City of Doral

RFP No. 2021-11

Adaptive Re-Use Infrastructure Development Design Build

Addendum No. 3

Below are questions/ clarifications that were received regarding this project as well as the City's responses. This Addendum is and does become a part of the above-mentioned solicitation. This addendum is issued to modify the subject solicitation as follows:

Please see attached the following Exhibits:

- **Exhibit A – Adaptive Re-Use Master Plan**
- **Exhibit B – Preliminary Survey**
- **Exhibit C – Preliminary Geotechnical Report**

CITY OF DORAL

ADAPTIVE REUSE STUDY AREA ACTION PLAN

FINAL

MAY 2019

DORAL
FLORIDA

ACKNOWLEDGEMENTS

A special thanks to the City of Doral elected officials and staff involved in the development of this plan:

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Vice Mayor Claudia Mariaca

Councilwoman Digna Cabral

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TABLE OF CONTENTS

EXECUTIVE SUMMARY

The City of Doral has experienced significant recent population growth and development, with a 49% increase from the 2010 census population count (45,704) to the 2018 Bureau of Economic and Business Research population estimate (68,224) (see Figure E-1). This growth has stimulated several major residential and mixed-use projects in the City, including the Downtown Doral project. The evolution of Downtown Doral into a dynamic city center with restaurants, retail, and residential is driving interest in development and redevelopment of surrounding areas, such as the commercial and industrial area directly to the north (referred to hereafter as the "Study Area", see Map E-1) which is the focus of this Adaptive Reuse Study Area Action Plan (Plan).

Additionally, both the Study Area and Doral as a whole are approaching full build-out. The Study Area is 11% vacant (13 acres), and the city is 5% vacant (450 acres), based on 2018 Florida Department of Revenue data. The limited amount of land for new development further emphasizes the focus on redevelopment, particularly for structures in the Study Area that are generally older than those in the City at large. The percentage of square footage built in the Study Area peaked at over 50% in the 1970's, while the city hit its peak at just over 30% in the 1990's, see Figure E-2.

The Plan provides recommendations for the adaptive reuse and redevelopment of the Study Area.

POPULATION GROWTH 2010-2018

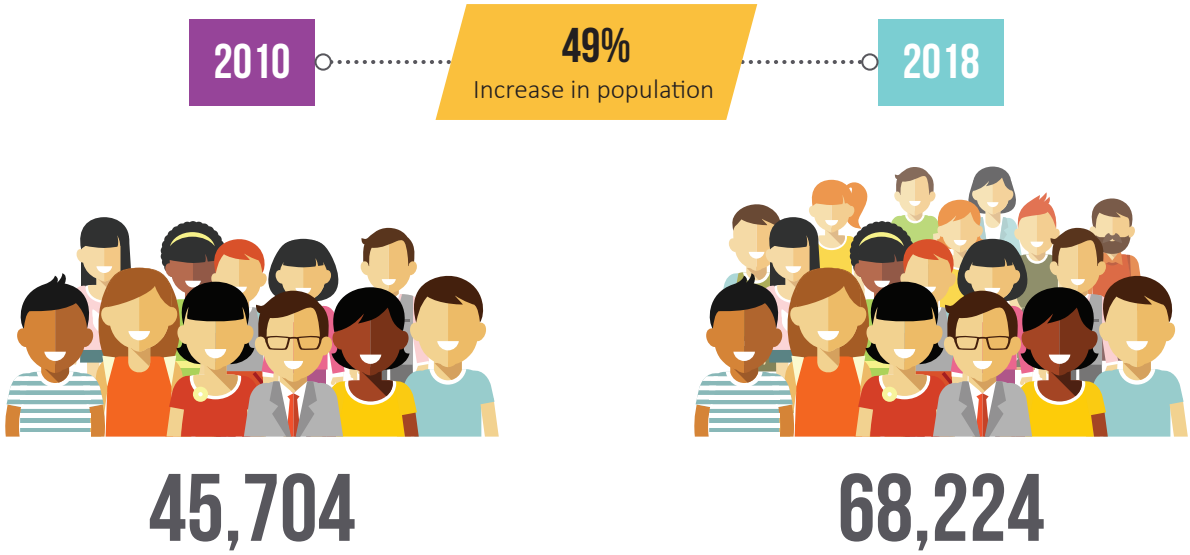

Figure E-1: Population Change from 2010 to 2018. ***Source:*** *US Census, Bureau of Economic and Business Research.*

PERCENT SQUARE FOOTAGE BY DECADE

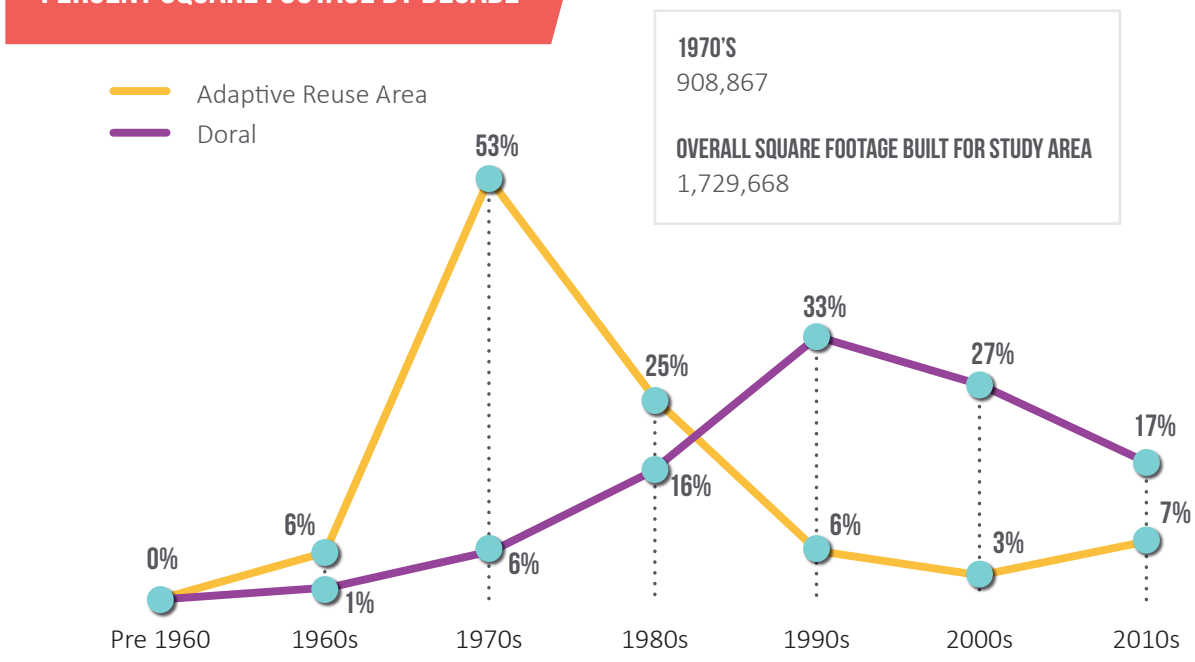

Figure E-2: Square Footage Built by Decade. ***Source:*** *Florida Department of Revenue, 2018.*

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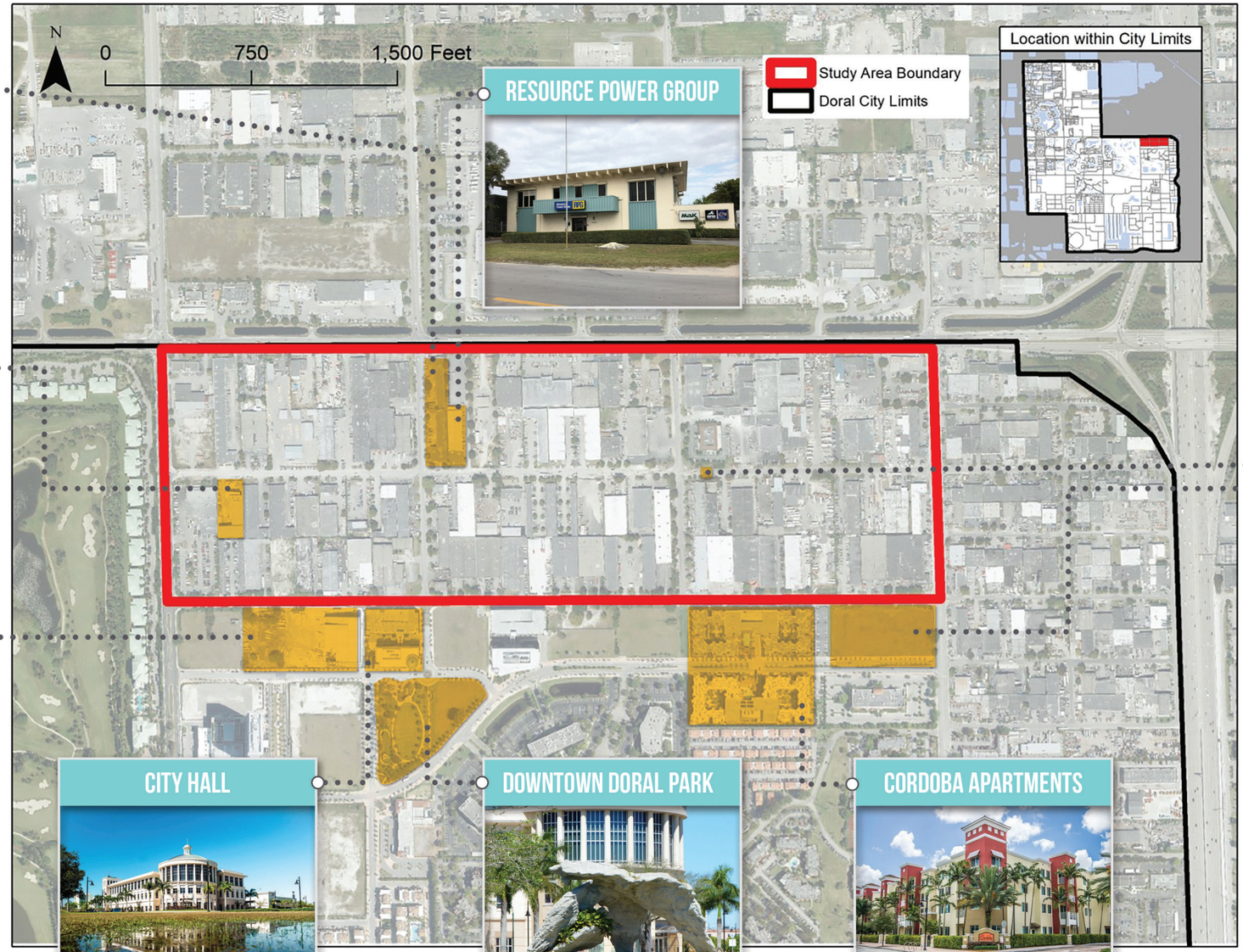

Map E-1: *Study Area*

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The Plan provides key takeaways from an existing conditions analysis, case study research, and public outreach to guide redevelopment efforts (Figure E-3 illustrates the plan development and public outreach process); these takeaways are paired with recommendations for improvements and are followed by a capital improvements plan and funding strategies for implementation. This Executive Summary highlights recommendations by theme with a summary of associated implementation costs.

LAND USE

- Expand allowable uses in the Study Area to include uses such as creative office, food and beverage, entertainment, assembly, expanded retail, and live/work uses.
- Modify the Community Mixed Use (CMU) Comprehensive Plan requirements, zoning requirements, and development review process to promote mixed-use and workforce housing in the Study Area.
- To maintain a unique local character as reuse and redevelopment occurs, institute permitting and design criteria that would make the Study Area less attractive to chain stores.
- Establish design and operating criteria to enhance compatibility between uses as the Study Area transitions towards the redevelopment vision of the Plan.
- Collaborate with Miami-Dade County to develop a land use vision for the unincorporated land immediately north of the Study Area, which has been subject of an annexation request by the City.

URBAN DESIGN

- Evaluate and adjust site design requirements in the LDC for adaptive reuse of buildings; items to consider include provision of windows in building facades, allowance of murals, and allowance of creative signage.
- Evaluate and adjust site design requirements in the LDC for redevelopment projects in the Study Area to promote more urban-style development; items to consider include building height, reducing setbacks and requiring stepbacks, on-site parking location and design requirements, and active first floor requirements.
- The City should provide basic streetscape and infrastructure improvements to support adaptive reuse and redevelopment in the Study Area; improvements may include those related to permeable pavement, basic lighting, and reconstruction of the roadway between the curbs.
- Establish streetscape and infrastructure improvements or funding required of private redevelopment projects, which may include sidewalk additions, lighting in an updated style, landscaping, curb and gutter design, wayfinding and gateway signage, and placement of utility lines underground. Adjust the existing green

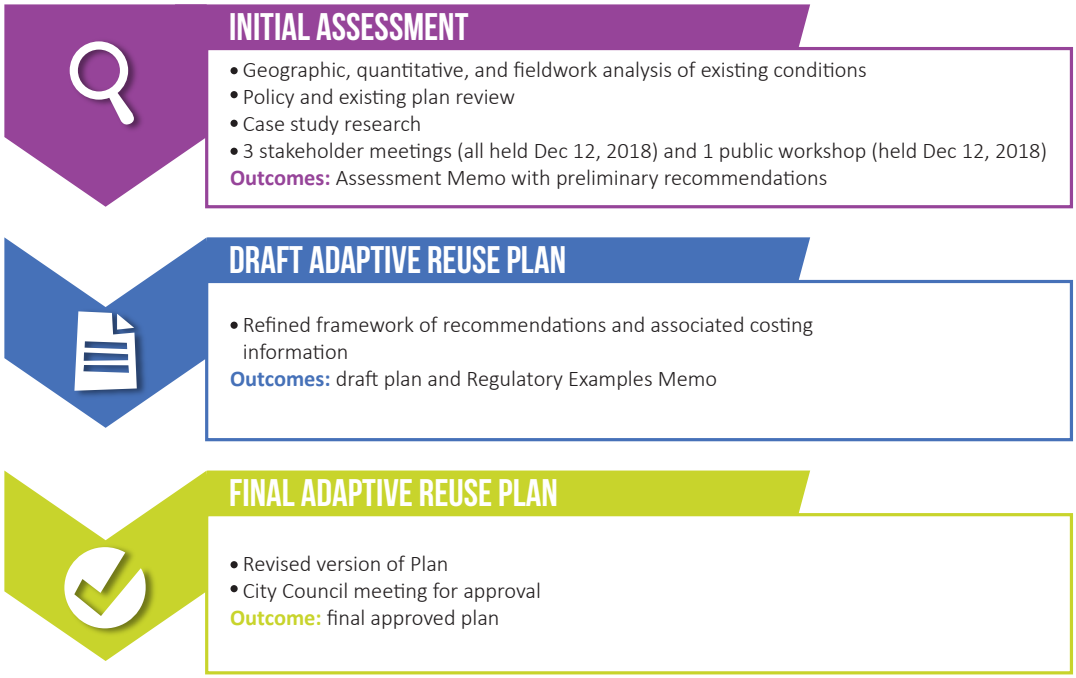

Figure E-3: *Overview of Plan Development and Public Outreach Process*

infrastructure and low-impact development (LID) incentives in the code to further promote these approaches and help address specific challenges such as those related to stormwater; incentives to consider may include a density bonus or fee deferments/ waivers.

TRANSPORTATION & CONNECTIVITY

- Add bicycle parking design standards to the LDC, which may include standards for bicycle rack style and placement.
- The following bicycle and pedestrian improvements should be put forth for programming in the City's capital improvements process or obtained via the private development process:
  - North/south connection between the pedestrian facilities along NW 53rd Street and proposed shared use path on NW 58th St
  - Improved trolley/other transit stops with first/last mile active transportation access
  - Bicycle parking infrastructure
  - Sidewalk and bicycle facilities on streets within the Study Area
- Consider the following items to address parking challenges in the Study Area:
  - On-street parking
  - Parking requirement reductions
  - Off-site/off-street parking alternatives
  - Shared parking
  - Coordination with shuttling, transit, micromobility (e.g., dockless scooters, shared bikes), etc.
  - Parking enforcement
- Evaluate options for a shuttle (e.g., Freebee) to serve the Study Area and surroundings.
- All improvements should accommodate potential retrofits for micromobility options that may come in the future.

ECONOMIC DEVELOPMENT

- Provide and promote existing relocation guidance/ assistance for existing industrial uses to move to other industrial areas of the city.
- Establish targeted business funding and/or incentives for the Study Area, with a focus on small, local, and/or innovative businesses.
- Expand the façade improvement grant program (or create a new program) to apply to general desired public realm improvements, which may include green infrastructure and streetscape amenities.

ORGANIZATIONAL STRUCTURES

- Encourage formation of a Business Improvement District (BID, see Figure E-4) to help implement improvements in the Study Area and provide additional funding for improvements.

WHAT IS A BUSINESS IMPROVEMENT DISTRICT (BID)?

A BID establishes a geographically defined area where a special assessment is charged to property owners in the district to provide special services, programs, and/or improvements within the district above and beyond what the local government provides. It typically has an entity that oversees the district and implementation or initiatives and projects, such as a non-profit organization with a Board of Directors and committees.

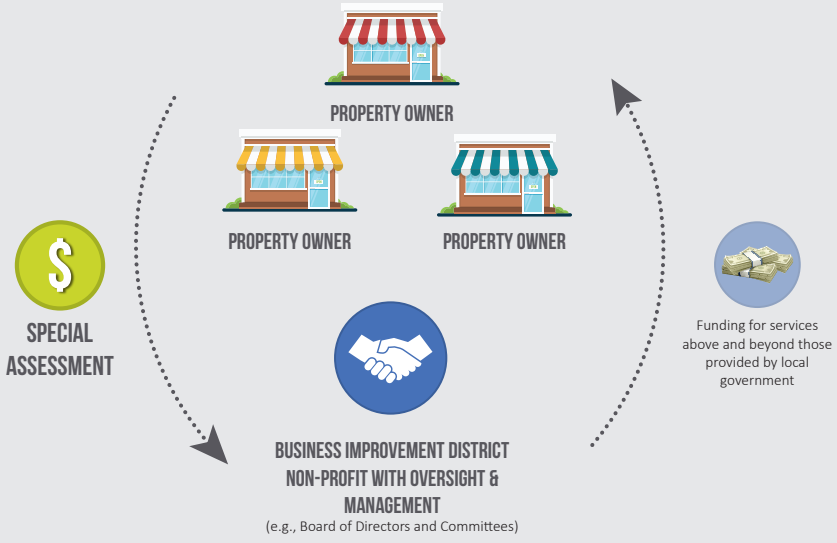

Figure E-4: *Business Improvement District*

CAPITAL AND NON-CAPITAL FUNDING SUMMARY

Figures E-5, E-6, and E-7 show the break-down of proposed project and program expenditures associated with the recommendations (including capital and non-capital). Note that recommended projects and programs require further evaluation and approval prior to implementation. See Section 3.0 for more information. Potential funding sources include:

- General Fund
- State Brownfield Program Incentives
- Special Assessment District Funds (e.g., BID)
- Impact Fees
- Stormwater Utility
- In-Lieu Parking Fee and Parking Trust Fund

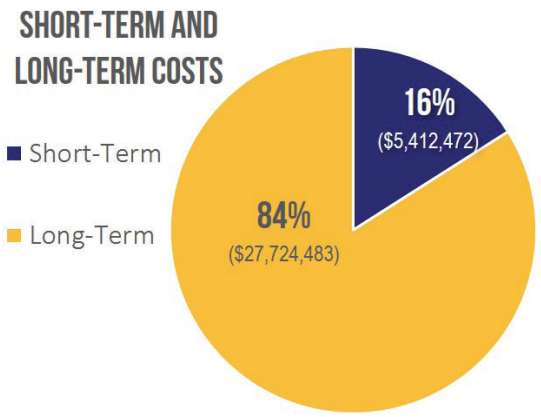

Figure E-5: *Short-Term & Long-Term Costs*

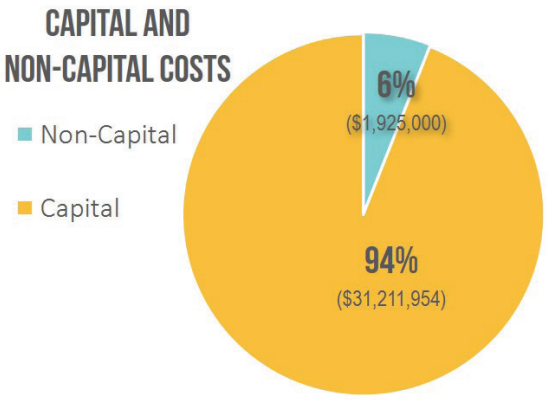

Figure E-6: *Capital & Non-Capital Costs*

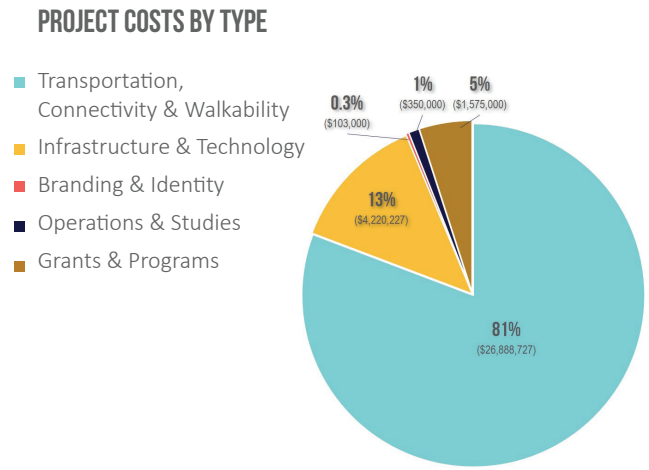

Figure E-7: *Project Costs by Type*

1.0 INTRODUCTION

The Doral Adaptive Reuse & Redevelopment Plan (Plan) provides recommendations for the adaptive reuse and redevelopment of the commercial and industrial area north of Downtown Doral ("Study Area", see Map 1-1).

The City of Doral has experienced significant recent population growth and development, with nearly a 49% increase from the 2010 census population count (45,704) to the 2018 Bureau of Economic and Business Research population estimate (68,224) (See Figure 1-1). This growth has stimulated several major residential and mixed-use projects in the City, including the Downtown Doral project. The evolution of Downtown Doral into a dynamic city center with restaurants, retail, and residential is driving interest in development and redevelopment of surrounding areas, such as the Study Area. Additionally, both the Study Area and Doral are approaching full build-out. The Study Area is 11% vacant (13 acres), and the city is 5% vacant (450 acres) based on Florida Department of Revenue data. The limited amount of land for new development further emphasizes the focus on redevelopment, particularly for structures in the Study Area that are generally older than those in the City at large. The percentage of square footage built in the Study Area peaked at over 50% in the 1970's, while the city hit its peak at just over 30% in the 1990's, see Figure 1-2.

1.1 PLAN PURPOSE AND PROCESS

The recommendations in this Plan are based on an existing conditions analysis, case study research, and public outreach to guide redevelopment efforts. Figure 1-3 provides an overview of the plan development and public outreach process, and Figure 1-4 provides an overview of the case studies used to inform recommendations; more details can be found in the separate Assessment Memo document.

Note that in addition to serving as one of the case studies used to develop recommendations for the Plan, the Wynwood Arts District in Miami was further analyzed during the initial assessment for peer comparison to the Study Area given its proximity, and its artistic and industrial design character. Like the Study Area, Wynwood was previously zoned industrial. Then in 2015, the district was rezoned to facilitate its transition mainly to commercial uses with an arts focus. More details can be found in the Assessment Memo document.

The remainder of this section provides insights on Study Area context from the initial assessment and a discussion of potential types of redevelopment that could occur in the Study Area. The following summarizes information in each section of the Plan:

- **Section 2.0: Key Takeaways & Recommendations –** summarizes takeaways from the initial assessment and public outreach, as well as recommendations for redevelopment, by theme: Land Use, Urban Design, Transportation & Connectivity, Economic Development, and Organizational Structures
- **Section 3.0: Capital Planning & Funding Strategies –** suggests a capital and non-capital project plan in support of recommendations with recommended phasing and potential funding sources; concludes the plan with next steps for implementation.

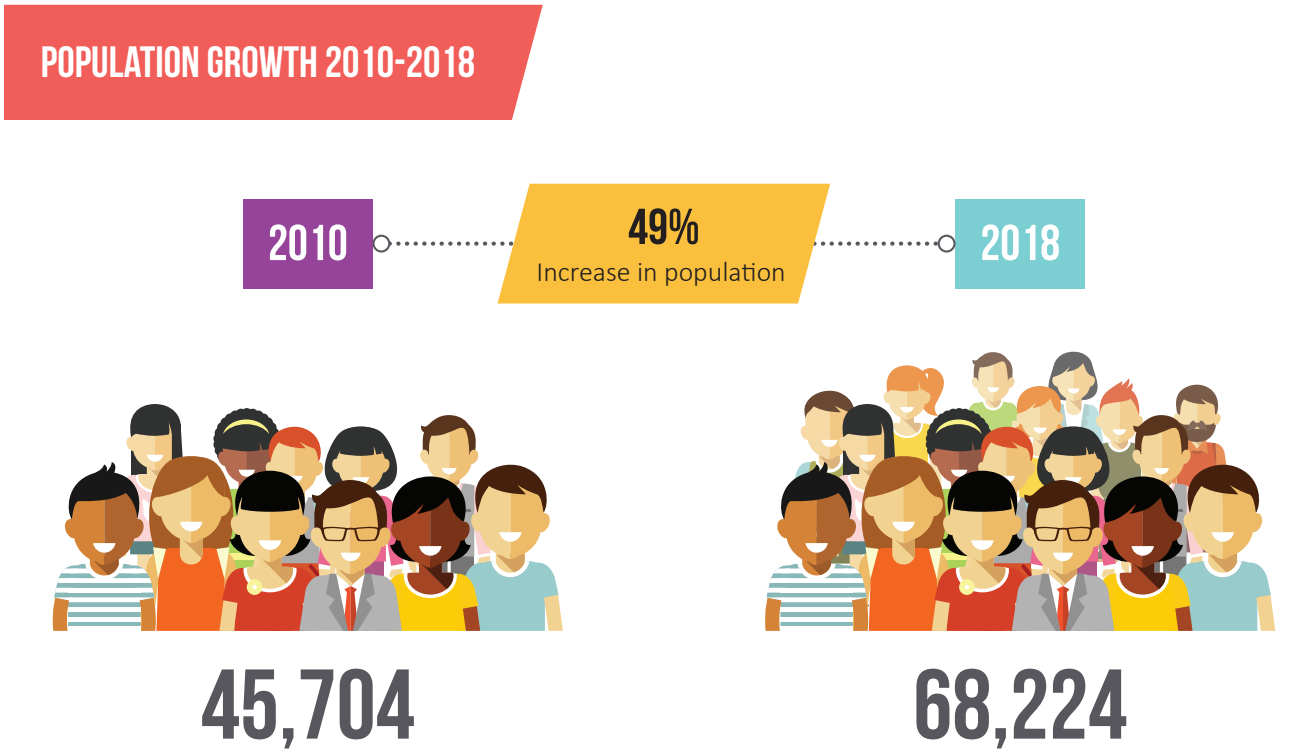

Figure 1-1: *Population Change from 2010 to 2018.* ***Source:*** *US Census, Bureau of Economic and Business Research.*

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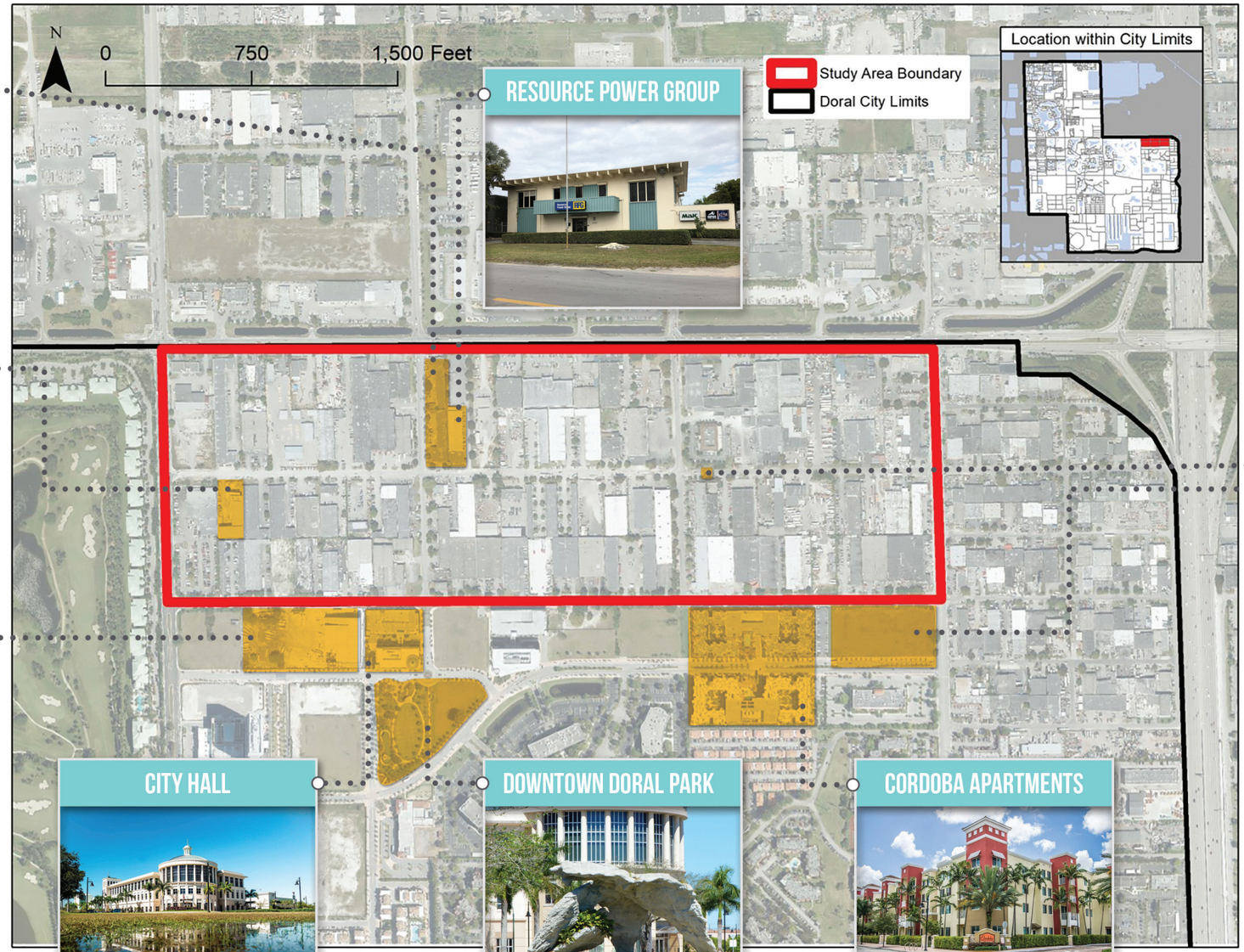

Map 1-1: *Study Area*

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PERCENT SQUARE FOOTAGE BY DECADE

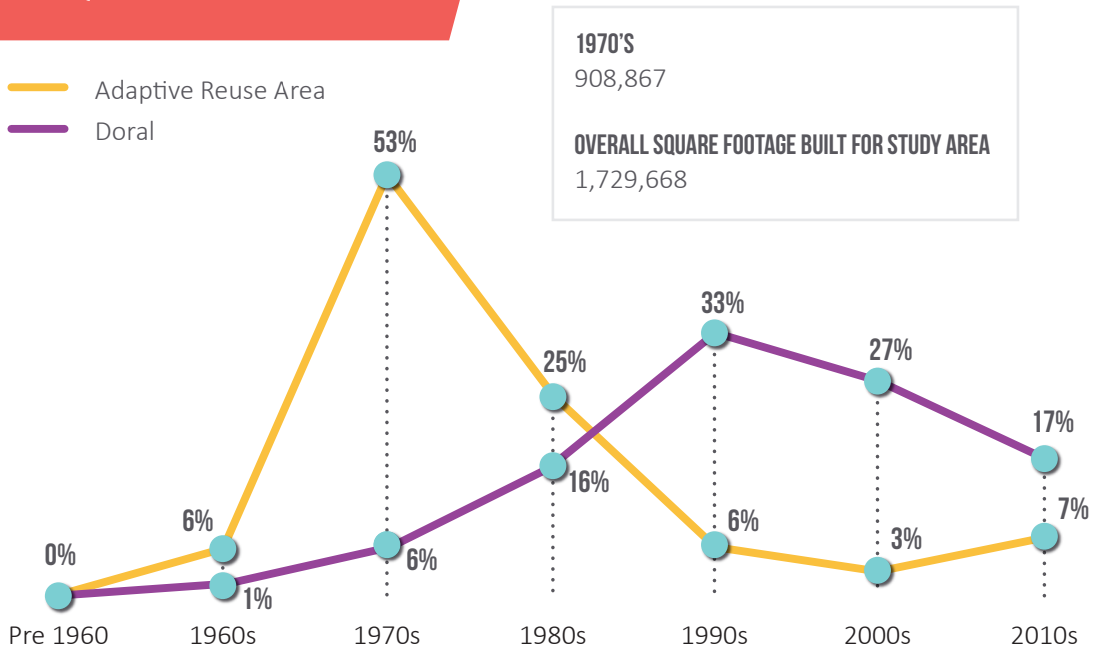


Figure 1-2: *Square Footage Built by Decade.* ***Source:*** *Florida Department of Revenue, 2018*

INITIAL ASSESSMENT

- Geographic, quantitative, and fieldwork analysis of existing conditions
- Policy and existing plan review
- Case study research
- 3 stakeholder meetings (all held Dec 12, 2018) and 1 public workshop (held Dec 12, 2018)

Outcomes: Assessment Memo with preliminary recommendations

DRAFT ADAPTIVE REUSE PLAN

- Refined framework of recommendations and associated costing information

Outcomes: draft plan and Regulatory Examples Memo

FINAL ADAPTIVE REUSE PLAN

- Revised version of Plan
- City Council meeting for approval

Outcome: final approved plan

Figure 1-3: *Overview of Plan Development and Public Outreach Process*

WYNWOOD ARTS DISTRICT

District transitioning from industrial uses to more commercial uses with an arts focus

MIAMI, FL

EDGE DISTRICT

District that has undergone revitalization via a business association, Main Street Program accreditation, and floor-area-ratio (FAR) incentives

ST. PETERSBURG, FL

HIALEAH MARKET DISTRICT

District undergoing redevelopment through a Community Redevelopment Area (CRA) designation and Transit-Oriented Development (TOD) zoning

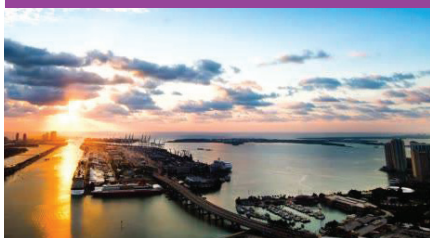
HIALEAH, FL

CITY OF ST. PETERSBURG

City considering regulations to support independently owned businesses along core corridors with storefront width regulations, which can serve as a model for the Study Area in Doral

ST. PETERSBURG, FL

MIAMI-DADE COUNTY



County offers targeted business assistance incentives, which can serve as a model for the Study Area in Doral

MIAMI-DADE, FL

KENNEDY OVERLAY

Provides an example of design and streetscape improvements required of private development

TAMPA, FL

CITY OF FORT LAUDERDALE

Provides an example of a dockless scooter ordinance

FORT LAUDERDALE, FL

Figure 1-4: *Overview of Case Studies*
Sources:

