris includes all larger organic materials, such items as trees, stumps, limbs, brush, vegetation, or similar; all such materials must be either "burned" or "mulched" by the Contractor prior to reuse or disposal onsite.)

If acceptable to the governing environmental agency, then all such "burned" or "mulched" site clearing/grubbing debris, if approved in writing first by the Owner/Geotechnical Consultant/Engineer, could be: a) placed as "mulch" material surface dressing in future landscape areas, stockpiling of such "mulched" materials (amounts/locations), if acceptable, will be directed by the Owner/Geotechnical Consultant/Landscape Architect/Engineer;

b) placed in temporarily excavated littoral shelf areas in selected stormwater ponds, or in temporarily excavated selected wetland mitigation ponds, in either case not in side banks and not below the permitted design depth of the pond, or such organic debris could be buried in temporarily excavated passive recreation/park areas (at least 30 feet from any structure) at approved depths/locations, but all these disposal areas will require adequate soil mixing (mix soil with the organic materials) and then refilling (with compaction) to required design grades;

c) placed along the bottom of selected floodplain mitigation ponds (not in side banks), not below the permitted excavation depth of the pond, but will require adequate soil cover; d) placed along the bottom of selected deeper stormwater ponds (not in side banks), not below the permitted design depth, but will require adequate soil cover.

In all instances, the minimum pond depth (including floodplain and wetland mitigation areas) shall be no less than required by the Engineer.

All organic debris burial areas in stormwater pond areas and floodplain mitigation pond areas will require adequate soil cover (with compaction) by the Contractor, meaning at least an adequate weight/thickness of soil material overtop the buried organic debris. Such that there will be no future floating up of debris; and for all organic debris burial areas in littoral shelf areas, wetland mitigation pond areas, and passive recreation/park areas, adequate soil/mulch mixing (with compaction) will be necessary by the Contractor, such that no significant future unacceptable settlement of a littoral shelf area, created wetland area, or park/grassland area will occur.

If any of these procedures are contemplated by the Contractor, then the Contractor shall notify the Owner/Geotechnical Consultant/Engineer in writing, at the start of construction, with some specific information, including the estimated quantity and types of materials, to which stormwater ponds, floodplain mitigation ponds, wetland mitigation ponds, or passive recreation/park areas they propose to use for this type of organic material disposal, and what approximate elevations will be the top and bottom of the organic debris.

WATER, SEWER & RECLAIMED WATER CONSTRUCTION NOTES:

- 1. Prior to construction, the Contractor shall obtain from the Engineer or Owner a copy of all pertinent permits related to this project.
2. Solid sod, all areas in existing rights-of-way disturbed by construction.
3. Contractor is to coordinate all work within, but not limited to, Pasco County rights-of-way with utility companies in order to prevent damage to utility lines and the making of adjustments to same, if required.
4. All utility materials and workmanship must comply with Standards for Design and Construction of Water, Wastewater and Reclaimed Water Facilities.
5. Fire hydrant, gate valve and blow-off valve assemblies shall consist of all pipe, valves, less, fittings, and any and all other appurtenances comprising a complete, working unit.
6. All 4"-12" PVC water main pipe shall conform to the requirements found in AWWA Standard C-900, latest edition at the time of plan approval.
7. All water mains shall be deflected vertically where crossing storm sewer pipe to obtain a minimum vertical clearance of 18 inches between the outside of the 29 water main and the outside of the storm sewer.
8. Water mains should be laid at least 10 feet horizontally from any existing or proposed storm sewer.
9. At no time should vertical clearance between force main or gravity sewer and water main be less than 18" at crossing of same.
10. At no time should horizontal clearance between force main or gravity sewer and water main be less than 10' when same are paralleling each other.
11. Adjusting manhole tops to match grade and slope of the finish paving shall be included in the respective contract unit price for manholes, payment of which will constitute full compensation for the construction and completion of the manhole, and no additional payment will be allowed or made for adjusting manhole tops.
12. The locations and elevation of all service lines are to be determined in the field by Owner and/or Contractor prior to construction of same.
13. Bends shall be installed in force main or water main to avoid unforeseen conflicts in existing or proposed structures.
14. The joint deflection method shall be used where practical in lieu of installing bends.
15. Contractor shall verify locations and depths of existing water and sewer lines prior to beginning construction.
16. The existing underground utility lines shown hereon were taken from documents furnished by others and not field verified, therefore, the Engineer cannot guarantee the accuracy of same nor that all are shown. The Contractor shall expose all underground utility lines in coordination with the Owners to his satisfaction and make adjustments to same in the event there are conflicts with new construction.
17. Contractor shall be responsible for obtaining any and all road crossing or utility permits.
18. All 8" sanitary sewer pipe shall be constructed at a 0.40% minimum slope unless otherwise noted.
19. All valve box assemblies located within roadways or parking areas shall be protected from truck traffic by use of 6" thick reinforced concrete pads poured around valve boxes (see detail).
20. All subsurface construction shall comply with the "Trench Safety Act."
21. Connections into existing county-owned systems shall be via wet tap. Wet taps shall be performed by the Pasco County Utilities Services Branch at the Developer's expense. Material for wet-taps larger than 2" shall be provided and installed by the project Contractor. Excavation, backfill and surface restoration shall be the Contractor's responsibility.

3. Muck/Peat Organic Materials (Typically generated from wetland or lowland areas, or similar areas, permitted for impact or displacement, including excavation of suitable organic materials and refilling with suitable sandy soils to accommodate development, includes significant organic peat materials, organic sandy muck materials, and mucky or organic sand materials, designated either F1 or A-6, per the Unified and AASHTO Soil Classification Systems, respectively; those organic materials whose presence, or placement by the Contractor, is unacceptable beneath any type of structure, pavement, roadway, house, building, pipeline, slab, etc.)
If acceptable to the governing environmental agency, then all such muck/peat (significant) organic materials, if approved in writing first by the Owner/Geotechnical Consultant/Engineer, could be: a) placed as "peat/muck/organic matter" surface layer in new or created wetland mitigation areas, stockpiling of such "significant organic" materials (amounts/locations), if acceptable, will be directed by the Owner/Wetland Consultant;

b) placed in temporarily excavated littoral shelf areas in selected stormwater ponds, or in temporarily excavated selected wetland mitigation ponds, in either case not in side banks and not below the permitted design depth of the pond, or such organic materials could be buried in temporarily excavated passive recreation/park areas (at least 30 feet from any structure) at approved depths/locations, but all these disposal areas will require adequate soil mixing (mix soil with the organic materials) and then refilling (with compaction) to required design grades;

c) placed along the bottom of selected floodplain mitigation ponds (not in side banks), not below the permitted excavation depth of the pond, but will require adequate soil cover; d) placed along the bottom of selected deeper stormwater ponds (not in side banks), not below the permitted design depth, but will require adequate soil cover.

All organic debris burial areas in stormwater pond areas and floodplain mitigation pond areas will require adequate soil cover (with compaction) by the Contractor, meaning at least an adequate weight/thickness of soil material overtop the buried organic debris, such that there will be no future floating up of debris; and for all organic debris burial areas in littoral shelf areas, wetland mitigation pond areas, and passive recreation/park areas, adequate soil/mulch mixing (with compaction) will be necessary by the Contractor, such that no significant future unacceptable settlement of a littoral shelf area, created wetland area, or park/grassland area will occur.

If any of these procedures are contemplated by the Contractor, then the Contractor shall notify the Owner/Geotechnical Consultant/Engineer in writing, at the start of construction, with some specific information, including the estimated quantity and types of materials, to which stormwater ponds, floodplain mitigation ponds, wetland mitigation ponds, or passive recreation/park areas they propose to use for this type of organic material disposal, and what approximate elevations will be the top and bottom of the organic debris.

4. Topsoils/Site Strippings (Typically generated from upland areas, after demolition/clearing/grubbing/discing operations; stripping of surficial organics/topsoils being a requirement over at least all structure, building, concrete slab and pavement areas prior to filling to accommodate development, includes topsoils and organic laden sands; those topsoil/organic sand materials whose presence, or placement by the Contractor, is unacceptable beneath any type of structure, pavement, roadway, house, building, pipeline, slab, etc.)

Approved in writing first by the Owner/Geotechnical Consultant/Engineer, could be: a) placed as fill in new (larger) landscape/grass common areas or landscape berm areas (with adequate weight/thickness of soil material overtop the buried organic debris, such that there will be no future floating up of debris; and for all organic debris burial areas in littoral shelf areas, wetland mitigation pond areas, and passive recreation/park areas, adequate soil/mulch mixing (with compaction) will be necessary by the Contractor, such that no significant future unacceptable settlement of a littoral shelf area, created wetland area, or park/grassland area will occur.)

b) placed in temporarily excavated littoral shelf areas in selected stormwater ponds, or in temporarily excavated selected wetland mitigation ponds, in either case not in side banks and not below the permitted design depth of the pond, or such organic materials could be buried in temporarily excavated passive recreation/park areas (at least 30 feet from any structure) at approved depths/locations, but all these disposal areas will require adequate soil mixing (mix soil with the organic materials) and then refilling (with compaction) to required design grades;

c) placed along the bottom of selected floodplain mitigation ponds (not in side banks), not below the permitted excavation depth of the pond, but will require adequate soil cover; d) placed along the bottom of selected deeper stormwater ponds (not in side banks), not below the permitted design depth, but will require adequate soil cover.

All topsoil/organic laden sand disposal areas in littoral shelf areas, wetland mitigation pond areas, passive recreation/park areas, or landscape/berm areas will require adequate compaction by the Contractor, such that no significant future unacceptable settlement of a littoral shelf area, created wetland area, park/grassland area, or landscape berm will occur.

If any of these procedures are contemplated by the Contractor, then the Contractor shall notify the Owner/Geotechnical Consultant/Engineer in writing, at the start of construction, with some specific information, including the estimated quantity and types of materials, to which stormwater ponds, floodplain mitigation ponds, wetland mitigation ponds, passive recreation/park areas, or landscape/berm areas they propose to use for this type of organic material disposal, and what approximate elevations will be the top and bottom of the clayey materials.

6) Structural Sand Fill Materials (Typically generated from pond/lake excavations, cut from higher elevation areas, or from utility pipeline/manhole excavations; such sand materials, with typically 35% fines or less passing the No. 200 sieve, designated either SP, SP-SM, SM or A-2-4, A-2-6 or A-3, per the Unified and AASHTO Soil Classification Systems, respectively; such sand materials being suitable or acceptable for reuse by the Contractor as building pad fill, structural fill, roadway embankment fill, and pipeline or manhole excavation backfill.)

All such sand materials shall be reused onsite by the Contractor, per the Geotechnical reports, as building pad fill, structural fill, roadway embankment fill, and pipeline or manhole excavation backfill; placed by the Contractor in loose lifts not exceeding 12-inches compacted to at least 95% or 98% modified Proctor (per ASTM D-1557 or AASHTO T-180), whichever is applicable depending upon the future use of the filled area (see Geotechnical reports), with density testing on each fill lift for acceptance by the Geotechnical Consultant, upon Contractor request, prior to the next fill lift being placed.

a) placed as fill in new (larger) landscape/grass common areas or landscape berm areas (with adequate weight/thickness of soil material overtop the buried organic debris, such that there will be no future floating up of debris; and for all organic debris burial areas in littoral shelf areas, wetland mitigation pond areas, and passive recreation/park areas, adequate soil/mulch mixing (with compaction) will be necessary by the Contractor, such that no significant future unacceptable settlement of a littoral shelf area, created wetland area, or park/grassland area will occur.)

b) placed in temporarily excavated littoral shelf areas in selected stormwater ponds, or in temporarily excavated selected wetland mitigation ponds, in either case not in side banks and not below the permitted design depth of the pond, or such organic materials could be buried in temporarily excavated passive recreation/park areas (at least 30 feet from any structure) at approved depths/locations, but all these disposal areas will require adequate soil mixing (with compaction) to required design grades;

c) placed along the bottom of selected floodplain mitigation ponds (not in side banks), not below the permitted excavation depth of the pond; d) placed along the bottom of selected deeper stormwater ponds (not in side banks), not below the permitted design depth.

All topsoil/organic laden sand disposal areas in littoral shelf areas, wetland mitigation pond areas, passive recreation/park areas, or landscape/berm areas will require adequate compaction by the Contractor, such that no significant future unacceptable settlement of a littoral shelf area, created wetland area, park/grassland area, or landscape berm will occur.

coated, a tapping valve with mechanical joint and the equipment to provide, and conduct a pressure test. County personnel will witness the pressure test which must be at 150 psi for duration of thirty minutes.

The Contractor is responsible for the excavation before any County personnel will enter an excavated area. If the trench is four feet in depth or deeper, it will require a trench box or shoring, and a ladder according to occupational safety and health administration (OSHA) standards.

The tapping valve will require a blocking device made of suitable material or device. This blocking device or material will be placed under the valve and remain in place until the tap machine is removed and the tap is completed.

Note: If the Contractor has not fulfilled his responsibilities, as stated above, prior to the arrival of Pasco County Utilities Operations and Maintenance tapping crew, there will be an additional charge of \$95.00.

If you have any questions regarding this information, contact Nelson D. Holt, Field Supervisor, Utilities Services Branch, at (727) 847-8145, or e-mail nholt@pascocountyfl.net.

A grease trap and/or oil/grease separator will be installed if/when the project requires it.

Fire hydrants shall be fire-tested and color-coded based on flow results.

The Utilities Services Branch shall not own or maintain on-site waterlines, sewer lines, or facilities unless otherwise approved by the Utilities Services Branch.

Pool backwash shall be directed to the grassed area via a flex hose.

A minimum 10-foot horizontal separation shall be maintained in parallel installations between any type of sewer (including drainage inlets) and water main whenever present. A minimum 5-foot horizontal separation shall be maintained in parallel installation between reclaimed water mains and water mains, and between reclaimed water mains and sanitary sewers whenever present.

In cases where it is not possible to maintain a 10-foot horizontal separation between any type of parallel sewer and water main, or a 5-foot separation between reclaimed main and water main, the water main must be installed in a separate trench or on an undisturbed earth shelf located on one side of the sewer, reclaimed main, or force main at such an elevation that the bottom of the water main is at least 18 inches above the top of the sewer.

Where it is not possible to maintain a vertical distance of 18 inches or a horizontal distance of 10 feet in parallel installations, the water main shall be constructed of DIP and the sewer, reclaimed main or the force main shall be constructed of DIP (if available in the size proposed) with a minimum vertical distance of 6 inches. The water main should be above the sewer, reclaimed main, or force main, joints on the water main shall be located as far apart as possible from joints on the sewer, reclaimed main, or force main (staggered joints).

In consideration of Pasco County's agreement to provide potable water and/or reclaimed water to the subject property, developer/owner, and its successors assigns, agree to the following:

a. In the event of production failure or shortfall by Tampa Bay water, as set forth in section 3.19 of the interlocal agreement creating Tampa Bay Water, developer/owner shall transfer to Pasco County any and all water use permits or water use rights the developer/owner may have to use or consume surface or ground water within Pasco County.

b. Prior to developer/owner selling water or water use permits or water use rights, developer/owner shall notify Pasco County, and Pasco County shall have a right of first refusal to purchase such water or water use permits or water use rights.

Contractor's responsibilities regarding wet taps two inches and larger shall be as follows:

2" only- this excavated trench must be dry or the trench will require rock and a pump to be in place. The minimum distance from the face of the valve to the top of the trench is to be six feet.

3" and larger- the contractor will supply a tapping saddle being epoxy

If any of these procedures are contemplated by the Contractor, then the Contractor shall notify the Owner/Geotechnical Consultant/Engineer in writing, at the start of construction, with some specific information, including the estimated quantity and types of materials, to which stormwater ponds, floodplain mitigation ponds, wetland mitigation ponds, passive recreation/park areas, or landscape berm areas they propose to use for this type of organic debris disposal, and what approximate elevations will be the top and bottom of the organic debris.

5) Non-Structural Clayey Sand/Clay Materials (Typically generated from pond/lake excavations or from utility pipeline/manhole excavations; such clayey sand/clay materials, with typically 40% fines or more passing the No. 200 sieve, designated either SC, CL, CH or A-4 to A-7, per the Unified and AASHTO Soil Classification Systems, respectively; such clayey sand/clay materials being suitable or unacceptable for reuse by the Contractor as building pad fill, structural fill, roadway embankment fill, and pipeline or manhole excavation backfill.)

If acceptable to the governing environmental agency, all such clayey sand/clay materials, if approved in writing first by the Owner/Geotechnical Consultant/Engineer, could be: a) placed as fill in new (larger) landscape/grass common areas or landscape berm areas (with compaction), provide some surface sandy soils (min. of 18-inches) as directed by the Landscape Consultant for planting, stockpiling of such "clayey sand/clay materials" (amounts/locations), if acceptable, will be directed by the Owner/Landscape Consultant;

b) placed in temporarily excavated littoral shelf areas in selected stormwater ponds, or in temporarily excavated selected wetland mitigation ponds, in either case not in side banks and not below the permitted design depth of the pond, or such clayey sand/clay materials could be buried in temporarily excavated passive recreation/park areas (at least 30 feet from any structure) at approved depths/locations, but all these disposal areas will require refilling (with compaction) to required design grades, and the top 2 feet (min.) being sand materials (not clayey materials) for turbidity control and planting;

c) placed along the bottom of selected floodplain mitigation ponds (not in side banks), not below the permitted excavation depth of the pond; however, a 12-inch layer (min.) of sand material overtop the clayey materials will be necessary for turbidity control.

d) placed along the bottom of selected deeper stormwater ponds (not in side banks), not below the permitted design depth, however, a 12-inch layer (min.) of sand material overtop the clayey materials will be necessary for turbidity control.

All clayey sand/clay disposal areas in littoral shelf areas, wetland mitigation pond areas, passive recreation/park areas, or landscape/berm areas will require adequate compaction by the Contractor, such that no significant future unacceptable settlement of a littoral shelf area, created wetland area, park/grassland area, or landscape berm will occur.