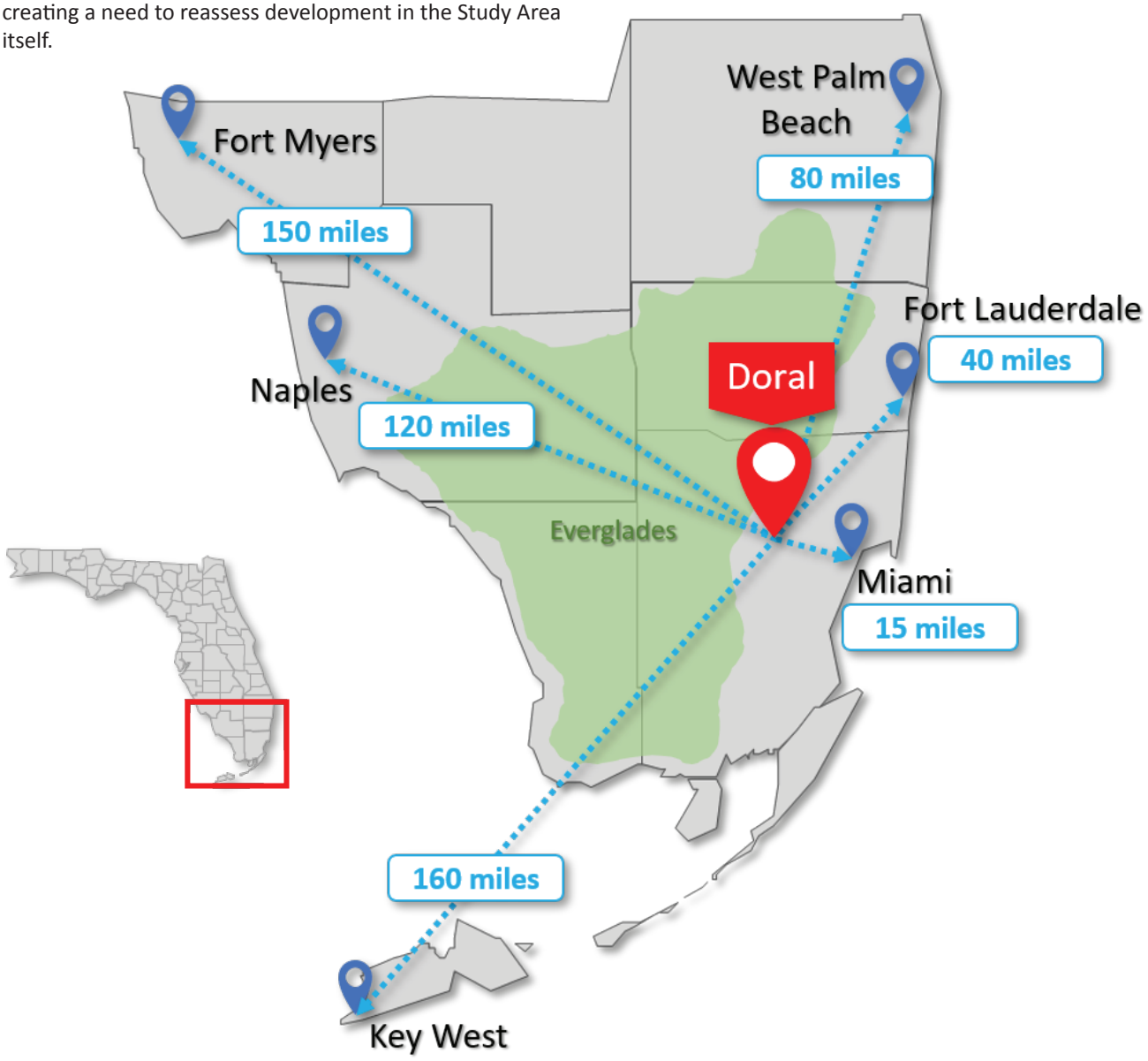
- *Wynwood Arts District: https://www.facebook.com/wynwoodarcade/photos /a.152974285400478 9/1699320110380395/?type=3&theater*
- *EDGE District - https://www.facebook.com/theEDGEstpete/photos /a.326565167427517/969514433132584/?type=3&theater*
- *Hialeah Market District – Phillip from Miami, Wikimedia Commons https://en.wikipedia. org/wiki/Hialeah_Market_station#/media/File:Hialeah_Tri_Rail_Station_(8427497251).jpg*
- *City of St Petersburg - https://www.facebook.com/StPeteFL/photos /a.10150747276767316/10154135581072316/?type=3&theater*
- *Miami-Dade County - https://www.facebook.com/miamidadecounty/photos /a.10150596443090800/10154483446925800/?type=3&theater*
- *Kennedy Overlay – Google Maps https://www.google.com/maps/@27.9447749,-82.4783197,3a,75y,243.57h,92.24t/data=!3m6!1e1!3m4!1sh4MaT4WdP3jNcNZxr4Sy-VA!2e0!7i16384!8i8192*
- *City of Ft Lauderdale - https://www.fortlauderdale.gov/departments/transportation-and-mobility/transportation-division/programs-policies-and-initiatives/dockless-bike-and-scooter-sharing*

1.2 CONTEXT TAKEAWAYS

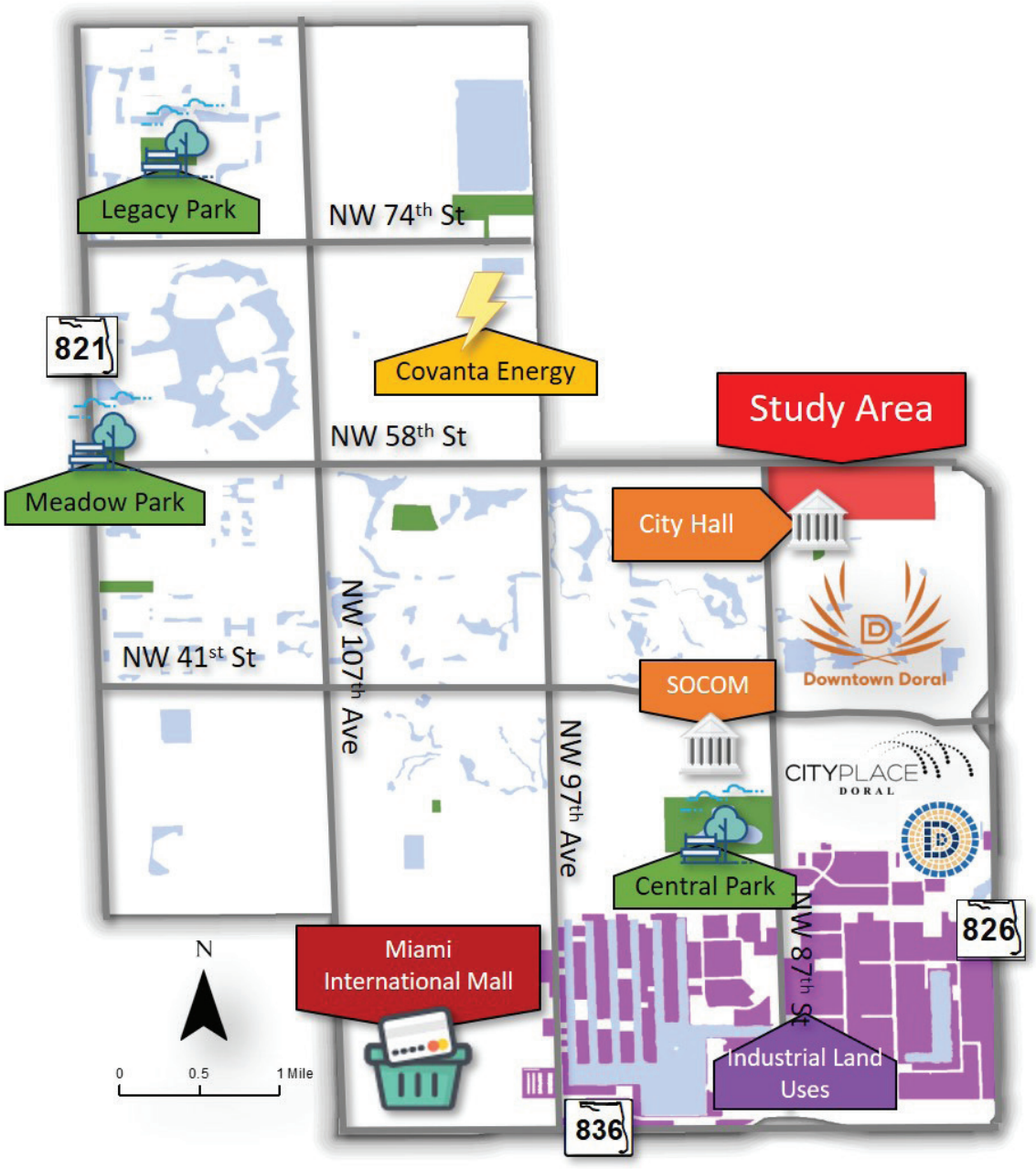
Doral's proximity to major population centers such as Miami and transportation/economic development infrastructure (see Map 1-2), as well as its sizable population growth and economic development activity, make it an attractive area for development and redevelopment efforts. This development and redevelopment can in turn support further growth and economic activity.

Major development with a mix of residential, commercial, office, and civic uses has been occurring south of the Study Area in Downtown Doral (see Map 1-3 and Figure 1-5), creating a need to reassess development in the Study Area itself.

As summarized in Figure 1-6, the taxable values in the Study Area have not seen as widespread positive change as have the rest of Doral and its other industrial areas. Redevelopment may help bring the taxable value increases in closer alignment with the city as a whole.



Map 1-2: *Regional Context*



Map 1-3: *City Context/Local Context*

Use	Downtown Doral Development Program (First Amendment Approval)
Retail/Commercial1	213,895 sq. ft.
Office	1,509,901 sq. ft. (upon final build-out and existing sq. ft. to remain)
Residential	2,840 dwelling units
Municipal/Civic	100,000 sq. ft.
School	800 students
Height	Between 4 and 18 stories; an area equal to 80% of the 18th story may rise from 19 to 20 stories

1. Retail/commercial may include offices.
2. Municipal/civic use that is not assigned to the development of a City Hall within the project may be converted by the Developer at its option to office use.

Figure 1-5: *Downtown Doral Office at 8333 NW 53rd St.* ***Sources:*** *www.loopnet.com/Listing/8333-NW-53rd-St-Doral-FL/6475964/; Downtown Doral Urban Regulations (Revision approved: January 10, 2014)*

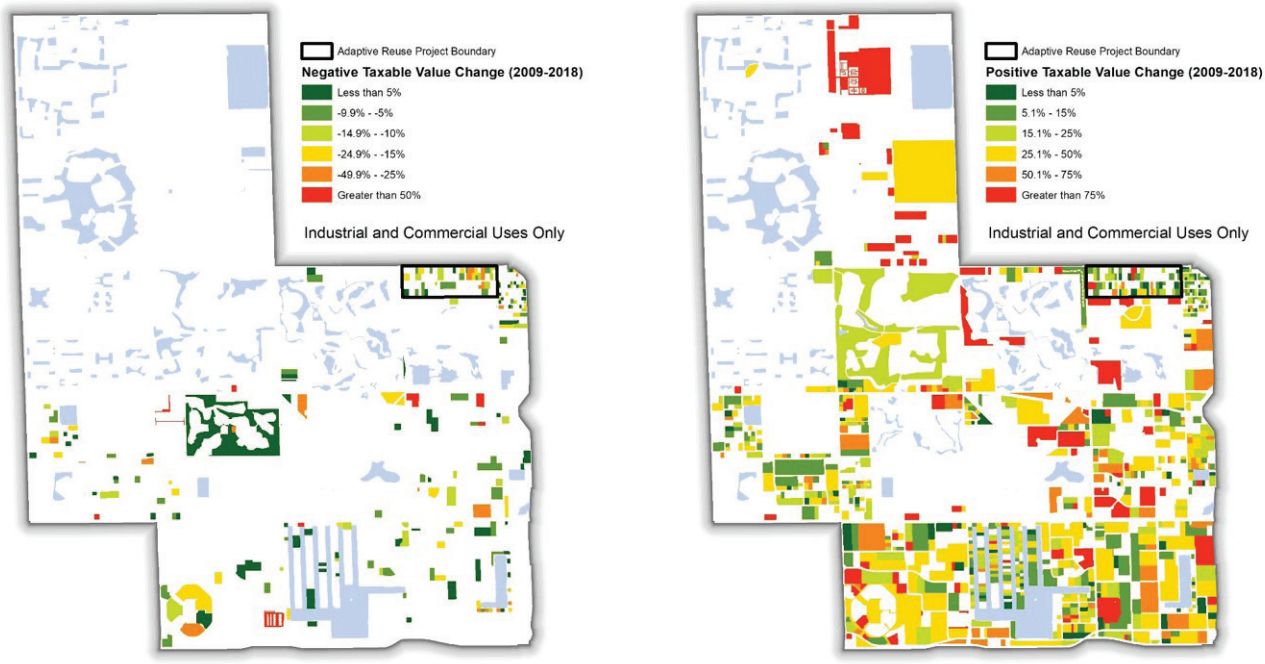


Figure 1-6: *Taxable Value Change for Industrial and Commercial Uses.* ***Source:*** *Florida Department of Revenue, 2018*

1.3 VISION & FUTURE SCENARIOS

This Plan generally aims to foster arts-oriented development, walkability, and green design in the Study Area, while maintaining aspects of the current industrial design aesthetic. This vision can be achieved through an adaptive reuse approach to land use and design transitions or a redevelopment approach.

Adaptive reuse involves improving and repurposing existing lots and structures for new uses. This approach involves more minimal or superficial changes to lots and building/structures than razing the building and developing a new structure. In contrast, redevelopment involves aggregating smaller parcels and mostly or completely redesigning and/or reconstructing buildings and structures (see Figure 1-7). This approach offers advantages in streamlining redevelopment of larger areas given the single property owner and in allowing for a greater variety of uses given the larger area with which to work, especially if on-site stormwater infrastructure is needed.

At this time, transition in the area may take the form of adaptive reuse or redevelopment. Recent purchases of multiple parcels in the Study Area by single investors indicate that parcel aggregation may be occurring with the ultimate intention of larger-scale redevelopment (see Map 1-4). Aggregation has already occurred, and redevelopment is in process now for a new commercial development at the intersection of NW 87th Avenue and NW 58th Street. The recommendations contained within this Plan help provide guidance for both adaptive reuse and redevelopment projects, in order to allow for a smooth transition of the area from industrial to a commercial and mixed-use district over time.

ADAPTIVE REUSE

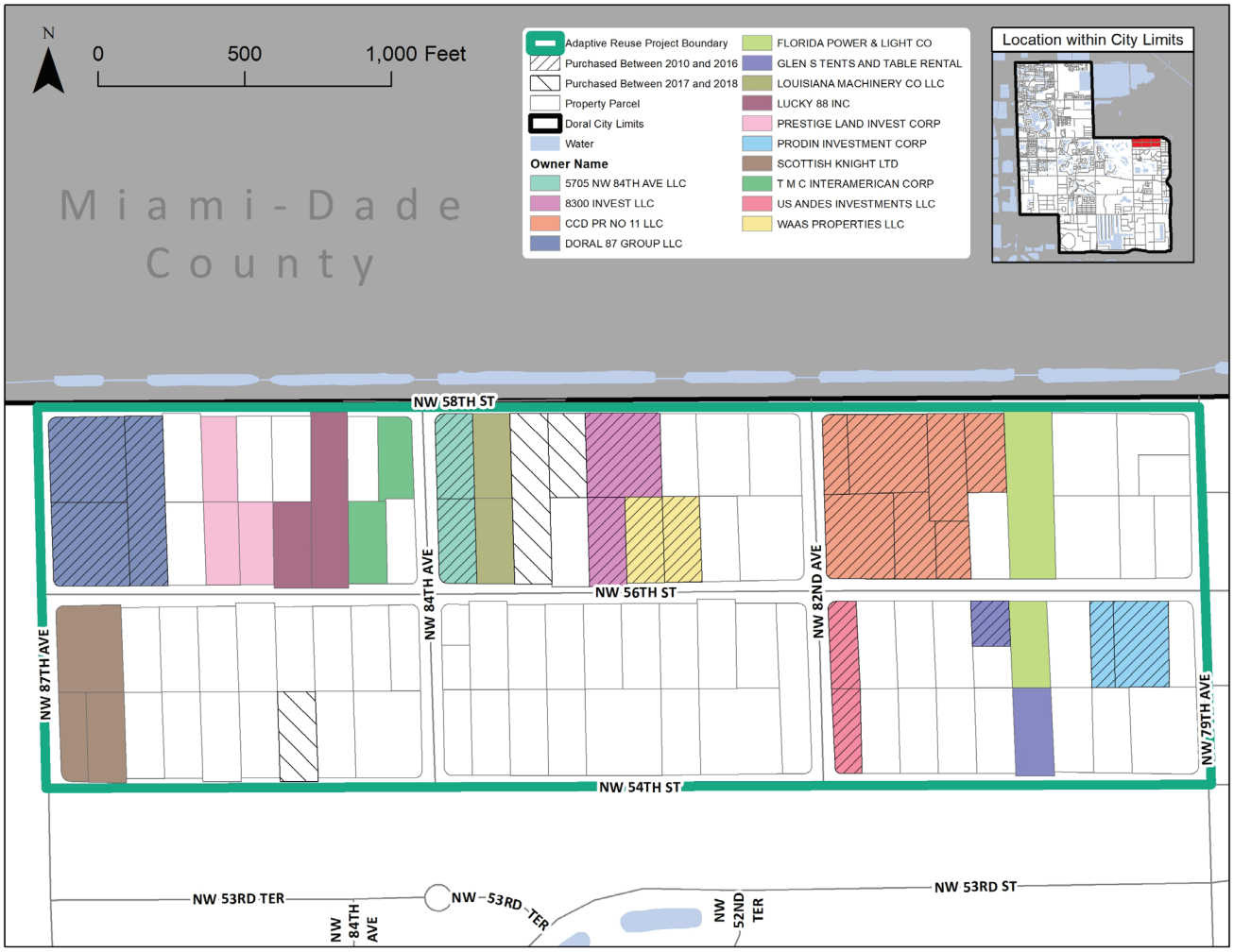
The Wynwood Arts District in Miami, FL was formerly an industrial area rezoned in 2015 to include commercial, residential, and institutional uses. Many structures feature murals and have been repurposed, as opposed to being demolished and rebuilt.

VS.

REDEVELOPMENT

Canarias residences at Downtown Doral are new structures built on a former golf course.

Figure 1-7: *Adaptive Reuse Vs Redevelopment* ***Sources:*** *T. Tseng, Wynwood Arts District, Miami -https://www.flickr.com/photos/68147320@N02/9248023691; http://residencesdowntowndoral.com/*



Map 1-4: *Multiple Parcel Ownership by Single Owner*

2.0 KEY TAKEAWAYS & RECOMMENDATIONS

This section provides key takeaways from the Assessment Memo that details the baseline conditions analysis, case study research, and public outreach for the Plan; these takeaways serve as the basis for recommendations to facilitate adaptive reuse and redevelopment in the Study Area. Takeaways and recommendations are organized by theme:

- Land Use
- Urban Design
- Transportation & Connectivity
- Economic Development
- Organizational Structures

2.1 LAND USE

RELATED ASSESSMENT MEMO TAKEAWAYS

- The Study Area is bordered by residential and commercial uses to the south and could evolve towards these uses as it redevelops; any infill and redevelopment efforts will also need to account for land use transitions between any incompatible uses, including coordination with the proposed annexation area to the north and any needed land use transitions (see future land use, zoning, and existing land use in Maps 2-1 and 2-2 and Figure 2-1).
- The current redevelopment project located at NW 87th Avenue and NW 58th Street is primarily retail in nature and signals a market desire to transition uses in the area away from industrial and heavy commercial in the Study Area (see Figure 2-2). However, allowable uses should be expanded to incorporate the full range of desired uses, which will ultimately facilitate adaptive reuse and redevelopment. The dimensional and design standards should also be evaluated for compatibility with the ultimate redevelopment vision of the Plan.
- Public and stakeholder input indicated that there is demand for creative office, restaurant, and other related space in the Study Area. The zoning code does not currently allow for many of these uses and should be updated.
- Public and stakeholder input indicated that there is currently little appetite for new-build residential development (apartments, condos, etc.), although building conversions to allow for live/work are supported. The Doral Housing Master Plan also identifies the Study Area as a location to target workforce housing initiatives, which may be coupled with residential in mixed-use projects.
- The Community Mixed Use Opportunity Area Overlay can facilitate the transition of the Study Area to include CMU, which incorporates commercial and residential uses. The City can modify the CMU category to incentivize mixed-use projects.
- Allowable uses in the Hialeah Market District case study that may serve as an example for uses in the Study Area include co-retail spaces, manufacturing-enabled retail, live/work units (conditional use), retail businesses, service businesses, mixed-use commercial/residential, parking structures, parks and recreational/cultural facilities.
- Allowable uses in Wynwood Arts District case study that serve as an example for those in the Study Area include manufacturing-enabled retail, art gallery, privately-owned public open spaces.

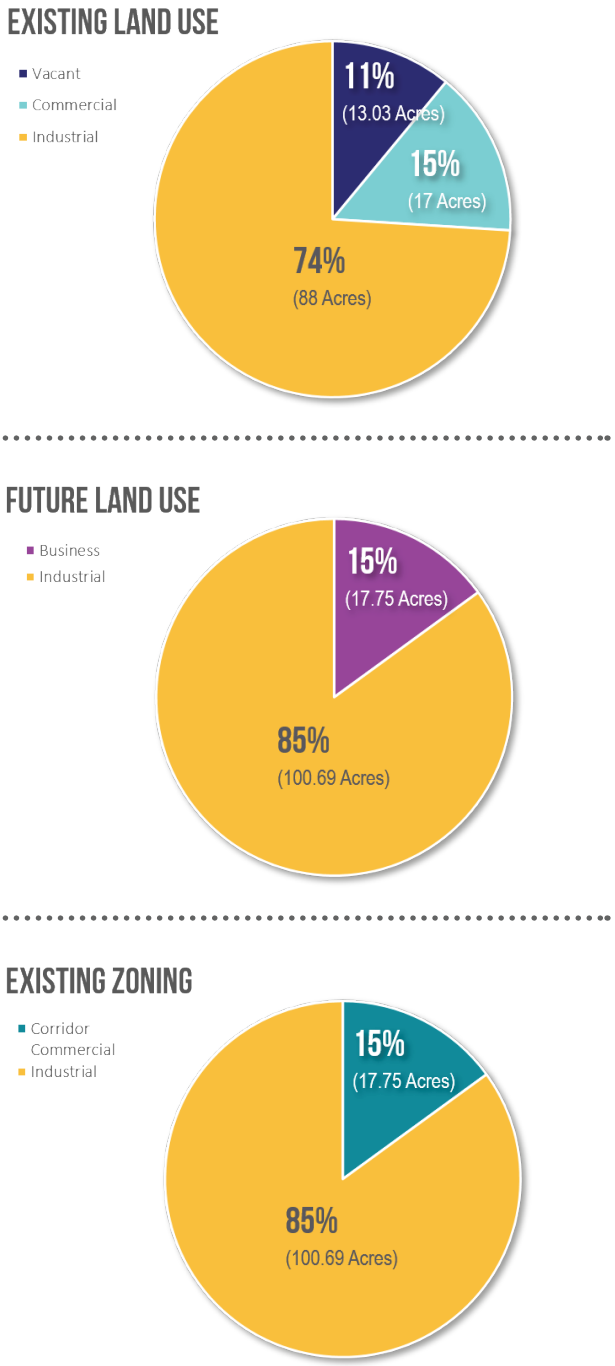


Figure 2-1: *Exisisting Land Use, Zoning, and Future Land Use*

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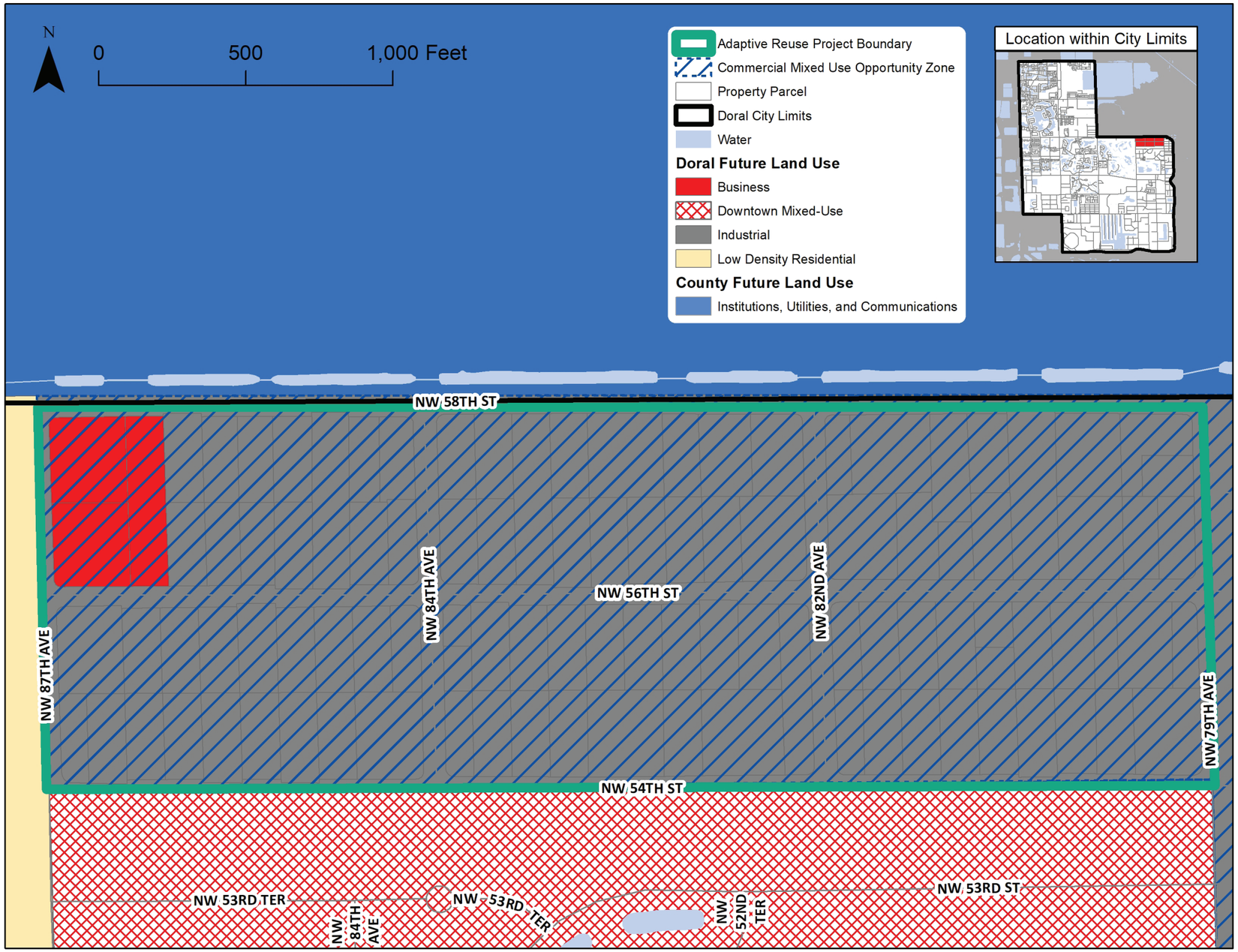
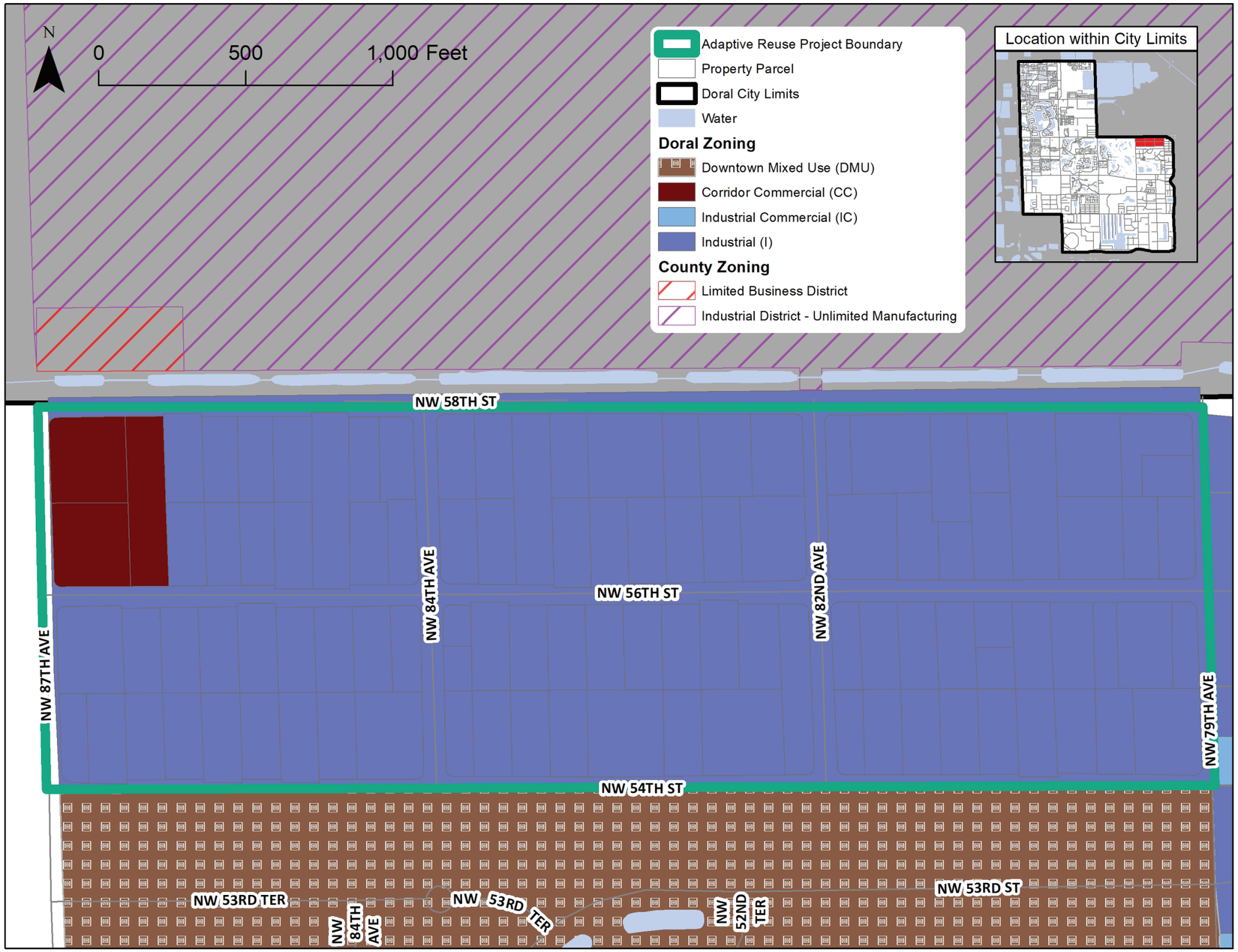


Map 2-1: Future Land Use



Map 2-2: Zoning

Doral 87th Retail Development Details	
Height	2 stories (maximum of 6 allowed)
Retail Space	46,840 sq. ft.

Figure 2-2: *New Commercial Development at SE corner of NW 87th Ave and NW 56th St.* ***Source:*** *Modis Architects application package for site plan review (August 24, 2018)*

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- Storefront width limitations and other design requirements in the Study Area can support independently owned businesses, limit chain stores, and help maintain a more unique mix of establishments and character in the area.

RECOMMENDATIONS

Expand allowable uses in the Study Area to include uses such as creative office, food and beverage, entertainment, assembly, expanded retail, and live/work uses.

Remove current percentage restrictions on retail and services in the Study Area. Allow the following uses in addition to the uses currently permitted:

- Creative studios, creative office
- Breweries (see Figure 2-3)
- Brewpubs
- Restaurants
- Entertainment establishments
- Alcohol beverage service establishments
- Places of assembly
- Retail (see Figure 2-4)
- Live/work units

Modify the Community Mixed Use (CMU) Comprehensive Plan requirements, zoning requirements, and development review process to promote mixed-use and workforce housing in the Study Area.

Figure 2-3: *Coppertail Brewing, Tampa, Fl is an example of an adaptive reuse brewery development.* ***Source:*** *The Trot Line: www.setthetrotline.com/2015/04/14/start-your-tampa-brewery-tour-at-coppertail-brewing-co/*

Figure 2-4: *Wynwood Arcade in the Wynwood Arts District of Miami is an example of adaptive reuse retail.* ***Source:*** *Wynwood Arcade Facebook: www.facebook.com/wynwoodarcade/photo/a.1529742854004789/1699320110380395/?type=3&theater*

The Housing Master Plan identifies the Study Area as a target location for workforce housing, aimed at households earning between 60 and 150% Area Median Income (AMI). Mixed-use projects would help bring a more urban-style development to the area and provide an opportunity for residential that can include workforce housing (note that mixed-use project in the CMU category must include residential according to the Comprehensive Plan). The City should create a special district in the Comprehensive Plan CMU category and an overlay in the CMU zoning district that matches the Study Area boundaries; the following provisions should apply to this Study Area district/overlay:

- Expedited review for mixed-use projects
- Acreage requirements relaxed to a three-acre minimum; current minimums are 10 acres (7 acres for projects fronting Doral Boulevard), which may pose a barrier to these projects in the Study Area where many parcels are between a half-acre and an acre.
- Increase the base maximum allowable density and height to 25 units per acre and 10 stories; note that these amounts are based on those currently allowed with City Council approval for projects exhibiting creative excellence in exceeding minimum design standards of Section 86-83 of the code. This allowed increase can be paired with stepback requirements discussed later in this section to maintain a comfortable street experience with greater building heights in conjunction with existing right-of-way widths (avoiding a "canyon" feel).
- Require a workforce housing set-aside as part of mixed-use developments. Note that Community Mixed Use developments can also still apply for the voluntary workforce housing density bonus for an additional 30% of density with 2/3 of units set aside for workforce housing, as noted in the Comprehensive Plan (see Figure 2-5). The Comprehensive Plan reference should be updated to refer to the City's Workforce Housing Density Bonus program as opposed to the County's.

To maintain a unique local character as reuse and redevelopment occurs, institute permitting and design criteria that would make the Study Area less attractive to chain stores.

- Conditional use requirements
- General limitation on storefront widths – this approach may align with adaptive reuse redevelopment but may also place restrictions on parcel agglomeration and wholesale redevelopment.
- Compatible use and design standards in-keeping with the general character of the district and neighboring development.

See separate Regulatory Examples document for specific code language examples defining chain stores and related criteria.

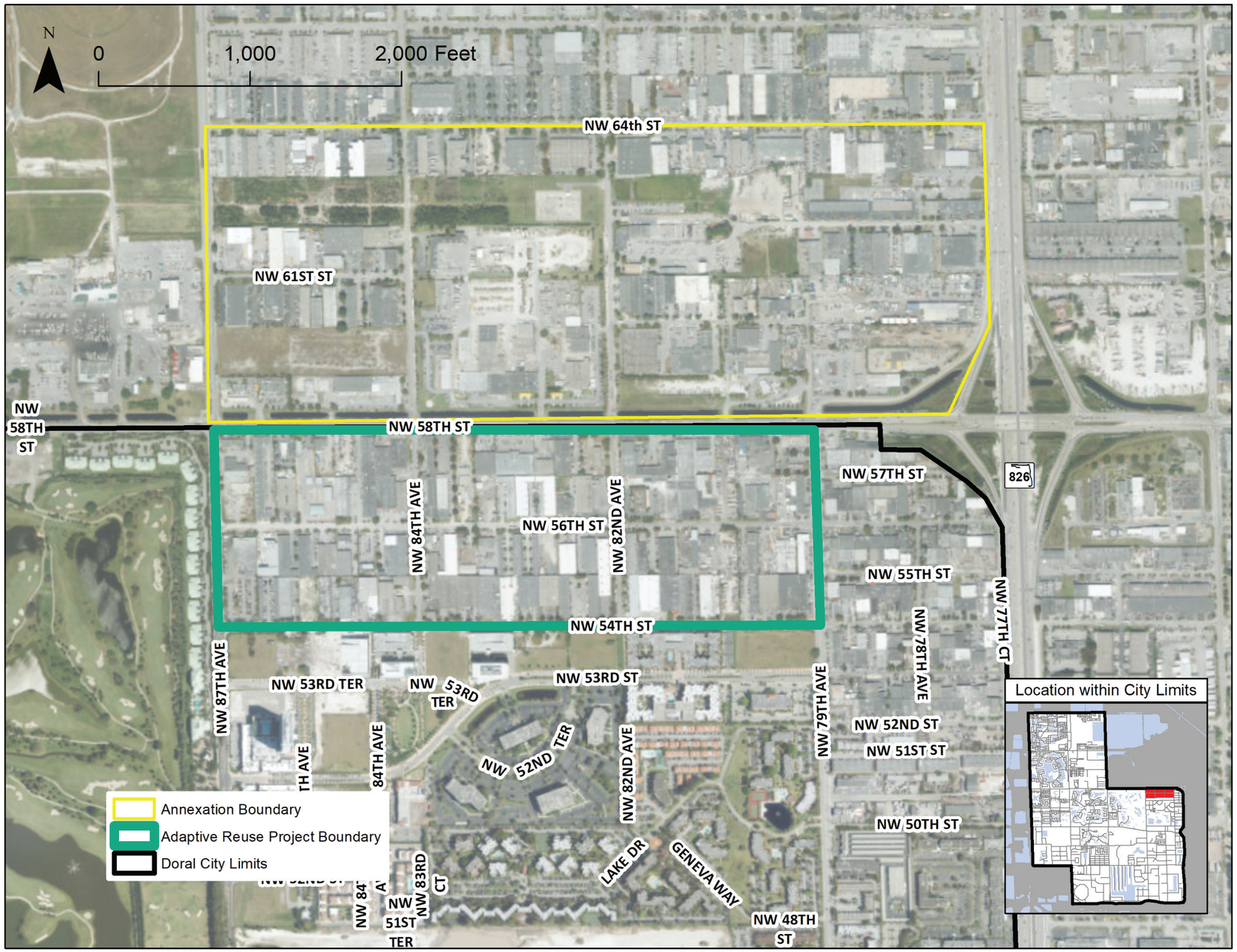
Establish design and operating criteria to enhance compatibility between uses as the Study Area transitions towards the redevelopment vision of the Plan.

A primary focus will be buffering residential uses in mixed-use development from non-residential uses in the area. Approaches may include limitations on exposure of garages or loading bays unless goods are actively being moved in/out, limitations on outside heavy industrial/factory uses unless goods are being moved in/out of storage areas, etc.

Collaborate with Miami-Dade County to develop a land use vision for the unincorporated land immediately north of the Study Area, which has been subject of an annexation request by the City.

See Map 2-3. This process should coordinate with the vision sought in the Study Area based on this Plan, identifying points of compatibility and inconsistency, and seek public/stakeholder input.

Figure 2-5: *Workforce Housing Set-Aside with Bonus Height/Density in Community Mixed Use Projects*



Map 2-3: *Potential Annexation Area*

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2.2 URBAN DESIGN

RELATED ASSESSMENT MEMO TAKEAWAYS

- Evaluate opportunities to coordinate needed roadway and right-of-way improvements, such as the addition of sidewalks, new lighting, curbs and gutters, landscaping, on-street parking, and paving, as part of the City's general capital improvement and maintenance planning process and off-site improvements completed by developers. See Figure 2-6 for example of existing streetscape where these elements should be considered and Figure 2-7 where some new improvements have been made in the Study Area.
- Street lighting, where it is present, is more utilitarian in style; an evaluation of the style in terms of aesthetics can be integrated into the Adaptive Reuse & Redevelopment planning process.
- Evaluate site design guideline modifications or additions based on whether redevelopment will take the form of adaptive reuse or redevelopment. Adaptive reuse design guidelines may focus more on superficial design improvements, such as the addition of windows. More comprehensive redevelopment design guidelines may include more robust changes to the site, including greater building heights, the addition of step back requirements, reduced setback requirements, and limits on on-site parking in front of buildings. See Figure 2-8 for a character image of recent development in the area that illustrates current standards.
- Landscaping, paving, and other roadway/right-of-way standards and improvements provide opportunities to coordinate with green infrastructure and low-impact development practices that can help address stormwater and flooding issues.
- Evaluate and modify existing development incentives and programs, based on the review of the following regulations, plans, and programs, in support of the vision developed for the Plan:
    - Green building incentives in the Land Development Code
    - Green Master Plan (2008)
    - Low Impact Development Master Plan (2016)
    - Doral Façade Improvement Grant Program
- The Wynwood Arts District and Hialeah Market District provide examples of desired built form; their zoning provisions can inform an evaluation and any modifications to the Study Area zoning (see the separate Assessment Memo document case study information and recommendations discussion in following section).

Figure 2-6: *Existing Streetscape*

Figure 2-7: *Example of Recent Streetscape Improvements*

Figure 2-8: *Example of Recent Development*

- Public input identified street flooding as an issue in parts of the Study Area despite recent City stormwater improvements. Staff are continuing to work on longer-term improvements to address this issue (including making a connection to the canal system north of NW 58th Street).

RECOMMENDATIONS

Evaluate and adjust site design requirements in the LDC for adaptive reuse of buildings.

These may include the following (summarized in Figure 2-9):

- **Provision of windows in building facades -** specific window requirements may be added for the Study Area, such as those in the Hialeah Market District, which requires that the exterior building wall contain transparent glass (windows/doorways) covering of at least 50% of the linear frontage of the building (measured at least 30 inches above the sidewalk) for the first ten feet of height above the public sidewalk elevation. Additionally, the base of all transparent openings shall be no more than 30 inches above the sidewalk. For more details and additional design requirements, see the separate Regulatory Examples document.
- **Allowance of murals -** allow murals in the district and evaluate options for design review and baseline standards, which may include review by a Business Improvement District design review committee (see Section 2.5 for more information) and/or coordination with the guidelines and review process established by the Doral Public Arts Program (Sec. 75-100 through 75-125). See Figure 2-10 for a Wynwood District mural example.
- **Allowance of creative signage -** one option is to allow painted wall signs by right in the Study Area, a strategy used by Wynwood (see the separate Regulatory Examples document for specific language). The current standards in Doral for commercial retail wall signs include but are not limited to the following:
  - Wall signs are permitted only on buildings where the majority of the floor area is in retail use. In the case of a multi-tenant center, wall signs are permitted on walls that face an access drive or internal courtyard.
  - Maximum number: One per ground or second floor establishment which has its own frontage and entrance facing a public street. (If the parcel frontage requirement for a monument sign precludes an office building from having a monument sign, one building identification wall sign that otherwise meet the wall sign standards is authorized). Corner or through store locations may have an additional wall sign. Such second sign shall be limited to 50 percent of the square footage of the primary sign. Individual use buildings, may have multiple signs not to exceed the sign area requirements.
  - Maximum sign area: 1.25 square feet for each one lineal foot of tenant frontage

  The size provisions are comparable to aggregate area ratios laid out in Wynwood's code (see the separate Regulatory Examples document for more details).

Summary of Adaptive Reuse Design Standards Additions	
Façade Glass (Windows/Doors)	50% of the linear frontage of the building (measured at least 30 inches above the sidewalk) for the first ten feet of height above public sidewalk
Murals	Allowed with design review
Creative Signage	Painted wall signs by right, maintaining existing commercial retail wall sign standards

Figure 2-9: *Summary of Adaptive Reuse Design Standards Additions*

Figure 2-10: *Example of Wall Mural.* ***Source:*** *Wynwood Walls http://www.thewynwoodwalls.com/walls/avaf*

Evaluate and adjust site design requirements in the LDC for redevelopment projects in the Study Area to promote more urban-style development.

These adjustments might include those related to the following (see Figure 2-11 for proposed standards):

- **Building Height –**Current industrial building heights in the Study Area for industrially zoned properties are

the width of the right-of-way, which ranges from 60 to 100 feet, while commercial zoning currently allows six stories. The Study Area would thus see a decrease in maximum allowable heights with re-zoning. There may be an opportunity to allow for increased heights in the Study Area, particularly given that the Downtown Doral development and MF-4 designations are nearby, with maximum heights of 18 stories (with an area equal to 80% of the 18th story able to rise from 19 to 20 stories) and 9 stories, respectively. Furthermore, the case studies of the Wynwood and Hialeah Market Districts indicate heights of up to 12 stories in certain areas (which includes allowed density bonuses specific to these zoning districts), with Hialeah allowing a maximum of 15 stories along certain frontage of CSX right-of-way. See more details in the separate Regulatory Examples document.

Summary of Proposed Site Design Standards Changes	
Commercial Heights in Study Area	Evaluate increase from 6-story maximum to 9 stories, perhaps as an incentive for amenities (see recommendations in remainder of this section).
Setbacks and Stepbacks	• Allow 10-foot minimum setbacks in the Study Area for those currently over 10 feet (front, side street, and interior side/rear setbacks that abut residential) • For any stories potentially allowed above 6, add a 26-foot minimum setback • Encourage pedestrian-friendly amenities in setback (see incentivizes in remainder of this section)
On-Site Parking	• Prohibit parking in front setback • Require screening of side parking on a secondary frontage
Active First Floor Requirement	• Prohibit less active uses (e.g., parking, storage) • Require lighting • Require windows, faux window treatments, artistic treatments on the façade

Figure 2-11: *Summary of Proposed Site Design Standards Changes*

- **Setbacks and stepbacks –** given the presence of 10-foot minimum in the case study areas and the possibility of enhancing the urban feel of the Study Area with reduced setback requirements, allow 10-foot setback minimums in the Study Area for those currently exceeding 10 feet. Current setbacks for Industrial and Commercial Corridor districts in Doral have the following minimums:
  - Front: 20 ft.
  - Side Street: 15 ft.
  - Interior Side: 5 ft. setback where adjacent property is either commercial, business and/or office district; 15 ft. setback when abutting residential district.
  - Rear: 5 ft. setback where adjacent property is either commercial, business and/or office district; 15 ft. setback when abutting residential district.
  - Hialeah Market District setbacks range from 10 to 100 feet depending on the location; Wynwood Arts District setbacks range from a minimum of zero to 10 feet.

  Pedestrian-friendly uses may also be encouraged in the setback area; amenities to encourage may include the following, compliant with certain safety standards such as those preserving sight lines:
  - Landscaping
  - Balconies, windows, or overhangs
  - Street furniture such as benches, trash cans, and bicycle racks
  - Outdoor dining areas

  Many of these elements may be incentivized as described later in this section.

  If allowable heights in the area are allowed as described previously in this section, an additional stepback is recommended for upper floors to maintain the openness of the streetscape and avoid a "canyon" feel. There is also a 10- to 46-foot minimum for stepbacks starting at the sixth story or above in certain cases, depending on the zoning district and abutting district. In some cases, there is a minimum of 10% of lot depth. See more details in the separate Regulatory Examples document.
- **On-Site Parking Location and Design Requirements –** prohibiting front parking, in conjunction with reduced front setbacks to bring building facades closer to the street, will enhance the streetscape and interest for sidewalk users in the Study Area. The Wynwood case provides alternative design requirements, which include screened parking that could apply to secondary frontage areas such as side parking. See the separate Regulatory Examples document for more details.

- **Active first floor requirement –** having a use and/or design that activates or creates interest on the first floor can enhance the pedestrian experience and walkability in an area. An active first floor requirement may achieve this interest without being overly restrictive in considering the following:
  - Prohibition of certain uses such as storage or parking that are less active
  - Lighting of windows and/or façade
  - Required windows (see previous Adaptive Reuse design recommendations), faux window treatments, artistic treatments such as murals, etc. to activate façade space

The City should provide basic streetscape and infrastructure improvements to support adaptive reuse and redevelopment in the Study Area.

See Section 3.0 for suggested project timing. Improvements to consider are listed below. Integrate green practices and LID approaches, which might relate to green and low impact development practices mentioned in the recommendations discussed in the remainder of this section.

- Reconstruction of the roadway between the curbs and access points. Incorporation of permeable surfaces, such as turf block, into parking areas and other paved areas (note that property owners would maintain these improvements)
- Basic right-of-way lighting on existing utility poles

Establish streetscape and infrastructure improvements or funding required of private redevelopment projects.

Public realm improvements beyond the most basic right-of-way improvements will likely require financial support from private development; improvements to consider in this case are listed below. Requirements may be limited to developments of a certain size and/or value, particularly for those that are more expensive. Required improvements may be made as part of new construction (or a certain percentage of redevelopment of a site) through code provisions; examples of a codified requirement include Doral Boulevard (Sec. 86-3 of the Code of Ordinances requires compliance with design and landscape standards for the boulevard, which are laid out in the Doral Boulevard Street Beautification Master Plan) and the Kennedy Boulevard Overlay in Tampa (Sec. 27-243 of the City of Tampa Code of Ordinances). The City may also determine that additional improvements will be provided as part of negotiated development agreements, where applicable. Certain improvements may also be funded and completed using a special assessment district, such as a BID (see Section 2.5 of this report for more details).

- Sidewalk additions
- Lighting based on an updated and standardized design style for the Study Area (see Figure 2-12 for examples of styles that the City can consider). Consider green and Low Impact Development practices in choosing a design
- Landscaping
- Curb and gutter design
- Wayfinding and gateway signage
- Placement of utility lines underground (recommended as a requirement for redevelopment projects of a certain size and/or value given the cost of this improvement)

Adjust the existing green infrastructure and low-impact development (LID) incentives in the code to further promote these approaches and help address specific challenges such as those related to stormwater.

The following incentives should be considered to promote permeable pavement for on-site parking, solar energy infrastructure, and sidewalk furniture in a development:

- Density bonus
- Fee deferments or waivers

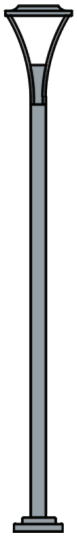


Figure 2-12: *Example of lighting.*

2.3 TRANSPORTATION & CONNECTIVITY

RELATED ASSESSMENT MEMO TAKEAWAYS

- Evaluate opportunities to coordinate needed roadway and right-of-way improvements, such as the addition of sidewalks, new lighting, curbs and gutters, landscaping, on-street parking, and paving, as part of the City's general capital improvement and maintenance planning process.
- There is sizable right-of-way allowing for a range of improvements, but these improvements will have to conform to the available space and variation of right-of-way widths unless the City makes them uniform.
- The limited multi-modal facilities within the Study Area will hamper future redevelopment; improvements can be made to fill these gaps and connect to existing walking, biking, and transit facilities bordering and near the Study Area, including a possible north/south connection between the proposed shared-use/multi-use paths along NW 58th Street and in the Downtown Doral area south of NW 53rd Street. The Freebee shuttle service is also available for a six-month pilot period in the Downtown Doral area.
- Improvements can be made to connect to existing transit facilities bordering and near the Study Area (Map 2-4). The consistent growth in ridership of Route 2 may warrant upgrades to existing trolley stops and facilities; developers may also construct transit shelters.
- Stakeholder and staff discussions identified parking as a major issue and indicated that there is not enough existing parking if uses change. Currently, there is formal/informal parking along street and in the right-of-way (Figure 2-13); on-street parking spaces on 54th Street and inside Downtown Doral are often used by construction workers and visitors for the entire day. Recommendations from stakeholder discussions included improvements to the right-of-way to allow for on-street parking (particularly reverse-angle parking) throughout the Study Area. Additional recommendations included developing shared parking arrangements with owners of buildings with large garages that are generally empty at night, establishing parking enforcement throughout the Study Area and Downtown Doral, and developing a parking in-lieu fee. The City is currently conducting a parking study to evaluate the issue in more detail.
- Ensure that transportation/infrastructure improvements in the Study Area connect or allow for connections in the future to surrounding transportation infrastructure and improvements (e.g., proposed trails south of the Study Area, express trolley proposed for 87th Avenue), as well as parks improvements at the Downtown Doral Park site. Ensure that any improvements in the Study Area are coordinated with improvements already programmed, such as the intersection and sidewalk improvements in the Doral Transportation Master Plan and Transit Mobility Plan.
- The Wynwood District and Hialeah Market District Parking Improvement Trust Funds and in-lieu parking fees (which can be used for land, construction, shuttling, public information, and other needs related to parking) can serve as examples for the Study Area (see the separate Assessment Memo document for more details).

Figure 2-13: *Existing Parking Conditions*

RECOMMENDATIONS

Add bicycle parking design standards to the LDC.

The LDC already includes a required number of bicycle space by use in Section 77-139. The City may consider additional design requirements for the provision of bicycle parking, including the following:

- Use of bicycle rack that supports bicycle at two points on the frame (such as the "Inverted U" design, see Figure 2-14) as a minimum standard; covered parking or parking that protects the entire bicycle (such as bike lockers that can accommodate employee bicycles) may be incentivized through the expanded façade improvement program described in section 2.4.
- Bicycle racks should be located no closer than 3 feet from any wall to allow for access and maneuvering
- Racks for customers and visitors should be located along a major building approach line and no more than 50 feet from building entrance or not further than closest vehicles parking space (whichever closer) for

visibility; for buildings with multiple major entrances, a portion of bike parking should be located at each.

- Rack placement should allow for visual monitoring by people within the building or entering the building

The following bicycle and pedestrian improvements should be put forth for programming in the City's capital improvements process or obtained via the private development process.

These improvements, identified based on findings from the initial analysis and public outreach, will provide additional support for alternative transportation in conjunction with existing and other planned improvements. They should be coordinated with urban design and public realm recommendations identified in Section 2.2 and 2.4.

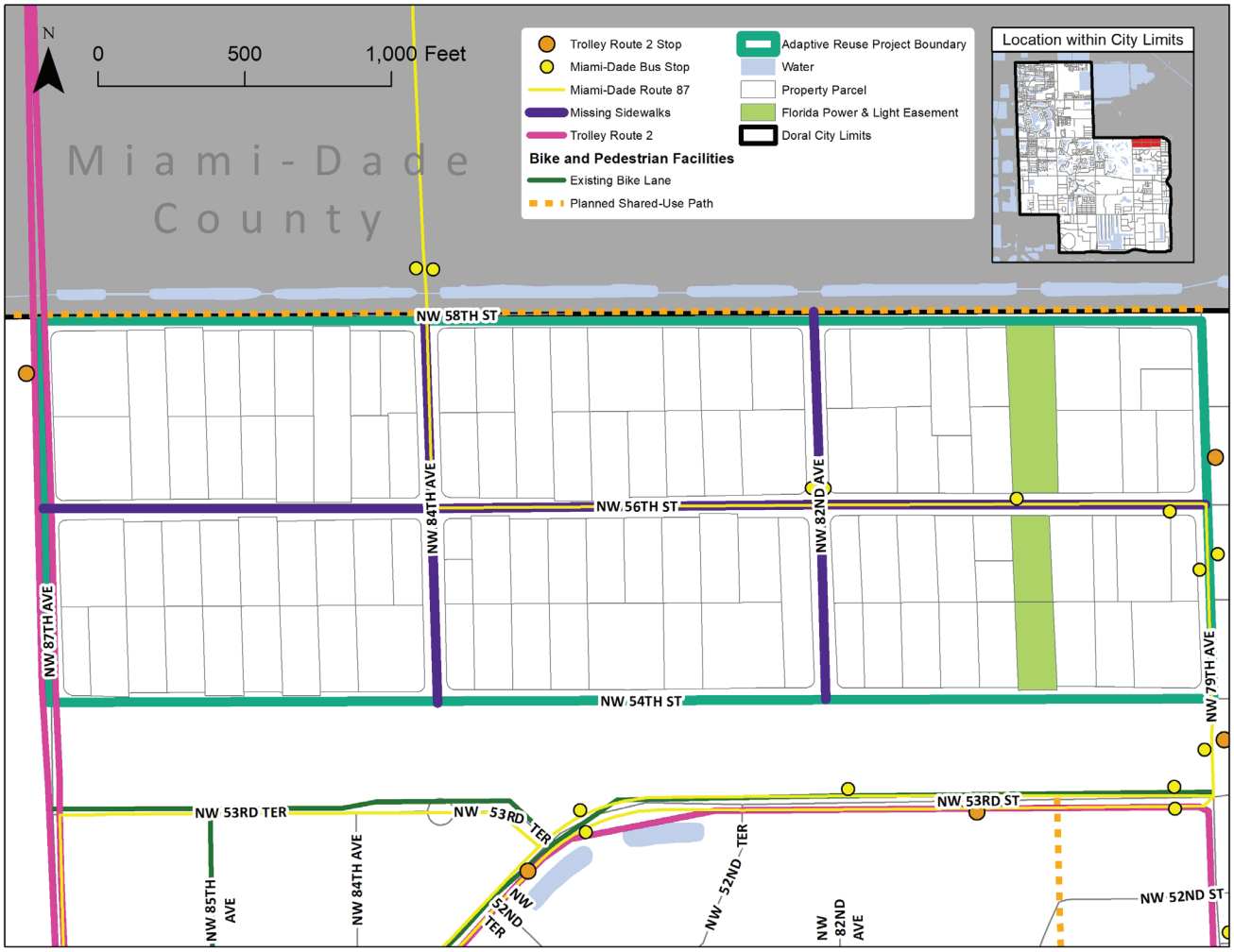
- North/south connection between the pedestrian facilities along NW 53rd Street and planned shared-use path along NW 58th St (Note that the suggested capital plan in Section 3.1 assumes for this project use of the FPL easement in the area and an easement on private development south of the Study Area.)
- Improved trolley/other transit stops with first/last mile active transportation and Freebee shuttle access
- Bicycle parking infrastructure
- Sidewalks and bicycle facilities in coordination with urban design recommendations in Section 2.2 and as shown in Figure 2-19 for proposed Complete Street sections of NW 56th St, NW 84th Ave, and NW 82nd Ave; note that parallel parking and angle parking options are shown
- Sidewalk, landscaping, and lighting on north side of NW 54th St, as well as pedestrian crosswalks at the intersection of NW 54th St and NW 84th Ave (See Figure 2-15; sidewalk and landscaping dimensions and lighting style are based on Figure 2-19)

Consider the following items to address parking challenges in the Study Area:

- **On-street parking –** evaluate feasibility of on-street parking scenarios (see Figure 2-16 for proposed angle parking in the area and Figure 2-17 for a comparison of different on-street parking styles). Note that in the past, the City has not typically approved head-in angle parking and 90-degree parking on City right-of-way. Program on-street parking improvements along 56th Street and evaluate opportunities on other streets in Study Area. The amount of on-street parking should consider findings from the recent parking study; implementation of parking should be coordinated with other infrastructure and urban design and public realm improvements noted in Section 2.2 and 2.4.

Figure 2-14: *"Inverted U" Bicycle Rack.* ***Source:*** *David Shay, Wikimedia Commons, https://commons.wikimedia.org/wiki/File:Bicycle_parking.jpg*

Figure 2-15: *Potential Intersection and Right-of-Way Improvement Concept for NW 54th St and NW 84th Ave*
Note: *Proposed improvements are meant as guidance; final roadway design may require modifications based on a more detailed engineering and design evaluation.*



Map 2-4: Existing Transit, Bicycle, and Pedestrian Facilities and Planned Improvements

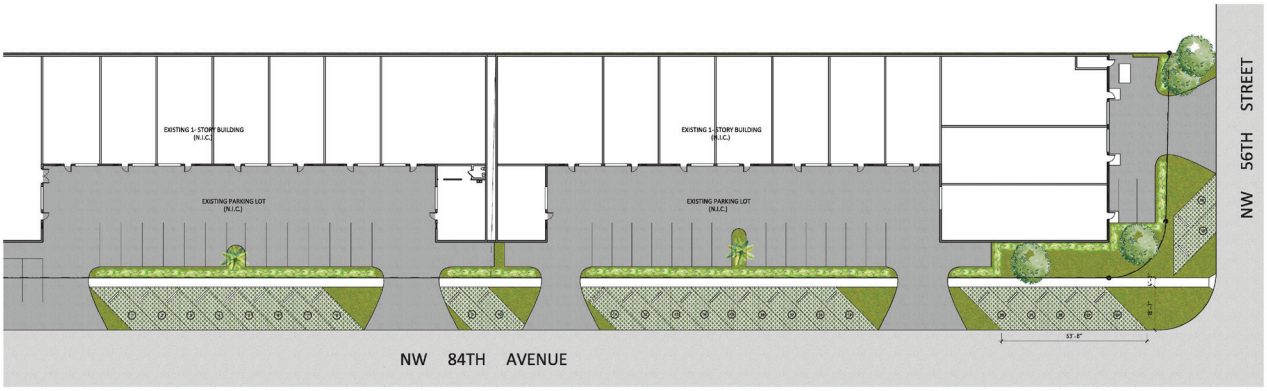


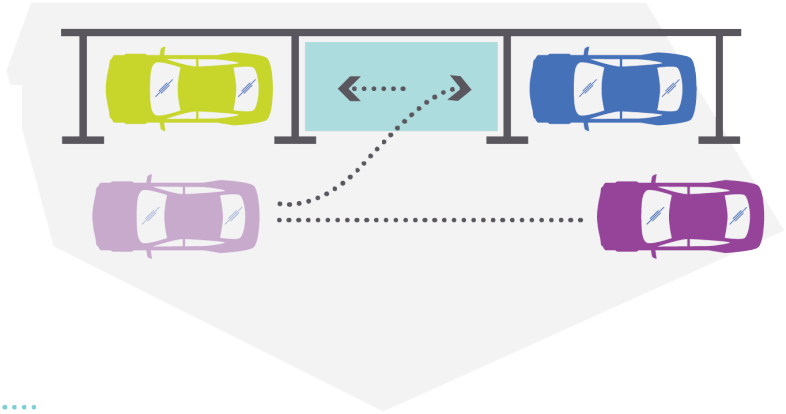
***Figure 2-16:** Proposed Parking Concept for 84th Avenue. **Source:** DNB Design Group.*

PARALLEL PARKING

PROS
- Allows additional ROW space for bike/ pedestrian facilities/ travel lanes
- Safe curbside access from passenger side

CONS
- Limited number of spaces
- More complex parking maneuver required to enter space
- Conflicts with entering/ exiting on the driver side with oncoming traffic

ESTIMATED SPACES
- 36

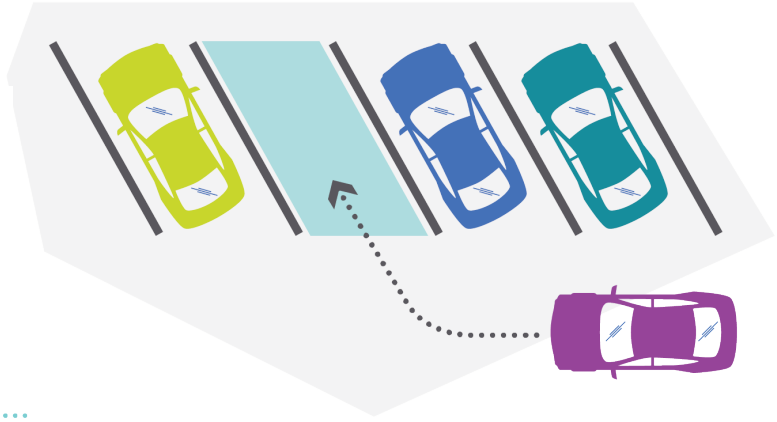


60 TO 45 DEGREE HEAD-IN ANGLE PARKING *

PROS
- Easy maneuverability entering the space
- Safe entering/ exiting the vehicle.
- Vehicle exhaust directed away from pedestrian areas.

CONS
- Conflicts with exiting the spot into oncoming traffic
- Reduces usable ROW space by requiring additional maneuvering space.
- Vehicle headlights shine onto pedestrian areas

ESTIMATED SPACES
- 75 (Estimates based on 60° parking)

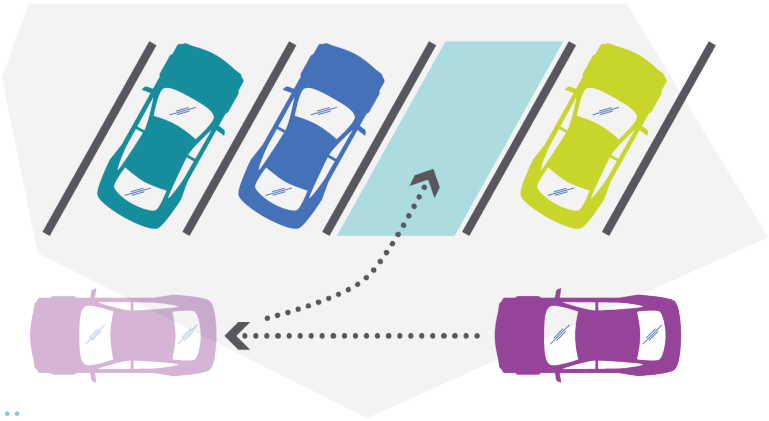


60 TO 45 DEGREE REVERSE ANGLE PARKING

PROS
- Safe entering/ exiting the vehicle.
- Safe exiting the space.
- Vehicle headlights avoid pedestrian areas

CONS
- Conflicts with entering the spot, reversing into the travel lane
- Reduces usable ROW space by requiring additional maneuvering space
- Vehicle exhaust directed toward pedestrian areas

ESTIMATED SPACES
- 75 (Estimates based on 60° parking)



90 DEGREE PARKING*

PROS
- Easy maneuverability entering space
- Maximum amount of spaces
- Safe entering/ exiting vehicle

CONS
- Conflicts when exiting the spot, reversing into the travel lane
- Vehicle headlights shine onto pedestrian areas

ESTIMATED SPACES
- 87

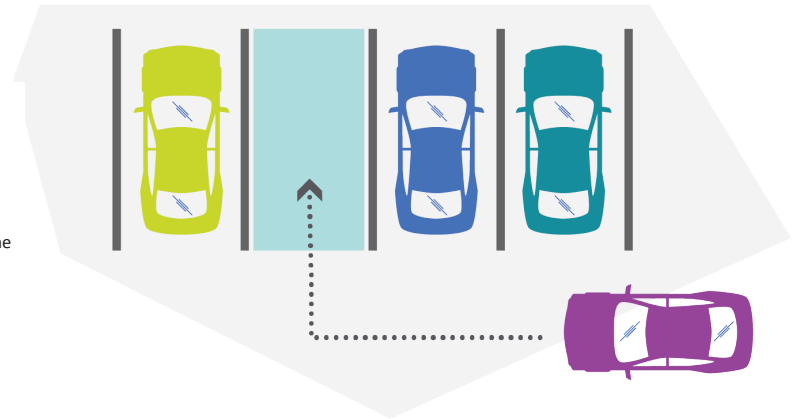


Figure 2-17: On-Street Parking Style Comparison. ***Note:*** *"Estimated Spaces" are estimated for the available length along one side of roadway on NW 84th Avenue, which is estimated here at 781 feet. *The City of Doral has not typically approved these parking styles on City right-of-way in the past.*

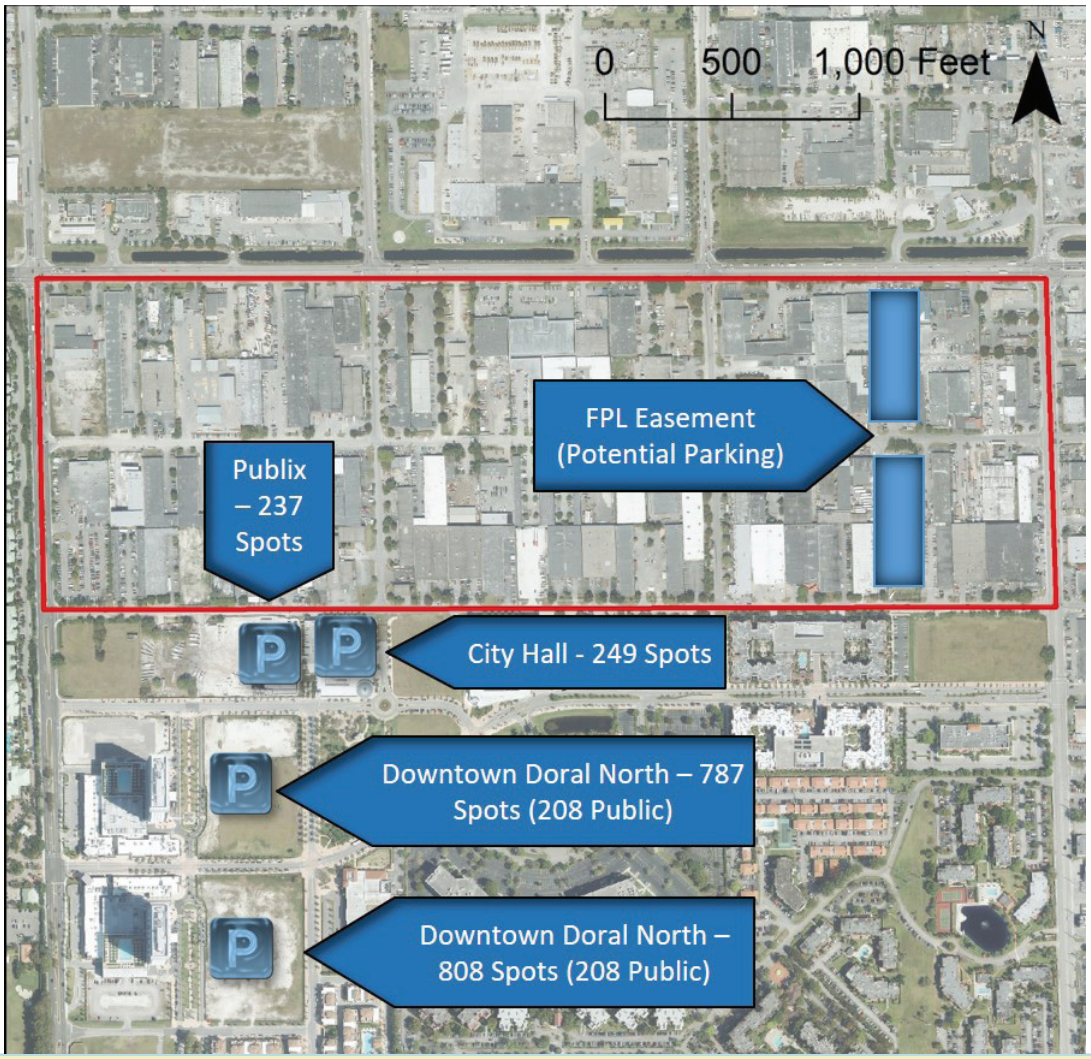
- **Parking requirement reductions –** evaluate the option of allowing reduced off-street parking requirements for developments, such as the reduction allowed in the Doral Design District which is 70% of the required minimum off-street parking spaces for cars in the code (note that the required amount of bicycle parking remains unchanged). Remote parking, such as those strategies discussed below, may provide a way of meeting these off-street parking requirements.
- **Off-site/off-street parking alternatives –** identify a location for a parking garage to serve the Study Area. Create a parking trust fund mechanism and adopt an in-lieu fee as an alternative to the provision of on-site parking to fund the development of the garage. See the separate Assessment Memo document for more details on parking trust funds and in-lieu fees used in the Hialeah Market District and Wynwood.
- **Shared parking –** evaluate options for shared parking for uses operating at different times of day/night; Map 2-5 shows existing parking garages, lots, and spaces (including the Florida Power & Light easement area) whose owners should be approached to identify shared parking opportunities.
- **Coordination with shuttling, transit, micromobility (e.g., dockless scooters, shared bikes), etc. –** planning and implementation of all these parking strategies should take into consideration available or potential future shuttle, transit, and micromobility (Figure 2-18) options that might facilitate remote and/or shared parking options or replacement of car trips. For example, increased use of shuttling may increase demand for curb and loading/unloading space; use of dockless scooters may affect need for sidewalk and/or roadway lane space and buffers.
- **Parking enforcement –** ensure parking enforcement in the Study Area to address current parking in the unmarked right-of-way and parking for extended periods of time.

See Figure 2-19 illustrating potential configuration of parking and parking alternative recommendations alongside recommendations from the urban design section.

Evaluate options for a shuttle (e.g., Freebee) to serve the Study Area and surroundings, including marketing efforts to highlight connections to transit and remote parking. Note that in March, City Council approved an agreement for a six-month pilot program with Freebee in Downtown Doral.