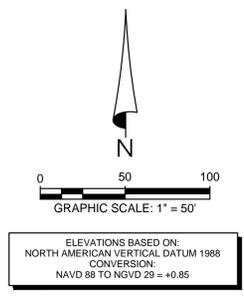
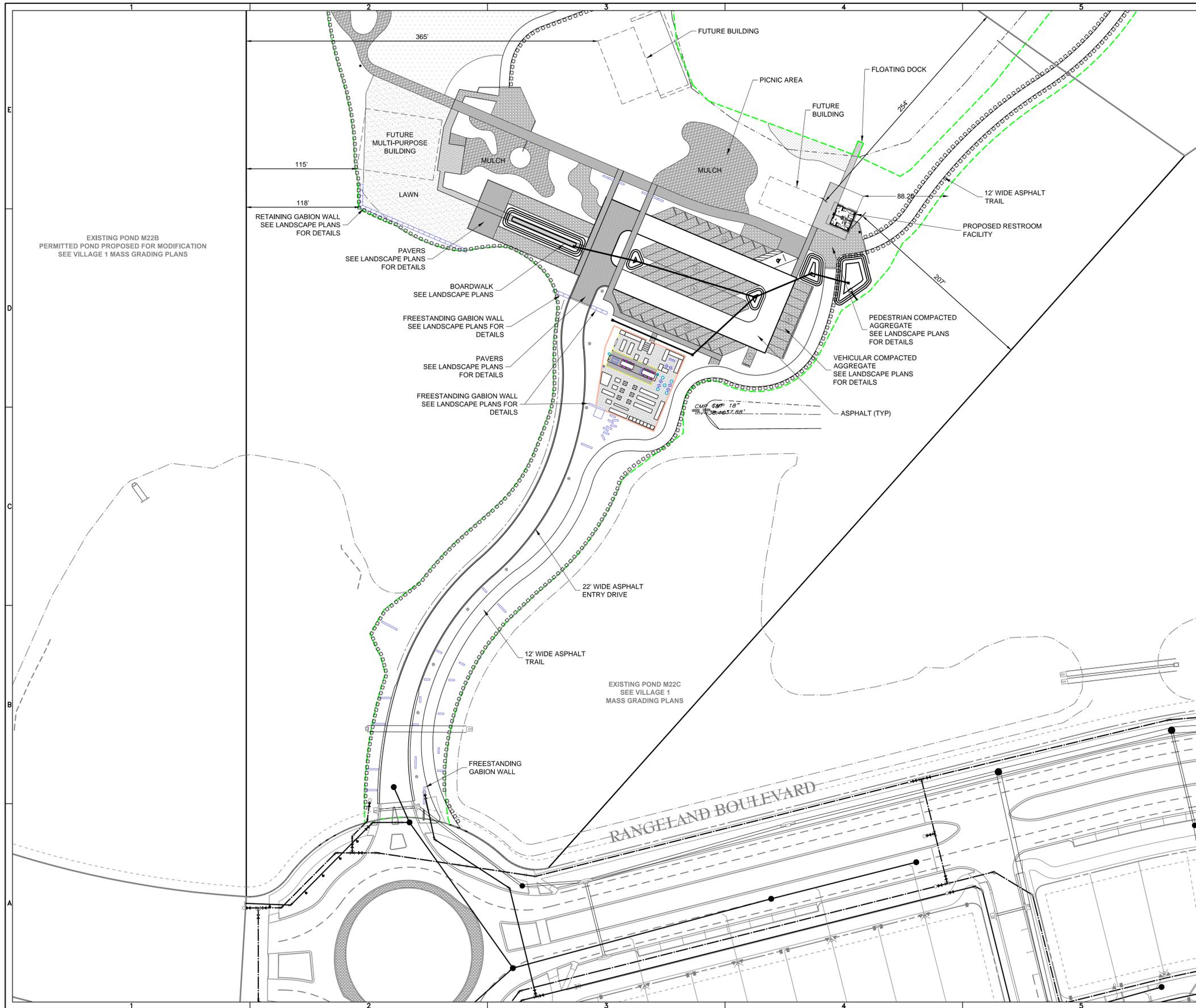
If any of these procedures are contemplated by the Contractor, then the Contractor shall notify the Owner/Geotechnical Consultant/Engineer in writing, at the start of construction, with some specific information, including the estimated quantity and types of materials, to which stormwater ponds, floodplain mitigation ponds, wetland mitigation ponds, passive recreation/park areas, or landscape/berm areas they propose to use for this type of clayey sand/clay disposal, and what approximate elevations will be the top and bottom of the clayey materials.

6) Structural Sand Fill Materials (Typically generated from pond/lake excavations, cut from higher elevation areas, or from utility pipeline/manhole excavations; such sand materials, with typically 35% fines or less passing the No. 200 sieve, designated either SP, SP-SM, SM or A-2-4, A-2-6 or A-3, per the Unified and AASHTO Soil Classification Systems, respectively; such sand materials being suitable or acceptable for reuse by the Contractor as building pad fill, structural fill, roadway embankment fill, and pipeline or manhole excavation backfill.)

All such sand materials shall be reused onsite by the Contractor, per the Geotechnical reports, as building pad fill, structural fill, roadway embankment fill, and pipeline or manhole excavation backfill; placed by the Contractor in loose lifts not exceeding 12-inches compacted to at least 95% or 98% modified Proctor (per ASTM D-1557 or AASHTO T-180), whichever is applicable depending upon the future use of the filled area (see Geotechnical reports), with density testing on each fill lift for acceptance by the Geotechnical Consultant, upon Contractor request, prior to the next fill lift being placed.

HEIDT DESIGN logo and contact information: 5806-B Breckenridge Pkwy, Tampa, Florida 33610, Office: 813-253-5311, Fax: 813-444-7629, www.HeidtDesign.com. STARKEY RANCH CUNNINGHAM PARK CENTRAL NEIGHBORHOOD GENERAL NOTES. WS-TSR, LLC. PROJECT NO: TSR-SR-1093, FILE: GNOTES, DESIGN BY: BU DEN, DRAWN BY: BU DEN, FLORIDA PROFESSIONAL ENGINEER, GARY D. MILLER, DATE: REGISTRATION NO. 52717, C-101.

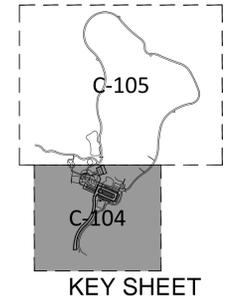
VERTICAL SCALE: 1" = 10' HORIZONTAL SCALE: 1" = 10' DATE: 07/13/2016 REVIEW SUBMITTAL DATE: 07/13/2016 DESCRIPTION: DATE: DESCRIPTION: PROJECT NO: TSR-SR-1093 FILE: GNOTES DESIGN BY: BU DEN DRAWN BY: BU DEN FLORIDA PROFESSIONAL ENGINEER GARY D. MILLER DATE: REGISTRATION NO. 52717 C-101



GENERAL LEGEND

--- (dashed line)	LIMITS OF WORK
--- (dashed line with squares)	STAKED EROSION CONTROL
--- (dashed line with dots)	RIGHT-OF-WAY LINE
--- (dashed line with triangles)	UTILITY EASEMENT
--- (dashed line with crosses)	FEMA FLOOD ZONE LINE
--- (dashed line with stars)	WETLAND LINE
--- (dashed line with circles)	WETLAND CONS. AREA SETBACK / LANDWARD EXTENT OF UPLAND BUFFER
--- (dashed line with diamonds)	PROPOSED HANDICAP PARKING SPACE

- PHASING NOTES:**
- 1) THE STARKEY RANCH CUNNINGHAM PARK WILL BE CONSTRUCTED IN A SINGLE PHASE.
 - 2) THE STARKEY RANCH CUNNINGHAM PARK RELIES UPON RANGELAND BOULEVARD FOR ACCESS AND UPON POND M22B FOR STORMWATER MANAGEMENT.



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 Landscape Architecture Certificate of Authorization No. LC26000405

**STARKEY RANCH CUNNINGHAM PARK
 CENTRAL NEIGHBORHOOD
 PRELIMINARY SITE PLAN**

PREPARED FOR: **WS-TSR, LLC**

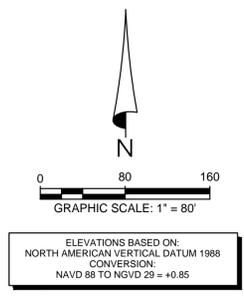
NO.	DATE	DESCRIPTION
1	07/13/2016	REVIEW SUBMITTAL

PROJECT NO: TSR-SR-1093
 FILE: SITE
 DESIGN BY: BUDEN
 DRAWN BY: BUDEN

FLORIDA PROFESSIONAL ENGINEER

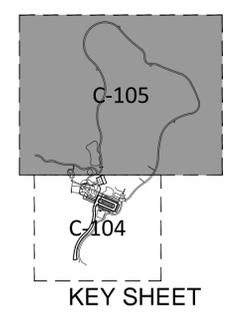
GARY D. MILLER
 DATE: _____
 REGISTRATION NO. 52717

C-104



GENERAL LEGEND

--- (dashed line)	LIMITS OF WORK
--- (dashed line with squares)	STAKED EROSION CONTROL
--- (dashed line with dots)	RIGHT-OF-WAY LINE
--- (dashed line with crosses)	UTILITY EASEMENT
--- (dashed line with triangles)	FEMA FLOOD ZONE LINE
--- (dashed line with stars)	WETLAND LINE
--- (dashed line with circles)	WETLAND CONS. AREA SETBACK / LANDWARD EXTENT OF UPLAND BUFFER



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**STARKEY RANCH CUNNINGHAM PARK
CENTRAL NEIGHBORHOOD
PRELIMINARY SITE PLAN**

PREPARED FOR: **WS-TSR, LLC**

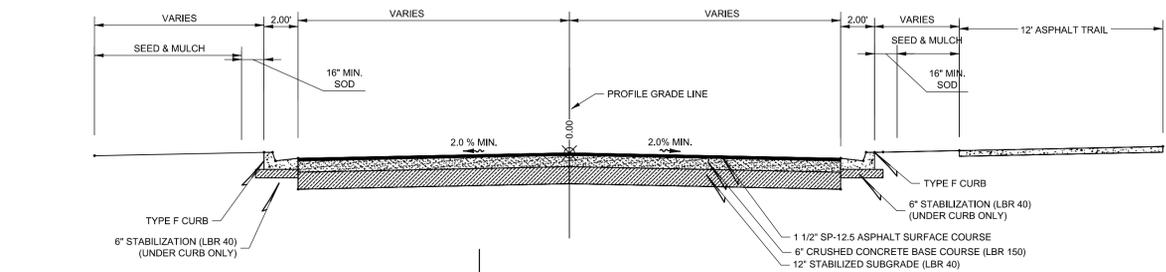
NO.	DATE	DESCRIPTION
1	07/13/2016	REVIEW SUBMITTAL

PROJECT NO: TSR-SR-1093
FILE: SITE
DESIGN BY: BUDEN
DRAWN BY: BUDEN

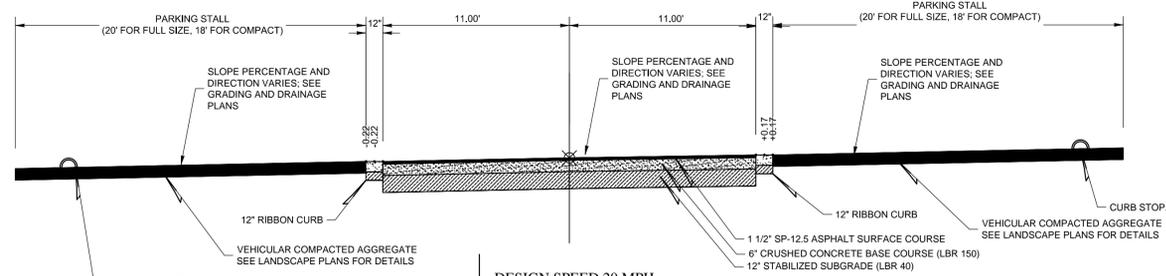
FLORIDA PROFESSIONAL ENGINEER

GARY D. MILLER
DATE: _____
REGISTRATION NO. 52717

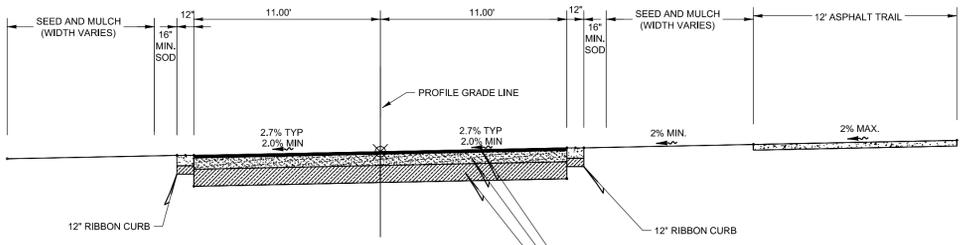
C-105



DESIGN SPEED 20 MPH
(ROUNDBOUT EXTENSION TO DRIVE AISLE)
SCALE: 1" = 5'



DESIGN SPEED 20 MPH
22' DRIVE AISLE WITH PARKING
SCALE: 1" = 5'



DESIGN SPEED 20 MPH
22' DRIVE AISLE
SCALE: 1" = 5'

PROPOSED ROADWAY DESIGN	
FOR ON-SITE PARKING & DRIVE AISLES	
LAYER COEFFICIENTS	THICKNESS
0.44 - TYPE SP-12.5 ASPHALT SURFACE COURSE	1.50"
0.15 - CRUSHED CONCRETE BASE COURSE (LBR 150)	6"
0.08 - STABILIZED SUBGRADE (12' MIN.)	12"
SN = (0.44 x 1.50) + (0.15 x 6) + (0.08 x 12) = 2.52	

PROPOSED ROADWAY DESIGN	
FOR ON-SITE PARKING & DRIVE AISLES (FOR SOIL CEMENT BASE ALTERNATIVE)	
LAYER COEFFICIENTS	THICKNESS
0.44 - TYPE SP-12.5 ASPHALT SURFACE COURSE	1.50"
0.15 - SOIL CEMENT BASE	6"
0.04 - COMPACTED SUBGRADE	12"
SN = (0.44 x 1.50) + (0.15 x 6) + (0.04 x 12) = 2.04	

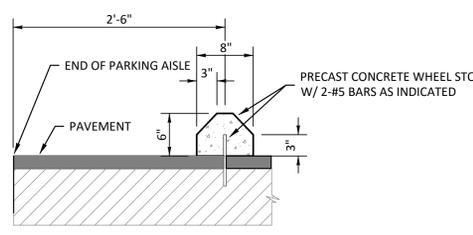
CRUSHED CONCRETE BASE WITH ALTERNATE FOR SOIL-CEMENT:

- Pavement wearing surface shall be asphaltic concrete of type and thickness shown in detail and shall meet current Department of Transportation Specifications.
- Pavement base shall be crushed concrete, as designated in plans, and shall be compacted to a minimum thickness as shown.
- Crushed concrete road base material shall be of uniform quality, free of all organics, steel rebar, asphalt debris, and any other deleterious materials.
- Crushed concrete road base material shall generally conform to the gradation chart for graded aggregate base, FDOT Section 204 and 901, tested at a frequency required by the Governing Agency having jurisdiction. In addition, crushed concrete shall conform to the applicable specification contained within Pasco County Design Standards, "Crushed Concrete Base Specification - Index 104."
- Crushed concrete road base material shall have a minimum compacted dry density of 114.0 pcf (per AASHTO T-180), and a minimum Limerock Bearing Ratio (LBR) of 150 (under-tolerance +/- 5%), tested at a frequency required by the Governing Agency having jurisdiction, or in the absence thereof, by minimum FDOT standards.
- Base single-course lifts shall not exceed 6 inches (compacted, 8 inches loose).
- Crushed concrete road base shall be compacted to a minimum of 100% of Modified Proctor per AASHTO T-180, tested at a frequency required by the Governing Agency having jurisdiction, or in the absence thereof, by minimum FDOT standards.
- Crushed concrete base shall have a 12-inch thick stabilized subgrade, Type "B" stabilization in accordance with FDOT Section 160 and shall have a minimum Limerock Bearing Ratio (LBR) of 40 or greater. Subgrade shall be compacted to the minimum thickness as shown. Subgrade shall be compacted to a minimum of 98% Modified Proctor per AASHTO T-180.
- Compacted subgrade (beneath stabilized subgrade, if required, or beneath base materials) shall be prepared in accordance with FDOT Index 505, latest edition. Embankment fills or natural sands to 24 inches below the bottom of the pavement base (if no stabilized subgrade), or to 24 inches below the bottom of stabilized subgrade, shall be sandy soils (A-3 or SP/SP-SM) with typically 15% fines or less passing the No. 200 sieve.
- Crushed concrete base surface shall be inspected and approved by the engineer prior to any paving operation.
- All curbs and gutters shall be placed on a foundation of Type "B" stabilized subgrade with a minimum LBR value of 40 (or a minimum FBV of 75) which has been compacted to a minimum density of ninety-eight percent (98%) of the maximum density as determined by AASHTO T-180 for a minimum depth of twelve (12) inches.
- All Portland Cement Concrete shall have a minimum compressive strength of 3000 psi.
- Roadway underdrain has been located on these plans to ensure adequate base protection. Prior to curb construction, the Geotechnical Engineer shall review the predesign borings and, along with their field inspection, make a recommendation regarding additional underdrain requirements.
- Should no underdrain be specified on the plans, the Contractor shall include 1,000 linear feet of underdrain at unit prices for bid purposes.
- All testing referenced above shall, at a minimum, be at the frequency required by the Governing Agency having jurisdiction, or in the absence thereof, by minimum FDOT standards.

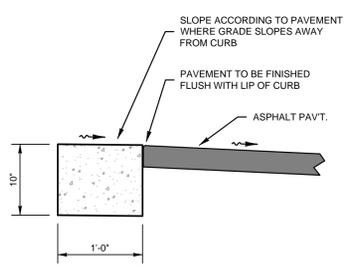
ALTERNATE FOR SOIL-CEMENT BASE MATERIAL:

- Soil-cement mix design shall be provided a minimum 30 days in advance of placement of base material for approval by the Engineer. The soil-cement product shall be in accordance with PCA standards.
- Soil-cement surface shall be inspected and approved by the Engineer prior to any paving operation.
- Subgrade for soil-cement shall be prepared in accordance with FDOT Index No. 505, latest edition. Embankment fills or natural sands to 24-inches below the bottom of the pavement base (if no stabilized subgrade), or to 24-inches below the bottom of stabilized subgrade, shall be sandy soils (A-3 or SP/SP-SM) with typically 15% fines or less passing the No. 200 sieve.
- Subgrade under a soil-cement base shall be proof-rolled to grade, as directed by the Engineer and approved by the Engineer with suitable compaction equipment to achieve a density of ninety-eight (98%) percent Modified Proctor for a depth of twelve (12) inches prior to placing soil-cement base.
- Subgrade under soil-cement base shall NOT be stabilized unless otherwise directed by Engineer of Record.

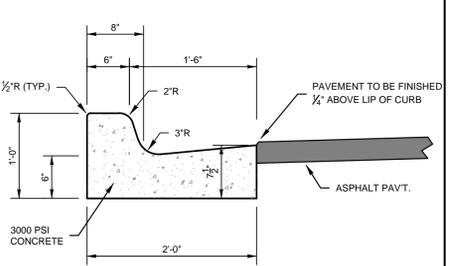
Contractor may propose alternate pavement designs.
Contractor shall submit any pavement alternatives to
Engineer for approval prior to final subgrade preparations.



CURB STOP DETAIL
SCALE: 1" = 1'



12" RIBBON CURB
SCALE: 1" = 1'



TYPE "F" CURB & GUTTER
SCALE: 1" = 1'

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STARKEY RANCH CUNNINGHAM PARK
CENTRAL NEIGHBORHOOD
ROADWAY TYPICAL SECTIONS AND
DETAILS

WS-TSR, LLC
PREPARED FOR:

NO.	DATE	DESCRIPTION
1	07/13/2016	REVIEW SUBMITTAL

PROJECT NO: TSR-SR-1093
FILE: RS
DESIGN BY: BUDEN
DRAWN BY: BUDEN

FLORIDA PROFESSIONAL ENGINEER

GARY D. MILLER
DATE:
REGISTRATION NO. 52717

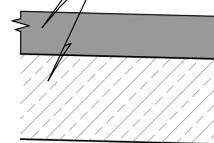
R:\STARKEY RANCH\CUNNINGHAM PARK\ENGINEERING\DWG-C-200 20160713 8:02 AM NATALIE BUDEN

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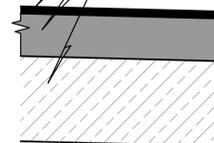
TYPICAL TRAIL SECTION ALTERNATIVES

WIDTH VARIES 6' TO 14' PER PLAN

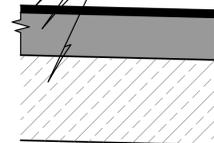
6" CONCRETE (3000 PSI)
12" COMPACTED SUBGRADE (98% MODIFIED PROCTOR)



1" TYPE SP ASPHALT SURFACE COURSE
4" CRUSHED CONCRETE BASE
12" TYPE B STABILIZED SUBGRADE (LBR 40)



1" TYPE SP ASPHALT SURFACE COURSE
4" SOIL CEMENT BASE
12" COMPACTED SUBGRADE (98% MODIFIED PROCTOR)



PASCO COUNTY CRUSHED CONCRETE BASE SPECIFICATIONS

THE WORK SPECIFIED UNDER THIS SECTION CONSISTS OF THE CONSTRUCTION OF ROADWAY BASE UTILIZING CRUSHED CONCRETE (RECLAIMED CONCRETE AGGREGATE BASE MATERIAL) ON A PREPARED STABILIZED SUBGRADE OF LBR 40 WITH A DENSITY OF 98% OF THE MODIFIED PROCTOR MAXIMUM DENSITY AS DETERMINED BY FM 3-T-180, METHOD D, IN CONFORMITY WITH THE LINES, GRADES NOTES AND TYPICAL CROSS SECTIONS SHOWN IN THE PLANS, AND AS DIRECTED BY THE COUNTY ENGINEER.

THE CONSTRUCTION OF CRUSHED CONCRETE BASE SHALL CONFORM TO THE REQUIREMENTS OF THIS SECTION, OR, IN LIEU THEREOF, SUCH REQUIREMENTS AS MAY BE ESTABLISHED BY THE COUNTY ENGINEER DURING CONSTRUCTION. THE COUNTY ENGINEER SHALL HAVE FULL AUTHORITY TO MODIFY THE PROVISIONS OF THIS SECTION AS DEEMED NECESSARY, IN HIS OPINION, TO MEET FIELD CONDITIONS AND REQUIREMENTS.

MATERIALS

CRUSHED CONCRETE MUST BE PRODUCED FROM A SOURCE APPROVED BY FLORIDA DEPARTMENT OF TRANSPORTATION OR THE COUNTY ENGINEER. THE SUPPLIER SHALL HAVE DEPARTMENT OF ENVIRONMENTAL PROTECTION (DEP) PERMIT REQUIREMENTS SECTION 62-701.730 OR BE QUALIFIED AS A CLEAN DEBRIS SOURCE UNDER DEP RULES. THE RECLAIMED CONCRETE AGGREGATE BASE SHALL CONSIST OF CRUSHED CONCRETE MATERIAL DERIVED FROM THE CRUSHING OF HARD PORTLAND CEMENT CONCRETE.

COMPOSITION

BASE MATERIAL SHALL CONFORM TO THE FOLLOWING GRADATION REQUIREMENTS:

SIZE	PERCENT BY WEIGHT PASSING
2 INCH	100
3/4 INCH	65 to 95
3/8 INCH	40 to 85
No. 4	25 to 65
No. 10	20 to 50
No. 50	5 to 25
No. 200	0 to 10

BASE MATERIAL SHALL CONFORM TO THE FOLLOWING PLASTICITY REQUIREMENTS:

CRUSHED CONCRETE BASE SHALL NOT CONTAIN PLASTIC SOILS SUCH THAT THE No. 40 SIEVE MATERIAL SHALL BE NON-PLASTIC. LIQUID LIMIT (AS DETERMINED BY AASHTO 790) (LESS THAN 25) PER MATERIAL TYPE.

THE FINISHED IN-PLACE CRUSHED CONCRETE BASE **LIME/ROCK BEARING RATIO** SHALL HAVE A MINIMUM (LBR) OF 150.

CRUSHED CONCRETE BASE SHALL BE FREE OF ALL MATERIALS THAT FALL UNDER THE CATEGORY OF SOLID WASTE OR HAZARDOUS MATERIALS AS DEFINED BY THE STATE OR LOCAL JURISDICTION AND SHALL MEET ALL DEP PERMIT REQUIREMENTS WHICH PERTAIN TO CONSTRUCTION, DEMOLITION AND RECYCLING OF THESE MATERIALS. CRUSHED CONCRETE BASE SHALL BE ASBESTOS FREE. THE FOLLOWING LIMITS SHALL NOT BE EXCEEDED:

BITUMINOUS CONCRETE1% BY WEIGHT
BRICKS1% BY WEIGHT
WOOD AND OTHER ORGANIC SUBSTANCES0.5% BY WEIGHT
HEAVY METALS (EXCEPT LEAD)5 PARTS PER MILLION
LEAD5 PARTS PER MILLION
REINFORCED STEEL AND WELDED WIRE FABRIC0.1% BY WEIGHT
PLASTER AND GYPSUM BOARD0.1% BY WEIGHT

THE MATERIAL FOR CRUSHED CONCRETE BASE SHALL CONSIST ONLY OF CRUSHED CONCRETE PAVEMENT AND SUCH ADDITIVE MATERIAL AS MAY BE APPROVED BY THE COUNTY ENGINEER FOR THE PURPOSE OF FACILITATING CONSTRUCTION AND ACHIEVING THE DESIRED CHARACTERISTICS OF THE FINISHED IN-PLACE PRODUCT. APPROVAL FROM THE COUNTY ENGINEER IS REQUIRED BEFORE PLACING MATERIAL FROM MORE THAN ONE SOURCE. ONCE APPROVED, A CHANGE IN THE SOURCE OF BASE MATERIAL SHALL REQUIRE ADDITIONAL ACCEPTANCE TESTING. THE MATERIAL SHALL NOT CONTAIN LUMPS, BALLS OR POCKETS OF SAND OR CLAY MATERIAL IN SIZE OR QUANTITY SUFFICIENT TO BE DETRIMENTAL TO THE PROPER BONDING, FINISHING, STRENGTH OF THE CONCRETE BASE. EXISTING BASE IS TO BE REMOVED TO CONSTRUCT THE NEW BASE.

INSPECTION

SUBGRADE AND BASE INSPECTIONS SHALL BE CONDUCTED BY THE ENGINEER OF RECORD AND THE COUNTY INSPECTOR PRIOR TO SURFACE COURSE CONSTRUCTION.

NOTE:
NO DEVIATIONS TO THIS DETAIL WILL BE PERMITTED UNLESS APPROVED BY THE COUNTY ENGINEER.
ANY PROPOSED ALTERATIONS SHALL BE CLEARLY IDENTIFIED AND HIGHLIGHTED ON DETAIL.

 PASCO COUNTY ENGINEERING SERVICES DESIGN STANDARDS	CRUSHED - CONCRETE BASE SPECIFICATIONS APPROVED BY: JOW BEC APPROVAL: _____ REVISED: _____	Sheet No. 1 of 2 Index No. 104
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EQUIPMENT, PLACEMENT AND SPREADING OF MATERIAL

USE MECHANICAL ROCK SPREADERS, EQUIPPED WITH A DEVICE THAT STRIKES OFF THE ROCK UNIFORMLY TO LAYING THICKNESS AND CAPABLE OF PRODUCING EVEN DISTRIBUTION. FOR ROADWAY WIDTHS OF 20 FEET OR LESS, CROSSOVERS, INTERSECTIONS, RAMP AREAS OR WHERE THE USE OF A MECHANICAL SPREADER IS NOT PRACTICABLE, THE CONTRACTOR MAY SPREAD THE CRUSHED CONCRETE BASE USING BULLDOZERS OR BLADE GRADERS. TRANSPORT CRUSHED CONCRETE TO THE POINT OF USE, OVER THE BASE PREVIOUSLY PLACED, AND DUMP IT ON THE END OF THE PRECEDING SPREAD. HAULING ON SUBGRADE TO DUMP CRUSHED CONCRETE BASE WILL BE PERMITTED ONLY WHEN, IN THE ENGINEER'S OPINION, THESE OPERATIONS WILL NOT BE DETRIMENTAL TO THE BASE AND SUBGRADE.

CRUSHED CONCRETE SHALL BE SPREAD UNIFORMLY WITHOUT SEGREGATION OF FINE OR COARSE MATERIALS. SEGREGATED AREAS SHALL BE REPLACED WITH PROPERLY GRADED CRUSHED CONCRETE AFTER REMOVAL.

THE MINIMUM THICKNESS OF THE CRUSHED CONCRETE BASE SHALL BE INDICATED ON THE PLANS. WHEN THE SPECIFIED COMPACTED THICKNESS OF THE CRUSHED CONCRETE BASE IS GREATER THAN SIX INCHES, CONSTRUCT THE BASE IN MULTIPLE COURSES OF EQUAL THICKNESS. INDIVIDUAL COURSES SHALL NOT BE LESS THAN THREE INCHES. PLACE CRUSHED CONCRETE MATERIAL TO ENSURE THE TOTAL THICKNESS SINGLE SOURCE INTEGRITY AT ANY STATION LOCATION OF THE BASE.

COMPACTION, FINISHING AND TESTING REQUIREMENTS

AFTER SPREADING IS COMPLETED THE CRUSHED CONCRETE SHALL BE UNIFORMLY COMPACTED, WITH WATER BEING ADDED AS REQUIRED TO A DENSITY OF NOT LESS THAN ONE HUNDRED PERCENT (100%) OF THE MAXIMUM DENSITY AS DETERMINED BY AASHTO T-180. DURING FINAL COMPACTION OPERATIONS, IF THE BLADING OF ANY AREAS IS NECESSARY TO OBTAIN THE TRUE GRADE AND CROSS SECTION, FREE OF SCABS AND LAMINATIONS, THE COMPACTION OPERATIONS FOR SUCH AREAS SHALL BE COMPLETED PRIOR TO THE PERFORMANCE OF DENSITY TESTS ON THE FINISHED BASE.

MULTIPLE COURSE BASE: CLEAN THE FIRST COURSE OF FOREIGN MATERIAL, THEN BLADE AND BRING IT TO A SURFACE CROSS-SECTION APPROXIMATELY PARALLEL TO THE FINISHED BASE. BEFORE SPREADING ANY MATERIAL FOR THE UPPER COURSES, OBTAIN DENSITY TESTS FOR THE LOWER COURSES TO DETERMINE THAT THE REQUIRED COMPACTION (NOT LESS THAN ONE HUNDRED PERCENT (100%) OF THE MAXIMUM DENSITY AS DETERMINED BY AASHTO T-180) HAS BEEN OBTAINED. AFTER SPREADING THE CRUSHED CONCRETE FOR THE TOP COURSE, FINISH AND SHAPE ITS SURFACE TO PRODUCE THE REQUIRED GRADE AND CROSS-SECTION, FREE OF SCABS AND LAMINATIONS, AFTER COMPACTION.

THE MINIMUM DENSITY THAT WILL BE ACCEPTED AT ANY LOCATION OUTSIDE THE TRAVELED ROADWAY (SUCH AS INTERSECTIONS, CROSSOVERS, TURNOUTS, ETC.) SHALL BE 98% OF THE MAXIMUM DENSITY AS DETERMINED BY AASHTO T-180.

TESTING OF BASE COURSE

THE MINIMUM FREQUENCY OF SAMPLING AND TESTING OF CRUSHED CONCRETE MATERIAL, LAB DENSITY, FIELD DENSITY AND THICKNESS SHALL ADHERE TO THE FREQUENCY OF TESTING FOR LIME/ROCK BASE IN THE MOST CURRENT EDITION OF "PASCO COUNTY ENGINEERING SERVICES DEPARTMENT TESTING SPECIFICATIONS FOR CONSTRUCTION OF ROADS, STORM DRAINAGE AND UTILITIES". ONE PLANT MIX DESIGN, ONE PLANT GRADATION TEST FOR SIEVE ANALYSIS OF FINE AND COARSE AGGREGATES (AASHTO T-27) (FM1-T027) INCLUDING A PLASTICITY INDEX (FM-1090) (AASHTO T-90) FROM THE APPROVED SOURCE SHALL BE SUBMITTED AT ONE PER DAY OR CHANGE OF MATERIAL. ONE ROADWAY FIELD TEST FOR SIEVE ANALYSIS FINE AND COARSE AGGREGATES (ASTM C-136) SHALL BE SUBMITTED PER 500 FEET OF ROAD PER DAY PER MIX DESIGN; MINIMUM ONE PER ROAD.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TESTING PERFORMED IN CONNECTION WITH CONSTRUCTION OF THE BASE.

CORRECTION OF DEFECTS

ALL SEGREGATED AREAS OF FINE OR COARSE CRUSHED CONCRETE SHALL BE REMOVED AND REPLACED WITH PROPERLY GRADED RECLAIMED CONCRETE AGGREGATE BASE MATERIAL. ALL DEFECTS IN MATERIALS AND CONSTRUCTION SHALL BE CORRECTED BY THE CONTRACTOR, AT HIS EXPENSE, AND TO THE SATISFACTION OF THE COUNTY ENGINEER.

PRIMING AND MAINTENANCE

APPLY THE PRIME COAT ONLY WHEN THE BASE MEETS THE SPECIFIED DENSITY REQUIREMENTS AND WHEN THE MOISTURE CONTENT, AT THE TIME OF PRIMING, ENSURE THAT THE BASE IS FIRM, UNWEARING AND IN SUCH CONDITION THAT NO UNDUCE DISTORTION WILL OCCUR. MAINTAIN THE TRUE CROWN AND TEMPLATE, WITH NO RUTTING OR DISTORTION, WHILE APPLYING THE SURFACE COURSE.

EMBANKMENT MATERIAL UNDER CONCRETE PAVEMENT SHALL BE PER FOOT INDEX No. 505.

PASCO COUNTY TESTING SPECIFICATIONS ON CRUSHED CONCRETE BASE

TESTS FOR BASE THICKNESS, AND DENSITY SHALL BE LOCATED NO MORE THAN THREE HUNDRED (300) FEET APART AND SHALL BE STAGGERED TO THE LEFT, RIGHT, AND ON THE CENTERLINE OF ROADWAY. THERE SHALL BE NO LESS THAN ONE (1) TEST PER STREET, BEARING VALLE, GRADATION AND FIELD TEST FOR SIEVE ANALYSIS OF FINE AND COARSE AGGREGATES (ASTM C-136) SHALL BE NO MORE THAN FIVE HUNDRED (500) FEET.

EXAMPLE: A SEVEN HUNDRED FEET ROAD WOULD REQUIRE TWO FIELD LBR AND GRADATION TESTS, THREE FIELD DENSITY AND THICKNESS TESTS ALONG WITH THE APPROPRIATE LAB TESTING.

NOTE:
NO DEVIATIONS TO THIS DETAIL WILL BE PERMITTED UNLESS APPROVED BY THE COUNTY ENGINEER.
ANY PROPOSED ALTERATIONS SHALL BE CLEARLY IDENTIFIED AND HIGHLIGHTED ON DETAIL.

 PASCO COUNTY ENGINEERING SERVICES DESIGN STANDARDS	CRUSHED - CONCRETE BASE SPECIFICATIONS APPROVED BY: JOW BEC APPROVAL: _____ REVISED: _____	Sheet No. 2 of 2 Index No. 104
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**STARKEY RANCH CUNNINGHAM PARK
CENTRAL NEIGHBORHOOD
ROADWAY DETAILS**

PREPARED FOR:
WS-TSR, LLC

NO.	DATE	DESCRIPTION
1	07/12/2016	REVIEW SUBMITTAL

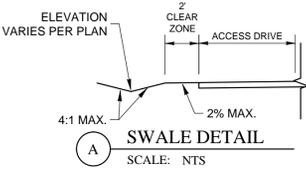
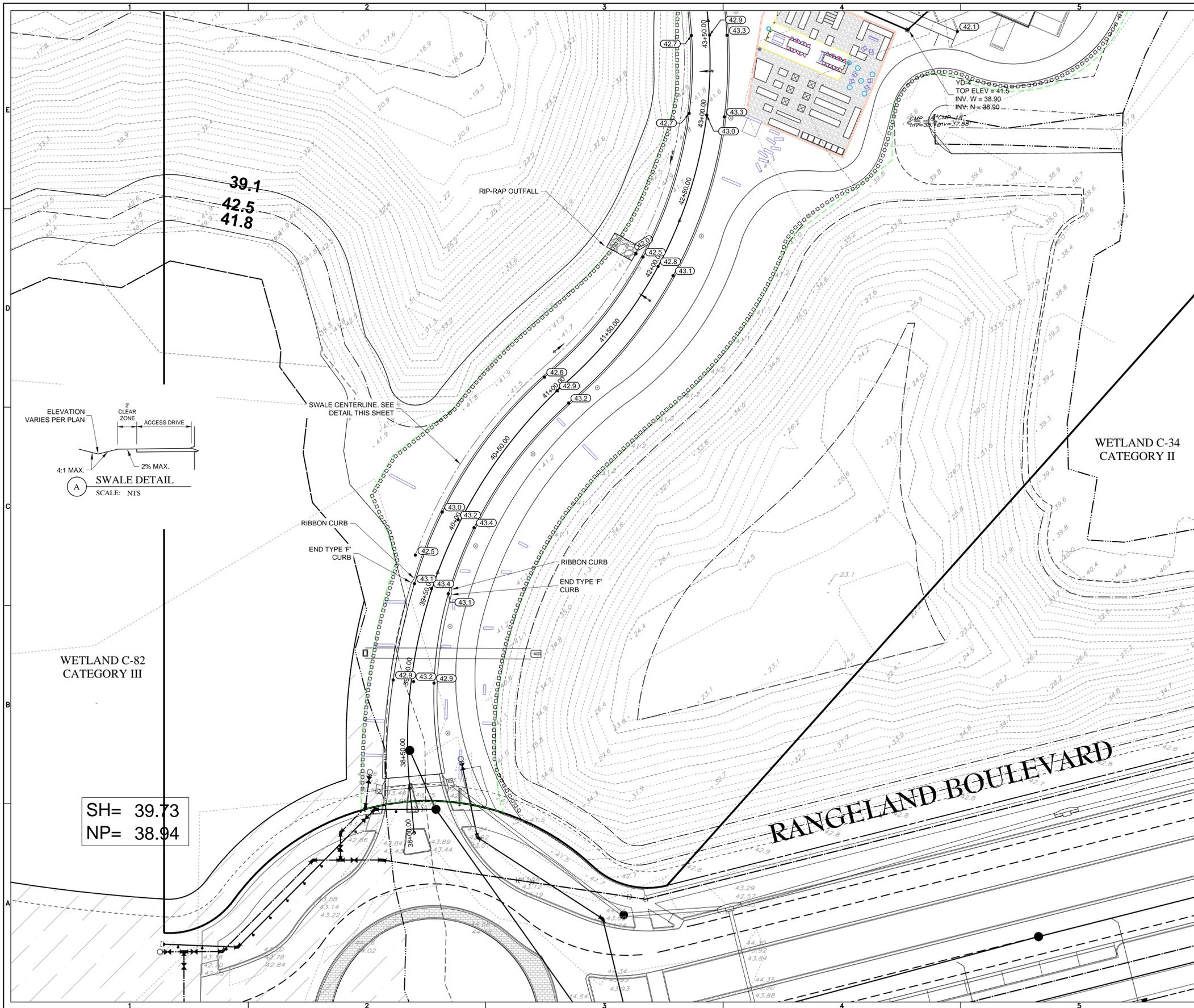
PROJECT NO: TSR-SR-1093
FILE: RS
DESIGN BY: BUDEN
DRAWN BY: BUDEN
FLORIDA PROFESSIONAL ENGINEER

GARY D. MILLER
DATE: _____
REGISTRATION NO. 52717

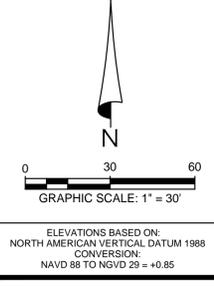
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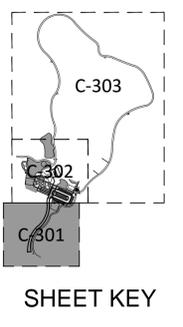
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DRAINAGE LEGEND

EXISTING	PROPOSED	DESCRIPTION
		STORM DRAINAGE STRUCTURE & PIPE
		STRUCTURE NO.
		SPOT ELEVATION GROUND
		SPOT ELEVATION PAVEMENT
		TOP OF WALL
		BOTTOM OF WALL
		PROFILE GRADE ELEVATION REFERENCE
		CONTOUR
		FF=000.00 FINISH FLOOR ELEVATION
		DIRECTION OF SURFACE FLOW
		UNDERDRAIN WITH CLEANOUT
		STAKED EROSION CONTROL
		SOIL BORING LOCATION