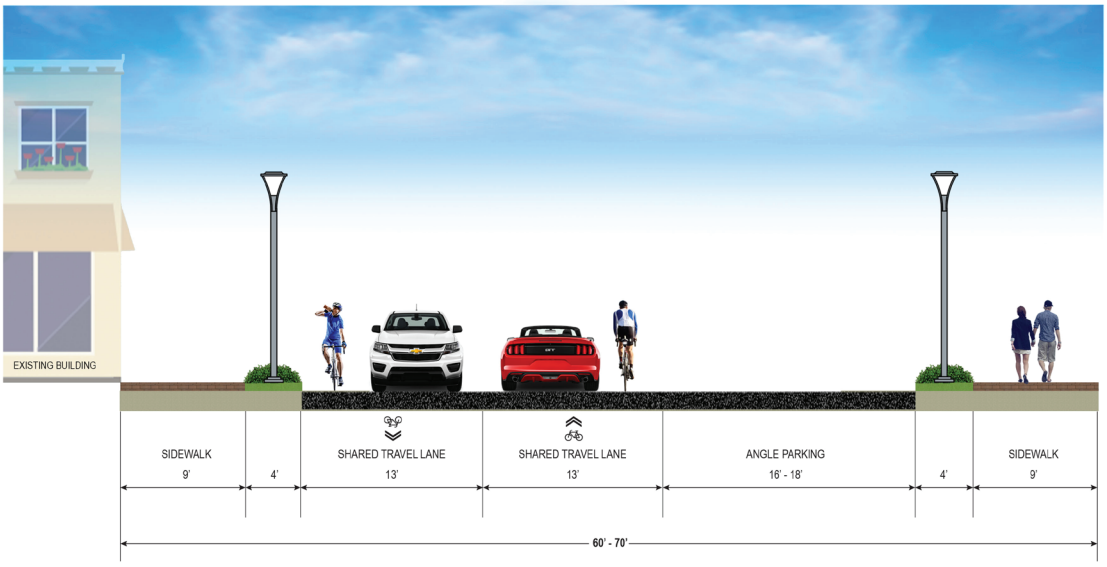
All improvements should accommodate potential retrofits for micromobility options that may come online in the future.

These considerations are evolving along with the technology becoming available and may affect use of transportation infrastructure (e.g., sidewalks and bike lanes), amount of on-street parking needed, ease of access to remote parking and transit, etc. For example, Fort Lauderdale authorizes use and parking of dockless scooters on the sidewalks, with certain stipulations (see the City's website and enabling ordinance C-18-16).



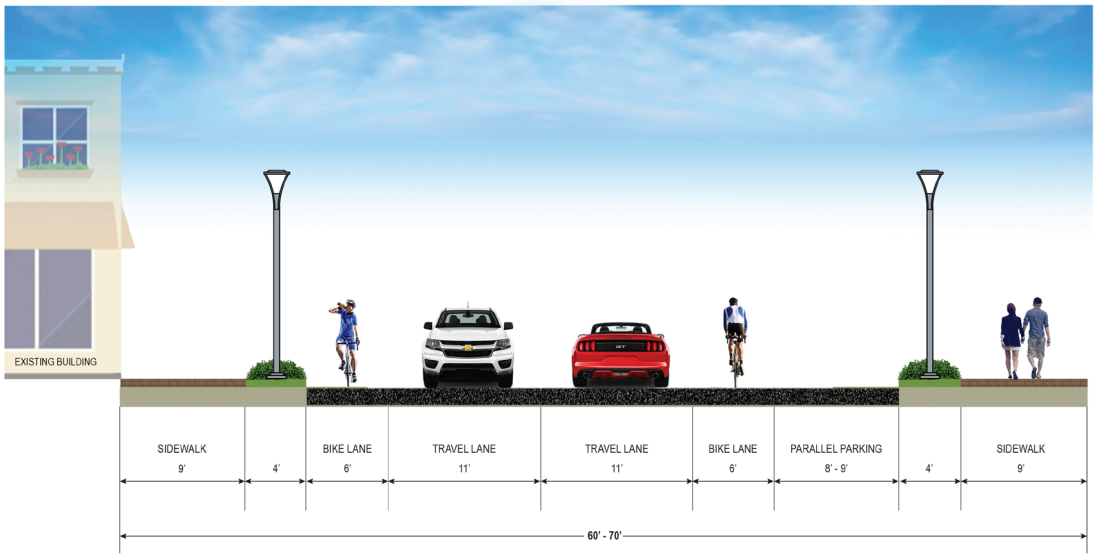
Map 2-5: *Potential Shared Parking Opportunities.*

Figure 2-18: *Example of Micromobility – Bird Scooters and Doral Bikeshare.* ***Source:*** *Tindale Oliver; City of Doral - www.cityofdoral.com/news/doral-partners-with-spin-to-launch-citys-first-stationless-smart-bikeshare-system/*



NW 56th Street - Angle Parking
05/31/19
** Right of way width is approximate and proposed dimensions are meant as guidance. Final roadway design may require modifications to the cross section.*

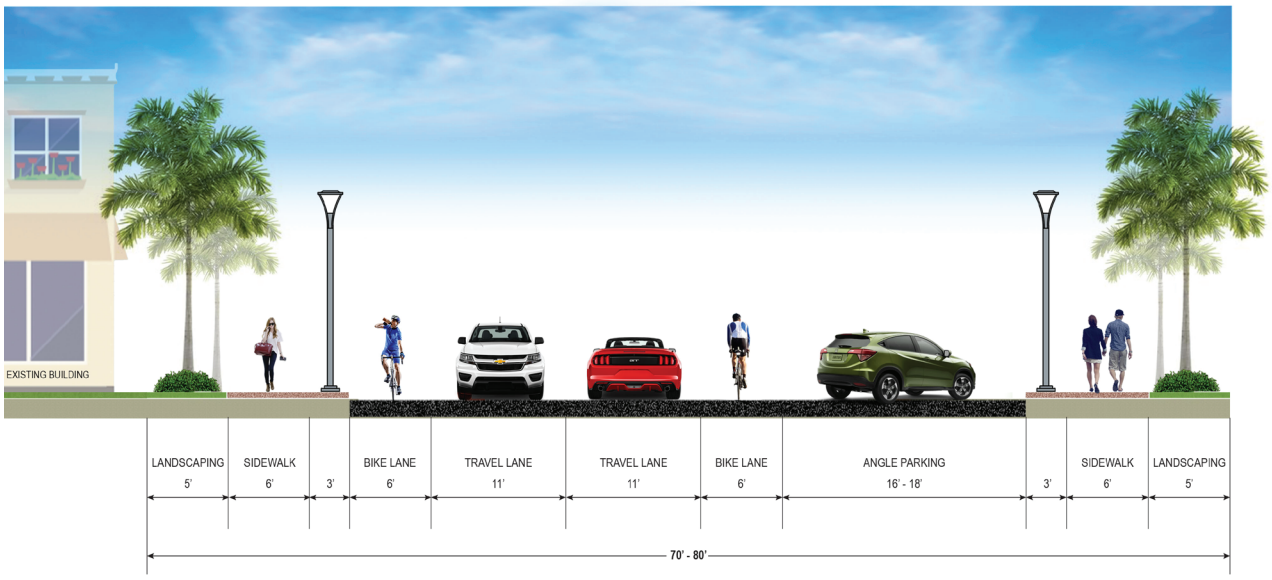
Tindale Oliver



NW 56th Street - Parallel Parking
05/31/19
** Right of way width is approximate and proposed dimensions are meant as guidance. Final roadway design may require modifications to the cross section.*

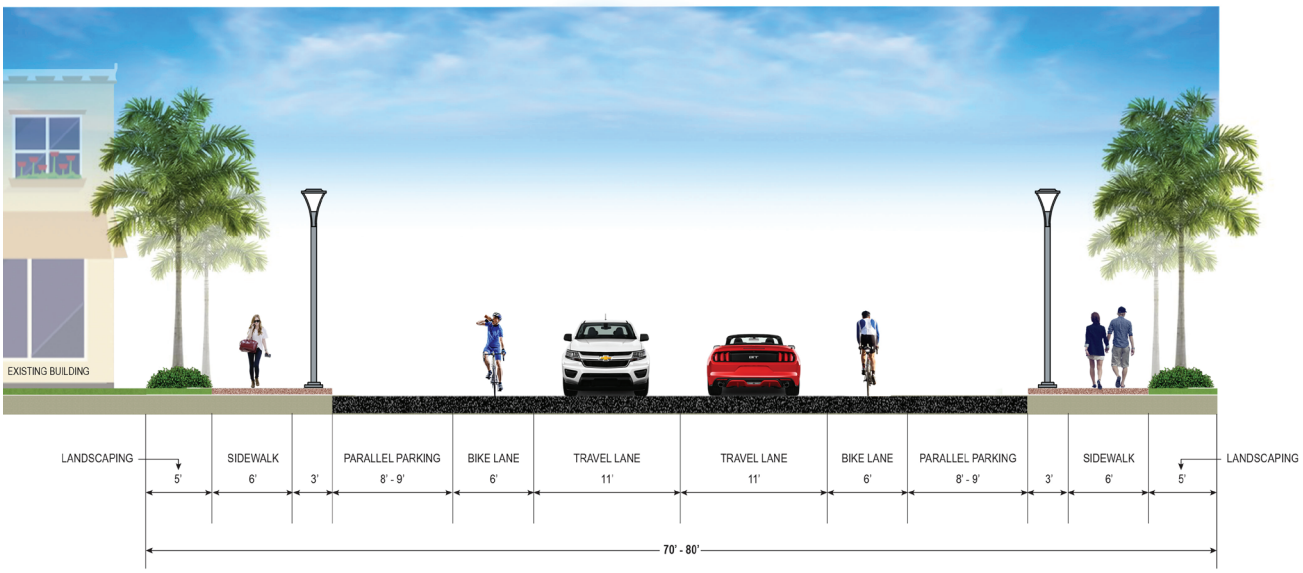
Tindale Oliver

Figure 2-19: *Proposed Street Sections.* ***Note:*** *These sections are meant as general design guidance; changes may be required upon more detailed design and engineering evaluations.*



NW 84th Avenue, NW 82nd Avenue - Angle Parking
05/31/19
** Right of way width is approximate and proposed dimensions are meant as guidance. Final roadway design may require modifications to the cross section.*

Tindale Oliver



NW 84th Avenue, NW 82nd Avenue - Parallel Parking
05/31/19
** Right of way width is approximate and proposed dimensions are meant as guidance. Final roadway design may require modifications to the cross section.*

Tindale Oliver

Figure 2-19: *Proposed Street Sections (Continued).* ***Note:*** *These sections are meant as general design guidance; changes may be required upon more detailed design and engineering evaluations.*

2.4 ECONOMIC DEVELOPMENT

RELATED ASSESSMENT MEMO TAKEAWAYS

- There are still several industrial-oriented uses (primarily distribution and heavy commercial) active in the Study Area, and stakeholder discussions indicated that demand for these uses remains strong. Additionally, workers in these fields primarily have lower wages (62% make less than $40,000), although this percentage is still in alignment with the city overall (63%). Relocation assistance can help transition these uses and workers to similar activities in other locations in the city and region, such as southeastern Doral.
- Evaluate and modify existing development incentives and programs, based on the review of the following regulations, plans, and programs, in support of the vision developed for the Plan:
  - Green building incentives in the Land Development Code
  - Green Master Plan (2008)
  - Low Impact Development Master Plan (2016)
  - Doral Façade Improvement Grant Program
- Wynwood provides an example of a public benefit program tied to incentives, and Miami-Dade County provides an example of a targeted business incentive fund.

RECOMMENDATIONS

Provide and promote existing relocation guidance/ assistance for existing industrial uses to move to other industrial areas of the city.

This effort may be coordinated through the Business Improvement District discussed in Section 2.5. Approaches to consider include:

- Promote the Miami-Dade Beacon Council inventory of vacant industrial lots in the City to industrial uses interested in re-location.
- Provide referrals between companies looking to relocate and owners of vacant lots; provide referrals between displaced industrial workers from the Study Area and industrial companies seeking to hire in the City.

Establish targeted business funding and/or incentives for the Study Area, with a focus on small, local, and/or innovative businesses.

Establish eligibility guidelines that may include the following considerations: targeted industries based on desired uses in the Study Area (e.g., creative or arts-oriented endeavors), small size, adherence to living wage standards, local designation, innovative business concept, etc. Standards may also be established to guide how the money is used; expenditure types may include: interior capital improvements (those that will not move if the tenant or property owner relocate), relocation costs, structure demolition/site cleanup , marketing support, insurance, technical assistance, training, professional services for business development, etc.

Expand the façade improvement grant program to apply to general desired public realm improvements.

The grant program currently reimburses up to 50% of costs, with a $10,000 cap per property, for façade improvements. Update the program criteria to include public realm and streetscape improvements above and beyond baseline improvements, which may relate to topics and improvements listed below mentioned in the 2008 Green Master Plan and 2016 Low Impact Development Master Plan (see Figures 2-20, 2-21, and 2-22 for examples). Note that these topics and improvements are suggestions for further vetting by City staff, and code adjustments may be needed to allow for these options. Additionally, maintenance would be the responsibility of the property owner, assured through a tool such as a maintenance agreement. Include general guidelines for these improvements in the program description.

- Bioretention Basins or Rain Gardens
- Tree plantings, Tree Box Filters or Infiltration Planters
- Vegetated Swales
- Filter Strips or Vegetated Buffers
- Infiltration Trench
- Exfiltration Trench or French Drains
- Green Roofs/“Cool” Roofs/Rain Barrels or Cisterns
- Permeable Pavement
- Detention Ponds
- Parking Chambers (for stormwater)
- Resource-efficient fixtures (e.g., LED lights)
- Urban garden
- Bike parking/infrastructure
- Public art
- Solar energy infrastructure
- Native landscaping
- Shade structures
- Street furniture
- Outdoor dining amenities

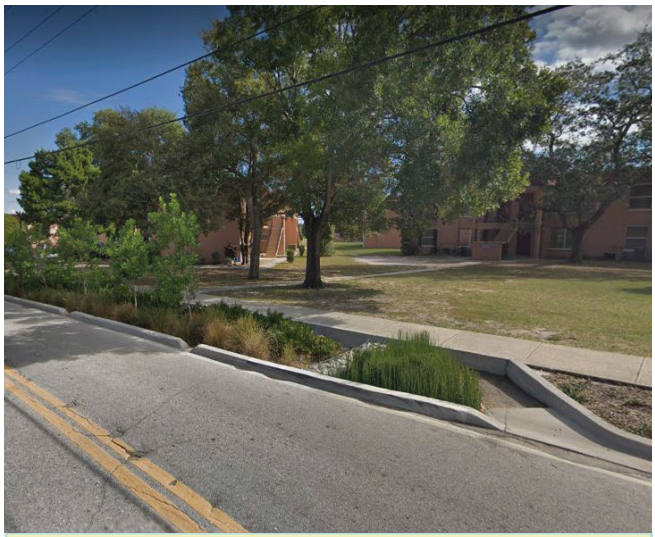


Figure 2-20: *Vegetated Swale.* ***Source:*** *Google Maps (1401 E Scott Street, Tampa)*

Figure 2-22: *Outdoor Dining.* ***Source:*** *www.columbiarestaurant.com/Menus-By-Location/Locations/Tampa-Bay-History-Center*

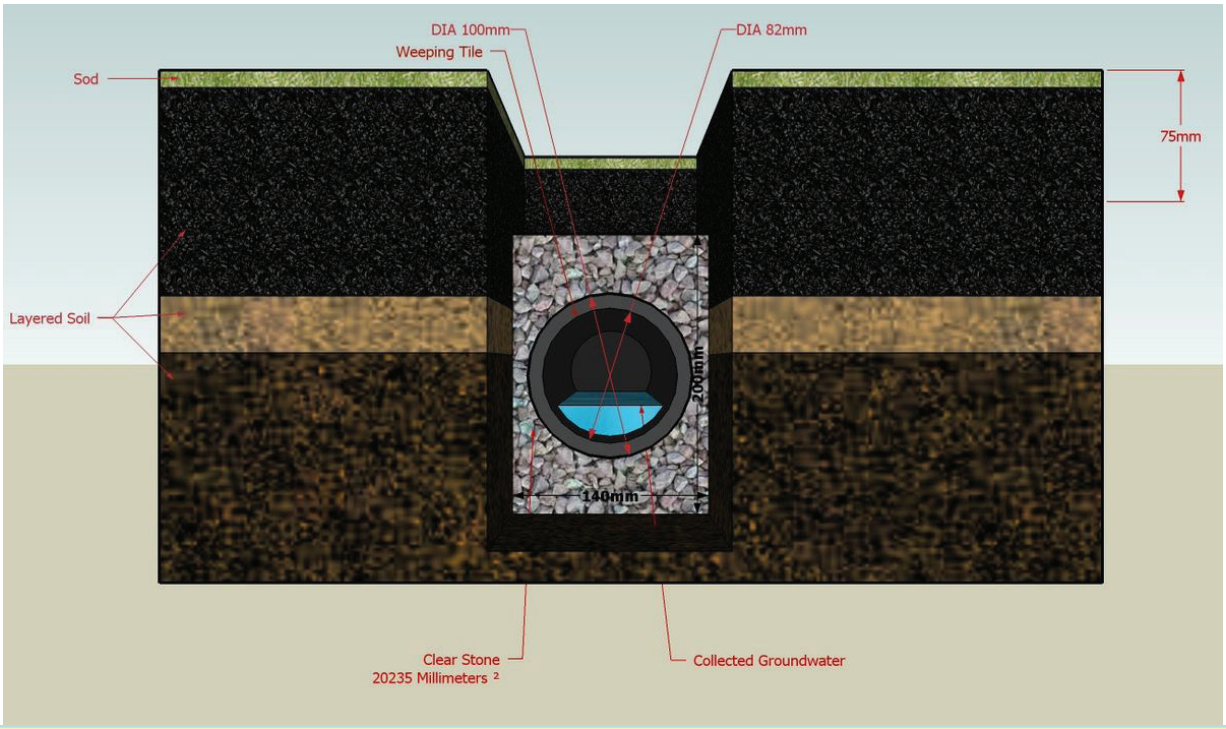


Figure 2-21: *French drain.* ***Source:*** *Wikimedia Commons - www.commons.wikimedia.org/wiki/File:French_drain_diagram.jpg*

2.5 ORGANIZATIONAL STRUCTURES

RELATED ASSESSMENT MEMO TAKEAWAYS

- Associations and funding mechanisms, an example of which are a Business Improvement District (BID, see Figure 2-23), could help oversee and fund the implementation of the vision and land use transition. Committees can be tailored to specific aims of the area, such as design review. Wynwood and the EDGE District in St. Petersburg provide example of BID-driven redevelopment.
- Stakeholder discussions indicated a need to more clearly establish an identity, including a name.

RECOMMENDATIONS

Encourage formation of a BID to help implement improvements in the Study Area and provide additional funding for improvements.

See case studies in the Assessment Memo in Section 4.1 for more information. The BID may help administer the following:

- A design review board or committee for the Study Area as part of the broader area association.
- A branding, marketing, and communication strategy to establish a name and identity for the association and Study Area.
- Relocation assistance initiatives (see Section 2.4)

WHAT IS A BUSINESS IMPROVEMENT DISTRICT (BID)?

A BID establishes a geographically defined area where a special assessment is charged to property owners in the district to provide special services, programs, and/or improvements within the district above and beyond what the local government provides. It typically has an entity that oversees the district and implementation or initiatives and projects, such as a non-profit organization with a Board of Directors and committees.

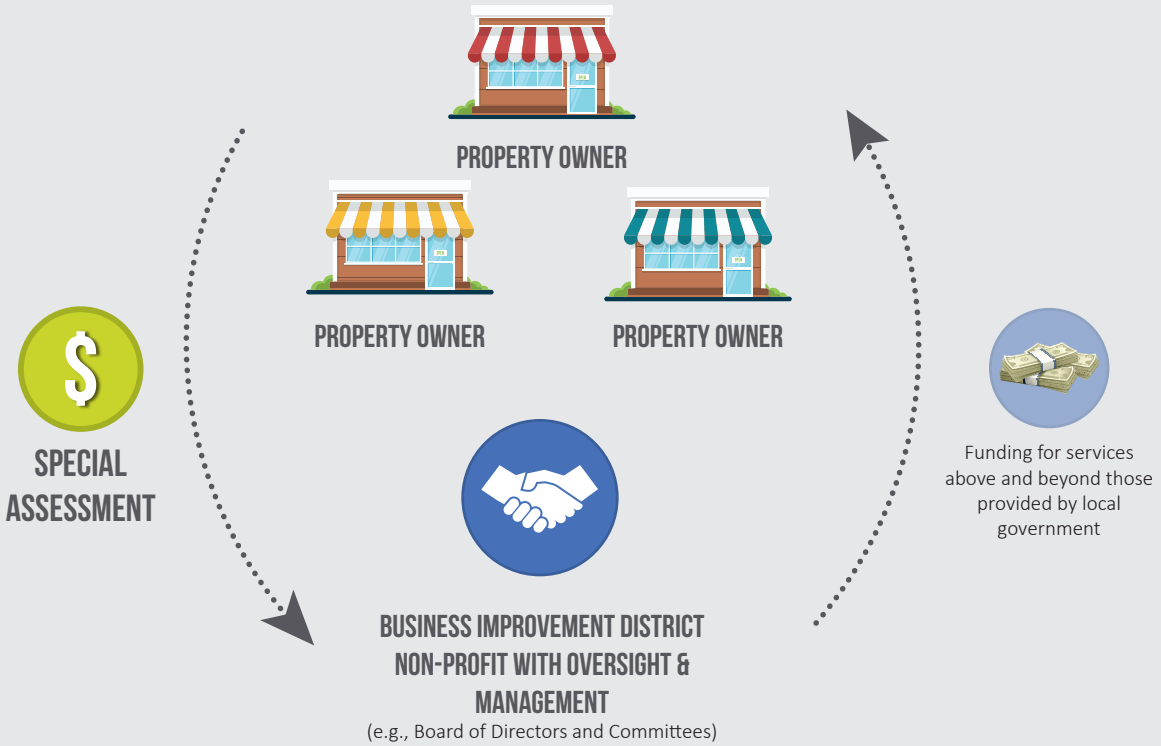


Figure 2-23: *Business Improvement District*

3.0 PROJECT PLANNING AND FUNDING STRATEGIES

This section proposes capital and non-capital projects and initiatives to implement the recommendations from Section 2.0, along with a suggested timeframe and funding source options.

Note that these projects and initiatives are recommendations that require further evaluation and approval prior to implementation.

3.1 CAPITAL & NON-CAPITAL PLAN

Figures 3-1 and 3-2 show capital and non-capital projects and programs recommended to implement the Adaptive Reuse Plan. More details on each project and program can be found in the associated referenced Plan sections. Total capital costs are estimated at $31.2 million and total non-capital at $1.9 million, for an overall total of $33.1 million. Figure 3-3 indicates that most of the costs are suggested for long-term programming (between year 6 and year 15 of plan implementation). Figure 3-4 indicates that the majority of costs are capital costs (94%), with most costs associated with transportation, connectivity, and walkability improvements (81% compared to other project types; see Figure 3-5).

Capital Expenditures				
Transportation, Connectivity & Walkability				
Project	**Reference Section**	**Total**	**Short-Term (1-5 Years)**	**Long Term (6-15+ Years)**
Complete Street on NW 56th Street	2.2 Urban Design and 2.3 Transportation & Connectivity	$4,607,441	$0	$4,607,441
Complete Street on NW 82nd Avenue	2.2 Urban Design and 2.3 Transportation & Connectivity	$1,498,067	$0	$1,498,067
Sidewalk, Landscaping, Lighting - North Side of NW 54th St	2.2 Urban Design and 2.3 Transportation & Connectivity	$2,100,961	$0	$2,100,961
Complete Street on NW 84th Avenue	2.2 Urban Design and 2.3 Transportation & Connectivity	$1,302,667	$1,302,667	$0
Bicycle Parking	2.3 Transportation & Connectivity	$2,200	$2,200	$0
Intersection Improvements - NW 54th Street and NW 84th Avenue	2.3 Transportation & Connectivity	$354,000	$354,000	$0
Enhance Transit Stops	2.3 Transportation & Connectivity	$16,000	$16,000	$0
North/South Trail Connection between NW 53rd St and NW 56th St	2.3 Transportation & Connectivity	$133,160	$0	$133,160
Land Acquisition for Parking Garage	2.3 Transportation & Connectivity	$2,644,074	$2,644,074	$0
Parking Garage Structure - 650 Spaces	2.3 Transportation & Connectivity	$14,230,158	$0	$14,230,158
	Total	**$26,888,727**	**$4,318,941**	**$22,569,786**

Figure 3-1: *Capital Projects*

Infrastructure & Technology				
Project	**Reference Section**	**Total**	**Short-Term (1-5 Years)**	**Long Term (6-15+ Years)**
Underground Utilities on NW 54th Street	2.2 Urban Design	$850,739	$0	$850,739
Underground Utilities on NW 56th Street	2.2 Urban Design	$850,739	$0	$850,739
Underground Utilities on NW 82nd Avenue	2.2 Urban Design	$276,610	$0	$276,610
Underground Utilities on NW 84th Avenue	2.2 Urban Design	$517,140	$240,530	$276,610
Stormwater & Green Infrastructure Enhancements	2.2 Urban Design	$1,725,000	$0	$1,725,000
	Total	**$4,220,227**	**$240,530**	**$3,979,697**

Branding & Identity				
Project	**Reference Section**	**Total**	**Short-Term (1-5 Years)**	**Long Term (6-15+ Years)**
Redesign and Construct Gateway Elements	2.2 Urban Design	$75,000	$75,000	$0
Place Directional Signage at Key Locations	2.2 Urban Design	$28,000	$28,000	$0
	Total	**$103,000**	**$103,000**	**$0**

Project	**Total**	**Short-Term (1-5 Years)**	**Long Term (6-15+ Years)**
Overall Capital Cost Total	$31,211,954	$4,662,472	$26,549,483
Overall Non-Capital Cost Total	$1,925,000	$750,000	$1,175,000
Grand Total	$33,136,954	$5,412,472	$27,724,483

Figure 3-1: *Capital Projects (Continued)*

Non-Capital Expenditures (Studies, Plans, Other)				
Operations & Studies				
Project	**Reference Section**	**Total**	**Short-Term (1-5 Years)**	**Long Term (6-15+ Years)**
Land Development Code Updates- based on recommendations from Adaptive Reuse Plan	2.1 Land Use 2.2 Urban Design 2.3 Transportation & Connectivity 2.5 Organizational Structures	$125,000	$100,000	$25,000
Marketing, Branding and Communication Strategy – website update, e-blast templates, marketing materials, etc.	2.5 Organizational Structures	$175,000	$75,000	$100,000
Vision Plan - for potential annexation area currently in Miami-Dade County north of Study Area	2.1 Land Use	$50,000	$50,000	$0
Grants & Programs				
Project	**Reference Section**	**Total**	**Short-Term (1-5 Years)**	**Long Term (6-15+ Years)**
Façade & Public Realm Improvement Grant	2.4 Economic Development	$450,000	$150,000	$300,000
Targeted Business Fund – funding for economic development incentives focusing on small, local and/or innovative businesses	2.4 Economic Development	$1,125,000	$375,000	$750,000
	Total	**$1,925,000**	**$750,000**	**$1,175,000**

Figure 3-2: *Non-Capital Projects and Programs*

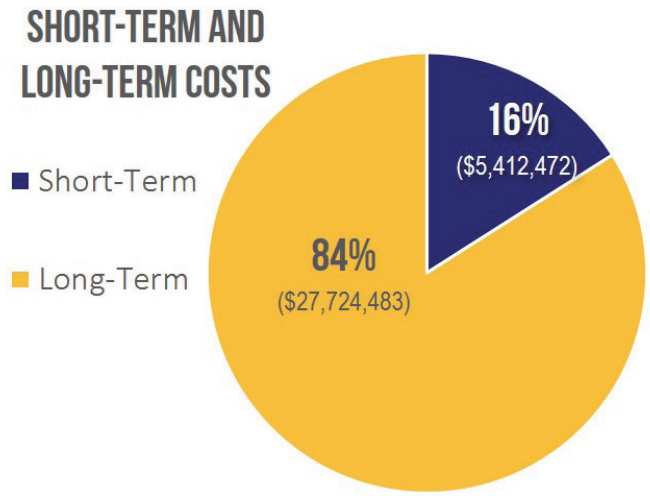


Figure 3-3: *Short-Term & Long-Term Costs*

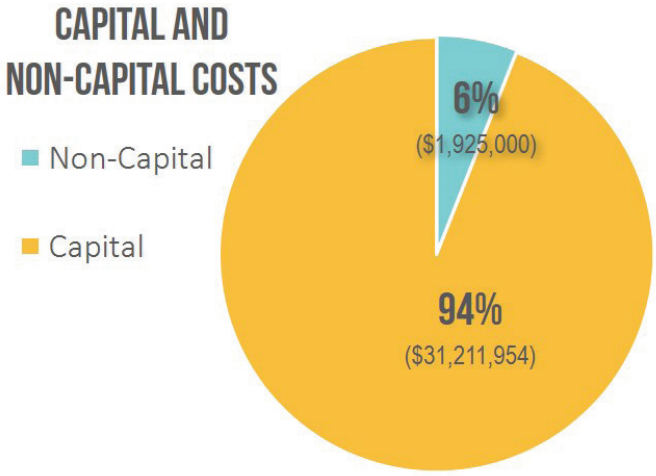


Figure 3-4: *Capital & Non-Capital Costs*

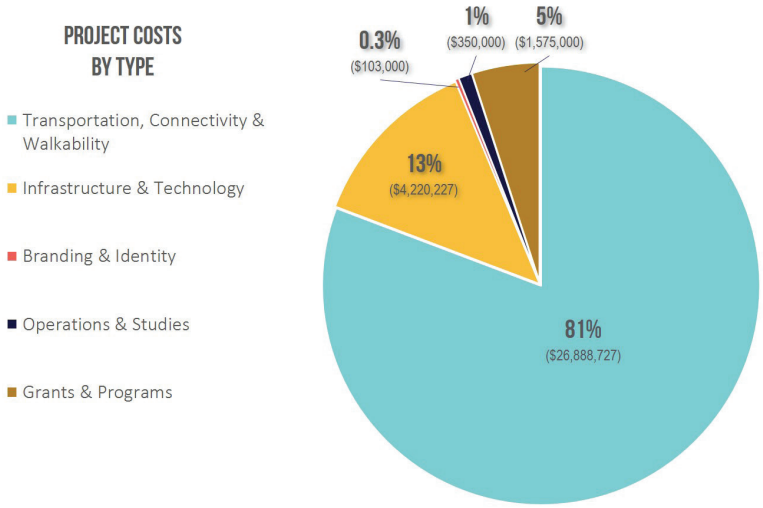


Figure 3-5: *Project Costs by Type*

3.2 FUNDING STRATEGIES

Aside from exploring options to program certain improvements through the City's typical capital improvement planning process and operational budgeting, the City and stakeholders will also likely need to rely on other processes and funding tools to implement projects and initiatives. These efforts may include necessary preliminary improvements, such as any brownfield remediation. Figure 3-6 describes potential funding sources or tools to explore further for Study Area improvements.

List/Description of Potential Funding Sources	
Fund	**Description**
General Fund	Used to account for all financial resources except those required to be accounted for in another fund; the major operating fund of the City of Doral but also can be used for capital costs as well
State Brownfield Program Incentives	Administered locally by Miami-Dade County, allows for Brownfield Site Rehabilitation Agreements (BSRAs) with accompanying eligibility for benefits and cleanup incentives. Miami-Dade County's website highlights some of the program benefits, including the State-sponsored Voluntary Cleanup Tax Credit (VCTC), "… cleanup liability protection for lenders and developers, application of Risk-Based Corrective Action principles to site rehabilitation … and a streamlined and expedited development, permitting and technical review process." According to the Miami-Dade County Brownfields Program 2018 Annual Report, the county had more than 30 sites with executed BSRAs. The BSRAs executed in the Wynwood District and their related documentation, including applications for VCTCs, can provide a guide for taking advantage of the state brownfield program in the Study Area.
Special Assessment District Funds (e.g., BID)	Option undertaken by property owners in the area to agree to pay additional taxes for area improvements (see potential revenue estimate if this option is adopted in Figure 3-7).
Impact Fees	Relate to parks and recreation, law enforcement, and roadway improvements (roadway improvements eligible for funds include those from City's Capital Improvement Plan, Transportation Master Plan, and unfunded projects list from Miami-Dade MPO's adopted LRTP); note that the City's impact fees are currently under evaluation for potential amendments.
Stormwater Utility	Fees on developed property to be used to plan, control, operate, and maintain the city's stormwater management system
In-Lieu Parking Fee and Parking Trust Fund	As discussed in section 2.3, an in-lieu parking fee may be offered as an alternative to providing required parking spaces to support development of a parking garage for the Study Area. Fees are collected in a parking trust fund. See case studies in the Assessment Memo document for more details.
Private Development	As part of code requirements, negotiated development agreements, and/or incentive and grant programs, private development may provide certain amenities as part of individual projects.

Figure 3-6: *List/description of potential funding sources*

Figure 3-7 provides a potential revenue estimate through 2040 based on a scenario in which the Study Area became a BID special assessment district in 2019, with revenue collection beginning in 2020 (note that revenue collected in a year is based on the prior year's taxable value). The estimated amount of revenue through 2040 is nearly $6 million, approximately 18% of the total capital and non-capital costs presented in Section 3.1. The estimate assumes:

- a 1.1 millage rate similar to other special service districts
- a tax value growth rate of 4.5% based on a more conservative assumption than the average annual tax value growth rate between 2005 and 2018 (6%)
- $1 of revenue for every $1,000 of taxable value

Projected BID Revenue Estimate		
Year	Adaptive Reuse Area Taxable Value	Projected BID Revenue
2019	$ 176,183,625	-
2020	$ 184,111,888	$176,184
2021	$ 192,396,923	$184,112
2022	$ 201,054,784	$192,397
2023	$ 210,102,250	$201,055
2024	$ 219,556,851	$210,102
2025	$ 229,436,909	$219,557
2026	$ 239,761,570	$229,437
2027	$ 250,550,841	$239,762
2028	$ 261,825,628	$250,551
2029	$ 273,607,782	$261,826
2030	$ 285,920,132	$273,608
2031	$ 298,786,538	$285,920
2032	$ 312,231,932	$298,787
2033	$ 326,282,369	$312,232
2034	$ 340,965,076	$326,282
2035	$ 356,308,504	$340,965
2036	$ 372,342,387	$356,309
2037	$ 389,097,794	$372,342
2038	$ 406,607,195	$389,098
2039	$ 424,904,519	$406,607
2040	-	$424,905
	Total	$5,952,035

Figure 3-7: *Projected BID Revenue Estimate.* ***Source:*** *taxable value sourced from Florida Department of Revenue, 2018*
Note: *assumes 1.1 millage rate, tax value growth rate of 4.5%, and $1 of revenue per $1,000 of taxable value; collected revenue for each year is based on the prior year's taxable value.*

3.3 CONCLUSION

This Plan provided an initial step in identifying recommendations for supporting adaptive reuse and redevelopment in the Study Area. Next steps include further vetting, approval, and implementation of the capital and non-capital improvements and association efforts. These steps, along with the continued engagement of stakeholders, can help achieve the vision for the Study Area.

DORAL
FLORIDA

GOVERNMENT CENTER
8401 NW 53RD TERRACE
DORAL, FL 33166
305-593-6725

WWW.CITYOFDORAL.COM

TOPOGRAPHIC SURVEY

NW 56th STREET FROM NW 87th AVENUE TO NW 79th AVENUE
NW 54th STREET FROM NW 87th AVENUE TO NW 79th AVENUE
NW 84th AVENUE FROM NW 54th STREET TO NW 58th STREET
NW 82th AVENUE FROM NW 54th STREET TO NW 58th STREET
CITY OF DORAL
MIAMI-DADE COUNTY, FLORIDA

SHEET INDEX

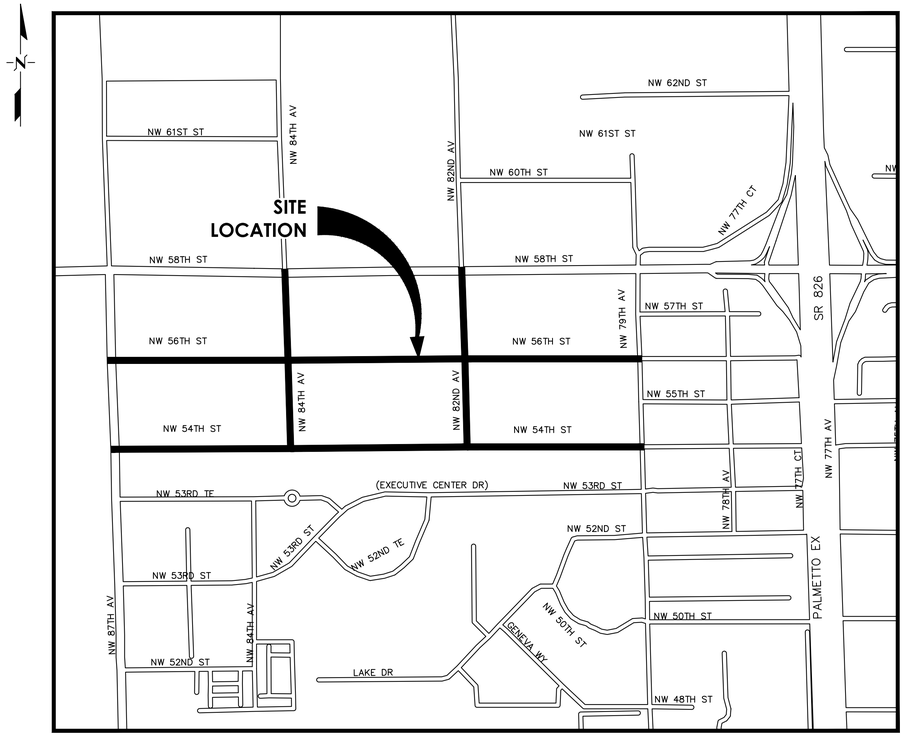
SURVEYOR NOTES:

1. THIS IS NOT A BOUNDARY SURVEY.
2. THE PURPOSED OF THIS SURVEY IS TO DEPICT TOPOGRAPHIC FEATURES ALONG SECTIONS OF:
   - NW 56th STREET FROM NW 87th AVENUE TO NW 79th AVENUE
   - NW 54th STREET FROM NW 87th AVENUE TO NW 79th AVENUE
   - NW 84th AVENUE FROM NW 54th STREET TO NW 58th STREET
   - NW 82th AVENUE FROM NW 54th STREET TO NW 58th STREET

   CITY OF DORAL
   MIAMI-DADE COUNTY, FLORIDA
3. THE RIGHT OF WAY INFORMATION SHOWN ON THIS MAP IS BASE ON RECORDED DOCUMENTS. AND IS SHOWN FOR REFERENCE ONLY.
4. NO EXCAVATION OR DETERMINATION WAS MADE AS TO HOW THE PROJECT SITE IS SERVED BY UTILITIES. SUBSURFACE UTILITIES, INCLUDING, BUT WITHOUT LIMITATION TO PIPES, WIRES, VAULTS, BOXES, DRAIN TILES, VOIDS, CABLES AND OTHER MATERIALS AUXILIARY TO DELIVERY AND/OR DISPOSAL OF WATER, WASTEWATER, SEWAGE, ELECTRICITY, GAS, TELEPHONE SERVICE, CABLE TELEVISION. AS THEY MAY EXIST WITHIN, UPON, ACROSS OR ABUTTING THE SUBJECT PROPERTY WERE NOT LOCATED. SURFACE STRUCTURES AS THEY MAY EXIST WITHIN, UPON, ACROSS OR ABUTTING THE SUBJECT PROPERTY WERE NOT LOCATED UNLESS OTHERWISE SHOWN ON THE SURVEY MAP.
5. ALL VISIBLE UTILITIES DURING THE TIME OF THIS SURVEY ARE SHOWN ON THIS MAP. THERE MAY BE ADDITIONAL UTILITIES THAT ARE NOT SHOWN.
6. SANITARY LINES SHOWN ON THIS SURVEY ARE BASE ON VISUAL INSPECTED OF MANHOLES STRUCTURES AND PROVIDED DATA BY THE CLIENT.
7. LOCATION FOR ALL WATER LINES SHOWN ON SURVEY ARE APPROXIMATE. UNDERGROUND UTILITY DISCOVERY WAS NOT PERFORMED. ALIGNMENTS AND LOCATIONS WERE PROVIDED BY THE CLIENT IN THE FORM OF A GEOGRAPHICAL INFORMATION SYSTEM (G.I.S.) LAYER. POSITIONAL ACCURACY G.I.S. LAYER HAS NOT BEEN DETERMINED.
8. WATER LINE PIPE DIAMETER SHOWN ON SURVEY WERE OBTAINED FROM GEOGRAPHICAL INFORMATION SYSTEM (G.I.S.) LAYER PROVIDE BY THE CLIENT.
9. GAS LINE UTILITY SHOWN ARE BASED ON EVIDENCE PRESENT ON SITE E.G., GAS VALVES, PAINT MARKINGS AND UTILITY MARKERS. LOCATION SHOWN IS ASSUMED TO BE APPROXIMATED.
10. DATE OF FIELD SURVEY 05/22/2019.

CERTIFIED TO:

PEVIDA HIGHWAY DESIGNERS, LLC



LOCATION MAP
N.T.S.

BENCHMARKS USED

BENCHMARK	DESCRIPTION	EL.
N-330-R (MIAMI-DADE)	PK NAIL AND BRASS WASHER ON TOP OF CATCH BASIN AT NW CORNER OF INTERSECTION - NW 56 ST --- 33.3' WEST OF WEST EP - NW 79 AVE --- 3.5' NORTH OF NORTH EP	5.89
N-534 (MIAMI-DADE)	PK NAIL AND BRASS WASHER IN SOUTH END OF A CATCH BASIN - NW 58 ST --- 65' SOUTH OF SOUTH EDGE OF PAVEMENT - NW 87 AVE --- 2' EAST OF EAST EDGE OF PAVEMENT	7.40
ELEVATIONS AS SHOWN HEREON REFER TO THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD 1929).		

SURVEYOR'S CERTIFICATE:

I HEREBY CERTIFY THIS "TOPOGRAPHIC SURVEY" IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AS RECENTLY SURVEYED AND DRAWN UNDER MY SUPERVISION AND DIRECTION. THIS SURVEY COMPLIES WITH THE MINIMUM TECHNICAL STANDARDS AS SET FORTH IN RULES ADOPTED BY THE FLORIDA STATE BOARD OF PROFESSIONAL SURVEYORS AND MAPPERS CONTAINED IN CHAPTER 5J-17, FLORIDA ADMINISTRATIVE CODE, PURSUANT TO 472.027, FLORIDA STATUTES.

PEGASUS LAND SURVEYORS, INC. A FLORIDA CORPORATION
FLORIDA CERTIFICATE OF AUTHORIZATION NUMBER LB 8025

DATE:
REVISIONS:
SEAL: VINICIO CABRERA P.S.M. No. LS6923 STATE OF FLORIDA
CERTIFICATION: THIS SURVEY MAP AND REPORT OR THE COPIES THEREOF ARE NOT VALID WITHOUT THE ORIGINAL SIGNATURE AND ORIGINAL RAISED SEAL OF A FLORIDA REGISTERED PROFESSIONAL SURVEYOR AND MAPPER.
BY: VINICIO CABRERA P.S.M. 6923 FOR THE FIRM
STATE OF FLORIDA
FIELD DATE: 09-23-20
DRAWN: Y.N.
CHECKED: V.C.
SCALE: AS SHOWN

PEGASUS LAND SURVEYORS INC.
9551 NW 26th Place
Sunrise, Florida 33322
Ph. 305-409-9291

PREPARED FOR: PEVIDA HIGHWAY DESIGNERS, LLC
PROJECT NAME: NW 56th STREET FROM NW 87th AVENUE TO NW 79th AVE
DRAWING NAME: COVER SHEET
DATE: 10-06-2020
SHEET: T-1
1 OF 7 SHEETS

TOPOGRAPHIC SURVEY

NW 56th STREET FROM NW 87th AVENUE TO NW 79th AVENUE
NW 54th STREET FROM NW 87th AVENUE TO NW 79th AVENUE
NW 84th AVENUE FROM NW 54th STREET TO NW 58th STREET
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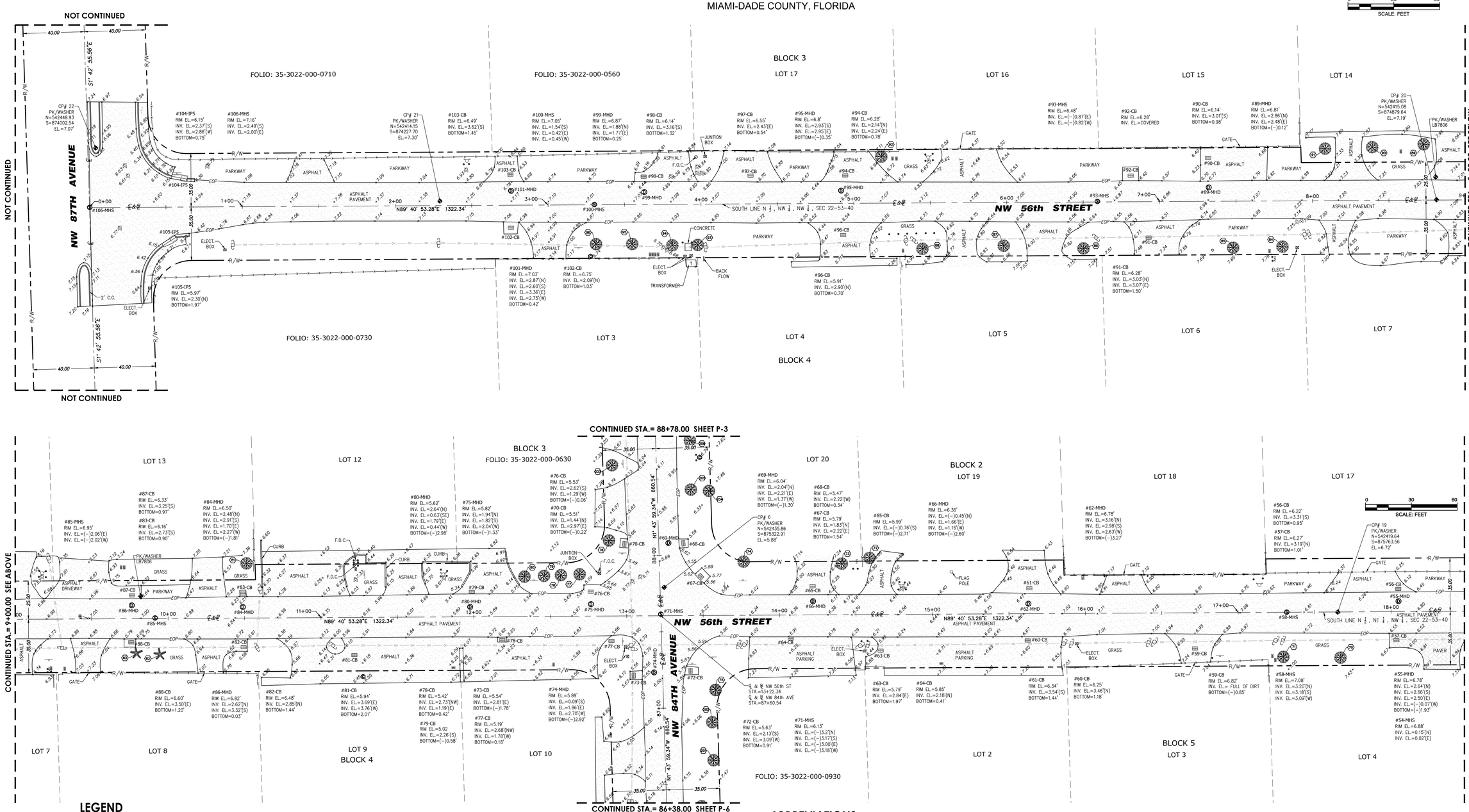
CITY OF DORAL
MIAMI-DADE COUNTY, FLORIDA



LEGEND

- IRRIGATION CONTROL VALVE
- WATER VALVE
- GAS VALVE
- SIGN
- UTILITY WOOD POLE
- UTILITY CONCRETE POLE
- STORM SEWER CATCH BASIN
- STORM SEWER MANHOLE
- SANITARY SEWER MANHOLE
- FIRE HYDRANT
- WATER METER
- SPOT ELEVATION
- CLEAN OUT
- LIGHT POLE
- BACK FLOW PREVENTER
- BOLLARD
- OVER HEAD WIRE
- GUARD RAIL
- CHAIN LINK FENCE
- IRON FENCE
- WOOD FENCE
- TRAFFIC LIGHT
- TREE
- PALM

ABBREVIATIONS

ACCE.	=ACCESSIBLE	NO.	=NUMBER	T.B.	=TANGENT BEARING
C.L.F.	=CHAIN LINK FENCE	BLDG	=BUILDING	C.O.	=CLEAN OUT
CONC.	=CONCRETE	FND	=FOUND	INV.	=INVERT
F.F.E	=FINISH FLOOR ELEVATION	B/L	=BASELINE	EL.	=ELEVATION
FND	=FOUND	O.R.B.	=OFFICIAL RECORDS BOOK	TOP	=TOP OF PIPE
F.O.C.	=FIBER OPTIC CABLE	(P)	=PLAT DATA	OH	=OVER HEAD
F.D.C.	=FIRE DEPARTMENT CONNECTION	P.B	=PLAT BOOK	SWK	=SIDEWALK
L.F.	=LINEAL FEET	PG.	=PAGE	MHS	=MANHOLE–SANITARY SEWER
R.B	=REBAR	P.O.B	=POINT OF BEGINNING	MHD	=MANHOLE–DRAINAGE STORM
C.B.	=CATCH BASIN	R/W	=RIGHT–OF–WAY	MH	=MANHOLE
		TYP.	=TYPICAL	ARV	=AIR RELEASE VALVE

DATE:
REVISIONS:

SEAL: VINICIO CABRERA, STATE OF FLORIDA, PROFESSIONAL SURVEYOR AND MAPPER, No. LS6923

CERTIFICATION: THIS SURVEY MAP AND REPORT OR THE COPIES THEREOF ARE NOT VALID WITHOUT THE ORIGINAL SIGNATURE AND THE ORIGINAL RAISED SEAL OF A FLORIDA REGISTERED PROFESSIONAL SURVEYOR AND MAPPER.

BY: VINICIO CABRERA P.S.M. #6923
STATE OF FLORIDA
FOR THE FIRM

FIELD DATE: 09-23-20
DRAWN: Y.N.
CHECKED: V.C.
SCALE: AS SHOWN

PEGASUS LAND SURVEYORS INC.
9551 NW 26th Place
Sunrise, Florida 33322
Ph. 305-409-9291

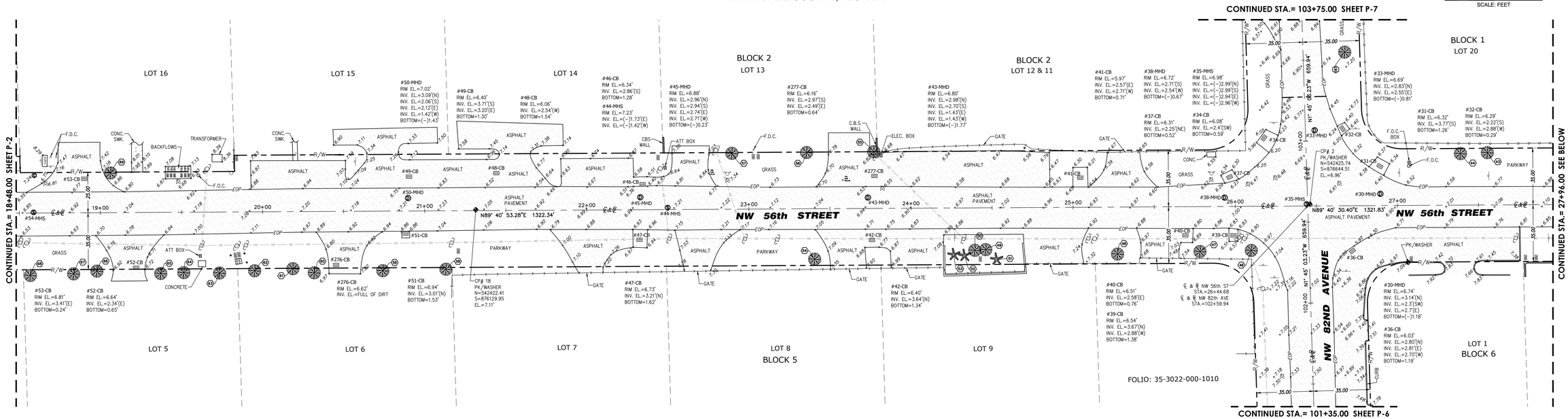
PREPARED FOR: PEVIDA HIGHWAY DESIGNERS, LLC
PROJECT NAME: NW 56th STREET FROM NW 87th AVENUE TO NW 79th AVE
DRAWING NAME: TOPOGRAPHIC SURVEY

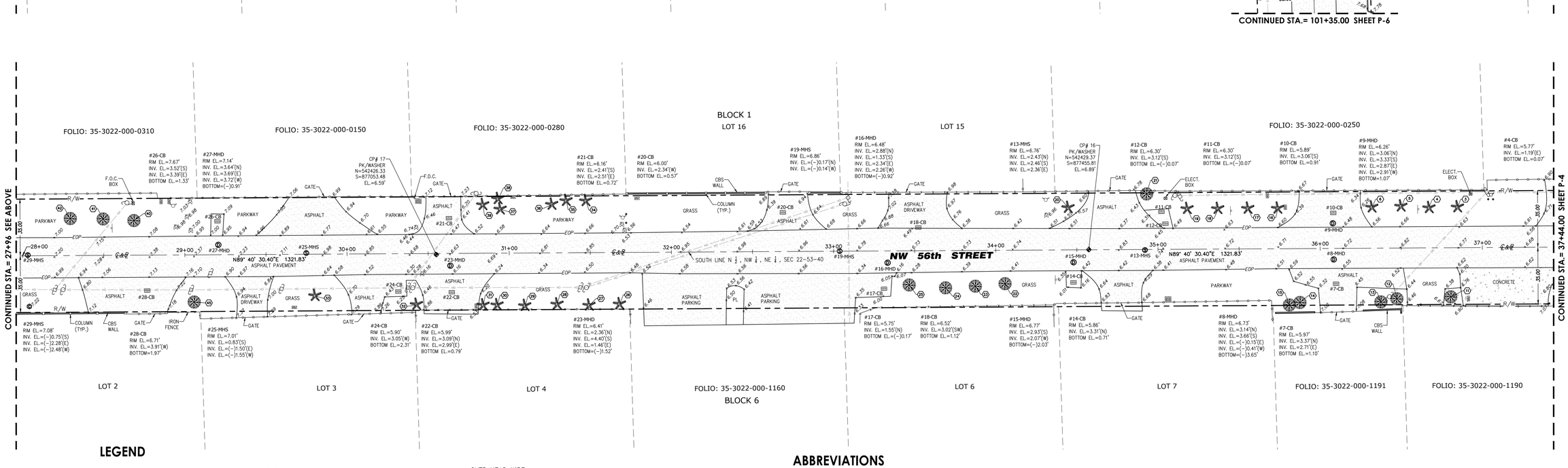
DATE: 10-06-2020

SHEET: T-2
2 OF 7 SHEETS

TOPOGRAPHIC SURVEY

NW 56th STREET FROM NW 87th AVENUE TO NW 79th AVENUE
NW 54th STREET FROM NW 87th AVENUE TO NW 79th AVENUE
NW 84th AVENUE FROM NW 54th STREET TO NW 58th STREET
NW 82th AVENUE FROM NW 54th STREET TO NW 58th STREET
CITY OF DORAL
MIAMI-DADE COUNTY, FLORIDA





LEGEND

- IRRIGATION CONTROL VALVE
- WATER VALVE
- GAS VALVE
- SIGN
- UTILITY WOOD POLE
- UTILITY CONCRETE POLE
- STORM SEWER CATCH BASIN
- STORM SEWER MANHOLE
- SANITARY SEWER MANHOLE
- FIRE HYDRANT
- WATER METER
- SPOT ELEVATION
- CLEAN OUT
- LIGHT POLE
- BACK FLOW PREVENTER
- BOLLARD
- OVER HEAD WIRE
- GUARD RAIL
- CHAIN LINK FENCE
- IRON FENCE
- WOOD FENCE
- TRAFFIC LIGHT
- TREE
- PALM

ABBREVIATIONS

ACCE.	=ACCESSIBLE
C.L.F.	=CHAIN LINK FENCE
CONC.	=CONCRETE
F.F.E	=FINISH FLOOR ELEVATION
FND	=FOUND
F.O.C.	=FIBER OPTIC CABLE
F.D.C.	=FIRE DEPARTMENT CONNECTION
L.F.	=LINEAL FEET
R.B	=REBAR
C.B.	=CATCH BASIN
NO.	=NUMBER
BLDG	=BUILDING
FND	=FOUND
B/L	=BASELINE
O.R.B.	=OFFICIAL RECORDS BOOK
(P)	=PLAT DATA
P.B	=PLAT BOOK
PG.	=PAGE
P.O.B	=POINT OF BEGINNING
R/W	=RIGHT-OF-WAY
TYP.	=TYPICAL
T.B.	=TANGENT BEARING
C.O.	=CLEAN OUT
INV.	=INVERT
EL.	=ELEVATION
TOP	=TOP OF PIPE
OH	=OVER HEAD
SWK	=SIDEWALK
MHS	=MANHOLE-SANITARY SEWER
MHD	=MANHOLE-DRAINAGE STORM
MH	=MANHOLE
ARV	=AIR RELEASE VALVE

DATE:
REVISIONS:

SEAL: VINICIO CABRERA P.S.M. No. LS6923 STATE OF FLORIDA PROFESSIONAL SURVEYOR & MAPPER

FIELD DATE: 09-23-20
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BY: VINICIO CABRERA P.S.M. 6923 STATE OF FLORIDA FOR THE FIRM

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Sunrise, Florida 33322
Ph: 305-409-9291

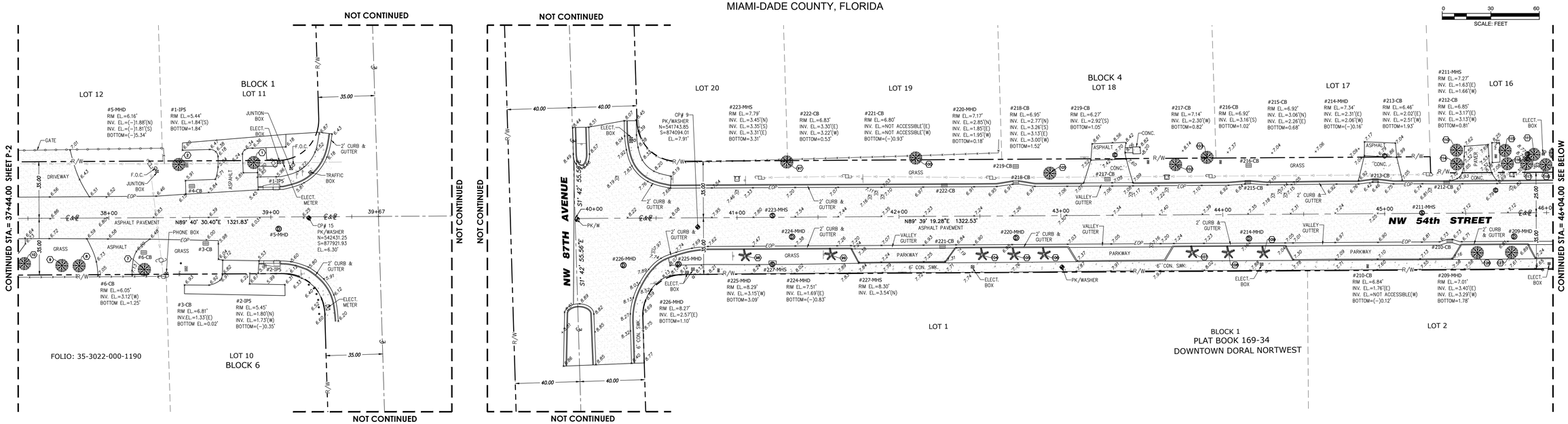
PREPARED FOR: PEVIDA HIGHWAY DESIGNERS, LLC
PROJECT NAME: NW 56th STREET FROM NW 87th AVENUE TO NW 79th AVE
DRAWING NAME: TOPOGRAPHIC SURVEY

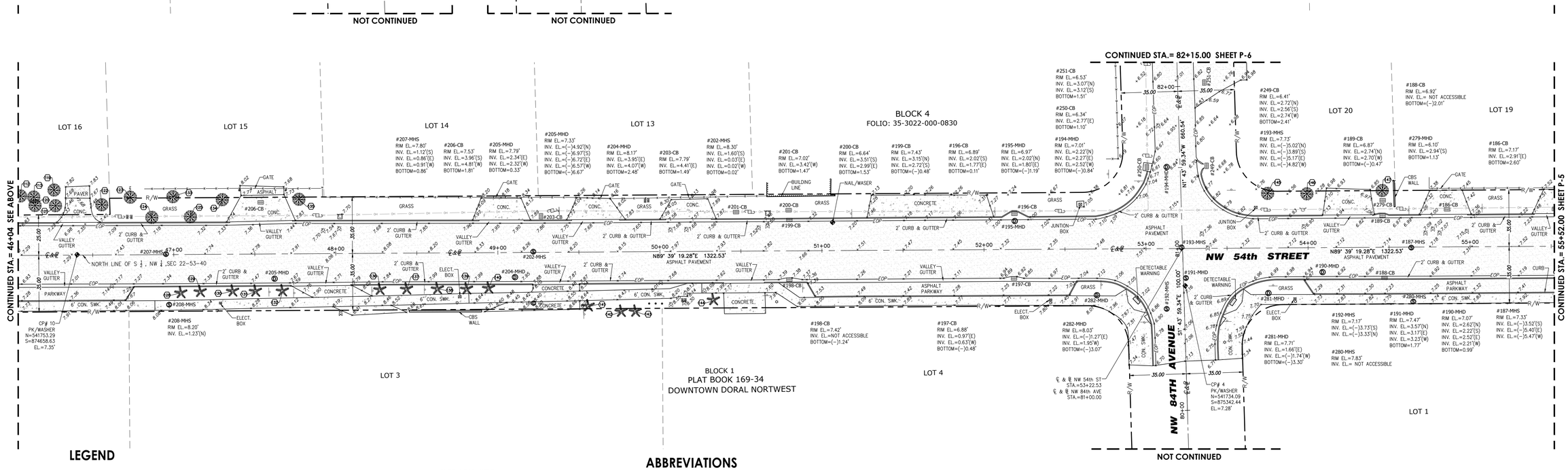
DATE: 10-06-2020

SHEET: T-3
3 OF 7 SHEETS

TOPOGRAPHIC SURVEY

NW 56th STREET FROM NW 87th AVENUE TO NW 79th AVENUE
NW 54th STREET FROM NW 87th AVENUE TO NW 79th AVENUE
NW 84th AVENUE FROM NW 54th STREET TO NW 58th STREET
NW 82th AVENUE FROM NW 54th STREET TO NW 58th STREET
CITY OF DORAL
MIAMI-DADE COUNTY, FLORIDA





LEGEND

- ICV — IRRIGATION CONTROL VALVE
- WV — WATER VALVE
- GV — GAS VALVE
- SIGN
- UTILITY WOOD POLE
- UTILITY CONCRETE POLE
- STORM SEWER CATCH BASIN
- STORM SEWER MANHOLE
- SANITARY SEWER MANHOLE
- FIRE HYDRANT
- WM — WATER METER
- x 0.00 — SPOT ELEVATION
- CLEAN OUT
- LIGHT POLE
- BACK FLOW PREVENTER
- BOLLARD
- OH — OH — OVER HEAD WIRE
- GUARD RAIL
- CHAIN LINK FENCE
- IRON FENCE
- WOOD FENCE
- TRAFFIC LIGHT
- TREE
- PALM

ABBREVIATIONS

ACCE.	=ACCESSIBLE
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L.F.	=LINEAL FEET
R.B	=REBAR
C.B.	=CATCH BASIN
NO.	=NUMBER
BLDG	=BUILDING
FND	=FOUND
B/L	=BASELINE
O.R.B.	=OFFICIAL RECORDS BOOK
(P)	=PLAT DATA
P.B	=PLAT BOOK
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P.O.B	=POINT OF BEGINNING
R/W	=RIGHT-OF-WAY
TYP.	=TYPICAL
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MH	=MANHOLE
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DATE:
REVISIONS:

SEAL: VINICIO CABRERA — STATE OF FLORIDA — PROFESSIONAL SURVEYOR AND MAPPER — No. LS6923

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BY: VINICIO CABRERA P.S.M. 6923 FOR THE FIRM
STATE OF FLORIDA

FIELD DATE: 09-23-20
DRAWN: Y.N.
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9551 NW 26th Place
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Ph: 305-409-9291

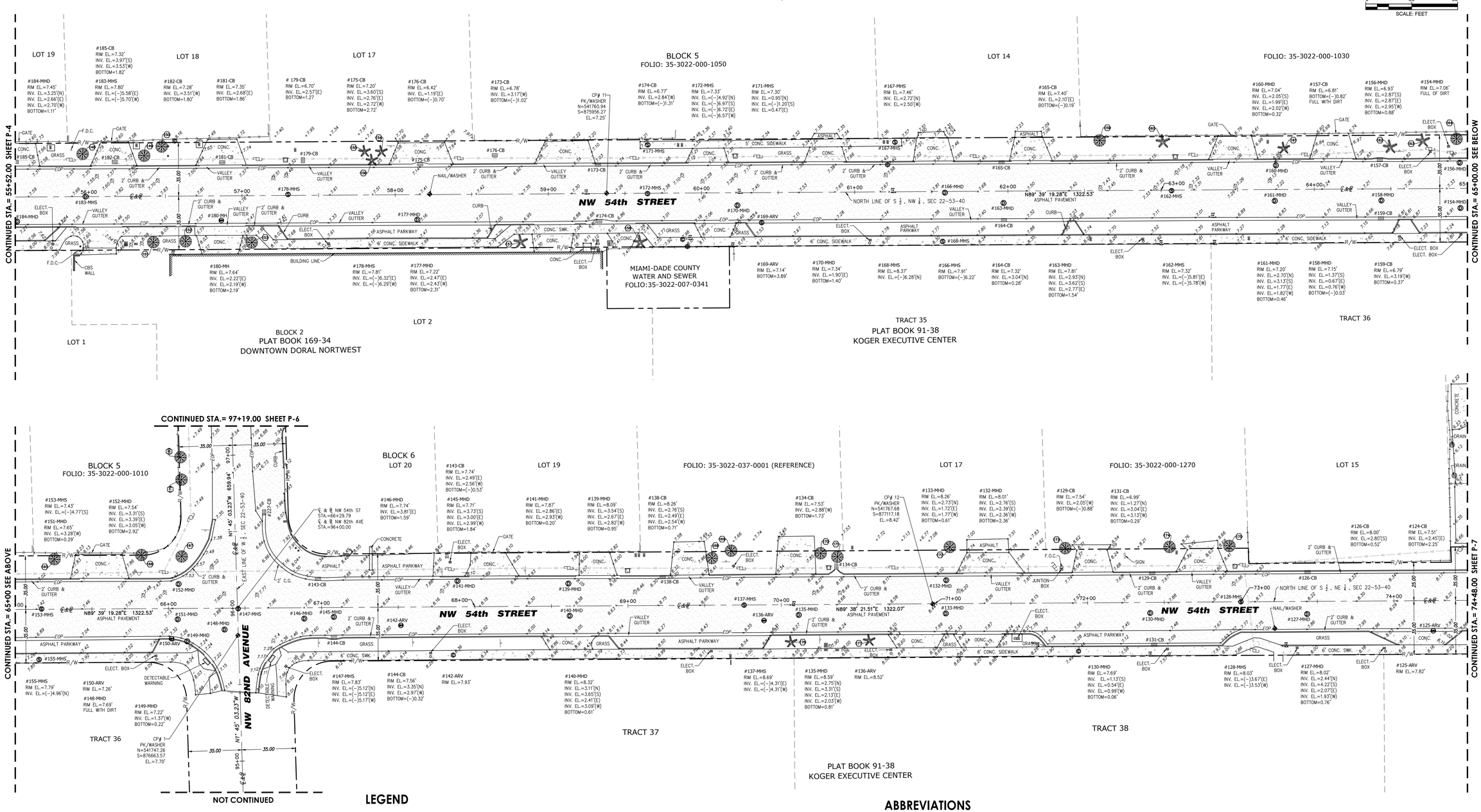
PREPARED FOR: PEVIDA HIGHWAY DESIGNERS, LLC
PROJECT NAME: NW 56th STREET FROM NW 87th AVENUE TO NW 79th AVE
DRAWING NAME: TOPOGRAPHIC SURVEY

DATE: 10-06-2020

SHEET: T-4
4 OF 7 SHEETS

TOPOGRAPHIC SURVEY

NW 56th STREET FROM NW 87th AVENUE TO NW 79th AVENUE
NW 54th STREET FROM NW 87th AVENUE TO NW 79th AVENUE
NW 84th AVENUE FROM NW 54th STREET TO NW 58th STREET
NW 82th AVENUE FROM NW 54th STREET TO NW 58th STREET
CITY OF DORAL
MIAMI-DADE COUNTY, FLORIDA



LEGEND

- IRRIGATION CONTROL VALVE
- WATER VALVE
- GAS VALVE
- SIGN
- UTILITY WOOD POLE
- UTILITY CONCRETE POLE
- STORM SEWER CATCH BASIN
- STORM SEWER MANHOLE
- SANITARY SEWER MANHOLE
- FIRE HYDRANT
- WATER METER
- SPOT ELEVATION
- CLEAN OUT
- LIGHT POLE
- BACK FLOW PREVENTER
- BOLLARD
- OVER HEAD WIRE
- GUARD RAIL
- CHAIN LINK FENCE
- IRON FENCE
- WOOD FENCE
- TRAFFIC LIGHT
- TREE
- PALM

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L.F.	=LINEAL FEET
R.B	=REBAR
C.B.	=CATCH BASIN
NO.	=NUMBER
BLDG	=BUILDING
FND	=FOUND
B/L	=BASELINE
O.R.B.	=OFFICIAL RECORDS BOOK
(P)	=PLAT DATA
P.B	=PLAT BOOK
PG.	=PAGE
P.O.B	=POINT OF BEGINNING
R/W	=RIGHT-OF-WAY
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SWK	=SIDEWALK
MHS	=MANHOLE-SANITARY SEWER
MHD	=MANHOLE-DRAINAGE STORM
MH	=MANHOLE
ARV	=AIR RELEASE VALVE

DATE:
REVISIONS:

SEAL: VINICIO CABRERA — STATE OF FLORIDA — PROFESSIONAL SURVEYOR & MAPPER — No. LS6923

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BY: VINICIO CABRERA P.S.M. #6923
STATE OF FLORIDA
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FIELD DATE: 09-23-20
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SCALE: AS SHOWN

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9551 NW 26th Place
Sunrise, Florida 33322
Ph. 305-409-9291