- DRAINAGE & GRADING NOTES**
- ALL SLOTTED SLOPES STEEPER THAN 4:1 SHALL BE INSTALLED WITH SOD PEGS.
 - ALL FIRST FLOOR ELEVATIONS SHALL BE A MINIMUM OF ONE FOOT ABOVE THE BASE FLOOD ELEVATION (BFE) AND A MINIMUM OF 16 INCHES ABOVE THE HIGHEST CROWN LINE OF THE STREET LYING BETWEEN THE PROJECTION OF THE SIDE BUILDING LINES.
 - NO EXCAVATION SHALL EXTEND BELOW THE PERMITTED DESIGN DEPTHS/ELEVATIONS SHOWN ON THE DRAWINGS, UNLESS ADDITIONAL TESTING SUPPORTS OTHERWISE; NO LOWER SEMI-CONFINING UNIT CLAYEY SOIL MATERIAL AND/OR NO LIMESTONE MATERIALS SHALL BE EXCAVATED REGARDLESS IF THEY ARE ENCOUNTERED WITHIN THE PERMITTED DEPTHS/ELEVATIONS. IF ANY LOWER SEMI-CONFINING UNIT CLAYEY SOIL MATERIALS OR LIMESTONE MATERIALS ARE ENCOUNTERED ABOVE THE PERMITTED DEPTHS/ELEVATIONS, THEN EXCAVATION OPERATIONS SHALL CEASE IN THE GENERAL LOCATION AND THE ENGINEER OF RECORD SHALL BE NOTIFIED IMMEDIATELY.
 - SHOULD ANY NOTICEABLE SOIL SLUMPING OR SINKHOLE FORMATION BECOME EVIDENT, THE APPLICANT/DEVELOPER SHALL IMMEDIATELY NOTIFY THE COUNTY, TAMPA BAY WATER (TBW), AND SWFWMD, AND ADOPT ONE OR MORE OF THE FOLLOWING PROCEDURES AS DETERMINED TO BE APPROPRIATE BY THE COUNTY AND SWFWMD:
 - IF THE SLUMPING OR SINKHOLE FORMATION BECOMES EVIDENT BEFORE OR DURING CONSTRUCTION ACTIVITIES, STOP ALL WORK (EXCEPT FOR MITIGATION ACTIVITIES) IN THE AFFECTED AREA AND REMAINS STOPPED UNTIL THE COUNTY AND SWFWMD APPROVE RESUMING CONSTRUCTION ACTIVITIES.
 - TAKE IMMEDIATE MEASURES TO ENSURE NO SURFACE WATER DRAINS INTO THE AFFECTED AREAS.
 - VISUALLY INSPECT THE AFFECTED AREA.
 - EXCAVATE AND BACKFILL OR GROUT AS REQUIRED TO FILL THE AFFECTED AREA AND PREVENT FURTHER SUBSIDENCE.
 - USE SOIL REINFORCEMENT MATERIALS IN THE BACKFILLING OPERATION, WHEN APPROPRIATE.
 - IF THE AFFECTED AREA IS IN THE VICINITY OF A WATER-RETENTION AREA, MAINTAIN A MINIMUM DISTANCE OF TWO FEET FROM THE BOTTOM OF THE RETENTION POND TO THE SURFACE OF THE LIME-ROCK OR KARST CONNECTION.
 - IF THE AFFECTED AREA IS IN THE VICINITY OF A WATER-RETENTION AREA AND THE ABOVE METHODS DO NOT STABILIZE THE COLLAPSE, RELOCATE THE RETENTION AREA.
 - DISCHARGE OF STORM-WATER INTO DEPRESSIONS WITH DIRECT OR DEMONSTRATED HYDROLOGIC CONNECTION TO THE FLORIDAN AQUIFER SHALL BE PROHIBITED.
 - UPON COMPLETION OF LAND DEVELOPMENT CONSTRUCTION ACTIVITIES, A PROFESSIONAL ENGINEER SHALL PROVIDE A CERTIFICATION TO PASCO COUNTY THAT THE PROJECT, INCLUDING THE PAD AREA, COMPLIES WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL / GEOLOGICAL ENGINEERING REPORT.
 - THE ENGINEER RESPONSIBLE FOR THE PROJECT SHALL CERTIFY TO PASCO COUNTY THAT THE UNDERDRAINS HAVE BEEN PROPERLY INSTALLED PRIOR TO THE INSTALLATION OF ANY ASPHALT. CERTIFICATION SHALL STRICTLY COMPLY WITH THE UNDERDRAIN CERTIFICATION FORM AVAILABLE IN "ENGINEERING SERVICES DEPARTMENT: A PROCEDURAL GUIDE FOR THE PREPARATION OF ASSURANCES OF COMPLETION AND MAINTENANCE"
 - PROPOSED MAINTENANCE EASEMENTS MUST CONTAIN CLEAR OPERABLE ACCESSIBILITY.
 - ALL SLOPES ALONG THE RIGHT-OF-WAY SHALL BE MAINTAINED.



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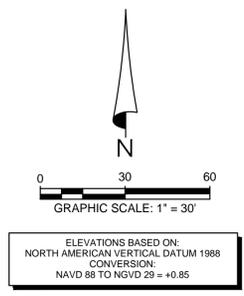
**STARKEY RANCH CUNNINGHAM PARK
CENTRAL NEIGHBORHOOD
GRADING & DRAINAGE PLAN**

PREPARED FOR: WS-TSR, LLC

NO.	DATE	DESCRIPTION
1	07/19/2016	REVIEW SUBMITTAL

PROJECT NO: TSR-SR-1093
FILE: GD
DESIGN BY: BUDEN
DRAWN BY: BUDEN
FLORIDA PROFESSIONAL ENGINEER
GARY D. MILLER
DATE: _____
REGISTRATION NO. 52717
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DRAINAGE LEGEND

EXISTING	PROPOSED	DESCRIPTION
		STORM DRAINAGE STRUCTURE & PIPE
		STRUCTURE NO.
		SPOT ELEVATION GROUND
		SPOT ELEVATION PAVEMENT
		TOP OF WALL
		BOTTOM OF WALL
		PROFILE GRADE ELEVATION REFERENCE
		CONTOUR
		FF=000.00 FINISH FLOOR ELEVATION
		DIRECTION OF SURFACE FLOW
		UNDERDRAIN WITH CLEANOUT
		STAKED EROSION CONTROL
		SOIL BORING LOCATION

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**STARKEY RANCH CUNNINGHAM PARK
 CENTRAL NEIGHBORHOOD
 GRADING & DRAINAGE PLAN**

PREPARED FOR: **WS-TSR, LLC**

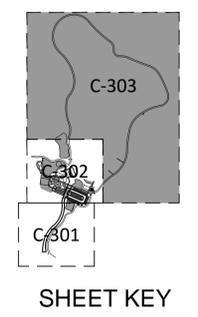
NO.	DATE	DESCRIPTION
1	07/13/2016	REVIEW SUBMITTAL

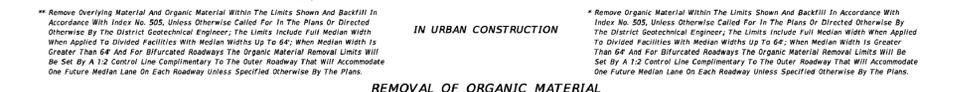
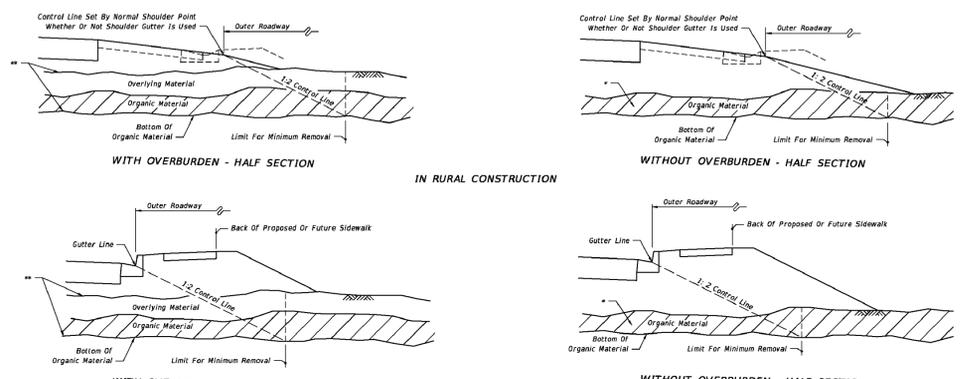
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GARY D. MILLER
 DATE: _____
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REMOVAL OF ORGANIC MATERIAL

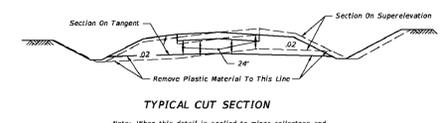
GENERAL NOTES

- All details shown on this Index for removal of organic and plastic materials apply unless otherwise shown on the plans.
- Utilization of excavated materials shall be in accordance with Index No. 505.
- Where organic or plastic material is undercut, backfill shall be made of suitable material in accordance with Index No. 505, unless otherwise shown on the plans.
- The term "Plastic Material" used in this Index in conjunction with removal of plastic soil is as defined under soil classifications for Plastic (P) and High Plastic (H) on Index No. 505.
- The term "Organic Material" as used on this Index is defined as any soil which has an average organic content greater than five (5.0) percent, or an individual organic content test result which exceeds seven (7.0) percent. Organic material shall be removed as shown on this Index and the plans unless directed otherwise by the District Geotechnical Engineer. Average organic content shall be determined from the test results from a minimum of three randomly selected samples from each stratum. Tests shall be performed in accordance with ASTM D 2001 on the portion of a sample passing the No. 4 sieve.
- The normal depth of side ditches shall be 3.5 below the shoulder point except in special cases.
- In municipal areas, where underdrain is to be constructed beneath the proposed pavement, the grade of the underdrain filter material will not extend above the bottom of the stabilized section of the subgrade. Gradation of the filter material shall conform to FDOT specifications. Minimum grade on underdrain pipe shall be 0.2%.
- See Index No. 506 for miscellaneous earthwork details.

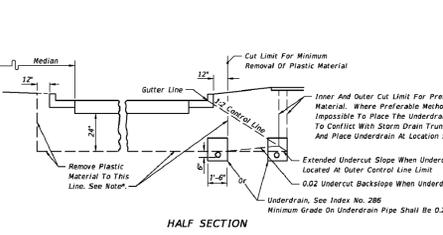
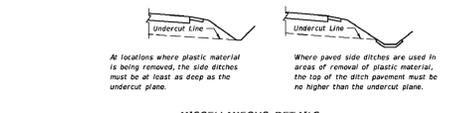
DESIGN NOTES

- At locations where organic material or other soft soil deposits persists to such depth that removal is impractical, the construction of a geosynthetic foundation over those soils should be considered. The Engineer of Record should request guidance from the District Geotechnical Engineer and make a geosynthetic foundation design in accordance with Index No. 501 when pursuing geosynthetic alternatives.
- The designer shall take into consideration the expectancy of roadway widening to the outside, and where widening is anticipated specify in the plans the limits of removal of organic and plastic materials necessary to accommodate anticipated widening.

LAST REVISION	DESCRIPTION	FDOT DESIGN STANDARDS 2013	REMOVAL OF ORGANIC AND PLASTIC MATERIAL	INDEX NO. 500	SHEET NO. 1
02	REVISED				



REMOVAL OF PLASTIC MATERIAL ON DIVIDED FREEWAYS, ARTERIALS AND MAJOR COLLECTORS HAVING FLUSH MEDIANS, AND ON UNDIVIDED ARTERIALS AND MAJOR COLLECTORS



REMOVAL OF PLASTIC MATERIAL AND LOCATION OF UNDERDRAIN IN URBAN CONSTRUCTION

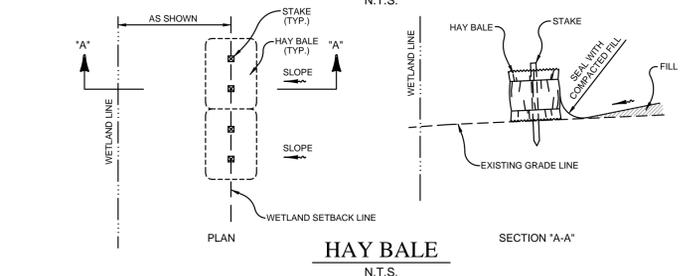
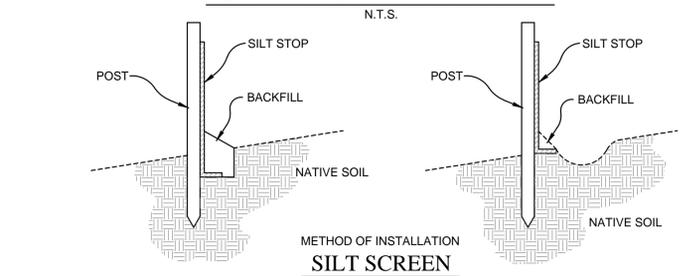
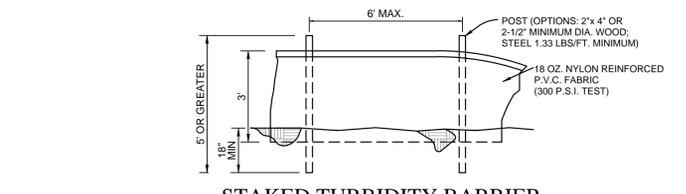
NOTES:

- Refer to roadway cross sections to determine whether minimum or preferable removal is used.
- Where frequency of median breaks indicates that it is impractical to leave plastic material in the median, the designer may elect to indicate total removal of this material. If during construction it becomes apparent, due to normal required construction procedures, that it is impractical to leave the plastic material in the median, total removal of this material shall be approved by the Engineer.

REMOVAL OF PLASTIC MATERIAL

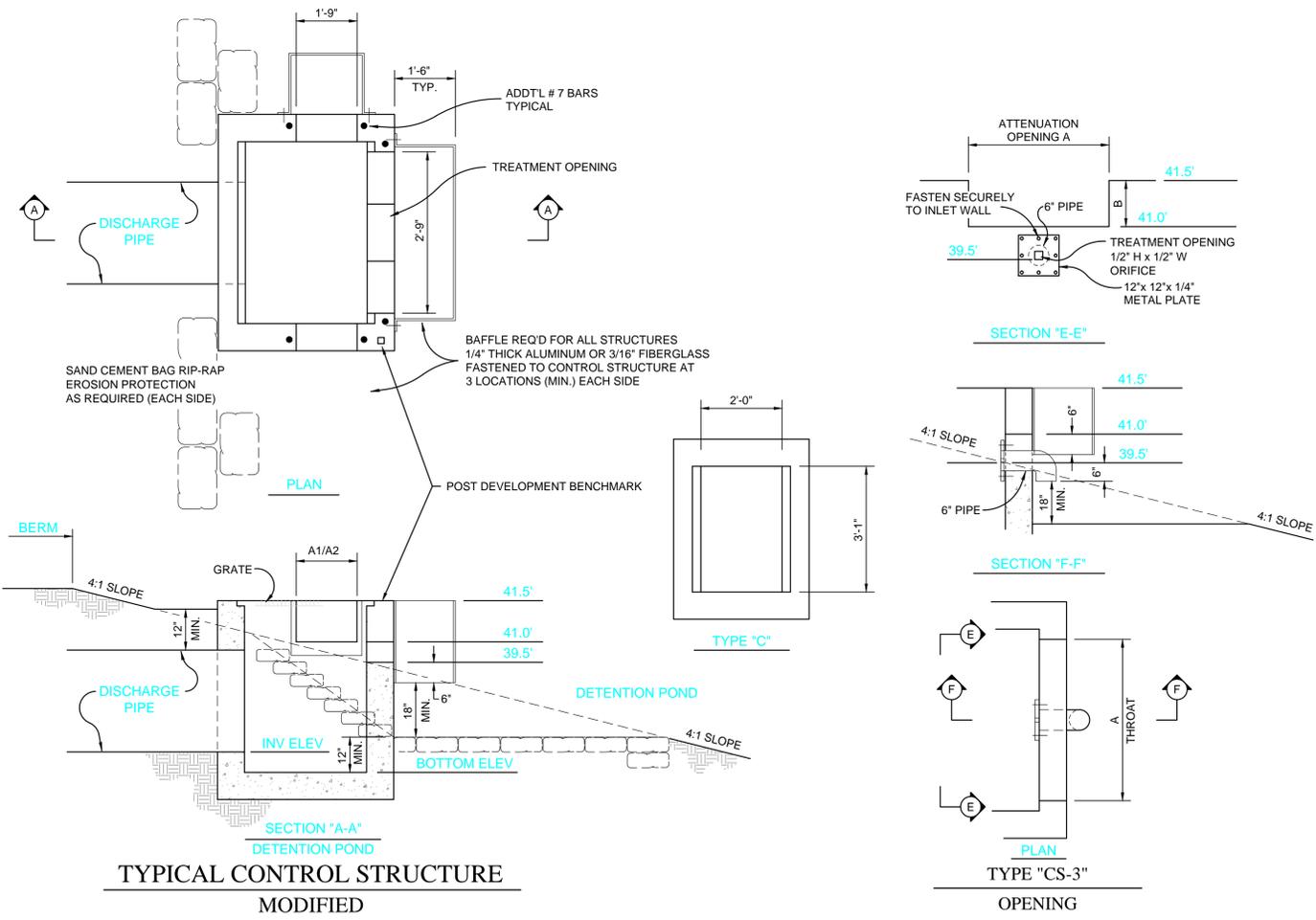
Note: For GENERAL NOTES see Sheet 1.

LAST REVISION	DESCRIPTION	FDOT DESIGN STANDARDS 2013	REMOVAL OF ORGANIC AND PLASTIC MATERIAL	INDEX NO. 500	SHEET NO. 2
07/01/09	REVISED				



EROSION CONTROL DETAILS

NOTE: THE EROSION BARRIERS, AS SHOWN, ARE NOT TO BE CONSTRUED TO MEAN THAT THEY ARE ALL THAT MAY BE REQUIRED. THE CONTRACTOR IS TO TAKE WHATEVER MEASURES NECESSARY TO CONTROL EROSION THROUGHOUT THE PROJECT.