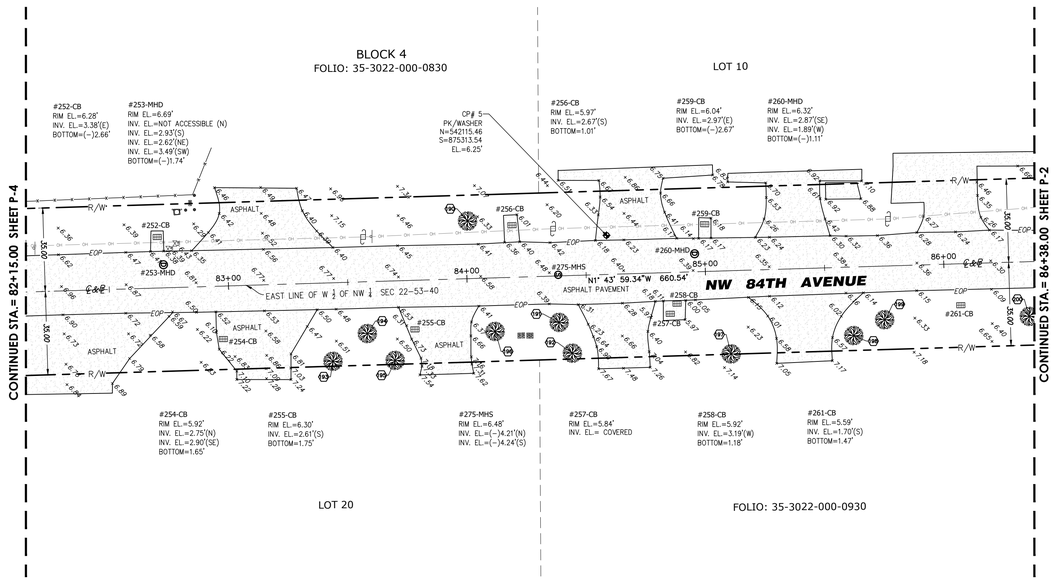
PREPARED FOR: PEVIDA HIGHWAY DESIGNERS, LLC
PROJECT NAME: NW 54th STREET FROM NW 87th AVENUE TO NW 79th AVE
DRAWING NAME: TOPOGRAPHIC SURVEY

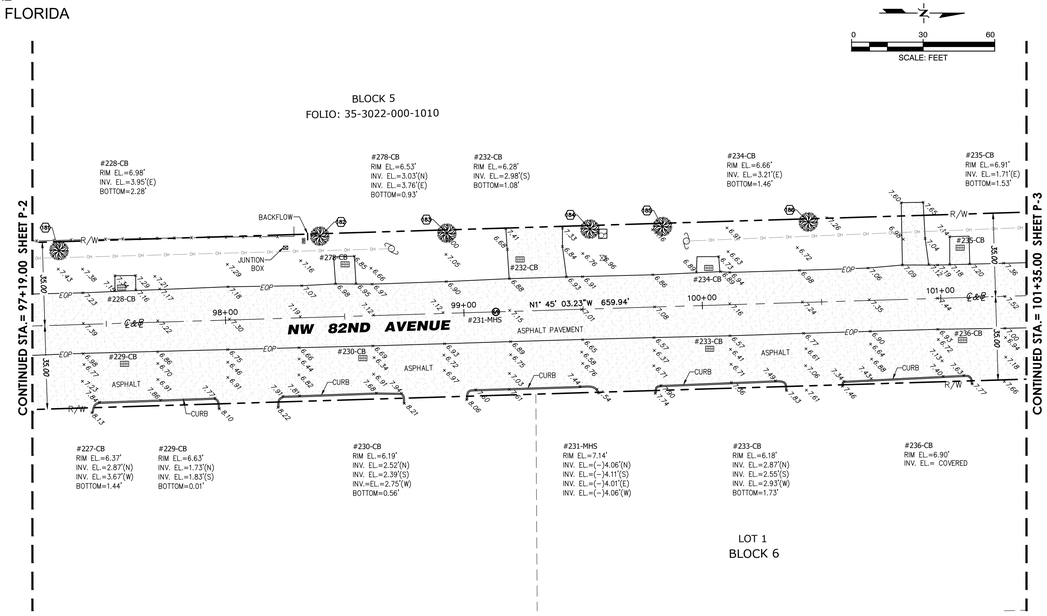
DATE: 20-06-2020

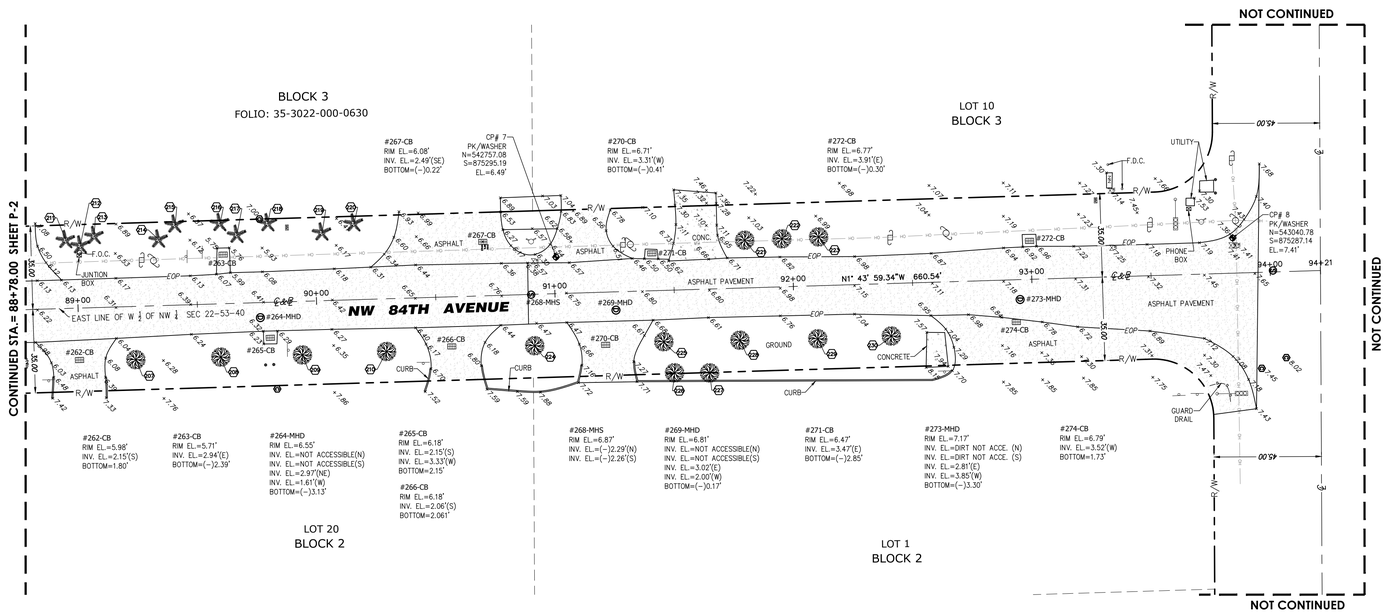
SHEET: T-5
5 OF 7 SHEETS

TOPOGRAPHIC SURVEY

NW 56th STREET FROM NW 87th AVENUE TO NW 79th AVENUE
NW 54th STREET FROM NW 87th AVENUE TO NW 79th AVENUE
NW 84th AVENUE FROM NW 54th STREET TO NW 58th STREET
NW 82th AVENUE FROM NW 54th STREET TO NW 58th STREET
CITY OF DORAL
MIAMI-DADE COUNTY, FLORIDA







LEGEND

- IRRIGATION CONTROL VALVE
- WATER VALVE
- GAS VALVE
- SIGN
- UTILITY WOOD POLE
- UTILITY CONCRETE POLE
- STORM SEWER CATCH BASIN
- STORM SEWER MANHOLE
- SANITARY SEWER MANHOLE
- FIRE HYDRANT
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- SPOT ELEVATION
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CONC.	=CONCRETE	FND	=FOUND	INV.	=INVERT
F.F.E	=FINISH FLOOR ELEVATION	B/L	=BASELINE	EL.	=ELEVATION
FND	=FOUND	O.R.B.	=OFFICIAL RECORDS BOOK	TOP	=TOP OF PIPE
F.O.C.	=FIBER OPTIC CABLE	(P)	=PLAT DATA	OH	=OVER HEAD
F.D.C.	=FIRE DEPARTMENT CONNECTION	P.B	=PLAT BOOK	SWK	=SIDEWALK
L.F.	=LINEAL FEET	PG.	=PAGE	MHS	=MANHOLE-SANITARY SEWER
R.B	=REBAR	P.O.B	=POINT OF BEGINNING	MHD	=MANHOLE-DRAINAGE STORM
C.B.	=CATCH BASIN	R/W	=RIGHT-OF-WAY	MH	=MANHOLE
		TYP.	=TYPICAL	ARV	=AIR RELEASE VALVE

DATE:
REVISIONS:

SEAL: VINICIO CABRERA — STATE OF FLORIDA — PROFESSIONAL SURVEYOR AND MAPPER — No. LS6923

FOR THE FIRM

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BY: VINICIO CABRERA P.S.M. #6923
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Sunrise, Florida 33322
Ph. 305-409-9291

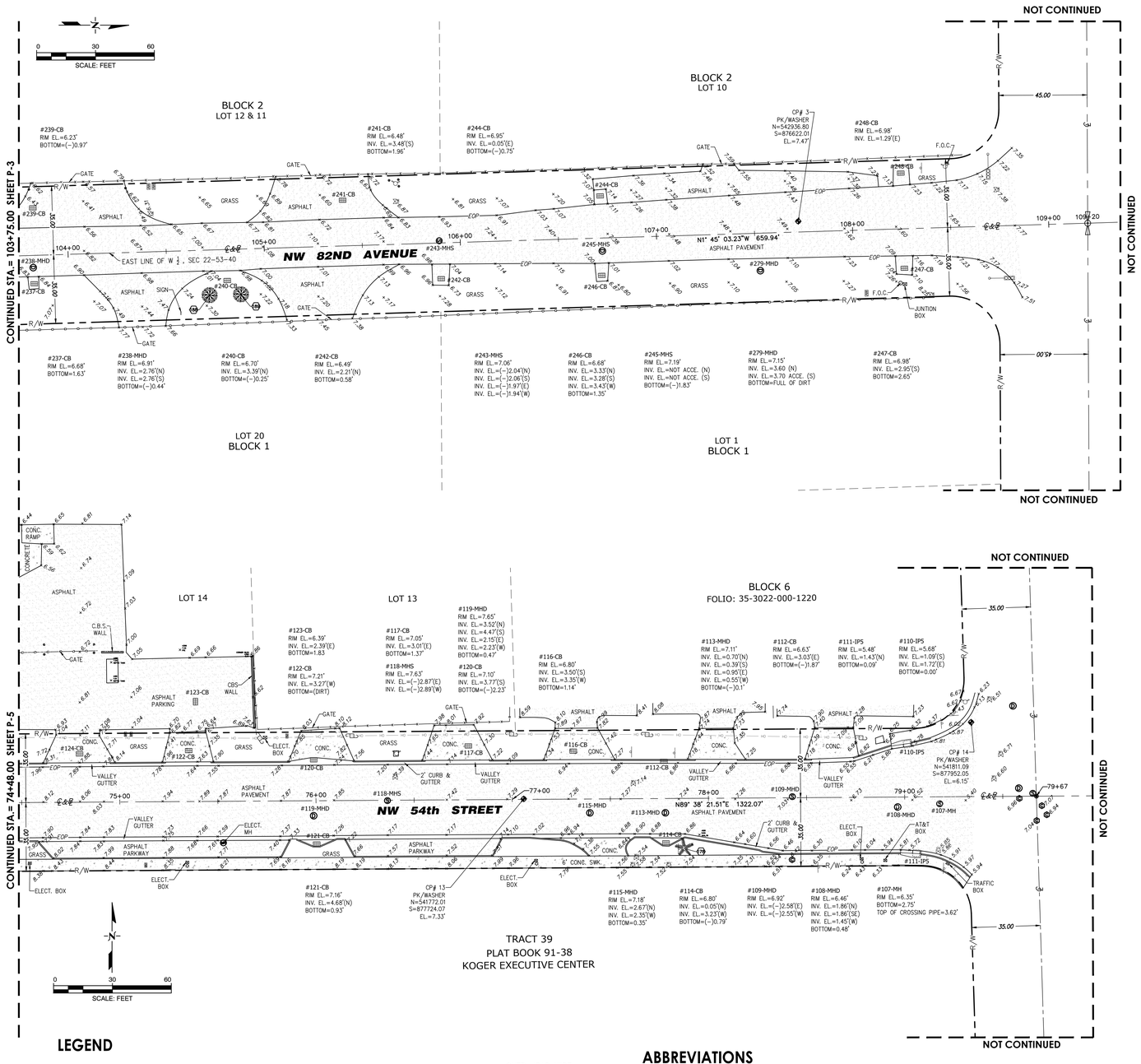
PREPARED FOR: PEVIDA HIGHWAY DESIGNERS, LLC
PROJECT NAME: NW 56th STREET FROM NW 87th AVENUE TO NW 79th AVE
DRAWING NAME: TOPOGRAPHIC SURVEY

DATE: 10-06-2020

SHEET: T-6

TOPOGRAPHIC SURVEY

NW 56th STREET FROM NW 87th AVENUE TO NW 79th AVENUE
NW 54th STREET FROM NW 87th AVENUE TO NW 79th AVENUE
NW 84th AVENUE FROM NW 54th STREET TO NW 58th STREET
NW 82th AVENUE FROM NW 54th STREET TO NW 58th STREET
CITY OF DORAL
MIAMI-DADE COUNTY, FLORIDA



TREE #	NAME	TRUNK (FT)	HIGH (FT)	CANOPY (FT)
1	WALNUT TREE	2.0	22.0	18.0
2	ALMEZ	3.0	20.0	25.0
3	PALM	2.0	20.0	20.0
4	PALM	2.0	20.0	20.0
5	PALM	2.0	20.0	20.0
6	PALM	2.0	20.0	20.0
7	WALNUT TREE	0.8	19.0	17.0
8	WILLOW TREE	1.0	18.0	16.0
9	WILLOW TREE	1.0	18.0	16.0
10	WILLOW TREE	1.0	18.0	16.0
11	WILLOW TREE	1.0	18.0	16.0
12	WILLOW TREE	1.5	20.0	18.0
13	WILLOW TREE	1.5	20.0	18.0
14	WILLOW TREE	1.5	20.0	18.0
15	PALM	1.5	20.0	18.0
16	PALM	1.5	20.0	18.0
17	PALM	1.5	20.0	18.0
18	PALM	1.5	20.0	18.0
19	PALM	1.5	20.0	18.0
20	PALM	1.5	20.0	18.0
21	WILLOW TREE	2.0	22.0	20.0
22	WILLOW TREE	2.0	22.0	20.0
23	WILLOW TREE	2.0	22.0	20.0
24	WILLOW TREE	2.0	22.0	20.0
25	WILLOW TREE	2.0	22.0	20.0
26	COCONUT TREE	1.0	15.0	10.0
27	COCONUT TREE	1.0	15.0	10.0
28	COCONUT TREE	1.0	15.0	10.0
29	COCONUT TREE	1.0	15.0	10.0
30	COCONUT TREE	1.0	15.0	10.0
31	COCONUT TREE	1.0	15.0	10.0
32	COCONUT TREE	1.0	15.0	10.0
33	COCONUT TREE	1.0	15.0	10.0
34	PALM TREE	1.0	25.0	15.0
35	COCONUT TREE	1.0	25.0	15.0
36	COCONUT TREE	1.0	25.0	15.0
37	COCONUT TREE	1.0	25.0	15.0
38	COCONUT TREE	1.0	25.0	15.0
39	COCONUT TREE	1.0	25.0	15.0
40	FICUS	1.5	25.0	20.0
41	FICUS	1.5	25.0	20.0
42	FICUS	1.5	25.0	20.0
43	FICUS	1.5	25.0	20.0
44	FICUS	1.5	25.0	20.0
45	FICUS	3.0	30.0	25.0
46	OAK	1.5	25.0	20.0
47	OAK	1.5	25.0	20.0
48	OAK	1.5	25.0	20.0
49	PINE TREE	1.0	12.0	6.0
50	PINE TREE	1.0	12.0	6.0
51	PALM TREE	1.0	18.0	15.0
52	PALM TREE	1.0	18.0	15.0
53	PALM TREE	1.0	18.0	15.0
54	OAK	3.0	30.0	30.0
55	OAK	3.0	30.0	30.0
56	OAK	3.0	30.0	25.0
57	OAK	3.0	30.0	25.0
58	FICUS	1.5	25.0	20.0
59	FICUS	1.5	25.0	20.0
60	FICUS	1.0	25.0	20.0
61	FICUS	1.5	24.0	20.0
62	FICUS	1.5	25.0	20.0
63	FICUS	1.5	25.0	20.0
64	FICUS	1.5	24.0	15.0
65	FICUS	1.0	25.0	20.0
66	FICUS	1.5	25.0	20.0
67	FICUS	1.5	25.0	20.0
68	FICUS	1.5	25.0	20.0
69	PALM TREE	1.0	15.0	10.0
70	PALM TREE	1.0	15.0	10.0
71	PALM TREE	1.0	15.0	10.0
72	GINKGO TREE	1.5	30.0	25.0
73	GINKGO TREE	1.5	30.0	25.0
74	GINKGO TREE	1.5	30.0	25.0
75	OAK	2.5	30.0	35.0
76	OAK	2.0	25.0	20.0
77	OAK	2.0	25.0	20.0
78	OAK	2.0	25.0	20.0
79	OAK	2.0	25.0	20.0
80	OAK	2.0	25.0	20.0
81	OAK	3.0	35.0	30.0
82	PALM TREE	1.0	15.0	12.0
83	PALM TREE	1.0	15.0	12.0
84	PALM TREE	1.0	15.0	12.0
85	OAK	2.0	20.0	15.0
86	OAK	2.0	20.0	15.0
87	OAK	2.0	20.0	15.0
88	OAK	2.0	20.0	15.0
89	OAK	2.5	25.0	20.0
90	OAK	2.5	25.0	20.0
91	OAK	2.5	25.0	20.0
92	PALM	2.0	15.0	12.0
93	PALM	2.0	15.0	12.0
94	PALM	0.5	15.0	10.0
95	PALM	0.5	15.0	10.0
96	PALM	0.5	15.0	10.0
97	OAK	2.0	20.0	25.0
98	PALM TREE	1.0	15.0	10.0
99	PALM TREE	1.0	15.0	10.0
100	OAK	2.0	20.0	25.0
101	OAK	2.0	20.0	25.0
102	OAK	2.0	20.0	25.0
103	OAK	2.0	20.0	25.0
104	PALM TREE	1.0	15.0	10.0
105	PALM TREE	1.0	15.0	10.0
106	PALM TREE	1.0	15.0	10.0
107	PALM TREE	1.0	15.0	10.0
108	PALM TREE	1.0	15.0	10.0
109	PALM TREE	1.0	15.0	10.0
110	PALM TREE	0.8	12.0	8.0
111	PALM TREE	0.8	12.0	8.0
112	PALM TREE	0.8	12.0	8.0
113	PALM TREE	0.8	12.0	8.0
114	OAK	0.5	10.0	5.0
115	OAK	0.5	10.0	5.0

TREE #	NAME	TRUNK (FT)	HIGH (FT)	CANOPY (FT)
116	OAK	0.5	10.0	5.0
117	OAK	0.5	10.0	5.0
118	OAK	0.5	10.0	5.0
119	OAK	0.5	10.0	5.0
120	OAK	0.5	10.0	5.0
121	OAK	0.5	10.0	5.0
122	OAK	0.5	10.0	5.0
123	FICUS	2.0	30.0	30.0
124	FICUS	2.0	30.0	30.0
125	FICUS	2.0	30.0	30.0
126	OAK	0.7	15.0	10.0
127	OAK	0.7	15.0	10.0
128	PALM TREE	2.0	25.0	15.0
129	PALM TREE	2.0	25.0	15.0
130	PALM TREE	2.0	25.0	15.0
131	PALM TREE	2.0	25.0	15.0
132	PALM TREE	2.0	25.0	15.0
133	FICUS	2.0	30.0	30.0
134	FICUS	2.0	30.0	30.0
135	FICUS	2.0	30.0	30.0
136	PALM TREE	2.0	30.0	15.0
137	PALM TREE	2.0	30.0	15.0
138	PALM TREE	2.0	30.0	15.0
139	PALM TREE	2.0	30.0	15.0
140	PALM TREE	2.0	30.0	15.0
141	PALM TREE	0.8	15.0	10.0
142	PALM TREE	2.0	30.0	15.0
143	PALM TREE	2.0	30.0	15.0
144	PALM TREE	0.8	15.0	10.0
145	ALMOND TREE	2.0	20.0	20.0
146	ALMOND TREE	2.0	20.0	20.0
147	ALMOND TREE	2.0	20.0	20.0
148	OAK	2.0	25.0	20.0
149	OAK	1.5	30.0	25.0
150	OAK	1.5	30.0	25.0
151	FICUS	1.0	15.0	15.0
152	OAK	1.0	15.0	15.0
153	OAK	1.0	15.0	15.0
154	PALM TREE	1.0	12.0	10.0
155	OAK	1.0	12.0	10.0
156	OAK	1.0	12.0	10.0
157	PALMA	1.0	15.0	12.0
158	PALMA	1.0	15.0	12.0
159	FICUS	2.0	25.0	25.0
160	PALMA TREE	2.0	10.0	12.0
161	PALMA TREE	2.0	10.0	12.0
162	PALMA TREE	2.0	10.0	12.0
163	PALMA TREE	2.0	10.0	20.0
164	OAK	2.0	15.0	20.0
165	OAK	2.0	20.0	25.0
166	OAK	2.0	15.0	20.0
167	OAK	2.0	15.0	20.0
168	WILLOW TREE	2.0	10.0	5.0
169	FICUS	2.0	20.0	20.0
170	FICUS	1.5	20.0	20.0
171	FICUS	1.5	20.0	20.0
172	OAK	2.0	30.0	30.0
173	OAK	2.0	30.0	30.0
174	OAK	2.0	30.0	30.0
175	OAK	2.0	30.0	30.0
176	PALM TREE	1.0	15.0	10.0
177	OAK	1.0	15.0	10.0
178	PALM TREE	1.0	18.0	10.0
179	OAK	2.0	25.0	20.0
180	OAK	1.0	18.0	10.0
181	OAK	1.0	18.0	10.0
182	OAK	2.0	30.0	30.0
183	OAK	2.0	30.0	30.0
184	OAK	2.0	30.0	30.0
185	OAK	2.0	30.0	30.0
186	OAK	2.0	30.0	30.0
187	FICUS	2.0	20.0	20.0
188	OAK	2.0	20.0	20.0
189	OAK	2.0	20.0	20.0
190	TAMARIND TREE	0.5	12.0	12.0
191	ACACIA	1.0	20.0	20.0
192	ACACIA	1.0	20.0	20.0
193	FICUS	1.0	25.0	20.0
194	FICUS	1.0	25.0	20.0
195	FICUS	1.0	25.0	20.0
196	FICUS	1.0	25.0	20.0
197	OAK	1.5	25.0	25.0
198	OAK	1.5	25.0	25.0
199	OAK	1.5	25.0	25.0
200	OAK	1.5	25.0	25.0
201	OAK	2.0	35.0	40.0
202	OAK	2.0	35.0	30.0
203	CHERRY TREE	1.0	15.0	15.0
204	TAMARIND TREE	1.0	20.0	18.0
205	TAMARIND TREE	1.0	20.0	18.0
206	TAMARIND TREE	1.0	20.0	18.0
207	TAMARIND TREE	1.0	20.0	18.0
208	TAMARIND TREE	1.0	20.0	18.0
209	TAMARIND TREE	1.0	20.0	18.0
210	TAMARIND TREE	1.0	20.0	18.0
211	PALM TREE	1.5	25.0	15.0
212	PALM TREE	1.5	25.0	15.0
213	PALM TREE	1.5	25.0	15.0
214	PALM TREE	1.5	25.0	15.0
215	PALM TREE	1.5	25.0	15.0
216	PALM TREE	1.5	25.0	15.0
217	PALM TREE	1.5	25.0	15.0
218	PALM TREE	1.5	25.0	15.0
219	PALM TREE	1.5	25.0	15.0
220	PALM TREE	1.5	25.0	15.0
221	TAMARIND TREE	0.7	15.0	12.0
222	TAMARIND TREE	0.7	15.0	12.0
223	TAMARIND TREE	0.7	15.0	12.0
224	TAMARIND TREE	1.0	15.0	15.0
225	TAMARIND TREE	1.0	15.0	15.0
226	PALM TREE	1.0	12.0	10.0
227	PALM TREE	1.0	12.0	10.0
228	TAMARIND TREE	1.0	15.0	15.0
229	TAMARIND TREE	1.0	15.0	15.0
230	TAMARIND TREE	1.0	15.0	15.0

LEGEND

- IRRIGATION CONTROL VALVE
- WATER VALVE
- GAS VALVE
- SIGN
- UTILITY WOOD POLE
- UTILITY CONCRETE POLE
- STORM SEWER CATCH BASIN
- STORM SEWER MANHOLE
- SANITARY SEWER MANHOLE
- FIRE HYDRANT
- WATER METER
- SPOT ELEVATION
- CLEAN OUT
- LIGHT POLE
- BACK FLOW PREVENTER
- BOLLARD
- OVER HEAD WIRE
- GUARD RAIL
- CHAIN LINK FENCE
- IRON FENCE
- WOOD FENCE
- TRAFFIC LIGHT
- TREE
- PALM

ABBREVIATIONS

ACCE.	=ACCESSIBLE
C.L.F.	=CHAIN LINK FENCE
CONC.	=CONCRETE
F.F.E	=FINISH FLOOR ELEVATION
FND	=FOUND
F.O.C.	=FIBER OPTIC CABLE
F.D.C.	=FIRE DEPARTMENT CONNECTION
L.F.	=LINEAL FEET
R.B	=REBAR
C.B.	=CATCH BASIN
NO.	=NUMBER
BLDG	=BUILDING
FND	=FOUND
B/L	=BASELINE
O.R.B.	=OFFICIAL RECORDS BOOK
(P)	=PLAT DATA
P.B	=PLAT BOOK
PG.	=PAGE
P.O.B	=POINT OF BEGINNING
R/W	=RIGHT-OF-WAY
TYP.	=TYPICAL
T.B.	=TANGENT BEARING
C.O.	=CLEAN OUT
INV.	=INVERT
EL.	=ELEVATION
TOP	=TOP OF PIPE
OH	=OVER HEAD
SWK	=SIDEWALK
MHS	=MANHOLE-SANITARY SEWER
MHD	=MANHOLE-DRAINAGE STORM
MH	=MANHOLE
ARV	=AIR RELEASE VALVE

DATE:
REVISIONS:

SEAL:
VINICIO CABRERA LEWIS
No. LS6923
STATE OF FLORIDA
PROFESSIONAL SURVEYOR AND MAPPER

CERTIFICATION:
THIS SURVEY MAP AND REPORT OR THE COPIES THEREOF ARE NOT VALID WITHOUT THE ORIGINAL SIGNED SEAL OF A FLORIDA REGISTERED PROFESSIONAL SURVEYOR AND MAPPER.

BY: VINICIO CABRERA P.S.M. #6923
STATE OF FLORIDA
FOR THE FIRM

FIELD DATE: 09-23-20
DRAWN: Y.N.
CHECKED: V.C.
SCALE: AS SHOWN

PEGASUS LAND SURVEYORS INC.
9551 NW 26th Place
Sunrise, Florida 33322
Ph. 305-409-9291

PREPARED FOR: PEVIDA HIGHWAY DESIGNERS, LLC
PROJECT NAME: NW 56th STREET FROM NW 87th AVENUE TO NW 79th AVE
DRAWING NAME: TOPOGRAPHIC SURVEY

DATE: 10-06-2020

SHEET: T-7
7 OF 7 SHEETS

City of Doral

Roadway Improvements at NW 84th Ave,
NW 82nd Ave, NW 54th St
and NW 56th St
City of Doral, Miami-Dade, FL.
GCES Project No. G10201017

Geotechnical Engineering Services

Geotechnical Data Report

GCES ENGINEERING SERVICES, LLC
10860 NW 138th Street I Unit 4 I Hialeah Gardens, FL 33018
305.964.0669 / 954.440.8623
www.gces-usa.com

October 14, 2020

Geotechnical ■ Construction ■ Engineering ■ Solutions

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October 14, 2020

Eugene Collings-Bonfill, P.E., P.S.M., DBIA, PMP, CFM
Assistant Director/Chief of Engineering
City of Doral
8401 NW 53 Terrace
Doral, FL 33166

Subject: Geotechnical Engineering Services
Geotechnical Data Report
Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St
City of Doral, Florida
GCES Project No. G10201017

Dear Mr. Collings-Bonfill:

GCES Engineering Services, LLC (GCES) has completed the geotechnical engineering services in connection with the above referenced project. These services were performed in accordance with our proposal GCES's proposal No.: P10-0520001 dated May 12, 2020.

This geotechnical data report presents the results of the subsurface exploration and laboratory testing.

We appreciate the opportunity to provide our services on this project. If you have any questions concerning the information provided, please do not hesitate to contact our office.

GCES ENGINEERING SERVICES, LLC

Dhayana Chacon
Engineering Staff

Alejandro R. Montenegro, P.E.
Senior Geotechnical Engineer
Florida PE # 59426

ALEJANDRO R. MONTENEGRO LICENSE No. 59426 STATE OF FLORIDA PROFESSIONAL ENGINEER

10/14/20

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TABLE OF CONTENTS

APPENDICES

APPENDIX A

Vicinity Map - Figure 1
Boring Location Plan, Figures 2A through 2D
Exfiltration Test Location Plan, Figures 2E and 2F
Pavement Core Location Plan, Figures 2G and 2H
Soil Survey Map - Figure 3
USGS Map – Figure 4
Usual Open Hole – Figure 5

APPENDIX B

Roadway Soil Profile - Sheets 1 through 3

APPENDIX C

Tables 1A through 1C - Summary of Test Boring Locations
Table 1D - Summary of Exfiltration Test Locations
Table 1E - Summary of Pavement Core Locations
Tables 2A through 2C - Summary of Laboratory Testing Results
Table 3 - Pavement Coring Data
Table 4 - Summary of Exfiltration Test Results
Table 5 - Soil Boring Information With GWT

APPENDIX D

Grain Size Analysis Test Results and Curves
Exfiltration Test Sheets
Pavement Core Photographs
Field Exploratory Description
Laboratory Testing Procedure
Unified Soil Classification System

1.0 INTRODUCTION

1.1 GENERAL

GCES Engineering Services. LLC, (GCES) has prepared a geotechnical data report (GDR) to present the findings of our geotechnical subsurface exploration and laboratory test data and to summarize existing geotechnical subsurface information for the subject project.

We understand the City intends to advertise the project area as a design-build for a complete streets program of roadway improvements. Thus, this geotechnical data report was prepared to be included as attachments to the RFP.

1.2 PROJECT LOCATION

The location of the proposed improvements is located within the boundaries of NW 84th Ave and NW 79th Ave and NW 58th Street and NW 54th Street in the City of Doral in Miami-Dade County, Florida. We have appended a project Vicinity Map, Figure 1, which identifies the location of the study area. This map is presented in Appendix A.

1.3 PROJECT DESCRIPTION

GCES understands that the project involves the improvement of the following roadways:

- North side of NW 54 Street between NW 87th and NW 79th Avenues
- All of NW 56 Street between NW 87th and NW 79th Avenues
- All of NW 82 Avenue between NW 54th and NW 58th Streets
- All of NW 84 Avenue between NW 54th and NW 58th Streets

The total length of roadway improvement is approximately 10,500 Linear feet. The proposed improvement will include possible widenings and some areas may be built out from ROW to ROW possibly including sidewalks, shared use paths and on street parking. We anticipate the proposed widened portions will match the existing grade elevations.

If any of our understandings is not correct or if the structure differs from the characterization we have provided in this report, please inform us immediately so that we may re-evaluate our analyses.

2.0 SCOPE OF SERVICES

Our services for this project consisted of obtaining subsurface soil data to summarize subsurface conditions. These services will include field and laboratory testing programs. The services included the following:

- Conducted a field reconnaissance prior to the subsurface exploration.

- Assessed conditions with respect to the drilling equipment access, general topographic site conditions, property restrictions, overhead utilities, and utility underground.

- Coordinated with utility locating service to locate utilities within rights-of-ways and easements for the boring.

- Marked the boring location in the field by GCES personnel using layout procedures.

- Reviewed of available subsurface test data, such as the "Soil Survey of Broward County, Florida" published by the United States Department of Agriculture (USDA) and the USGS survey map for the project vicinity.

- Executed a program of subsurface exploration consisting of subsurface sampling and field testing. The subsurface sampling was accomplished by performing a total of fifty-four (54) roadway borings. Due to site constraints and overhead power lines along the widening alignment on NW 54th Street, the subsurface sampling was accomplished by performing a total of nineteen (19) hand auger borings. The borings performed along NW 84th Ave, NW 82nd Ave, and NW 56th Street consisted of SPT borings (SPT borings with continuous sampling substituted Auger borings) with termination depths ranging from 4 and 10 feet below the existing grades. In each boring, samples were collected virtually continuously from the ground surface to

boring termination depths. In addition, exfiltration tests were performed to determine the hydraulic conductivity of the subsurface soils.

- Collected a total of ten (10) pavement core samples from the project site.

- Classified soil samples using the AASHTO Soil Classification System and performed a limited laboratory testing to establish the soil properties. The laboratory testing included grain size analysis, moisture content and organic content determination and Atterberg limit tests.

- Measure groundwater levels in the borings.

- Reviewed field and laboratory data, then prepare a Geotechnical Data Report (GDR) to provide geotechnical information pertaining to the site subsurface soil, rock, and water conditions to support the city with the RFP.

3.0 FIELD EXPLORATION AND LABORATORY TESTING

3.1 FIELD TEST LOCATION AND UTILITY CLEARANCE

The boring, exfiltration and pavement core locations were located in the field by a hand-held Global Positional System (GPS) device, unit model Garmin Instinct 20X, with an accuracy of +/- 10 feet, existing features encountered in the field and a sketch drawing provided by Mr. Eugene Collings-Bonfill, P.E which shows the limits of the proposed widening.

A summary of the field test locations performed is presented in Tables 1A through 1E of Appendix C. Utility clearances were coordinated and updated as required for the duration of the field investigation. Some boring locations were offset from its original location to avoid any conflict with underground utilities.

3.2 FIELD EXPLORATION

The field exploration included hand auger borings and Standard Penetration Test (SPT) borings at locations accessible to our drilling equipment and in areas cleared of underground utilities. A brief description of the Field Exploration procedures employed in our subsurface investigation is provided in Appendix D of this report.

3.2.1 ROADWAY BORINGS - STANDARD PENETRATION TEST (SPT)

GCES's field exploration consisted of performing five Standard Penetration Test (SPT) borings (borings with continuous sampling substituted Auger borings) to depths ranging from 4 and 10 feet below existing grade. The field exploration was conducted between September 9, 2020 and October 8, 2020.

The SPT borings were performed using a truck-mounted drill rig equipped with a calibrated automatic hammer. The boreholes were advanced using drilling mud techniques and casing. The boring was performed in general accordance with ASTM Standard D-1586.

The SPT borings were continuously sampled in the upper 10 feet. Thereafter, the sampling interval was every 5 feet. Each boring was logged by the on-site personnel during the field exploration. Disturbed soil samples were placed in glass jars or sealed plastic bags and returned to our laboratory for additional visual classification by a GCES Engineer. Upon completion of the SPT borings, the boreholes were backfilled with cement grout, the surface restored (with cold mix asphalt where applicable), and the site cleaned as required.

The results of the SPT tests are presented on the generalized soil profile, Roadway Soil Profile – Sheets 1 through 3 included in Appendix B. These sheets present a generalized soil profile along with groundwater levels. The Soil Profile represent an interpretation of the field log and includes modifications based on a geotechnical engineer's visual classification of the samples returned to the laboratory. The boring locations can be found on the Boring Location Plan, Figures 2A through 2D, in Appendix A. Due to the scale of the drawing, the boring shown on the Boring Location Plan should be considered approximate. A summary of the boring locations performed is presented in Tables 1A through 1C of Appendix C.

3.2.2 HAND AUGER BORING

Twenty shallow hand auger borings were performed along the proposed roadway widening on NW 54th Street to depths ranging from 0.5 and 2 feet from existing ground surface between September 9, 2020 and October 8, 2020.

The hand augers were performed at the following locations:

AB-1, AB-2, AB-3, AB-4, AB-5. AB-6. AB-8, AB-9, AB-10, AB-11, AB-13, AB-14, AB-16, AB-17, AB-18, AB-19, AB-20 and AB-21

The hand augers were terminated at shallow depths than the originally scheduled, 5-foot depth due to auger refusal. The hand auger borings were performed by manually twisting and advancing an auger into the ground in 4 to 6-inch increments. As each soil type revealed, representative samples were placed in air-tight jars and returned to the laboratory for review by a geotechnical engineer and confirmation of the field classification. The results of the hand auger borings are presented on the generalized soil profile, Roadway Soil Profile – Sheets 1 through 3 included in Appendix B.