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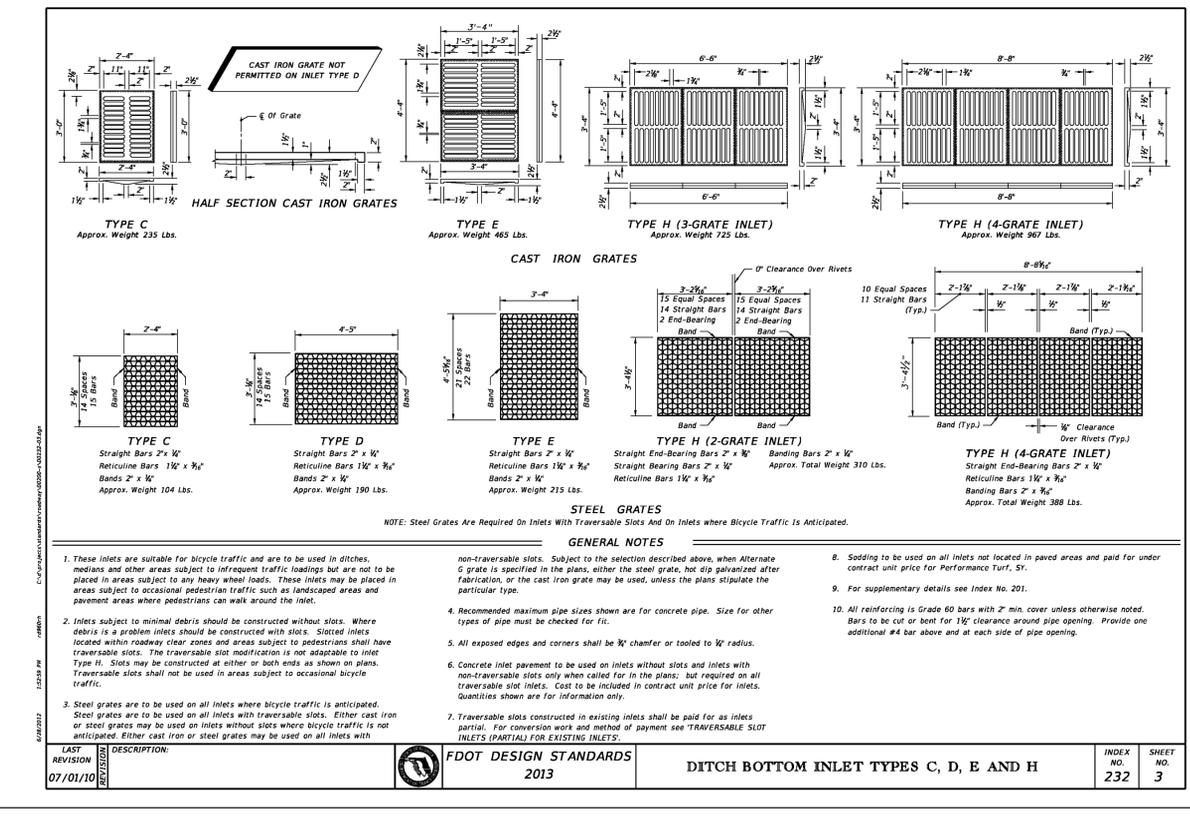
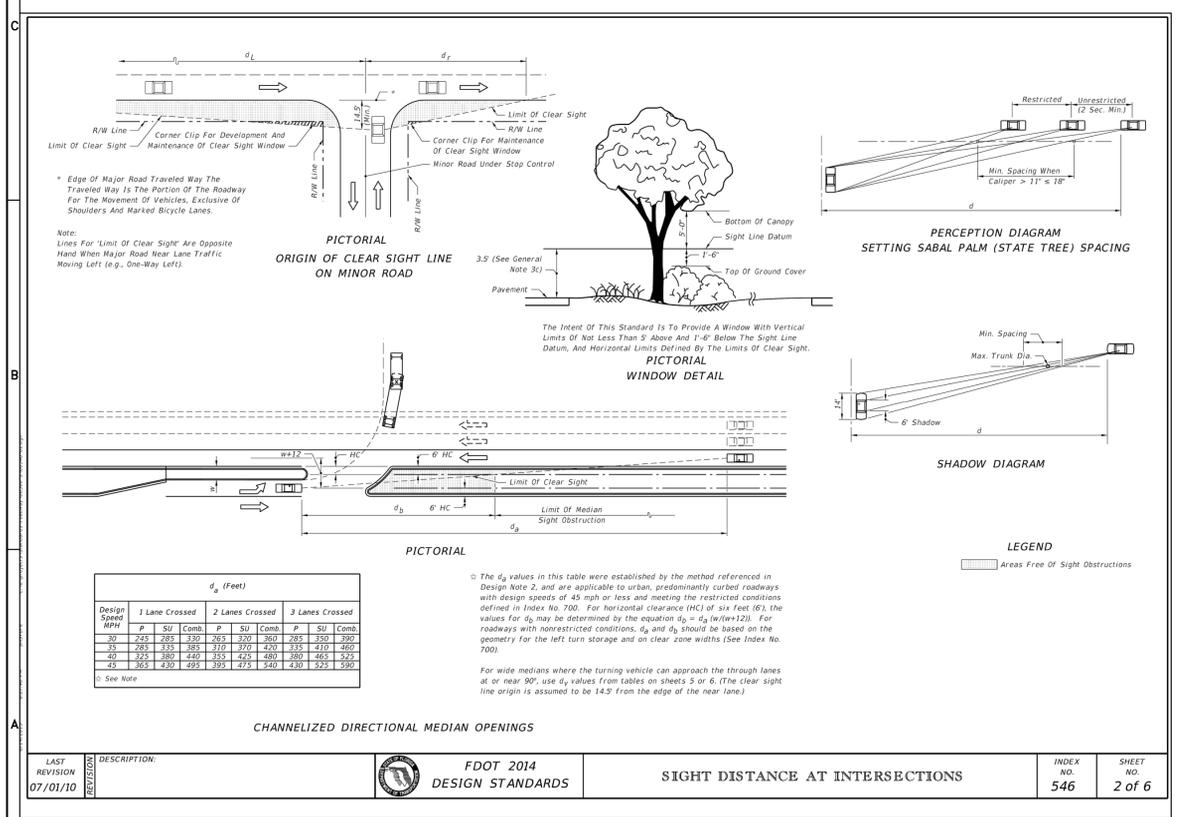
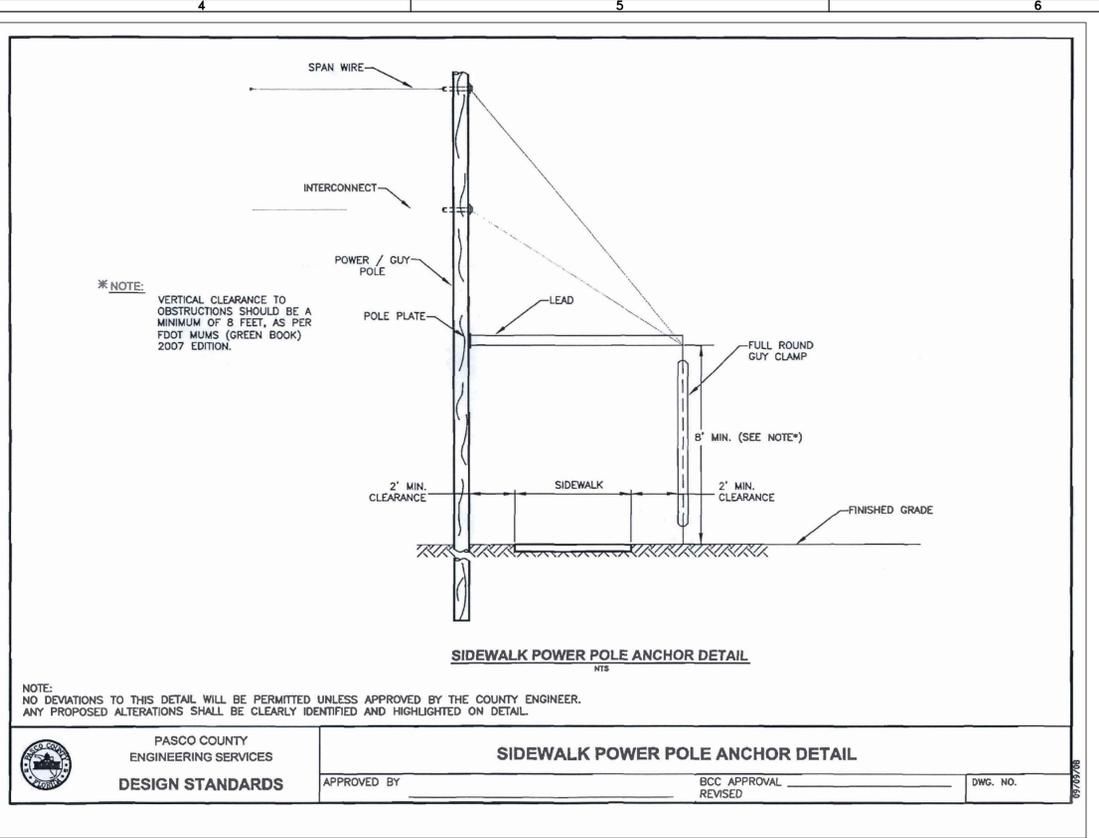
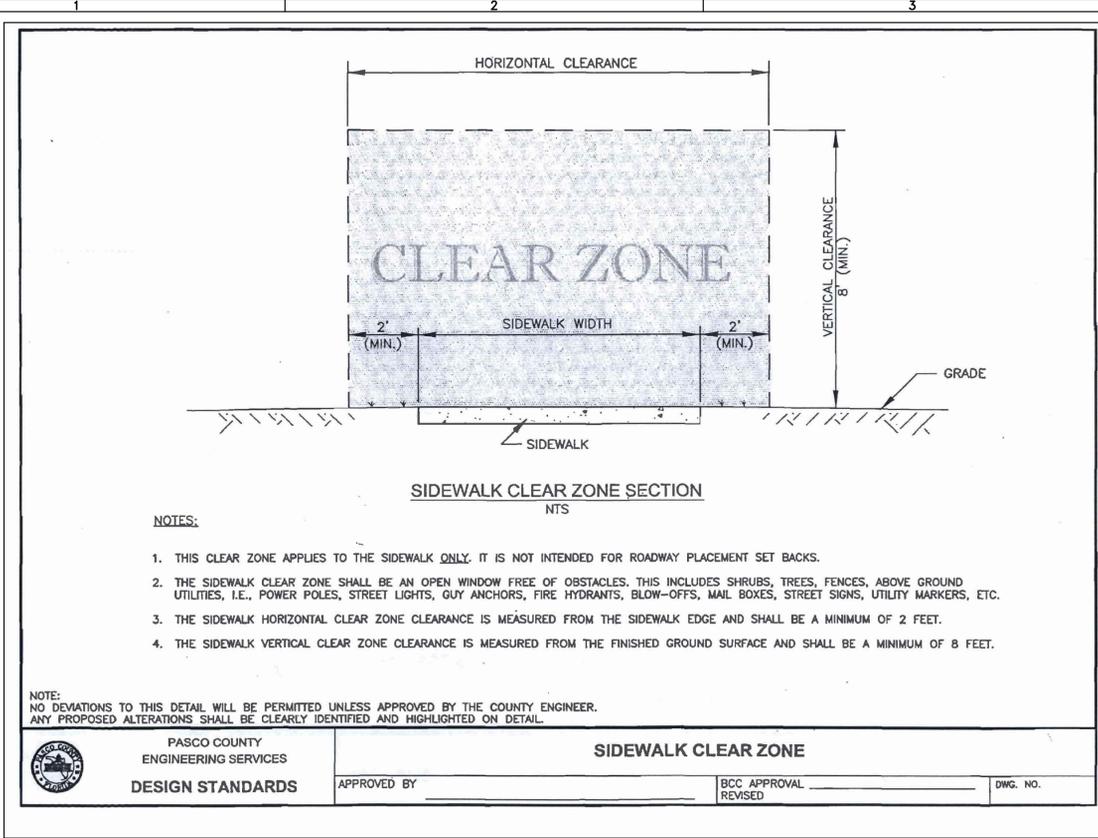
DRAINAGE DETAILS

WS-TSR, LLC

DATE	DESCRIPTION	DATE	DESCRIPTION
07/12/2016	REVIEW SUBMITTAL		

PROJECT NO:	TSR-SR-1093
FILE:	DD
DESIGN BY:	BUDEN
DRAWN BY:	BUDEN
FLORIDA PROFESSIONAL ENGINEER	
DATE:	
REGISTRATION NO.:	52717

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DRAINAGE DETAILS

PREPARED FOR: **WS-TSR, LLC**

DATE	DESCRIPTION
07/10/2016	REVIEW SUBMITTAL

PROJECT NO: **TSR-SR-1093**

FILE: **DD**

DESIGN BY: **BU DEN**

DRAWN BY: **BU DEN**

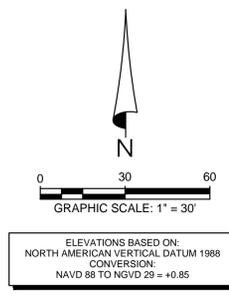
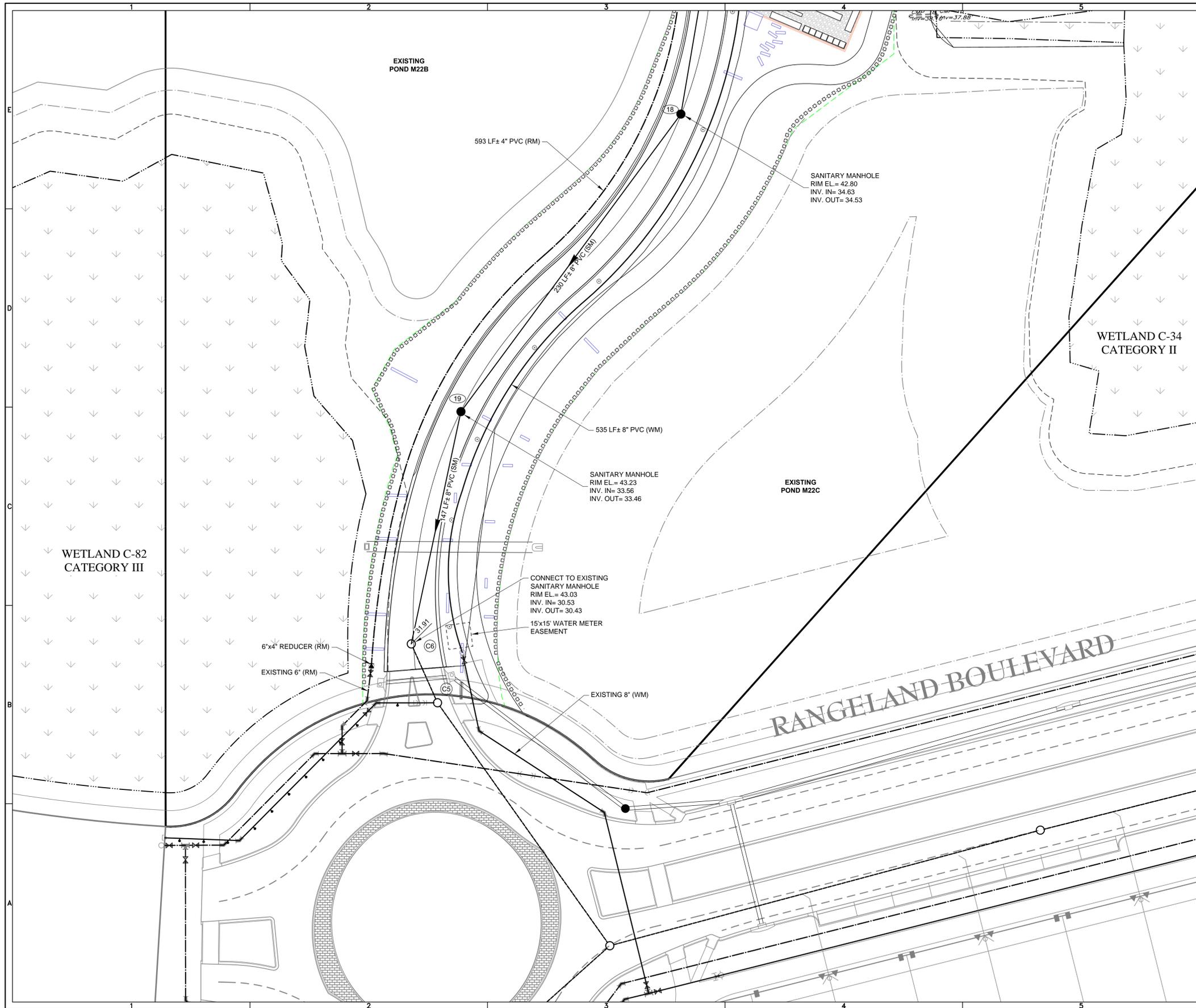
FLORIDA PROFESSIONAL ENGINEER

GARY D. MILLER

DATE: _____
 REGISTRATION NO. **52717**

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WATER & SEWER LEGEND

EXISTING	PROPOSED	DESCRIPTION
		STORM STRUCTURE NUMBER STORM DRAINAGE STRUCTURE
		WATER MAIN (WM) RECLAIMED WATER MAIN (RM)
		FIRE HYDRANT VALVE & BOX
		REDUCER PLUG
		BLOW-OFF BENDS
		VERTICAL BENDS WATER DISTRIBUTION SAMPLING POINT
		WATER SERVICE DOUBLE WATER SERVICE SINGLE
		WATER SERVICE CASING RECLAIMED WATER SERVICE DOUBLE
		RECLAIMED WATER SERVICE SINGLE RECLAIMED WATER SERVICE SLEEVE
		SANITARY SEWER (SM) SANITARY FORCE MAIN (FM)
		SANITARY SERVICE DOUBLE W/CLEANOUT SANITARY SERVICE SINGLE W/CLEANOUT

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**STARKEY RANCH CUNNINGHAM PARK
CENTRAL NEIGHBORHOOD
UTILITY PLAN**

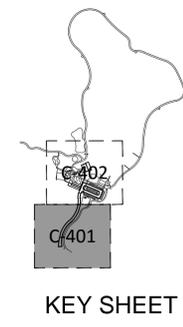
PREPARED FOR: **WS-TSR, LLC**

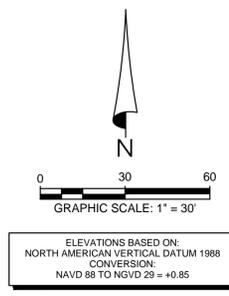
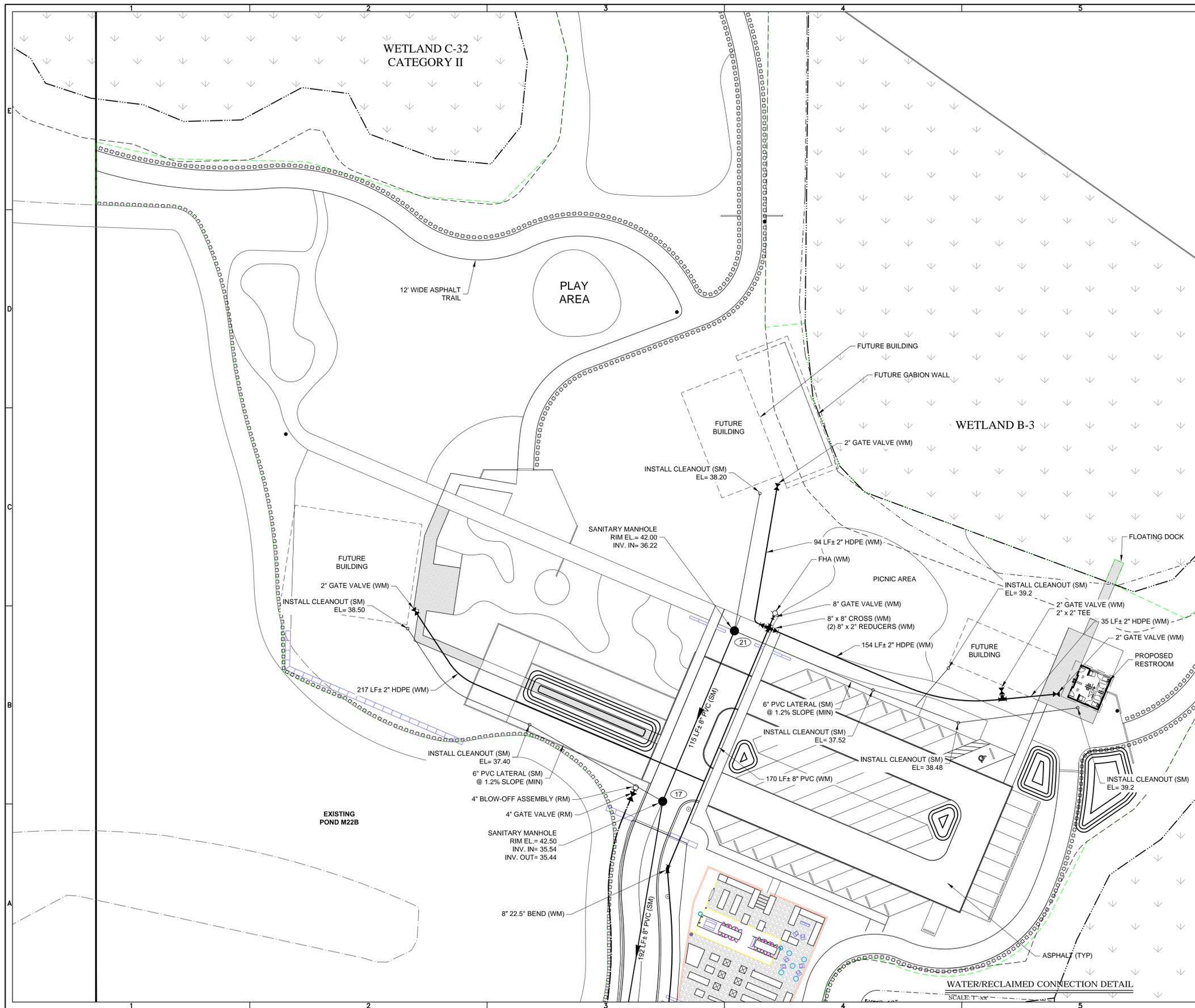
NO.	DATE	DESCRIPTION
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PROJECT NO: **TSR-SR-1093**
FILE: **WS**
DESIGN BY: **BUDEN**
DRAWN BY: **BUDEN**

FLORIDA PROFESSIONAL ENGINEER
GARY D. MILLER
DATE: _____
REGISTRATION NO. **52717**

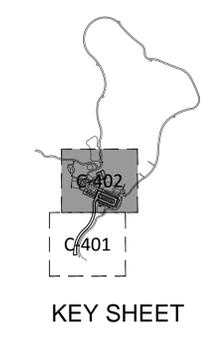
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WATER & SEWER LEGEND

EXISTING	PROPOSED	DESCRIPTION
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		WATER MAIN (WM) RECLAIMED WATER MAIN (RM)
		FIRE HYDRANT VALVE & BOX
		REDUCER PLUG
		BLOW-OFF BENDS
		VERTICAL BENDS WATER DISTRIBUTION SAMPLING POINT
		WATER SERVICE DOUBLE WATER SERVICE SINGLE
		WATER SERVICE CASING RECLAIMED WATER SERVICE DOUBLE
		RECLAIMED WATER SERVICE SINGLE RECLAIMED WATER SERVICE SLEEVE
		SANITARY SEWER (SM) SANITARY FORCE MAIN (FM)
		SANITARY SERVICE DOUBLE W/CLEANOUT SANITARY SERVICE SINGLE W/CLEANOUT



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Engineering Business Certificate of Authorization No. 28752
Landscape Architecture Certificate of Authorization No. LC26000405

**STARKEY RANCH CUNNINGHAM PARK
CENTRAL NEIGHBORHOOD
UTILITY PLAN**

PREPARED FOR: **WS-TSR, LLC**

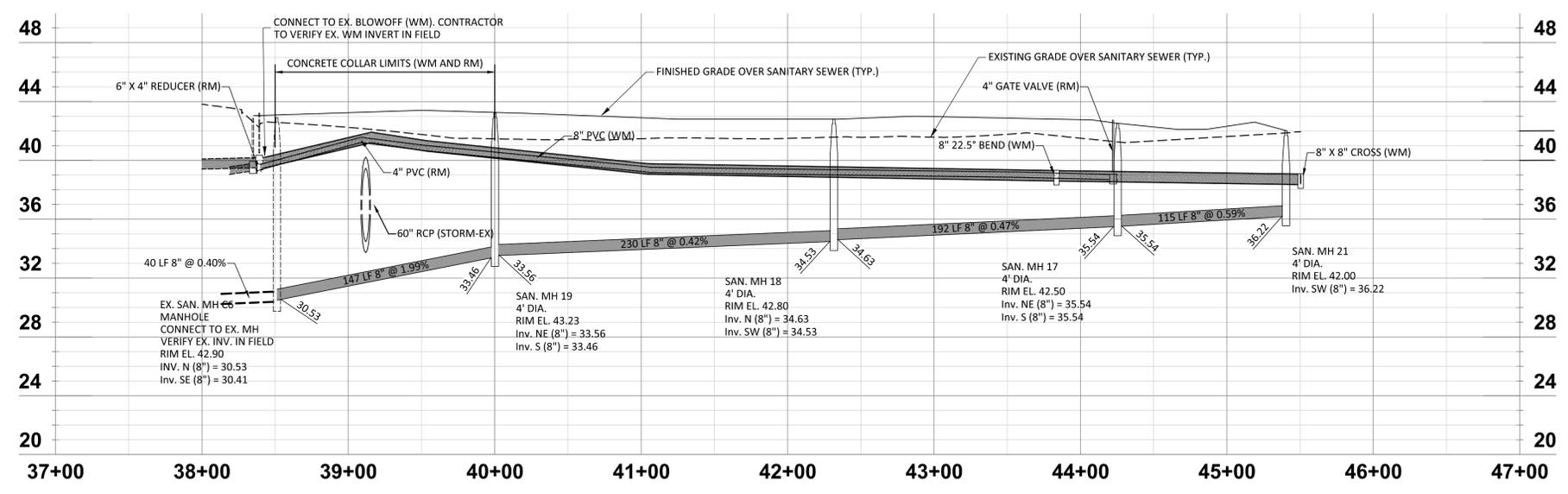
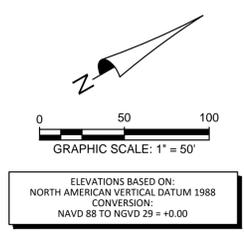
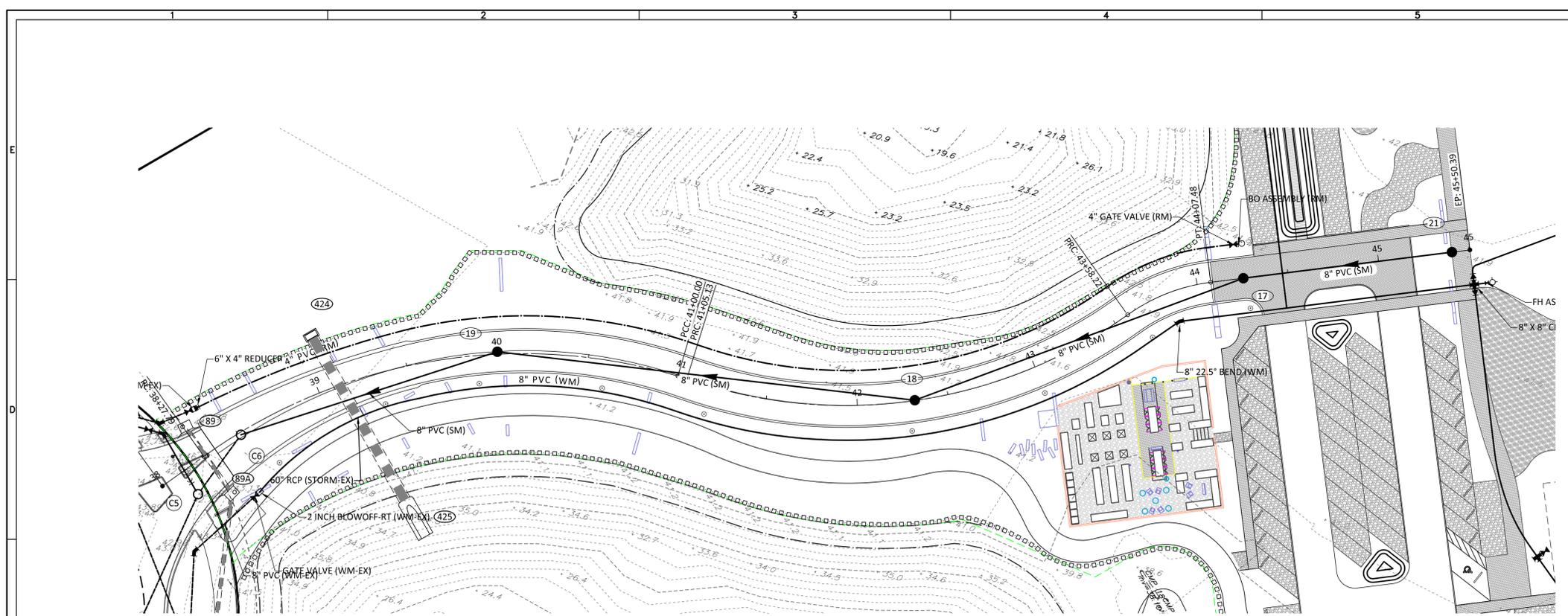
NO.	DATE	DESCRIPTION
1	07/15/2016	REVIEW SUBMITTAL

PROJECT NO: TSR-SR-1093
FILE: WS
DESIGN BY: BUDEN
DRAWN BY: BUDEN

FLORIDA PROFESSIONAL ENGINEER

GARY D. MILLER
DATE: _____
REGISTRATION NO. 52717

C-402



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**STARKEY RANCH CUNNINGHAM
 PARK
 CENTRAL-NEIGHBORHOOD
 PLAN & PROFILE**

PREPARED FOR:
 WS-TSR, L.L.C.

NO.	DATE	REVISION SUBMITTAL	DESCRIPTION
1	07/15/2016		

PROJECT NO: TSR-SR-1093
 FILE: C-501 PLAN & PROFILE
 DESIGN BY: DR DESIGN
 DRAWN BY: DR DRAWN
 FLORIDA PROFESSIONAL ENGINEER

MICHAEL R. TUCKER
 DATE: _____
 REGISTRATION NO. 40569

C-501

**PIPE RESTRAINT LENGTHS IN FEET
COMMON FITTINGS**

PIPE SIZE	WATER MAINS - TEST PRESSURE 150 PSI				
	FITTING TYPE				
	11-1/4°	22-1/2°	45°	90°	DEAD END
4"	2'	4'	8'	20'	45'
6"	3'	6'	12'	28'	63'
8"	4'	7'	15'	36'	82'
10"	4'	9'	18'	43'	98'
12"	5'	10'	21'	50'	116'
16"	6'	13'	26'	63'	148'
20"	7'	15'	31'	76'	179'
24"	9'	17'	36'	87'	208'

PIPE SIZE	FORCE MAINS - TEST PRESSURE 100 PSI				
	FITTING TYPE				
	11-1/4°	22-1/2°	45°	90°	DEAD END
4"	1'	3'	6'	13'	30'
6"	2'	4'	8'	19'	42'
8"	2'	5'	10'	24'	55'
10"	3'	6'	12'	29'	66'
12"	3'	7'	14'	34'	77'
16"	4'	8'	18'	42'	99'
20"	5'	10'	21'	50'	119'
24"	6'	11'	24'	58'	139'

RESTRAINT LENGTHS ARE MEASURED FROM THE CENTER LINE OF THE FITTING ALONG THE PIPE IN BOTH DIRECTIONS (EXCEPT DEAD ENDS).

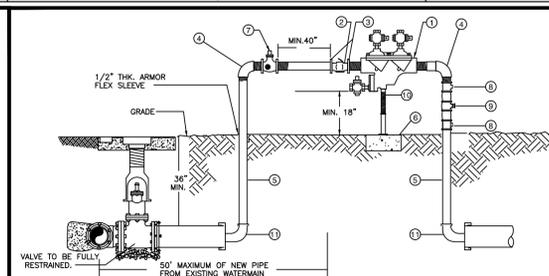
CREATED 02/24/03	RESTRAINED JOINT TABLE COMMON FITTINGS	PROVIDED FOR INFORMATIONAL PURPOSES ONLY. NO MODIFICATIONS WITHOUT WRITTEN PCU APPROVAL
REVISED	PASCO COUNTY UTILITIES	DETAIL 31

**PIPE RESTRAINT LENGTHS IN FEET
TEES (BRANCH SIDE)**

RUN SIZE	WATER MAINS - TEST PRESSURE 150 PSI									
	BRANCH SIZE									
	3"	4"	6"	8"	10"	12"	16"	20"	24"	
3"	6'	14'	30'	—	—	—	—	—	—	—
4"	2'	11'	28'	44'	—	—	—	—	—	—
6"	1'	2'	22'	40'	52'	—	—	—	—	—
8"	1'	1'	16'	35'	48'	62'	—	—	—	—
10"	1'	1'	10'	30'	44'	58'	83'	—	—	—
12"	1'	1'	3'	25'	40'	55'	80'	103'	—	—
16"	1'	1'	1'	14'	31'	48'	75'	98'	119'	—
20"	1'	1'	1'	2'	22'	40'	69'	94'	116'	—
24"	1'	1'	1'	1'	11'	31'	63'	89'	111'	—

RESTRAINT LENGTHS ARE MEASURED FROM THE CENTER LINE OF THE TEE ALONG THE BRANCH FOR THE DISTANCE INDICATED. A MINIMUM OF 5 FEET OF RESTRAINED PIPE MUST BE INSTALLED ON BOTH RUNS OF THE TEE. MEGALUG TYPE RESTRAINERS ARE REQUIRED ON ALL JOINTS.

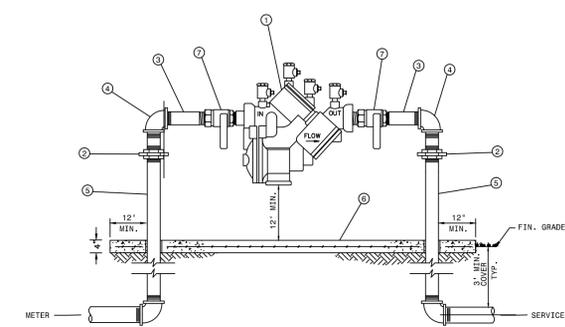
CREATED 02/24/03	RESTRAINED JOINT TABLE TEES (BRANCH SIDE)	PROVIDED FOR INFORMATIONAL PURPOSES ONLY. NO MODIFICATIONS WITHOUT WRITTEN PCU APPROVAL
REVISED	PASCO COUNTY UTILITIES	DETAIL 32



ITEM	QUANT.	DESCRIPTION
1	1	2" BACKFLOW PREVENTER ASSEMBLY, REDUCED PRESSURE ZONE
2	1	2" METER FURNISHED BY PASCO COUNTY UTILITIES
3	2	BRASS-METER FLANGES OR ADAPTORS
4	2	2" ELBOWS - GALV., 90°
5	2	2" RISER - GALV.
6	1	CONCRETE SLAB
7	1	2" VALVE - BRASS OR S.S.
8	2	TEE/ VALVES - BRASS OR S.S.
9	1	2" GATE VALVE - BRASS OR S.S.
10	1	PIPE STAND (SUPPORT)
11	2	M.J. CAP WITH 2" TAP

NOTE: CONTRACTOR/CUSTOMER SHALL APPLY AT PASCO COUNTY UTILITIES CUSTOMER SERVICE FOR TEMPORARY WATER SERVICE AT LEAST THREE DAYS PRIOR TO REQUIRED SERVICE DATE.
- THE METER WILL BE FURNISHED, INSTALLED AND INITIAL READING TAKEN BY PASCO COUNTY UTILITIES. ALL FITTINGS, PIPING, VALVES AND MATERIALS INCLUDING THE PASCO COUNTY APPROVED REDUCED PRESSURE BACKFLOW PREVENTION DEVICE SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR/CUSTOMER.
- CONTRACTOR/CUSTOMER FURNISHED REDUCED PRESSURE BACKFLOW PREVENTION DEVICE MUST BE INSTALLED BEFORE THE METER IS INSTALLED BY PASCO COUNTY UTILITIES. THE APPROVED BACKFLOW PREVENTION DEVICE SHALL BE TESTED AND CERTIFIED BY PASCO COUNTY UTILITIES CERTIFIED BACKFLOW PREVENTION TECHNICIAN AT TIME OF METER INSTALLATION.
- CONTRACTOR/CUSTOMER SHALL PROTECT THE JUMPER/METER ASSEMBLY FROM DAMAGE.
- CONTRACTOR/CUSTOMER IS RESPONSIBLE FOR BACTERIOLOGICAL TESTING AFTER CONNECTION OF TEMPORARY WATER SERVICE.
- TEMPORARY CONSTRUCTION JUMPER/METER ASSEMBLY SHALL NOT BE REMOVED UNTIL SYSTEM IS ACCEPTED AND DEPARTMENT OF HEALTH CERTIFICATION AND CLEARANCE FOR SERVICE FORM HAS BEEN RECEIVED BY PASCO COUNTY UTILITIES.
- WHEN THE NEW SYSTEM IS ACCEPTED AND THE FINAL METER READING TAKEN BY PASCO COUNTY, THE TEMPORARY CONSTRUCTION JUMPER/METER ASSEMBLY MUST BE COMPLETELY REMOVED FROM M.J. CAP TO M.J. CAP AND A NEW WATER MAIN IS TO BE CHLORINATED AND INSTALLED COMPLETING THE FINAL CONNECTION.
- BY APPLYING FOR SERVICE, CONTRACTOR/CUSTOMER AGREES TO TAKE WATER SERVICE FROM PASCO COUNTY UTILITIES IN ACCORDANCE WITH THE APPROPRIATE RATE SCHEDULE AND IN ACCORDANCE WITH PASCO COUNTY UTILITIES RULES AND REGULATION.

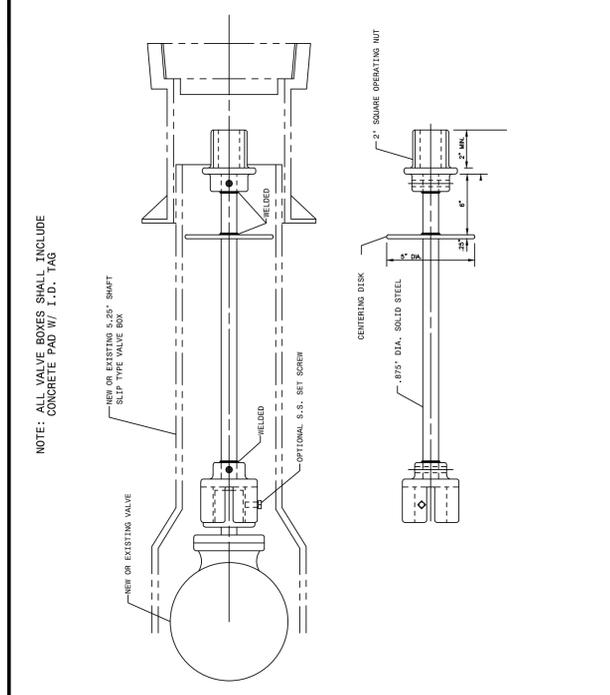
CREATED 11/18/05	TEMPORARY CONSTRUCTION WATER SERVICE	PROVIDED FOR INFORMATIONAL PURPOSES ONLY. NO MODIFICATIONS WITHOUT WRITTEN PCU APPROVAL
REVISED 06/30/06	PASCO COUNTY UTILITIES	DETAIL 01



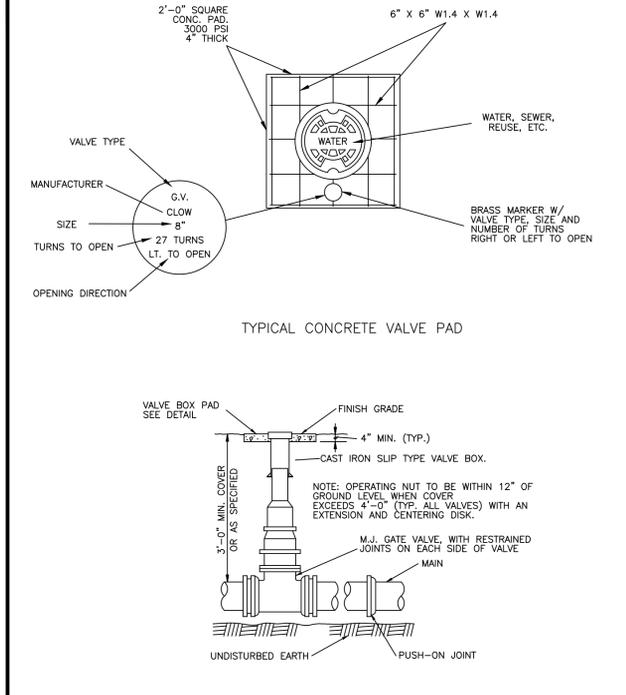
ITEM	QUANT.	DESCRIPTION
1	1	BACKFLOW PREVENTER ASSEMBLY, REDUCED PRESSURE ZONE
2	2	UNIONS - GALV.
3	2	NIPPLES - BRASS
4	2	ELBOWS - GALV., 90°
5	2	RISER - GALV.
6	1	CONCRETE SLAB
7	2	BALL VALVES - BRASS OR S.S. (PROVIDED WITH BFP ASS'Y)

NOTE: FIELD ADJUST AND CUT ITEM 5 TO THE PROPER LENGTH.
- MINIMUM CLEARANCE OF 24" TO BE MAINTAINED AROUND DEVICE FOR TESTING.
- ENTIRE ASSEMBLY TO BE PAINTED SAFETY BLUE.
- CONCRETE SLAB TO EXTEND 12" MIN. AROUND ENTIRE DEVICE.
- DEVICE MUST BE LISTED WITH THE UNIVERSITY OF SOUTHERN CALIFORNIA FOUNDATION FOR CROSS CONNECTION CONTROL AND HYDRAULIC RESEARCH.