3.2.3 EXFILTRATION TESTS

The exfiltration tests were performed in general accordance with SFWMD procedures for the "Usual Condition Constant Head" Exfiltration Tests. The constant-head exfiltration test were performed at the locations indicated on the Summary of Exfiltration Test Locations in Table 1D provided in Appendix C. The approximate test locations are also shown on the Exfiltration Test Location Plan, Figures 2E and 2F in Appendix A.

The tests were performed during the period of September 23, 2020 and September 24, 2020. The tests were performed in 6-3/4-inch diameter augered boreholes predrilled to depths of 20 feet below the existing ground surface, using hollow-stem auger techniques. Water was then pumped into a 6-inch cased borehole to attempt to raise the water level in the boreholes to the ground surface level. Once the inflow stabilized with the outflow rate, the average pumping rate and the elevation of the water obtained with this stabilized flow rate were then recorded. The hydraulic conductivity value was calculated based on the results obtained in the field and reported in units of cubic feet per second per square foot of seepage area per foot of head (cfs/ft2-ft).

The results of the exfiltration tests are summarized in Table 4 in Appendix C and on the exfiltration test log sheets EX-1 through EX-10 in Appendix D.

3.2.4 PAVEMENT CORES

A total of ten (10) pavement core samples were cut along the existing roadway. The asphalt pavement cores were obtained using a 6-inch diameter core barrel that was attached to an AWJ diameter drilling rod and to a truck mounted drill rig. The core barrel was advanced by slowly drilling through the asphalt pavement. Water was used to aid the drilling process and to keep the core barrel cool.

Upon reaching the surface of the base materials, the coring process was terminated and the pavement core was retrieved. The total thickness of the asphalt pavement was measured and recorded. Upon completion, all pavement cores were patched with cold asphalt concrete patch. The field cores were labeled in the field, visually observed by our field technician to record the condition of the cores and wrapped with masking tape.

The total thickness of the asphalt pavement was measured and recorded. We have prepared a Pavement Coring Data sheet, Table 3, and is presented in Appendix C. In addition, representative photographs of the pavement cores are also included in Appendix D. The approximate location of the pavement cores is presented on the Pavement Core Location Plan, Figures 2G and 2H in Appendix A and indicated on the Summary of Pavement Core Locations in Table 1E provided in Appendix C,

3.3 WATER LEVEL MEASUREMENTS

A water level depth was obtained during the test boring operations. In relatively previous soils, such as sandy (granular) soils, the indicated depths are usually groundwater levels. Seasonal variations, tidal conditions, temperature, land use, and recent rainfall conditions may influence the depths of the groundwater.

3.4 TRAFFIC CONTROL AND SIGNS

Flagmen, barricades, cones, and sign devices were used in general compliance with Roadway and Traffic Design Standards Index Drawings.

3.5 LABORATORY TESTING

Representative samples collected from the SPT boring were visually reviewed in the laboratory by a geotechnical engineer to confirm the field classifications. The descriptions of the soils indicated in the Roadway Soil Profile are in general accordance with the enclosed Unified Soil Classification System (USCS) and the American Association of State Highway and Transportation Officials (AASHTO) Soil Classification System in general accordance with the American Society of Testing and Materials (ASTM) test designation D-3282, titled "Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes."

Designated group symbols are given on the generalized soil profiles. The classification was based on visual observations, texture, and consistency. The visual classification of the soil was confirmed with the use of the laboratory test results. Laboratory index tests consisting of sieve analyses, natural moisture content and organic content determination were performed on selected samples. The tests were performed on selected samples believed to be representative of the materials encountered.

The results of the laboratory tests are presented in Tables 2A through 2C - Summary of Laboratory Testing Results in Appendix C of this report. The grain-size analysis curves are presented in Appendix D of this report. A brief description of the laboratory testing procedure employed in our subsurface investigation is provided in Appendix D of this report. A brief description of the USCS classification system is attached to this report, Appendix D.

4.0 SITE AND SUBSURFACE CONDITIONS

4.1 SITE CONDITIONS

Our understanding of the existing site conditions is based on the information provided to us by RS&H Inc, and our observations during the field exploration. The existing roadway is a two-lane divided paved roadway, with sidewalks and existing right of ways. The adjacent areas are generally developed and include mainly retail\commercial\industrial\office activities.

The ground surface of the proposed widening to be constructed along the north side of NW 54th Street is mainly covered by grass. The ground surface along NW 84th Ave, NW 82nd Ave, and NW 56th Street was covered either by asphalt or gravel.

4.2 SOIL SURVEY

The Soil Surveys of Broward County, Florida, as prepared by the U.S. Department of Agriculture, Soil Conservation Service (later renamed the Natural Resource Conservation Service), dated 1967, identifies one soil type at the subject site as follows:

15 - Urban Land. This map unit is in areas where more than 85 percent of the surface is covered by shopping centers, parking lots, streets, sidewalks, airports, large buildings, houses, and other structures. The natural soil cannot be observed. The soils in open areas, mostly lawns, vacant lots, playgrounds, and parks, are mainly Udorthents. These soils generally have been altered by land grading and shaping or have been covered with about 18 inches of extremely stony, loamy fill material. Areas of these soils are so small that mapping them separately is impractical. We note that the maximum depth of the survey is six feet.

A USDA Soil Survey Map of the site is included in Appendix A.

It should be noted that the Soil Survey is not intended as a substitute for site-specific geotechnical exploration; rather it is a useful tool in planning a project scope in that it provides information on soil types likely to be encountered. Boundaries between adjacent soil types on the Soil Survey maps are approximate.

4.3 USGS GEOLOGICAL SURVEY QUADRANGLE MAP

The Quadrangle Survey Map published by the United States Geological Survey (USGS) was reviewed for the proposed project alignment. Based on the review, the project is located within the USGS "Hialeah" Quadrangle Map (1994), Township 53 South, Range 40 East, Section 16 and 22. A reproduction of the USGS map for the project area, Figure 4, is illustrated in Appendix A of this report.

4.4 SUBSURFACE CONDITIONS

4.4.1 REGIONAL GEOLOGY

Miami-Dade County is located in the Coastal Lowlands region of the Florida peninsula. The coastal lowlands consist of nearly level plains, and within Dade County the land surface is generally below Elevation +25 MSL. The surficial soils are comprised of pockets and remnants of Pamlico Sands. The sands are underlain by Miami Limestone (oolitic limestone) followed by limestone and/or sandstone and sand lenses of the Fort Thompson and Tamiami Formations.

The Pamlico Formation is composed of non-fossiliferous, unconsolidated quartz fine sand. Except where outcrops of limestone and man-made fills occur, this formation covers the Miami Limestone. Miami Limestone can be found at or near the surface in the Miami-Dade area. This formation is an oolitic limestone that is generally less than 40 feet thick. It characteristically contains large quantities of ooliths, which are small, spherical particles formed when calcite or aragonite was deposited in concentric layers around a nucleus of some type.

This formation contains solution channels in the limestone which may be up to several feet in diameter at some locations, and are filled with quartz fine sand and uncemented calcareous materials. The limestone varies in both thickness and competency within the investigated area. The degree of cementation, and therefore the competency of the rock, was influenced by both the abundance and the type of calcareous material in the original deposit.

The Fort Thompson Formation, which consists of interbedded limestone, sand, and shells, is one of the most productive units within the Biscayne aquifer. It averages 50 to 70 feet in thickness. It typically consists of alternating freshwater and marine sediments, which generally are permeable. The limestone beds in the Fort Thompson Formation can be cavernous and interconnected, thus providing channels through which water can flow.

The Fort Thompson Formation is composed of sediments of variable lithologies. The lithologies include non-fossilferous quartz fine sand, fossilferous quartz sandy limestone, coralline limestone, freshwater limestone and quartz sandstone. These lithologies alternate abruptly in thickness and lateral extent.

4.4.2 ROADWAY BORING RESULTS

Soil stratification is based on an examination of the recovered soil samples, the laboratory testing, and interpretation of field boring logs by a geotechnical engineer or geologist.

The results of the borings performed for roadway improvements are presented on Sheets 1 through 3 in the form of Soil Profiles along with the profile legend and other pertinent information such as measured groundwater levels. Tables 2A through 2C - Summary of Laboratory Testing Results are provided to show the general range of engineering properties measured in the laboratory for the various soil strata encountered during our exploration.

The stratification lines represent the approximate boundaries between soil types of significantly different engineering properties. The actual transition may be gradual. In some cases, small variations in properties not considered pertinent to our engineering evaluation may have been abbreviated or omitted for clarity. The profiles represent the conditions at the boring locations only and variations may occur among the borings.

The strata depths are referenced from the existing ground surface at the time of the field exploration, as well as the approximate ground surface elevation extrapolated from topographic plans.

4.5 GROUNDWATER CONDITIONS

Groundwater level was measured while drilling for the presence and level of groundwater. The groundwater level observed at the time of drilling is indicated on the Roadway Soil Profile – Sheets 1 through 3.

During the subsurface exploration, groundwater was observed at the SPT soil borings at depths ranging from about 3.1 and 4.8 feet below the existing ground surface. Groundwater was no observed at the hand auger boring locations.

The groundwater level observation provides an approximate indication of the groundwater conditions existing on the site at the time the boring was drilled. It should be noted that fluctuations in the groundwater table can occur due to

seasonal variations, tidal conditions, recent rainfall conditions and other factors not evident at the time the borings were performed.

In addition, perched water can develop over low permeability soil strata following periods of heavy or prolonged precipitation. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project. The actual groundwater levels shall be determined prior to the time of the construction to evaluate groundwater impact on their construction procedure.

We have prepared a table showing the groundwater table levels measured in all the borings applicable to the project. The information is presented in Appendix C, Table 5 - Soil Boring Information With GWT.

5.0 LIMITATIONS

This Report of Geotechnical Exploration were prepared for exclusive use of City of Doral for specific application of Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St in the City of Doral, Florida, and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, either express or implied, are intended or made.

In the event that changes in the nature, design, or location of the project as outlined in this report are planned, the data contained in this report shall not be considered valid unless GCES reviews the changes. Site safety, excavation support, and dewatering requirements are the responsibility of others. The assessment of site environmental conditions for the presence of contaminants in the soil, rock, surface, or groundwater of the site was beyond the scope of this exploration.

APPENDIX A

VICINITY MAP - FIGURE 1

BORING LOCATION PLAN, FIGURES 2A THROUGH 2D

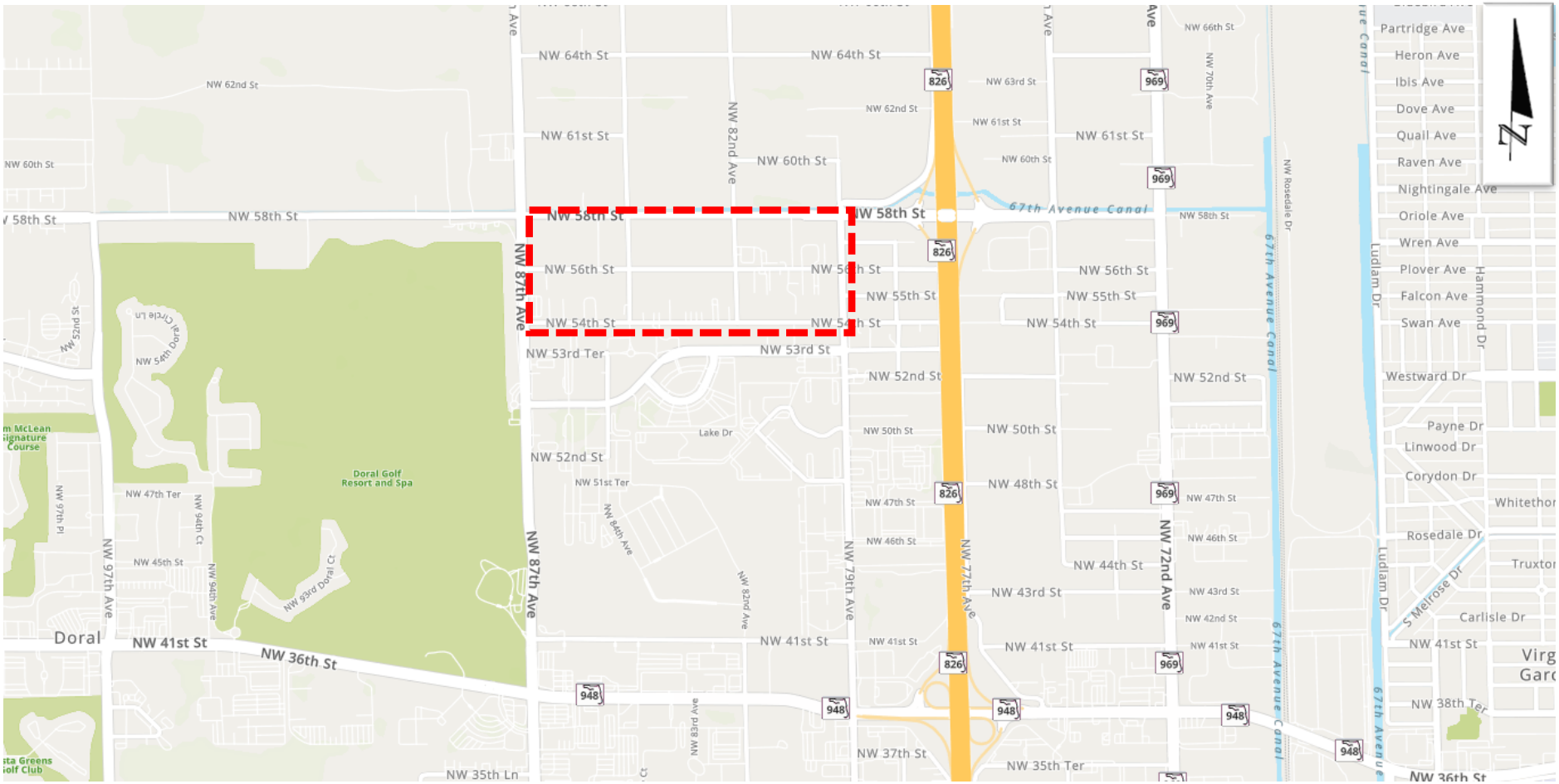
EXFILTRATION TEST LOCATION PLAN, FIGURES 2E AND 2F

PAVEMENT CORE LOCATION PLAN, FIGURES 2G AND 2H

SOIL SURVEY MAP - FIGURE 3

USGS MAP – FIGURE 4

USUAL OPEN HOLE – FIGURE 5



LEGEND

SUBJECT SITE

Site Boundaries Are Approximate

VICINITY MAP

Reference: http://www.mapquest.com

Project Manager:	ARM
Drawn by:	DC
Checked by:	ARM
Approved by:	ARM
Project No.	G10201017
Scale:	N.T.S.
File Name:	
Date:	10/13/2020

GCES
GEOTECHNICAL CONSTRUCTION & ENGINEERING SOLUTIONS

VICINITY MAP

Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St
City of Doral, Florida

FIG
1

LEGEND

⊕ *Approximate Boring Location*

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Manager: ARM	Project No. G10201017
Drawn by: DC	Scale: N.T.S.
Checked by: ARM	File Name:
Approved by: ARM	Date: 10/10/2020

GCES
GEOTECHNICAL CONSTRUCTION & ENGINEERING SOLUTIONS

BORING LOCATION PLAN

Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St
City of Doral, Florida

FIG 2A

LEGEND

⊕ *Approximate Boring Location*

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

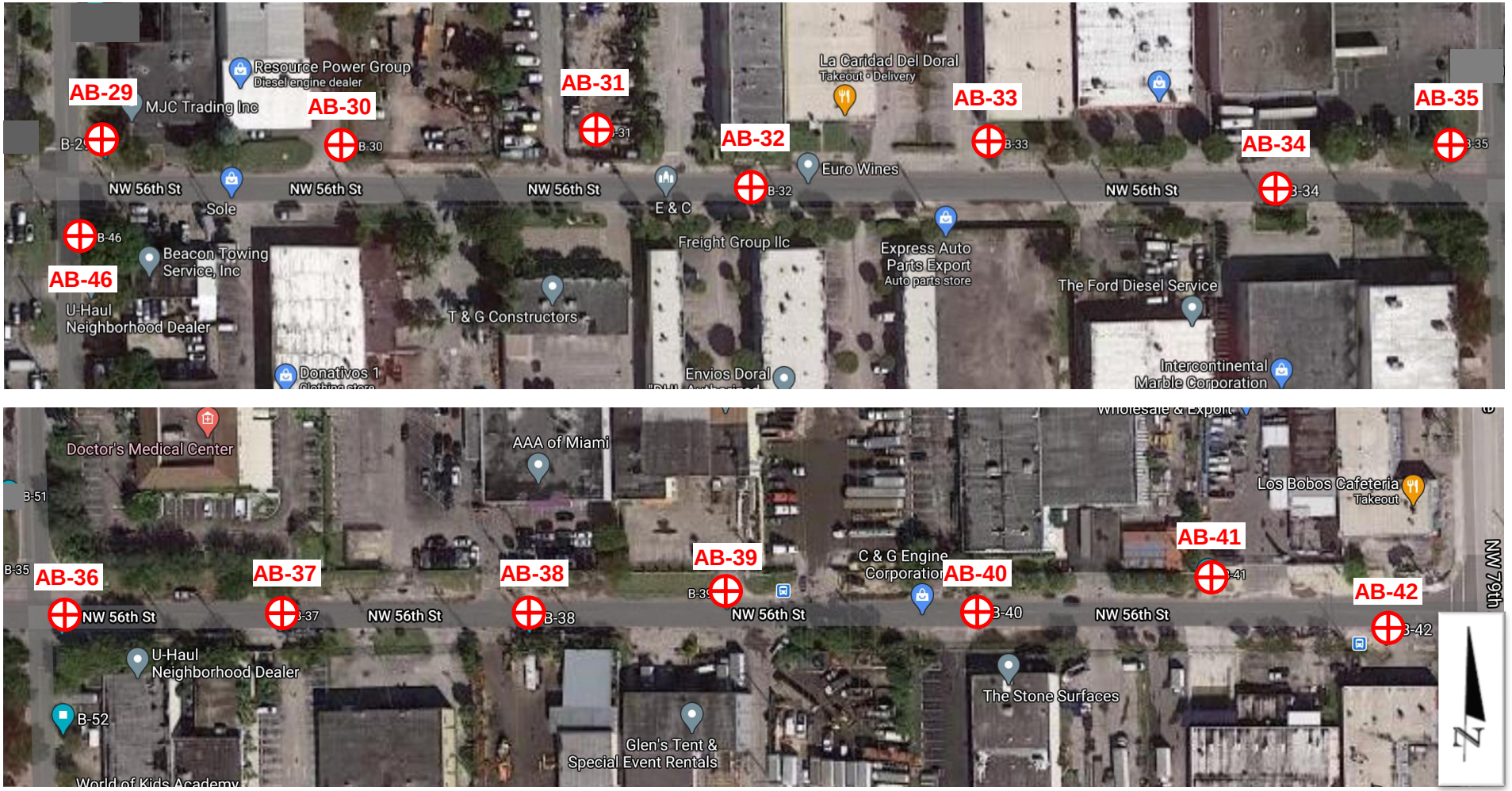
Project Manager: ARM	Project No. G10201017
Drawn by: DC	Scale: N.T.S.
Checked by: ARM	File Name:
Approved by: ARM	Date: 10/10/2020

GCES
GEOTECHNICAL CONSTRUCTION & ENGINEERING SOLUTIONS

BORING LOCATION PLAN

Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St
City of Doral, Florida

FIG 2B



LEGEND

⊕ *Approximate Boring Location*

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Manager: ARM	Project No. G10201017
Drawn by: DC	Scale: N.T.S.
Checked by: ARM	File Name:
Approved by: ARM	Date: 10/10/2020

GCES
GEOTECHNICAL CONSTRUCTION & ENGINEERING SOLUTIONS

BORING LOCATION PLAN

Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St
City of Doral, Florida

FIG
2C

LEGEND

⊕ *Approximate Boring Location*

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

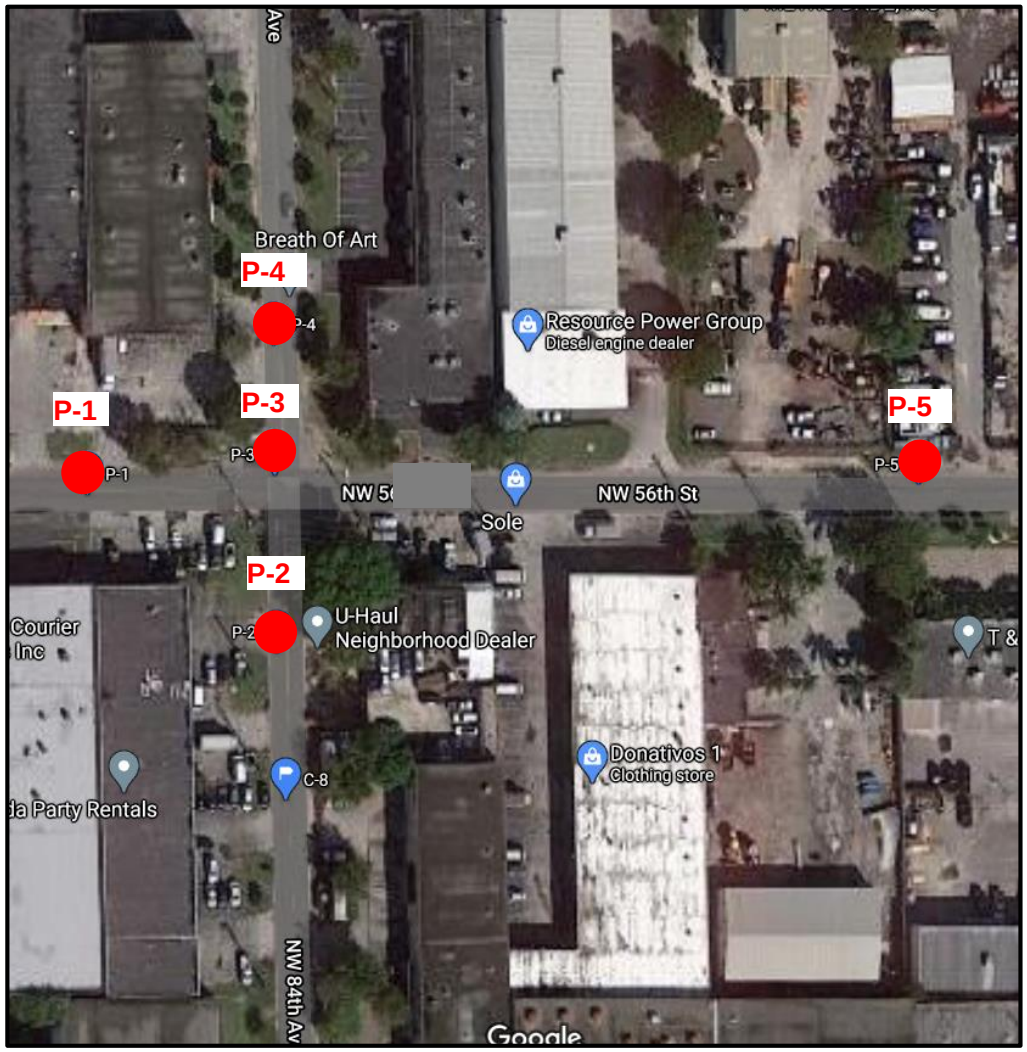
Project Manager: ARM	Project No. G10201017
Drawn by: DC	Scale: N.T.S.
Checked by: ARM	File Name:
Approved by: ARM	Date: 10/10/2020

GCES
GEOTECHNICAL CONSTRUCTION & ENGINEERING SOLUTIONS

BORING LOCATION PLAN

Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St
City of Doral, Florida

FIG 2D



LEGEND

● *Approximate Exfiltration Test Location*

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Manager: ARM	Project No. G10201017
Drawn by: DC	Scale: N.T.S.
Checked by: ARM	File Name:
Approved by: ARM	Date: 10/10/2020

GCES
GEOTECHNICAL CONSTRUCTION & ENGINEERING SOLUTIONS

EXFILTRATION TEST LOCATION PLAN

Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St
City of Doral, Florida

FIG
2E

LEGEND

● *Approximate Exfiltration Test Location*

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

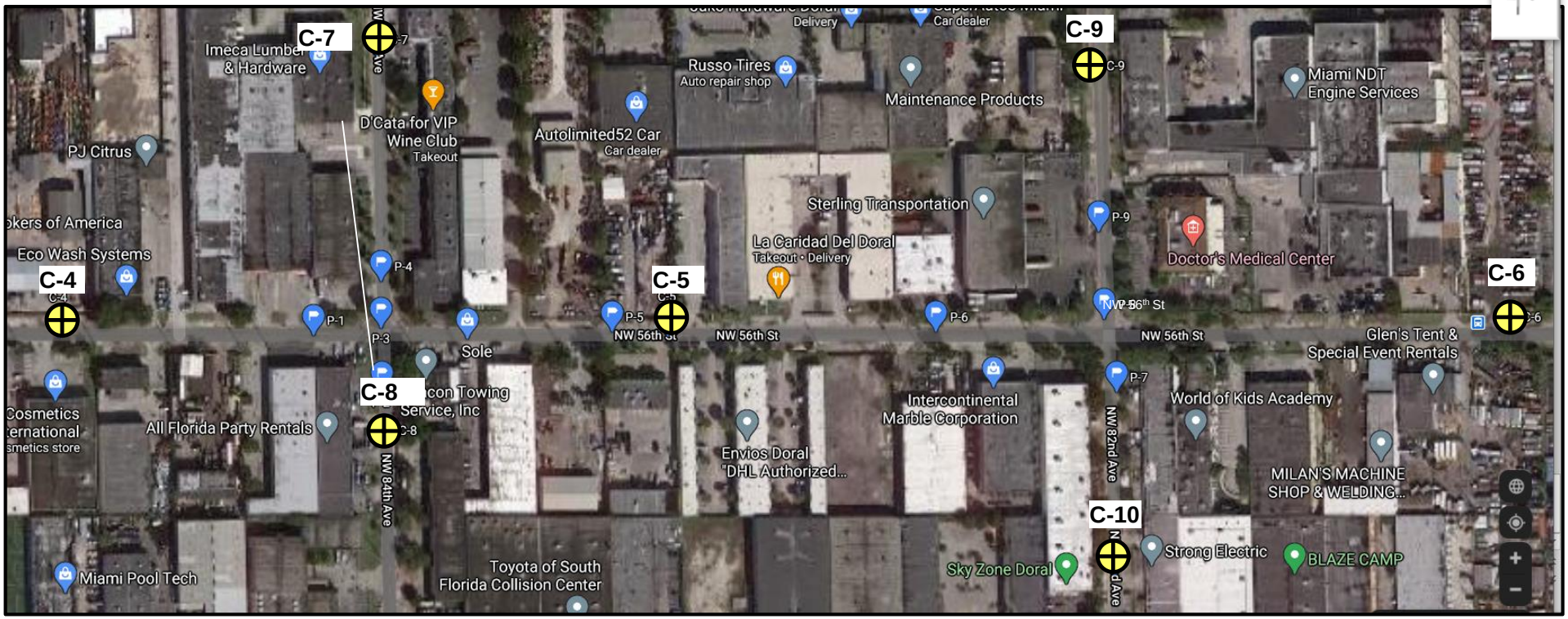
Project Manager: ARM	Project No. G10201017
Drawn by: DC	Scale: N.T.S.
Checked by: ARM	File Name:
Approved by: ARM	Date: 10/10/2020

GCES
GEOTECHNICAL CONSTRUCTION & ENGINEERING SOLUTIONS

EXFILTRATION TEST LOCATION PLAN

Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St
City of Doral, Florida

FIG 2F



LEGEND

⊕ *Approximate Pavement Core Location*

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

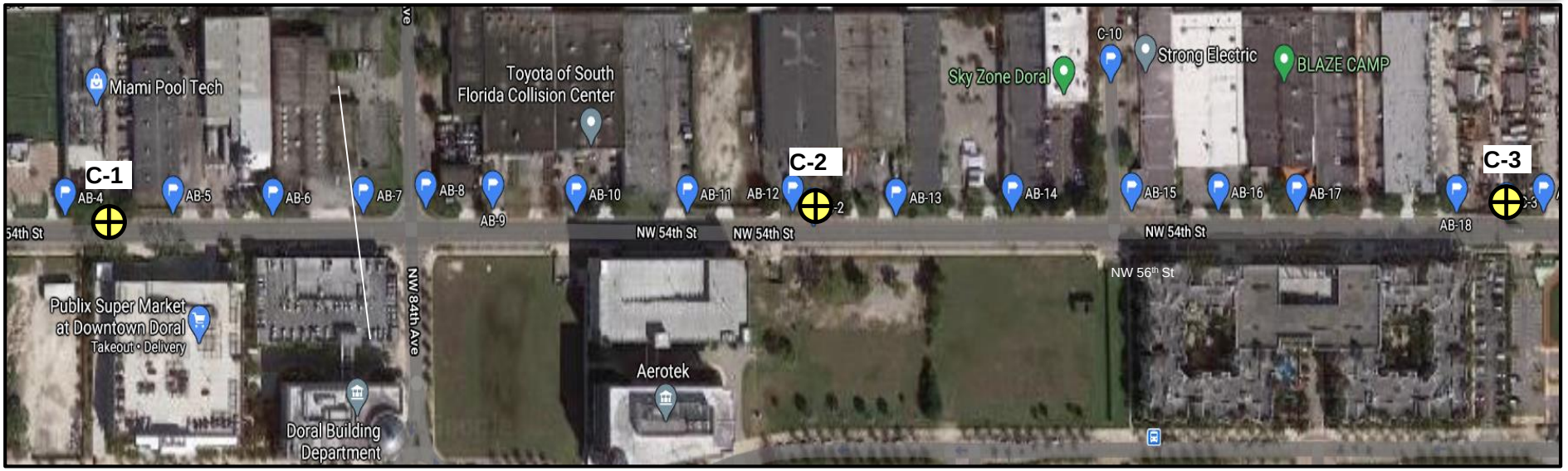
Project Manager: ARM	Project No. G10201017
Drawn by: DC	Scale: N.T.S.
Checked by: ARM	File Name:
Approved by: ARM	Date: 10/10/2020

GCES
GEOTECHNICAL CONSTRUCTION & ENGINEERING SOLUTIONS

PAVEMENT CORE LOCATION PLAN

Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St
City of Doral, Florida

FIG
2G



LEGEND

⊕ *Approximate Pavement Core Location*

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Manager: ARM	Project No. G10201017
Drawn by: DC	Scale: N.T.S.
Checked by: ARM	File Name:
Approved by: ARM	Date: 10/10/2020

GCES
GEOTECHNICAL CONSTRUCTION & ENGINEERING SOLUTIONS

PAVEMENT CORE LOCATION PLAN

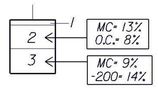
Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St
City of Doral, Florida

FIG 2H

APPENDIX B

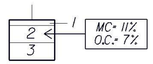
ROADWAY SOIL PROFILE - SHEETS 1 THROUGH 3

BOR # AB-1
ROAD NW 54th STREET
DATE 9/12/20
LATITUDE 25.822638
LONGITUDE -80.337539



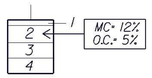
Boring Terminated at a Depth of 2 ft

BOR # AB-2
ROAD NW 54th STREET
DATE 9/12/20
LATITUDE 25.822652
LONGITUDE -80.336936



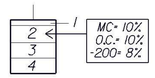
Boring Terminated at a Depth of 1.5 ft

BOR # AB-3
ROAD NW 54th STREET
DATE 9/22/20
LATITUDE 25.822642
LONGITUDE -80.336324



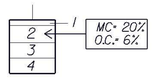
Boring Terminated at a Depth of 2 ft

BOR # AB-4
ROAD NW 54th STREET
DATE 9/22/20
LATITUDE 25.822637
LONGITUDE -80.335712



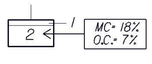
Boring Terminated at a Depth of 2 ft

BOR # AB-5
ROAD NW 54th STREET
DATE 9/22/20
LATITUDE 25.822649
LONGITUDE -80.335092



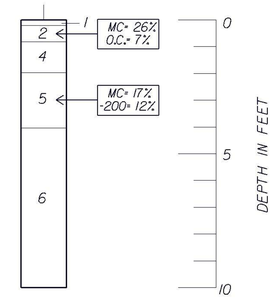
Boring Terminated at a Depth of 2 ft

BOR # AB-6
ROAD NW 54th STREET
DATE 9/22/20
LATITUDE 25.822637
LONGITUDE -80.334518



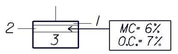
Boring Terminated at a Depth of 1 ft

BOR # AB-7
ROAD NW 54th STREET
DATE 9/23/20
LATITUDE 25.822645
LONGITUDE -80.333997



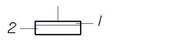
Boring Terminated at a Depth of 10 ft

BOR # AB-8
ROAD NW 54th STREET
DATE 10/6/20
LATITUDE 25.822671
LONGITUDE -80.333638



Boring Terminated at a Depth of 1 ft

BOR # AB-9
ROAD NW 54th STREET
DATE 10/8/20
LATITUDE 25.822668
LONGITUDE -80.333255

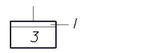


Boring Terminated at a Depth of 0.5 ft

BOR # AB-10
ROAD NW 54th STREET
DATE 10/6/20
LATITUDE 25.822653
LONGITUDE -80.332776

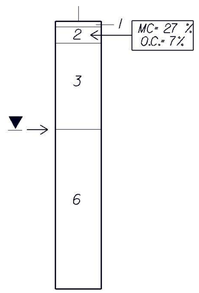
Boring Terminated at a Depth of 1 ft

BOR # AB-11
ROAD NW 54th STREET
DATE 10/6/20
LATITUDE 25.822651
LONGITUDE -80.332136



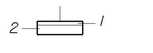
Boring Terminated at a Depth of 1 ft

BOR # AB-12
ROAD NW 54th STREET
DATE 9/23/20
LATITUDE 25.822655
LONGITUDE -80.331533



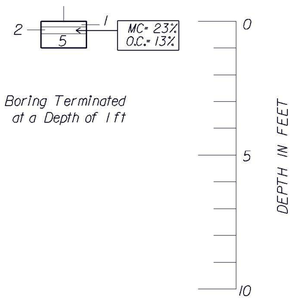
Boring Terminated at a Depth of 10 ft

BOR # AB-13
ROAD NW 54th STREET
DATE 10/8/20
LATITUDE 25.822640
LONGITUDE -80.330937



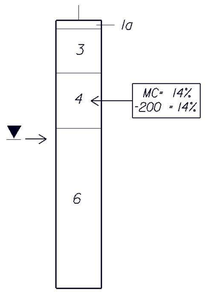
Boring Terminated at a Depth of 0.5 ft

BOR # AB-14
ROAD NW 54th STREET
DATE 10/6/20
LATITUDE 25.822655
LONGITUDE -80.330270



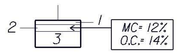
Boring Terminated at a Depth of 1 ft

BOR # AB-15
ROAD NW 54th STREET
DATE 9/15/20
LATITUDE 25.822659
LONGITUDE -80.329587



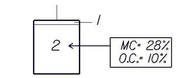
Boring Terminated at a Depth of 10 ft

BOR # AB-16
ROAD NW 54th STREET
DATE 9/12/20
LATITUDE 25.822662
LONGITUDE -80.329088



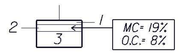
Boring Terminated at a Depth of 1 ft

BOR # AB-17
ROAD NW 54th STREET
DATE 10/6/20
LATITUDE 25.822655
LONGITUDE -80.328637



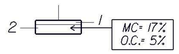
Boring Terminated at a Depth of 2 ft

BOR # AB-18
ROAD NW 54th STREET
DATE 9/12/20
LATITUDE 25.822653
LONGITUDE -80.327720



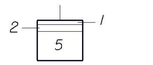
Boring Terminated at a Depth of 1 ft

BOR # AB-19
ROAD NW 54th STREET
DATE 10/6/20
LATITUDE 25.822657
LONGITUDE -80.327218



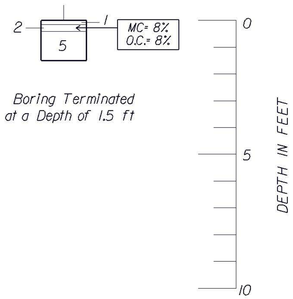
Boring Terminated at a Depth of 0.5 ft

BOR # AB-20
ROAD NW 54th STREET
DATE 9/12/20
LATITUDE 25.822646
LONGITUDE -80.326643



Boring Terminated at a Depth of 1.5 ft

BOR # AB-21
ROAD NW 54th STREET
DATE 9/12/20
LATITUDE 25.822640
LONGITUDE -80.326041



Boring Terminated at a Depth of 1.5 ft

0 2 10
Feet
Vertical Scale
Horizontal N.T.S.