CREATED 02/24/03	REDUCED PRESSURE BACKFLOW PREVENTER (SINGLE SERVICE: 3/4", 1", 1-1/2", 2")	PROVIDED FOR INFORMATIONAL PURPOSES ONLY. NO MODIFICATIONS WITHOUT WRITTEN PCU APPROVAL
REVISED	PASCO COUNTY UTILITIES	DETAIL 12



CREATED 02/24/03	VALVE EXTENSION RODS	PROVIDED FOR INFORMATIONAL PURPOSES ONLY. NO MODIFICATIONS WITHOUT WRITTEN PCU APPROVAL
REVISED	PASCO COUNTY UTILITIES	DETAIL 29



CREATED 02/24/03	VALVE BOX DETAIL SLIP TYPE	PROVIDED FOR INFORMATIONAL PURPOSES ONLY. NO MODIFICATIONS WITHOUT WRITTEN PCU APPROVAL
REVISED	PASCO COUNTY UTILITIES	DETAIL 30

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**STARKEY RANCH CUNNINGHAM PARK
CENTRAL NEIGHBORHOOD**

WATER & SEWER DETAILS

PREPARED FOR:
WS-TSR, LLC

DATE	DESCRIPTION
07/12/2016	REVIEW SUBMITTAL

PROJECT NO:	TSR-SR-1093
FILE:	WSD
DESIGN BY:	BUDEN
DRAWN BY:	BUDEN
FLORIDA PROFESSIONAL ENGINEER	

GARY D. MILLER
DATE:
REGISTRATION NO. 52717

C-601

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PASCO COUNTY UTILITIES DATA SHEET FOR SIZING WATER METERS

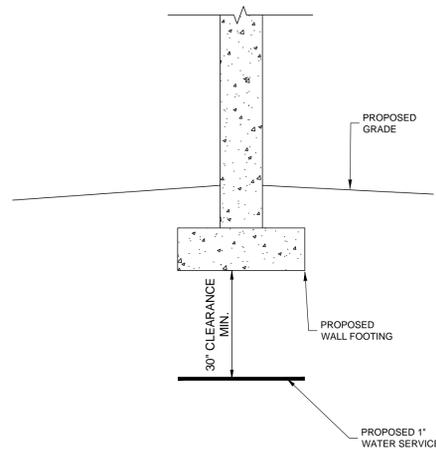
Customer: WS-TSR, LLC
 * Splash Pad, Deck Shower and Pool computed as a 3/4" hose bibb
 Type of Occupancy: Commercial (Pool Area)
 Property Identification No. 21 26 17 0000 00200 0000

Fixture	Fixture Value at 35 psi	No. of Fixtures	Fixture Value
Bathtub	8	x	=
Bedpan washer	10	x	=
Combination Sink & Tray	3	x	=
Dental Unit	1	x	=
Dental Lavatory	2	x	=
Drinking Fountain - Cooler	1	x	=
Drinking Fountain - Public	2	x	2 = 4
Kitchen Sink - 1/2" connection	3	x	=
- 3/4" connection	7	x	=
Lavatory - 3/8" connection	2	x	2 = 4
- 1/2" connection	4	x	=
Laundry Tray - 1/2" connection	3	x	=
- 3/4" connection	7	x	=
Shower head (shower only)	4	x	=
Service Sink - 1/2" connection	3	x	=
- 3/4" connection	7	x	=
Urinal - Pedestal Flush Valve	10	x	=
- Wall Flush Valve	10	x	=
- Trough (2 ft. Unit)	2	x	=
Wash Sink (each set of faucets)	4	x	=
Water Closet - Flush Valve	10	x	4 = 40
- Tank Type	3	x	=
Dishwasher - 1/2" connection	5	x	=
- 3/4" connection	10	x	=
- 1" connection	25	x	=
Washing Machine - 1/2" connection	5	x	=
- 3/4" connection	10	x	=
- 1" connection	25	x	=
Hose connection - 1/2"	6	x	=
- 3/4"	10	x	4 = 40
Hose (50 ft.) - 1/2"	6	x	=
- 3/4"	9	x	=
- 1"	12	x	=
Combined Fixture Value Total			= 88
Customer Peak demand from Curves			= 50 gpm
Enter Line Pressure and Pressure Factor	65 PSI	1.35	
Customer Peak demand from Curves X Pressure factor			= 67.5 gpm

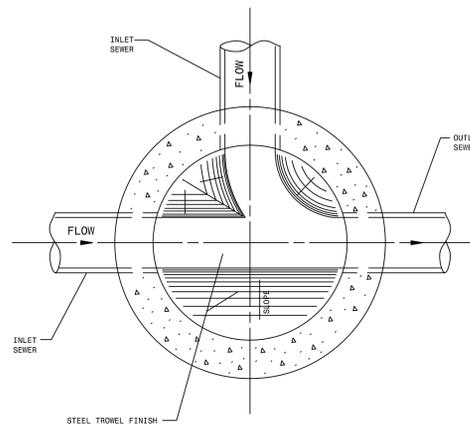
USE 1-1/2" POTABLE METER

NOTE: MAXIMUM IRRIGATION FLOW IS 65 GPM. A 1 1/2-INCH IRRIGATION METER IS PROPOSED

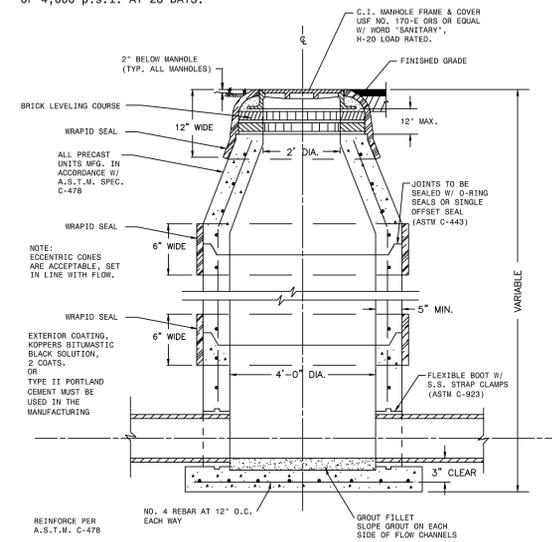
FIRE FLOW SHALL DELIVER A MINIMUM FLOW OF 1,000 GALLONS PER MINUTE FOR A PERIOD OF NOT LESS THAN TWO HOURS WITH A RESIDUAL PRESSURE OF 20 POUNDS PER SQUARE INCH



WATER SERVICE/ WALL CROSSING DETAIL
SCALE: NTS

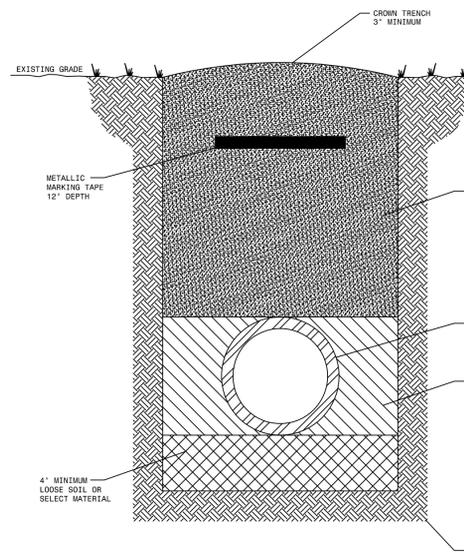


NOTE: PRECAST CONCRETE SHALL ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 4,000 p.s.i. AT 28 DAYS.



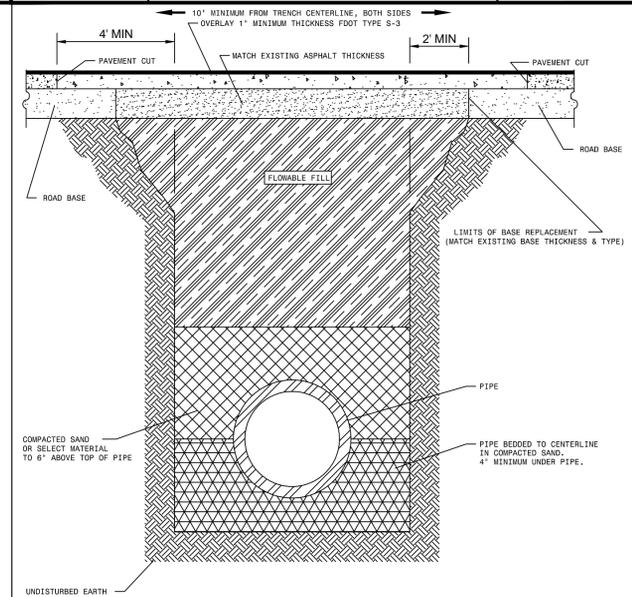
CREATED 02/24/03	STANDARD MANHOLE (BENCH AND INVERTS)	PROVIDED FOR INFORMATIONAL PURPOSES ONLY. NO MODIFICATIONS WITHOUT WRITTEN PCU APPROVAL.
REVISED		
PASCO COUNTY UTILITIES DETAIL 39		

CREATED 02/24/03	STANDARD MANHOLE	PROVIDED FOR INFORMATIONAL PURPOSES ONLY. NO MODIFICATIONS WITHOUT WRITTEN PCU APPROVAL.
REVISED		
PASCO COUNTY UTILITIES DETAIL 41		



NOTES: -LOOSE SOIL OR SELECT MATERIAL IS NATIVE SOIL EXCAVATED FROM THE TRENCH FREE OF ROCKS AND FOREIGN MATERIAL.
 -COMMON FILL TO BE PLACED AND COMPACTED IN 12" LAYERS.
 -ROLLING EQUIPMENT SHALL NOT BE USED FOR COMPACTION UNTIL A MINIMUM OF 18" OF COMMON FILL HAS BEEN PLACED AND COMPACTED OVER THE PIPE. THREE FEET OF FILL SHALL BE PLACED BEFORE A HYDROHAMMER MAY BE USED FOR COMPACTION.

CREATED 02/24/03	PIPE LAYING CONDITIONS STANDARD UNPAVED AREAS	PROVIDED FOR INFORMATIONAL PURPOSES ONLY. NO MODIFICATIONS WITHOUT WRITTEN PCU APPROVAL.
REVISED		
PASCO COUNTY UTILITIES DETAIL 35		



NOTE: -SELECT MATERIAL IS NATIVE SOIL EXCAVATED FROM THE TRENCH FREE OF ROCKS AND FOREIGN MATERIAL.
 -COMPACTION TO TOP OF FILL IS TO BE APPROXIMATELY 90% STANDARD PROCTOR, AASHTO T-99.
 -EXISTING CONCRETE/ASPHALT PAVEMENT SURFACE AND BASE TO BE CUT SQUARE WITH CONCRETE SAW.

CREATED 03/06/03	PIPE LAYING CONDITIONS FLOWABLE FILL BACKFILL EXISTING PAVED AREAS & ROADWAYS	PROVIDED FOR INFORMATIONAL PURPOSES ONLY. NO MODIFICATIONS WITHOUT WRITTEN PCU APPROVAL.
REVISED		
PASCO COUNTY UTILITIES DETAIL 36		

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**STARKEY RANCH CUNNINGHAM PARK
 CENTRAL NEIGHBORHOOD**

WATER & SEWER DETAILS

PREPARED FOR: **WS-TSR, LLC**

NO.	DATE	DESCRIPTION
1	07/13/2016	REVIEW SUBMITTAL

PROJECT NO:	TSR-SR-1093
FILE:	WSD
DESIGN BY:	BUDEN
DRAWN BY:	BUDEN

FLORIDA PROFESSIONAL ENGINEER

GARY D. MILLER
 DATE: _____
 REGISTRATION NO. 52717

C-602

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STORM WATER POLLUTION PREVENTION PLAN

Contained on these plans and within the following notes is a storm water pollution prevention plan (swppp) which has been developed by Heidt Design, LLC in accordance with the Florida Department of Environmental Protection's (FDEP) "National Pollutant Discharge Elimination System" (NPDES) generic permit for stormwater discharge from large and small construction activities.

The following entities are identified as team members of "SWPPP": Heidt Design, LLC, the developer as identified in the title box of these plans, and the site contractor and his sub-contractors. Each team member has specific responsibilities and obligations. In general, all team members, with regard to their involvement and responsibilities on the project, are to implement all necessary storm water management controls to assure compliance with the NPDES generic permit for storm water discharges from construction activities, the Southwest Florida Water Management District Permit, the applicable local governing agency (i.e. Pasco County) and the guidelines listed in the SWPPP. The duties and responsibilities of the team members as they pertain to the SWPPP are as follows:

HEIDT DESIGN, LLC:

- Develop SWPPP including, but not limited to, retention/detention ponds, control structures, erosion control methods and locations and stabilization criteria. This design is included within these construction plans and the following notes and instructions.
- Submit and obtain the necessary design related storm water permits from the Florida Department of Environmental Protection, the Southwest Florida Water Management District and other applicable governmental bodies.
- Upon notification by the developer of his intent to commence construction, submit a notice of intent to the FDEP on behalf of the developer and copy the contractor including SWPPP certification and copy of the permit.
- Submit to SWFWMD and the operator of the municipal separate storm water system, if applicable, a letter of construction commencement.
- Complete and submit a notice of termination and certification for developer. The NOI's shall be submitted no more than 30 days after;
 - Completion of the project and final stabilization of the site or
 - When responsibility for the site has ended. Final stabilization as defined by EPA is when all soil disturbing activities at the site have been completed and a uniform (e.g. evenly distributed, without large bare areas) perennial vegetative cover with a density of 70% of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures. As an alternative, equivalent permanent stabilization measures (such as riprap, gabions, or geotextiles) may be employed. The client shall notify Heidt Design, LLC when one of these criteria has been met.

CONTRACTOR:

- Sign and return to Heidt a contractor's certification form certifying your understanding of and willingness to comply with the Storm Water Pollution Prevention Plan no later than 48 hours prior to commencement of construction. Also, each subcontractor affected by the SWPPP must certify to the contractor that they understand and shall comply with the NPDES Permit and SWPPP. A record of these certifications shall be maintained by the contractor on site.
- During construction, assure compliance with the designed Storm Water Pollution Prevention plans prepared by Heidt Design, LLC and the NPDES Generic Permit for storm water discharges from large and small construction activities.
- Maintain a copy of the construction plans, which include the Storm Water Pollution Prevention Plan, the NOI, and all inspection reports and certifications on site.
- Undertake all reasonable Best Management Practices (BMP's) to assure that silted or otherwise polluted storm water is not allowed to discharge from the site during all phases of construction. Stabilization BMP's that may be used include:
 - Temporary or permanent seeding, mulching, geotextiles, sodding, vegetative buffer strips, protection of trees and preservation of mature vegetation. Structural erosion and sediment control BMP's that may be used include: straw bale dikes, silt fences, earth dikes, brush barriers, drainage swales, check dams, subsurface drain, pipe slope drain, level spreaders, storm drain inlet protection, outlet protection, sediment traps, and temporary sediment basins. Detention ponds may also be used as temporary sediment basins. Additional BMP's that may need to be implemented include: providing protected storage areas for chemicals, paints, solvents, fertilizers, and other potentially toxic materials. Providing waste receptacles at convenient locations and providing regular collection of wastes, including building material wastes. Minimizing off-site tracking of sediments. Making adequate preparations, including training and equipment to contain spills of oil and hazardous materials. Complying with applicable state or local waste disposal, sanitary sewer or septic system regulations and the use of appropriate pollution prevention measures for allowable non-storm water components of discharge.
- Notify Heidt Design, LLC and the developer in writing of any non-storm water pollution sources which are being stored, or otherwise used during the construction of the project, i.e. fertilizers, fuels, pesticides, other chemicals. This notification should be accompanied with the contractor's design and methods to prevent pollution run-off from these sources.
- Develop a maintenance and inspection plan which includes, but is not limited to the following:
 - The specific areas to be inspected and maintained that includes all the disturbed areas and material storage areas of the site.
 - The erosion and sediment controls identified in the swppp to be maintained and inspected and those additional controls that the contractor deems necessary.
 - Maintenance procedures.
 - The procedure to follow if additional work is required or whom to call.
 - Inspections and maintenance forms.
 - The personnel assigned to each task.

The following shall be inspected a minimum of once a week or within 24 hours after 0.50 inches of rainfall:

- Stabilization measures (once a month if fully stabilized).
- Structural controls.
- Discharge points.
- Construction entrances and exits.
- Areas used for storage of exposed materials.

An inspection form shall be completed for each inspection. Any permit violations should be noted and corrective measures shall be taken no later than 7 days after the inspection occurred. If revisions to the SWPPP are needed, a report form for changes in the SWPPP shall be completed and a copy sent to Heidt Design, LLC the original shall be kept on-site as documentation of the change. If the inspection passes, a certification that the facility is in compliance with the SWPPP and the NPDES Permit must be signed by a duly authorized representative of the principal executive official of the operator of the SWPPP with one of the following qualifications:

- Has successfully completed the Florida Stormwater, Erosion and Sediment Control Inspector Training Program.
- Successfully completed a similar training program.
- Has enough practical on the job training to be qualified to perform the inspections.
- Retain inspection reports and certifications for at least three years.

Site stabilization measures shall be initiated as soon as practical but in no case more than 7 days, in portions of the site where construction activities have temporarily or permanently ceased.

Releases in excess of reportable quantities.

- The discharge of hazardous substances or oil in the stormwater discharge(s) from a facility or activity shall be prevented or minimized in accordance with the applicable Stormwater Pollution Prevention Plan for the facility or activity. This permit does not relieve the operator of the reporting requirements of 40 cfr part 117 and 40 cfr part 302. Where a release containing a hazardous substance in an amount equal to or in excess of a reporting quantity established under either 40 cfr 117 or 40 cfr 302, occurs during a 24 hour period:
 - The operator is required to notify the State Warning Point (800-210-0519 or 850-413-9911) as soon as he or she has knowledge of the discharge;
 - The operator shall submit within 14 calendar days of knowledge of the release a written description of the release (including the type and estimate of the amount of material released), the date that such release occurred, the circumstances leading to the release, and remedial steps to be taken, to the Florida Department of Environmental Protection, NPDES Stormwater Section, Mail Station 2500, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; and
 - The Stormwater Pollution Prevention Plan required under part V of this permit must be modified within 14 calendar days of knowledge of the release to: provide a description of the release, the circumstances leading to the release, and the date of the release. In addition, the plan must be reviewed to identify measures to prevent the recurrence of such releases and to respond to such releases, and the plan must be modified where appropriate.
- This permit does not authorize the discharge of hazardous substances or oil resulting from an on-site spill.

DEVELOPER:

- Notify Heidt of your intent to commence construction. Sign the Notice of Intent form as operator of the storm water discharge facility and permittee and return to Heidt Design, LLC.
- Sign a certification of Storm Water Pollution Prevention Plan and return to Heidt Design, LLC.
- Notify Heidt when it is time to submit a Notice of Termination as defined under part E of the Heidt Design, LLC section of the SWPPP. Sign and return to Heidt Design, LLC for submittal to FDEP a Notice of Termination form and certification.

PRE-DEVELOPED SITE INFORMATION:

- Total Site Area: 2.61± AC.
- Land Use: UNDEVELOPED - AGRICULTURAL
- Vegetation: RANGE LAND, BAHIA GRASS PASTURE
- Receiving waters or municipal separate storm water system: ANCLOTE RIVER
- 2 Year/24 Hour Rainfall Depth: .45"
- Soil Types: SELLERS, IMMOLOAKE, AND ADAMSVILLE

PROJECT INFORMATION:

- Project Type - COMMERCIAL
- Anticipated Construction Sequence is as follows:
 - Complete Erosion Control Installation
 - Cleaning and Grubbing
 - Earthwork Activities
 - Storm Water System Construction
 - Utility Construction
 - Base and Pavement Construction
 - Final Stabilization
- Anticipated Start Date: FALL 2016
- Anticipated Completion Date: SPRING 2017
- Total Acres Disturbed: 59.0 AC.
- Pre-Developed "C" Factor: 0.20
- Post-Developed "C" Factor: 0.50
- The Storm Water Management System, upon completion of construction and appropriate certification and as-built submittals will be operated and maintained by WS-TSR, LLC.
- The potential source of pollution from this project is on-site development and construction activity.

OWNER'S INSTRUCTIONS FOR MAINTENANCE AND INSPECTION OF STORMWATER FILTER FACILITIES

Drainage systems should be inspected on a routine basis to ensure that they are functioning properly. Inspections can be on an annual or semi-annual basis, but should always be conducted following major storms. Systems that incorporate infiltration are most critical since poor maintenance practices can soon render them inefficient. Visual inspections of sand filters, control structures, and outfall pipes are highly recommended. It should be stressed that good records should be kept on all maintenance operations to help plan future work and identify facilities requiring attention.

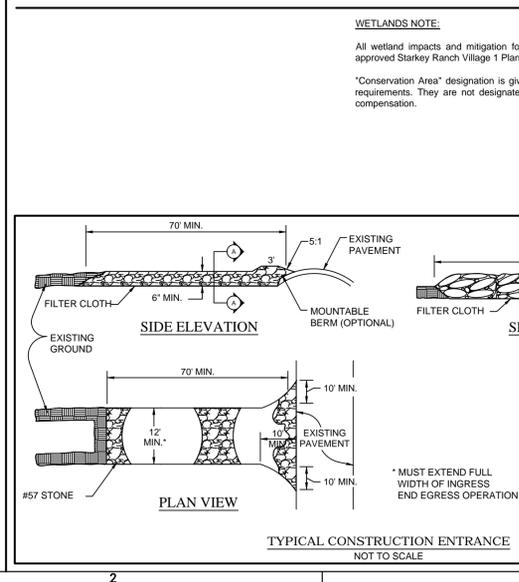
Sand filter surfaces are sometimes scarified or break up silt deposits and restore porosity. This should be accomplished after all sediment has been removed from the surface. After removing large debris (cups, paper, wood, etc.) it is recommended that raking the top 3" will properly scarify the surface or it may be required to replace the sand. Another technique requires removing the sand for washing.

The filter system is designed to have a wet-dry cycle to inhibit algae or bacterial growth. Cleanout frequency of filter beds will depend on whether they are vegetated or non-vegetated and will be a function of their storage capacity, infiltration characteristics, volume of inflow, and sediment load. Filter beds should be inspected closely at least once a year.

Perforated underdrain pipes are located 2' below the sand and cleanouts are located at the end of the system. In the event of sediment build-up in the underdrain pipe, cleaning can be accomplished through the cleanout with several of the techniques outlined below.

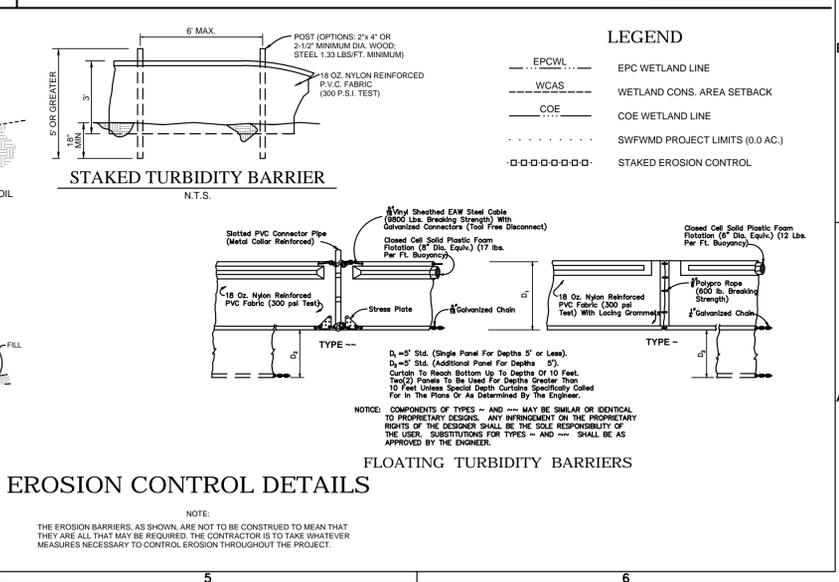
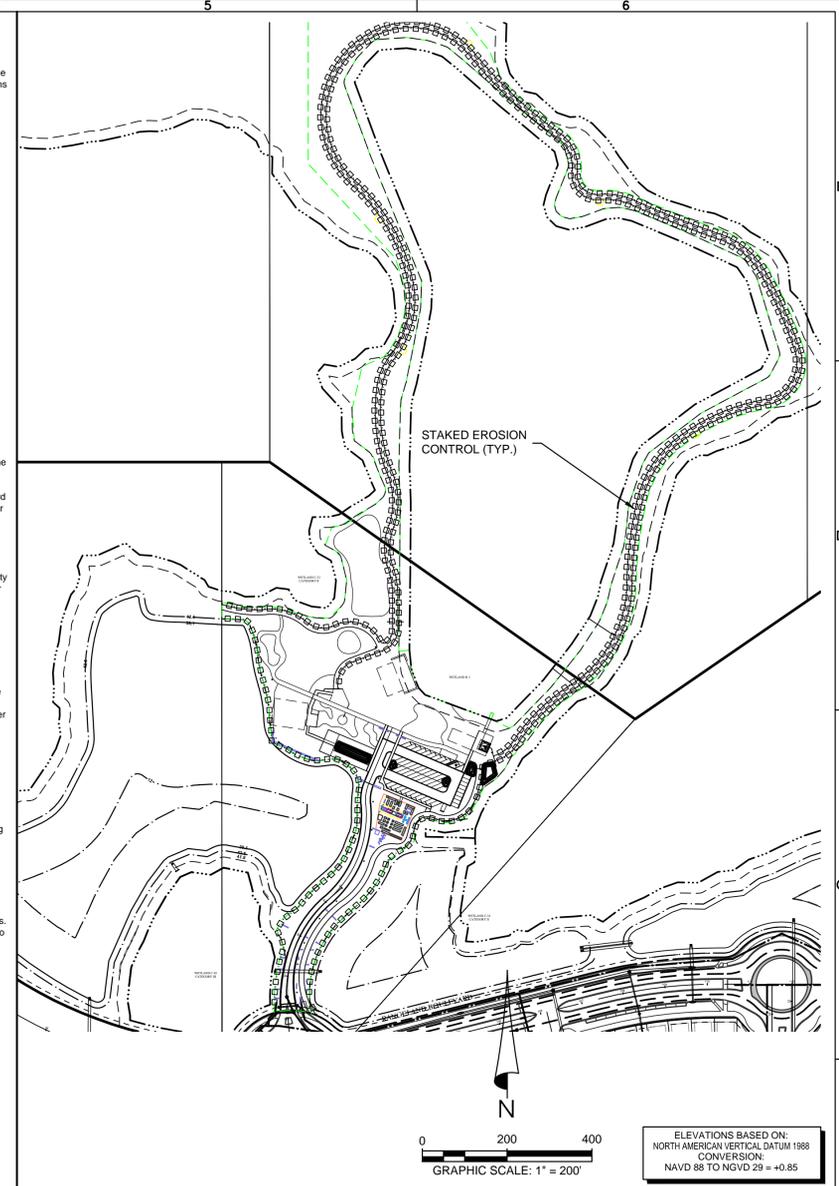
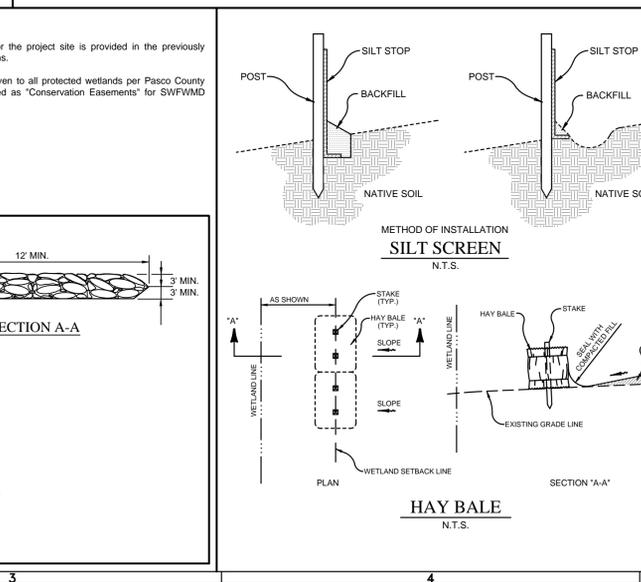
Methods and equipment for cleanout of systems various types of equipment are available commercially for maintenance of drainage systems. The most frequently used equipment and techniques are listed below:

- Vacuum Pump**
This device is normally used to remove sediment from sumps and pipes. The equipment for this system is generally mounted on a vehicle. It requires a 200 - 300 gallon (0.757 - 1.36m) holding tank and a vacuum pump that has a 10" (254mm) diameter flexible hose with a serrated metal end for breaking up cake sediment. A two-man crew can clean a catch basin in 5 to 10 minutes. This system can remove stones, bricks, leaves, litter and sediment deposits. Normal working depth is 0' - 20' (0 to 6m).
- Water Jet Spray**
This equipment is generally mounted on a self-contained vehicle with a high pressure pump and a 200 - 300 gallons (0.750 to 1.140m) water supply. A 3" (76mm) flexible hose with a metal nozzle that directs jets of water at a reverse angle, which propels the nozzle forward while blasting debris backwards toward the catch basin. As the hose line is reeled in, the jetting action forces all debris to the catch basin where it is removed by the vacuum pump equipment. Normal length of hose is approximately 200' (61m). Because of the energy supplied by the water jet, it should not be used to clean erodible trench walls.



GENERAL EROSION AND TURBIDITY CONTROL NOTES

- The Site Subcontractor shall be responsible for installation and maintenance of all erosion and turbidity controls and the quality and quantity of offsite or wetland discharges.
- Prior to construction, the Site Subcontractor is responsible for having his dewatering plan and turbidity control plan approved by the applicable reviewing agencies. Refer to the project's permit conditions for agencies requiring such review and approval. Questions concerning appropriate techniques should be addressed to those agencies and/or discussed with the project engineer and owner.
- The appropriate turbidity and erosion control methodologies selected by the Site Subcontractor for this project should be made following assessment of the plans and project site conditions and after consultation with the project engineer and appropriate agencies. The Site Subcontractor will be responsible for obtaining any and all necessary permits for such activity; several factors to consider are listed below:
 - Clay content in excavated materials and/or permeabilities rates
 - Depth of cut / embankments, trenches, or utility lines
 - Ambient ground water levels
 - Actual rainfall amounts and time of year relative to normal rainy season
 - Proximity to wetlands, water bodies or offsite properties
 - Class designation of receiving water bodies (i.e. Outstanding Florida Waters, shellfish harvesting areas, etc.)
 - Gully type, and proximity of upland vegetation to be retained during construction (for use as possible filtration areas)
 - Fill height relative to natural grade and length and steepness of the proposed slopes
 - Existing topography and directions of surface flow
 - Type of equipment used
 - Project type
 - Duration of construction activities
 - Separation distance of onsite ponds
 - Ambient quality of surface and groundwater
 - Temporary stockpile locations and heights
- At the onset of construction, the Site Subcontractor, as the party responsible for implementation of the erosion and sediment control plan, shall assess the above described conditions and factors with respect to relative cost effectiveness and select the appropriate methods of protection. A fairly extensive list of techniques are presented below but it must be stressed that any or all of the following may be necessary to maintain water quality and quantity standards. The construction sequencing should be thought out in advance of initiation to provide adequate protection of water quality.
 - Discharges which exceed 29 N.T.U.'s over the background levels are in violation of state water quality standards. Discharges of water quantities which affect offsite properties or may damage wetlands are also prohibited by regulating agencies.
 - The erosion and turbidity control measures shown herein are the minimum required for agency approval. Additional control and measures may be required due to the Site Subcontractor's construction sequence & unforeseen weather conditions. Any additional measures deemed necessary by the Site Subcontractor shall be included in the lump sum bid with no extras for materials and labor allowed.
 - Hay bales or silt screens shall be installed prior to land clearing to protect water quality and to identify areas to be protected from clearing activities and maintained for the duration of the project until all soil is stabilized.
 - Floating turbidity barriers shall be in place in flowing systems or in open water lake edges prior to initiation of earthwork and maintained for the duration of the project until all soil is stabilized.
 - No clay material shall be left exposed in any stormwater storage facility. If clay or sandy clays are encountered during stormwater storage excavation, the Site Subcontractor shall notify the Engineer immediately before proceeding with further excavation. If the Engineer of Record has determined that such soils are non-confining and must be excavated to meet permit and design conditions, excavation may proceed after obtaining written authorization from the appropriate governing agency. If said soils are left exposed at the permitted and designed depth, the Site Subcontractor shall over-excavate the pond's bottom and side slopes by a minimum of twelve (12") inches and backfill with clean sands to help prevent suspension of fine particles in the water column.
 - The installation of temporary erosion control barriers shall be coordinated with the construction of the permanent erosion control features to the extent necessary to assure effective and continuous control of erosion and water pollution throughout the life of the construction phase.
 - The type of erosion control barriers used shall be governed by the nature of the construction operation and soil type that will be exposed. Silty and clayey material may require solid sediment barriers to prevent turbid water discharge, while sandy material may need only silt screens or hay bales to prevent erosion. Floating turbidity curtains should generally be used in open water situations. Diversion ditches or swales may be required to prevent turbid stormwater runoff from being discharged to wetlands or other water bodies. It may be necessary to employ a combination of barriers, ditches, and other erosion/turbidity control measures if conditions warrant.
 - When pumps are to be used to remove turbid waters from construction areas, the water shall be treated prior to discharge to the wetlands. Treatment methods include, for example, turbid water being pumped into grassed swales or appropriate upland vegetated areas (other than upland preservation areas and wetland buffers), sediment basins, or confined by an appropriate enclosure such as turbidity barriers or low berms, and kept confined until turbidity levels meet State Water Quality Standards.
 - The Permittee shall schedule his operations such that the area of unprotected erodible earth exposed at any one time is not larger than the minimum area necessary for efficient construction operation, and the duration of exposed, uncompleted construction to the elements shall be as short as practicable. Clearing and grubbing shall be so scheduled and performed such that grading operations can follow immediately thereafter. Grading operations shall be so scheduled and performed that permanent erosion control features can follow immediately thereafter if conditions on the project permit.
 - Water derived from various dewatering methods should be passed through sufficiently wide areas of existing upland vegetation to filter out excess turbidity. If this is not sufficient, the water shall be retained in previously constructed permanent stormwater ponds or else retained in temporary sedimentation basins until the clarity is suitable to allow for its discharge. Plugging the outfalls from completed stormwater ponds may be needed to avoid discharge. However, such situations should be monitored closely to preclude berm failure if water levels rise too high.
 - Water can be transported around the site by the use of internal swales or by pumps and pipes.
 - Sheet flow of newly filled or scraped areas may be controlled or contained by the use of brush barriers, diversion swales, interceptor ditches or low berms. Flow should be directed toward areas where sediments can sufficiently settle out.
 - Exposed soils shall be stabilized as soon as possible, especially slopes leading to wetlands. Stabilization methods include solid sod, seeding and mulching or hydromulching to provide a temporary or permanent grass cover mulch blankets, filter fabrics, etc., can be employed to provide vegetative cover.
 - Energy dissipaters (such as rip rap, a gravel bed, hay bales, etc.) shall be installed at the discharge point of pipes or swales if scouring is observed.
 - Attempt to install roadway curb and gutters as soon as possible to reduce the surface area for erosion to occur.
 - Implement storm drain inlet protection (hay bales or gravel) to limit sedimentation within the stormwater system. Perform inspections and periodic cleaning of sediments which wash out into the streets until all soil is stabilized.
 - Water discharge velocities from impounded areas and temporary sedimentation basins shall be restricted to avoid scouring in receiving areas.
 - If water clarity does not reduce to state standards rapidly enough in holding ponds, it may be possible to use chemical agents such as alum to flocculate or coagulate the sediment particles.
 - Hay bales, silt screens, or gravel beds can be added around the pipe or swale discharge points to help clarify discharges. Spreader swales may help dissipate cloudy water prior to contact with wetlands.
 - All fuel storage areas or other hazardous storage areas shall conform to accepted state or federal criteria for such containment areas.
 - Vehicle or equipment washdown areas will be sufficiently removed from wetlands or offsite areas.
 - Fugitive dust controls (primarily by using water spray trucks) shall be employed as needed to control windborn emissions.
 - If the above controls remain ineffective in precluding release of turbid water, especially during wind or utility line dewatering, then the contractor may be compelled to use a vertical dewatering system such as well points or sock drains to withdraw groundwater which may already be clear enough to allow for direct discharge to wetlands.
 - Ongoing inspections and periodic maintenance by the Site Subcontractor shall occur throughout construction as necessary to insure the above methods are working suitably. This may be needed daily, if conditions so warrant. Site Subcontractors are encouraged to obtain and thoroughly review The Florida Development Manual: A Guide to Sound Land and Water Management, which was developed by the State of Florida Department of Environmental Protection in 1988. This provides fairly in-depth discussions of recommended techniques and also provides specific design and technical standards. A copy of this document is available for review at Heidt Design, LLC.
 - The contractor will perform daily inspections of all on-site wetlands within the construction area to ensure that water levels within those wetlands are not excessively impounded prior to the time when the permitted control structure or outfall is built. Water levels significantly above normal should be corrected at a frequency that prevents a change in the vegetative character or health of any wetlands.
 - Prior to commencement of clearing & grubbing or any soil disturbance, contractor shall coordinate with Heidt Design to schedule a pre-construction soil erosion and sediment control inspection with the Pasco County Stormwater Management Division.



HEIDT DESIGN
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Transportation Engineering
Ecological Services • Landscape Architecture

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STARKEY RANCH CUNNINGHAM PARK CENTRAL NEIGHBORHOOD CONSTRUCTION SURFACE WATER MANAGEMENT PLAN

WS-TSR, LLC

PREPARED FOR:

DATE	DESCRIPTION
04/21/2015	COUNTY COMMENTS
07/13/2016	REVIEW SUBMITTAL

PROJECT NO: **TSR-SR-1093**

FILE: **CSWMP**

DESIGN BY: **BU DEN**

DRAWN BY: **BU DEN**

FLORIDA PROFESSIONAL ENGINEER

GARY D. MILLER

DATE: **5/27/17**

REGISTRATION NO. **52717**

C-900

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