LEGEND

1 - TOPSOIL (A-8)

1a - ASPHALT

2- DARK BROWN ORGANIC SILTY FINE SAND, TRACE LIMEROCK FRAGMENTS (FILL) (A-8)

3- BROWN SILTY FINE SAND, WITH LIMEROCK FRAGMENTS (FILL) (A-1-b)

4- TAN / BROWN SILTY FINE SAND, WITH LIMEROCK FRAGMENTS (FILL) (A-2-4)

5- DARK BROWN SILTY FINE SAND, TRACE LIMEROCK FRAGMENTS (FILL) (A-2-4)

6- TAN LIMESTONE WITH FINE SAND

NOTES :

▼ WATER TABLE

DENOTES DEPTHS IN FEET FROM EXISTING GROUND SURFACE

● APPROXIMATE ROADWAY AUGER BORING LOCATION

STRATA BOUNDARIES ARE APPROXIMATE AND MAY VARY BETWEEN OR AWAY FROM BORING LOCATIONS.

HAND AUGER AND POWER AUGER WERE PERFORMED AT THE BORING LOCATIONS

REFUSAL WAS ENCOUNTERED AT THE TERMINATION DEPTHS OF THE HAND AUGERS

GROUNWATER ELEVATIONS SHOWN ON THE SUBSURFACE PROFILES REPRESENT GROUNDWATER SURFACES ON THE DATES SHOWN. GROUNDWATER LEVEL FLUCTUATIONS SHOULD BE ANTICIPATED THROUGHOUT THE YEAR.

MC= MOISTURE CONTENT (%)

-200= PERCENT PASSING # 200 SIEVE (%)

OC= ORGANIC CONTENT (%)

REVISIONS	
DATE	DESCRIPTION

GCES ENGINEERING SERVICES, LLC
ALEJANDRO R MONTENEGRO, P.E.
P.E. LICENSE No. 59426
10860 NW 138TH ST UNIT 4
HIALEAH GARDENS, FL 33018
CERTIFICATE OF AUTHORIZATION 30039

PUBLIC WORKS DEPARTMENT

CITY	INTERSECTION	PROJECT No
DORAL	NW 54th STREET AND NW 87th AVE / NW 79th AVE	

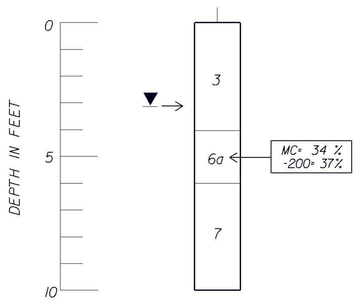
ROADWAY SOIL PROFILE

Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St, AND NW 56th St

SHEET NO. 1

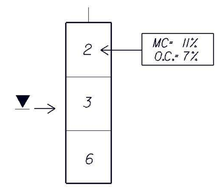
DORAL.DGN

BOR # AB-22
ROAD NW 56th STREET
DATE 9/14/20
LATITUDE 25.824338
LONGITUDE -80.337380



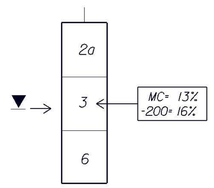
Boring Terminated at a Depth of 10 ft

BOR # AB-23
ROAD NW 56th STREET
DATE 9/14/20
LATITUDE 25.824452
LONGITUDE -80.336788



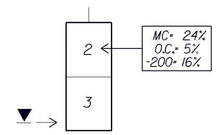
Boring Terminated at a Depth of 6 ft

BOR # AB-24
ROAD NW 56th STREET
DATE 9/14/20
LATITUDE 25.824462
LONGITUDE -80.336268



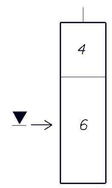
Boring Terminated at a Depth of 6 ft

BOR # AB-25
ROAD NW 56th STREET
DATE 9/14/20
LATITUDE 25.824484
LONGITUDE -80.335803



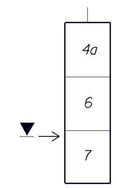
Boring Terminated at a Depth of 4 ft

BOR # AB-26
ROAD NW 56th STREET
DATE 9/14/20
LATITUDE 25.824516
LONGITUDE -80.335121



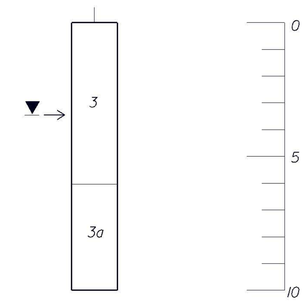
Boring Terminated at a Depth of 6 ft

BOR # AB-27
ROAD NW 56th STREET
DATE 9/14/20
LATITUDE 25.824470
LONGITUDE -80.334370



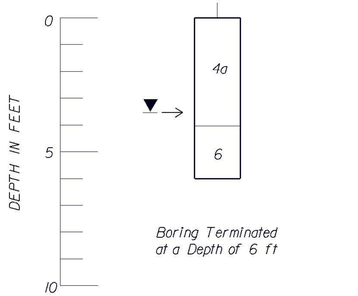
Boring Terminated at a Depth of 6 ft

BOR # AB-28
ROAD NW 56th STREET
DATE 9/14/20
LATITUDE 25.824472
LONGITUDE -80.333895



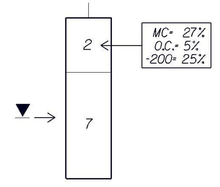
Boring Terminated at a Depth of 10 ft

BOR # AB-29
ROAD NW 56th STREET
DATE 9/14/20
LATITUDE 25.824459
LONGITUDE -80.333658



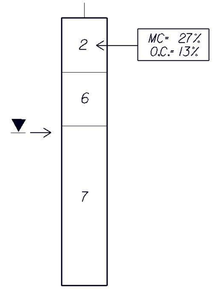
Boring Terminated at a Depth of 6 ft

BOR # AB-30
ROAD NW 56th STREET
DATE 9/14/20
LATITUDE 25.824453
LONGITUDE -80.332985



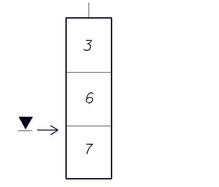
Boring Terminated at a Depth of 6 ft

BOR # AB-31
ROAD NW 56th STREET
DATE 9/14/20
LATITUDE 25.824488
LONGITUDE -80.332283



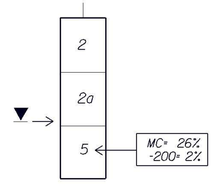
Boring Terminated at a Depth of 10 ft

BOR # AB-32
ROAD NW 56th STREET
DATE 9/14/20
LATITUDE 25.824341
LONGITUDE -80.331833



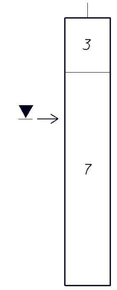
Boring Terminated at a Depth of 6 ft

BOR # AB-33
ROAD NW 56th STREET
DATE 9/14/20
LATITUDE 25.824459
LONGITUDE -80.331168



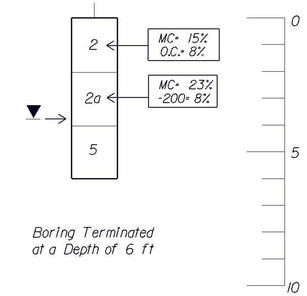
Boring Terminated at a Depth of 6 ft

BOR # AB-34
ROAD NW 56th STREET
DATE 9/14/20
LATITUDE 25.824341
LONGITUDE -80.330369



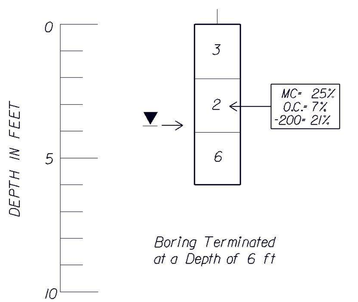
Boring Terminated at a Depth of 10 ft

BOR # AB-35
ROAD NW 56th STREET
DATE 9/14/20
LATITUDE 25.824460
LONGITUDE -80.329874



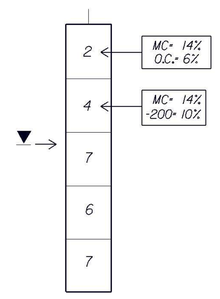
Boring Terminated at a Depth of 6 ft

BOR # AB-36
ROAD NW 56th STREET
DATE 9/15/20
LATITUDE 25.824336
LONGITUDE -80.329676



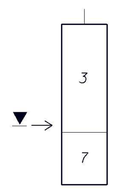
Boring Terminated at a Depth of 6 ft

BOR # AB-37
ROAD NW 56th STREET
DATE 9/15/20
LATITUDE 25.824345
LONGITUDE -80.329076



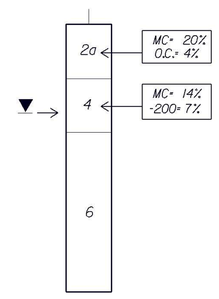
Boring Terminated at a Depth of 10 ft

BOR # AB-38
ROAD NW 56th STREET
DATE 9/15/20
LATITUDE 25.824340
LONGITUDE -80.328389



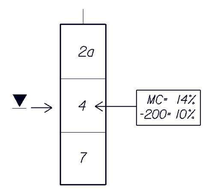
Boring Terminated at a Depth of 6 ft

BOR # AB-39
ROAD NW 56th STREET
DATE 9/15/20
LATITUDE 25.824400
LONGITUDE -80.327845



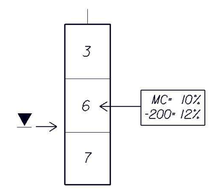
Boring Terminated at a Depth of 10 ft

BOR # AB-40
ROAD NW 56th STREET
DATE 9/15/20
LATITUDE 25.824354
LONGITUDE -80.327158



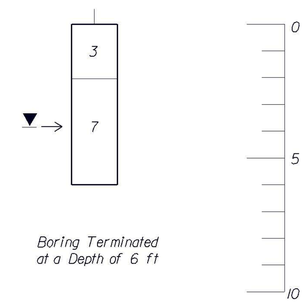
Boring Terminated at a Depth of 6 ft

BOR # AB-41
ROAD NW 56th STREET
DATE 9/15/20
LATITUDE 25.824448
LONGITUDE -80.326520



Boring Terminated at a Depth of 6 ft

BOR # AB-42
ROAD NW 56th STREET
DATE 9/15/20
LATITUDE 25.824310
LONGITUDE -80.326029



Boring Terminated at a Depth of 6 ft

LEGEND

1- TOPSOIL (A-8)

2- DARK BROWN ORGANIC SILTY FINE SAND, TRACE LIMEROCK FRAGMENTS (FILL) (A-8)

2a- DARK BROWN AND BROWN SILTY FINE SAND, TRACE ORGANICS AND LIMEROCK FRAGMENTS (FILL) (A-2-4)

3- BROWN / TAN SILTY FINE SAND, WITH LIMEROCK FRAGMENTS (FILL) (A-1-b)

3a- BROWN / TAN FINE SAND WITH SILT, WITH LIMEROCK FRAGMENTS (FILL) (A-1-a)

4- BROWN FINE SAND WITH SILT, TRACE LIMEROCK FRAGMENTS (FILL) (A-2-4)

4a- BROWN SILTY FINE SAND, TRACE LIMEROCK FRAGMENTS (FILL) (A-2-4)

5- BROWN FINE SAND (A-3)

6- TAN SILTY FINE SAND, WITH LIMESTONE (A-2-4)

6a- TAN SILTY FINE SAND (A-4)

7- TAN LIMESTONE WITH FINE SAND

NOTES :

▼ WATER TABLE

DENOTES DEPTHS IN FEET FROM EXISTING GROUND SURFACE

● APPROXIMATE ROADWAY AUGER BORING LOCATION

STRATA BOUNDARIES ARE APPROXIMATE AND MAY VARY BETWEEN OR AWAY FROM BORING LOCATIONS.

HAND AUGER AND POWER AUGER WERE PERFORMED AT THE BORING LOCATIONS

REFUSAL WAS ENCOUNTERED AT THE TERMINATION DEPTHS OF THE HAND AUGERS

GROUNWATER ELEVATIONS SHOWN ON THE SUBSURFACE PROFILES REPRESENT GROUNDWATER SURFACES ON THE DATES SHOWN. GROUNDWATER LEVEL FLUCTUATIONS SHOULD BE ANTICIPATED THROUGHOUT THE YEAR.

MC= MOISTURE CONTENT (%)

-200= PERCENT PASSING # 200 SIEVE (%)

OC= ORGANIC CONTENT (%)

REVISIONS	
DATE	DESCRIPTION

GCES ENGINEERING SERVICES, LLC
ALEJANDRO R MONTENEGRO, P.E.
P.E. LICENSE No. 59426
10860 NW 138TH ST UNIT 4
HIALEAH GARDENS, FL 33018
CERTIFICATE OF AUTHORIZATION 30039

PUBLIC WORKS DEPARTMENT

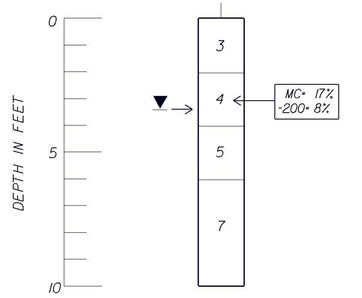
CITY	INTERSECTION	PROJECT No
DORAL	NW 56th STREET AND NW 87th AVE / NW 79th AVE	

ROADWAY SOIL PROFILE
Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St, AND NW 56th St

SHEET NO. 2

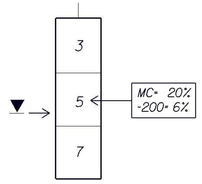
DORAL2.DGN

BOR # AB-43
ROAD NW 84th AVENUE
DATE 9/15/20
LATITUDE 25.826077
LONGITUDE -80.333735



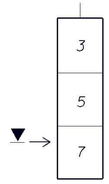
Boring Terminated at a Depth of 10 ft

BOR # AB-44
ROAD NW 84th AVENUE
DATE 9/15/20
LATITUDE 25.825376
LONGITUDE -80.333845



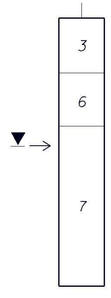
Boring Terminated at a Depth of 6 ft

BOR # AB-45
ROAD NW 84th AVENUE
DATE 9/15/20
LATITUDE 25.824785
LONGITUDE -80.333680



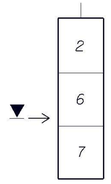
Boring Terminated at a Depth of 6 ft

BOR # AB-46
ROAD NW 84th AVENUE
DATE 9/15/20
LATITUDE 25.824223
LONGITUDE -80.333720



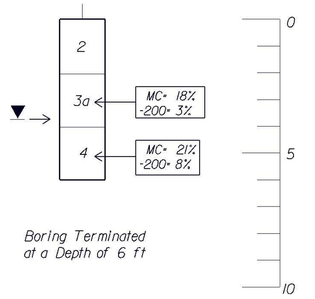
Boring Terminated at a Depth of 10 ft

BOR # AB-47
ROAD NW 84th AVENUE
DATE 9/15/20
LATITUDE 25.823490
LONGITUDE -80.333683



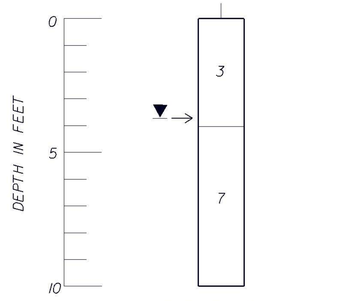
Boring Terminated at a Depth of 6 ft

BOR # AB-48
ROAD NW 84th AVENUE
DATE 9/15/20
LATITUDE 25.822814
LONGITUDE -80.333806



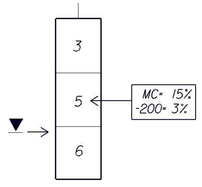
Boring Terminated at a Depth of 6 ft

BOR # AB-49
ROAD NW 82nd AVENUE
DATE 9/15/20
LATITUDE 25.826022
LONGITUDE -80.329704



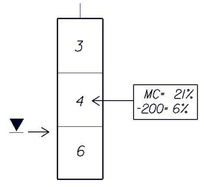
Boring Terminated at a Depth of 10 ft

BOR # AB-50
ROAD NW 82nd AVENUE
DATE 9/15/20
LATITUDE 25.825340
LONGITUDE -80.329726



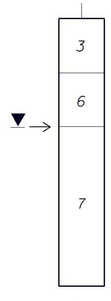
Boring Terminated at a Depth of 6 ft

BOR # AB-51
ROAD NW 82nd AVENUE
DATE 9/15/20
LATITUDE 25.824644
LONGITUDE -80.329824



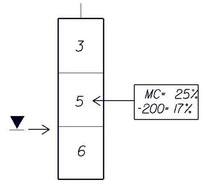
Boring Terminated at a Depth of 6 ft

BOR # AB-52
ROAD NW 82nd AVENUE
DATE 9/15/20
LATITUDE 25.824086
LONGITUDE -80.329674



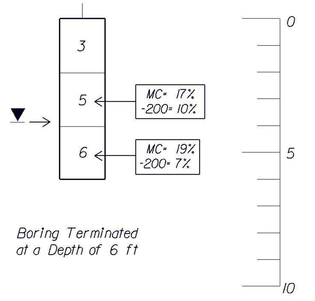
Boring Terminated at a Depth of 10 ft

BOR # AB-53
ROAD NW 82nd AVENUE
DATE 9/15/20
LATITUDE 25.823476
LONGITUDE -80.329769



Boring Terminated at a Depth of 6 ft

BOR # AB-54
ROAD NW 82nd AVENUE
DATE 9/15/20
LATITUDE 25.822817
LONGITUDE -80.329641



Boring Terminated at a Depth of 6 ft

LEGEND

1- TOPSOIL (A-8)

2- DARK BROWN SILTY FINE SAND, TRACE ORGANICS AND LIMEROCK FRAGMENTS (FILL)(A-8)

3- BROWN / TAN SILTY FINE SAND, WITH LIMEROCK FRAGMENTS (FILL)(A-1-b)

4- BROWN FINE SAND WITH SILT (A-2-4)

5- BROWN FINE SAND WITH SILT, TRACE LIMESTONE FRAGMENTS (A-2-4)

6- TAN / BROWN SILTY FINE SAND WITH LIMESTONE FRAGMENTS (A-2-4)

7- TAN LIMESTONE WITH FINE SAND

NOTES :

▼ WATER TABLE

DENOTES DEPTHS IN FEET FROM EXISTING GROUND SURFACE

● APPROXIMATE ROADWAY AUGER BORING LOCATION

STRATA BOUNDARIES ARE APPROXIMATE AND MAY VARY BETWEEN OR AWAY FROM BORING LOCATIONS.

HAND AUGER AND POWER AUGER WERE PERFORMED AT THE BORING LOCATIONS

REFUSAL WAS ENCOUNTERED AT THE TERMINATION DEPTHS OF THE HAND AUGERS

GROUNWATER ELEVATIONS SHOWN ON THE SUBSURFACE PROFILES REPRESENT GROUNDWATER SURFACES ON THE DATES SHOWN. GROUNDWATER LEVEL FLUCTUATIONS SHOULD BE ANTICIPATED THROUGHOUT THE YEAR.

MC= MOISTURE CONTENT (%)

-200= PERCENT PASSING # 200 SIEVE (%)

OC= ORGANIC CONTENT (%)

0 2 10
Feet
Vertical Scale
Horizontal N.T.S.

REVISIONS	
DATE	DESCRIPTION

GCES ENGINEERING SERVICES, LLC
ALEJANDRO R MONTENEGRO, P.E.
P.E. LICENSE No. 59426
10860 NW 138TH ST UNIT 4
HIALEAH GARDENS, FL 33018
CERTIFICATE OF AUTHORIZATION 30039

PUBLIC WORKS DEPARTMENT

CITY	INTERSECTION	PROJECT No
DORAL	NW 84th AVE & NW 82nd AVE	

ROADWAY SOIL PROFILE
Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St, AND NW 56th St

SHEET NO. 3

DORAL3.DGN

APPENDIX C

TABLES 1A THROUGH 1C - SUMMARY OF TEST BORING LOCATIONS

TABLE 1D - SUMMARY OF EXFILTRATION TEST LOCATIONS

TABLE 1E - SUMMARY OF PAVEMENT CORE LOCATIONS

TABLES 2A THROUGH 2C - SUMMARY OF LABORATORY TESTING RESULTS

TABLE 3 - PAVEMENT CORING DATA

TABLE 4 - SUMMARY OF EXFILTRATION TEST RESULTS

TABLE 5 - SOIL BORING INFORMATION WITH GWT

Table 1A: Summary of Boring Test Locations

Client: City of Doral

Project Name: Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.

Project Location: City of Doral, FL

Project #: G10201017

BORING / TEST No.	DEPTH OF BORING (FEET)	APPROXIMATE TEST LOCATION		ROAD C/L CONST.	GROUND SURFACE ELEVATION (Feet)
		LATITUDE	LONGITUDE		
AB-1	2.0	25.822638	-80.337539	NW 54 ST	N/A
AB-2	1.5	25.822652	-80.336936	NW 54 ST	N/A
AB-3	2.0	25.822642	-80.336324	NW 54 ST	N/A
AB-4	2.0	25.822637	-80.335712	NW 54 ST	N/A
AB-5	2.0	25.822649	-80.335092	NW 54 ST	N/A
AB-6	1.0	25.822637	-80.334518	NW 54 ST	N/A
AB-7	10.0	25.822645	-80.333997	NW 54 ST	N/A
AB-8	1.0	25.822671	-80.333638	NW 54 ST	N/A
AB-9	0.5	25.822668,	-80.333255	NW 54 ST	N/A
AB-10	1.0	25.822653	-80.332776	NW 54 ST	N/A
AB-11	1.0	25.822651	-80.332136	NW 54 ST	N/A
AB-12	10.0	25.822655	-80.331533	NW 54 ST	N/A
AB-13	0.5	25.822640	-80.330937	NW 54 ST	N/A
AB-14	1.0	25.822655	-80.330270	NW 54 ST	N/A
AB-15	10.0	25.822659	-80.329587	NW 54 ST	N/A
AB-16	1.0	25.822662	-80.329088	NW 54 ST	N/A
AB-17	2.0	25.822655	-80.328637	NW 54 ST	N/A
AB-18	1.0	25.822653	-80.327720	NW 54 ST	N/A
AB-19	0.5	25.822657	-80.327218	NW 54 ST	N/A
AB-20	1.5	25.822646	-80.326643	NW 54 ST	N/A
AB-21	1.5	25.822640	-80.326041	NW 54 ST	N/A

Table 1B: Summary of Boring Test Locations

Client:	City of Doral
Project Name:	Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.
Project Location:	City of Doral, FL
Project #:	G10201017

BORING / TEST No.	DEPTH OF BORING (FEET)	APPROXIMATE TEST LOCATION		ROAD C/L CONST.	GROUND SURFACE ELEVATION (Feet)
		LATITUDE	LONGITUDE		
AB-22	10	25.824338	-80.33738	NW 56 ST	N/A
AB-23	6	25.824452	-80.336788	NW 56 ST	N/A
AB-24	6	25.824462	-80.336268	NW 56 ST	N/A
AB-25	4	25.824484	-80.335803	NW 56 ST	N/A
AB-26	6	25.824516	-80.335121	NW 56 ST	N/A
AB-27	6	25.824470	-80.334370	NW 56 ST	N/A
AB-28	10	25.824472	-80.333895	NW 56 ST	N/A
AB-29	6	25.824459	-80.333658	NW 56 ST	N/A
AB-30	6	25.824453	-80.332985	NW 56 ST	N/A
AB-31	10	25.824488	-80.332283	NW 56 ST	N/A
AB-32	6	25.824341	-80.331833	NW 56 ST	N/A
AB-33	6	25.824459	-80.331168	NW 56 ST	N/A
AB-34	10	25.824341	-80.330369	NW 56 ST	N/A
AB-35	6	25.824460	-80.329874	NW 56 ST	N/A
AB-36	6	25.824336	-80.329676	NW 56 ST	N/A
AB-37	10	25.824345	-80.329076	NW 56 ST	N/A
AB-38	6	25.824340	-80.328389	NW 56 ST	N/A
AB-39	10	25.824400	-80.327845	NW 56 ST	N/A
AB-40	6	25.824354	-80.327158	NW 56 ST	N/A
AB-41	6	25.824448	-80.326520	NW 56 ST	N/A
AB-42	6	25.82431	-80.326029	NW 56 ST	N/A

Table 1C: Summary of Boring Test Locations

Client: City of Doral

Project Name: Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.

Project Location: City of Doral, FL

Project #: G10201017

BORING / TEST No.	DEPTH OF BORING (FEET)	APPROXIMATE TEST LOCATION		ROAD C/L CONST.	GROUND SURFACE ELEVATION (Feet)
		LATITUDE	LONGITUDE		
AB-43	10	25.826077	-80.333735	NW 84 ST	N/A
AB-44	6	25.825376	-80.333845	NW 84 ST	N/A
AB-45	6	25.824785	-80.333687	NW 84 ST	N/A
AB-46	10	25.824785	-80.333687	NW 84 ST	N/A
AB-47	6	25.823490	-80.333683	NW 84 ST	N/A
AB-48	6	25.822814	-80.333806	NW 84 ST	N/A
AB-49	10	25.826022	-80.329704	NW 82 ST	N/A
AB-50	6	25.825340	-80.329726	NW 82 ST	N/A
AB-51	6	25.824644	-80.329824	NW 82 ST	N/A
AB-52	10	25.824086	-80.329674	NW 82 ST	N/A
AB-53	6	25.823476	-80.329769	NW 82 ST	N/A
AB-54	6	25.822817	-80.329641	NW 82 ST	N/A

Table 1D: Summary of Exfiltration Test Locations

Client:	City of Doral
Project Name:	Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.
Project Location:	City of Doral, FL
GCES Project No:	G10201017

TEST No.	APPROXIMATE TEST LOCATION		NEAR INTERSECTION	ROAD	GROUND SURFACE ELEVATION (Feet)
	LATITUDE	LONGITUDE			
EX-1	25.824382	-80.334156	NW 56th Street & NW 84th Ave	NW 56th Street	N/A
EX-2	25.824098	-80.333779	NW 56th Street & NW 84th Ave	NW 84th Ave	N/A
EX-3	25.824417	-80.327431	NW 56th Street & NW 84th Ave	NW 84th Ave	N/A
EX-4	25.824649	-80.333785	NW 56th Street & NW 84th Ave	NW 84th Ave	N/A
EX-5	25.824400	-80.332500	NW 56th Street & NW 84th Ave	NW 56th Street	N/A
EX-6	25.824400	-80.330700	NW 56th Street & NW 82nd Ave	NW 56th Street	N/A
EX-7	25.824100	-80.329700	NW 56th Street & NW 82nd Ave	NW 82nd Ave	N/A
EX-8	25.824462	-80.329767	NW 56th Street & NW 82nd Ave	NW 82nd Ave	N/A
EX-9	25.824900	-80.329800	NW 56th Street & NW 82nd Ave	NW 82nd Ave	N/A
EX-10	25.824321	-80.326056	NW 56th Street & NW 79th Ave	NW 56th Street	N/A

Table 1E: Summary of Pavement Core Locations

Client:	City of Doral
Project Name:	Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.
Project Location:	City of Doral, FL
GCES Project No:	G10201017

CORE No.	APPROXIMATE TEST LOCATION		NEAR INTERSECTION	ROAD	LANES	*GROUND SURFACE ELEVATION (Feet)
	LATITUDE	LONGITUDE				
1	25.822604	-80.335540	NW 54th Street & NW 87th Ave	NW 54th Street	Westbound	N/A
2	25.822599	-80.331413	NW 54th Street & NW 82nd Ave	NW 54th Street	Westbound	N/A
3	25.822618	-80.327431	NW 54th Street & NW 79th Ave	NW 54th Street	Westbound	N/A
4	25.824371	-80.335571	NW 56th Street & NW 87th Ave	NW 56th Street	Eastbound	N/A
5	25.824375	-80.332190	NW 56th Street & NW 84th Ave	NW 56th Street	Eastbound	N/A
6	25.824400	-80.327516	NW 56th Street & NW 79th Ave	NW 56th Street	Westbound	N/A
7	25.825783	-80.333807	NW 58th Street & NW 84th Ave	NW 84th Ave	Southbound	N/A
8	25.823834	-80.333761	NW 56th Street & NW 84th Ave	NW 84th Ave	Southbound	N/A
9	25.825654	-80.329830	NW 58th Street & NW 82nd Ave	NW 82nd Ave	Southbound	N/A
10	25.823191	-80.329707	NW 54th Street & NW 82nd Ave	NW 82nd Ave	Northbound	N/A

GCES
GEOTECHNICAL CONSTRUCTION & ENGINEERING SOLUTIONS

TABLE 2A: Summary of Laboratory Testing Results

Client: City of Doral
Project Name: Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.
Project Location: City of Doral, FL
Project #: G10201017

BORING NUMBER	Sample Depth (Feet)		Stratum No.	AASHTO Group	Natural Moisture Content (%)	Organic Content (%)	Atterberg Limits			Sieve Analysis (Percent Passing)							
	From	To					LL (%)	PL (%)	PI (%)	3/4"	3/8"	#4	#10	#40	#60	#80	#200
AB-1	0	0.2	1	A-8	17	8	-	-	-								
AB-1	0.2	0.5	2	A-8	15	7	-	-	-								
AB-1	0.5	1	2	A-8	8	8	-	-	-								7
AB-1	1	1.5	3	A-1-b	9		-	-	-								14
AB-2	0	0.2	1	A-8	15	9	-	-	-								
AB-2	0.2	0.5	2	A-8	6	9	-	-	-								
AB-2	0.5	1	2	A-8	13	5	-	-	-								
AB-3	0.2	0.5	2	A-8	12	5	-	-	-								
AB-3	1	1.5	3	A-1-b	10		-	-	-	92	63	61	55	48	40	40	17

GCES
GEOTECHNICAL CONSTRUCTION & ENGINEERING SOLUTIONS

TABLE 2A: Summary of Laboratory Testing Results (Continue)

Client: City of Doral
Project Name: Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.
Project Location: City of Doral, FL
Project #: G10201017

BORING NUMBER	Sample Depth (Feet)		Stratum No.	AASHTO Group	Natural Moisture Content (%)	Organic Content (%)	Atterberg Limits			Sieve Analysis (Percent Passing)							
	From	To					LL (%)	PL (%)	PI (%)	3/4"	3/8"	#4	#10	#40	#60	#80	#200
AB-4	0.5	1	2	A-8	7	10	-	-	-	-	-	-	-	-	-	-	8
AB-4	1.5	2	4	A-2-4	13		-	-	-	100	83	71	61	54	46	36	29
AB-5	0.2	0.5	2	A-8	20	6	-	-	-	-	-	-	-	-	-	-	-
AB-6	0.5	1	2	A-8	18	7	-	-	-	-	-	-	-	-	-	-	-
AB-7A	0	0.2	2	A-8	25	7	-	-	-	-	-	-	-	-	-	-	-
AB-7	2	4	5	A-2-4	17		-	-	-	-	-	-	-	-	-	-	12
AB-8	0	0.5	2	A-8	6	7	-	-	-	-	-	-	-	-	-	-	-
AB-8	0.5	1	3	A-1-b	6	3	-	-	-	-	-	-	-	-	-	-	-
AB-11	0.5	1	3	A-1-b	9	3	-	-	-	-	-	-	-	-	-	-	-
AB-12A	0	0.2	2	A-8	27	7	-	-	-	-	-	-	-	-	-	-	-

GCES
GEOTECHNICAL CONSTRUCTION & ENGINEERING SOLUTIONS

TABLE 2A: Summary of Laboratory Testing Results (Continue)

Client: City of Doral
Project Name: Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.
Project Location: City of Doral, FL
Project #: G10201017

BORING NUMBER	Sample Depth (Feet)		Stratum No.	AASHTO Group	Natural Moisture Content (%)	Organic Content (%)	Atterberg Limits			Sieve Analysis (Percent Passing)							
	From	To					LL (%)	PL (%)	PI (%)	3/4"	3/8"	#4	#10	#40	#60	#80	#200
AB-12	4	6	6	A-1-a	19	3	-	-	-	-	-	-	-	-	-	-	-
AB-14	0	0.5	2	A-8	23	13	-	-	-	-	-	-	-	-	-	-	-
AB-15	2	4	4	A-2-4	13		-	-	-	-	-	-	-	-	-	-	14
AB-16	0	0.3	2	A-8	7	14	-	-	-	-	-	-	-	-	-	-	-
AB-16	0.5	1	3	A-1-b	18		-	-	-	91	72	59	52	42	34	23	14
AB-17	0.5	1	2	A-8	31	8	-	-	-	-	-	-	-	-	-	-	-
AB-17	1.5	2	2	A-8	26	12	-	-	-	-	-	-	-	-	-	-	-
AB-18	0	0.3	2	A-8	19	8	-	-	-	-	-	-	-	-	-	-	-
AB-19	0	0.5	2	A-8	17	5	-	-	-	-	-	-	-	-	-	-	-
AB-21	0	0.2	2	A-8	8	8	-	-	-	-	-	-	-	-	-	-	-
AB-21	0.5	1	5	A-2-4	7		-	-	-	77	71	66	61	56	48	35	28

GCES
GEOTECHNICAL CONSTRUCTION & ENGINEERING SOLUTIONS

TABLE 2B: Summary of Laboratory Testing Results

Client: City of Doral
Project Name: Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.
Project Location: City of Doral, FL
Project #: G10201017

BORING NUMBER	Sample Depth (Feet)		Stratum No.	AASHTO Group	Natural Moisture Content (%)	Organic Content (%)	Atterberg Limits			Sieve Analysis (Percent Passing)							
	From	To					LL (%)	PL (%)	PI (%)	3/4"	3/8"	#4	#10	#40	#60	#80	#200
AB-22	4	6	6a	A-4	34		-	-	-	-	-	-	-	-	-	-	37
AB-23	0	2	2	A-8	11	7	-	-	-	-	-	-	-	-	-	-	
AB-24	2	4	3	A-1-b	13	3	-	-	-	-	-	-	-	-	-	-	16
AB-25	0	2	2	A-8	24	5	-	-	-	-	-	-	-	-	-	-	16
AB-28	6	8	3a	A-1-a	12		-	-	-	69	38	27	22	18	15	10	6
AB-29	0	2	4a	A-2-4	19		-	-	-	91	73	68	64	61	52	34	21
AB-30	0	2	2	A-8	27	5	-	-	-	-	-	-	-	-	-	-	25
AB-31B	0	2	2	A-8	27	13	-	-	-	-	-	-	-	-	-	-	
AB-33	4	6	5	A-3	26		-	-	-	-	-	-	-	-	-	-	2

GCES
GEOTECHNICAL CONSTRUCTION & ENGINEERING SOLUTIONS

TABLE 2B: Summary of Laboratory Testing Results (Continue)

Client: City of Doral
Project Name: Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.
Project Location: City of Doral, FL
Project #: G10201017

BORING NUMBER	Sample Depth (Feet)		Stratum No.	AASHTO Group	Natural Moisture Content (%)	Organic Content (%)	Atterberg Limits			Sieve Analysis (Percent Passing)							
	From	To					LL (%)	PL (%)	PI (%)	3/4"	3/8"	#4	#10	#40	#60	#80	#200
AB-35	0	2	2	A-8	15	8	-	-	-	-	-	-	-	-	-	-	
AB-35	2	4	2a	A-2-4	23	4	-	-	-	-	-	-	-	-	-	-	8
AB-35	4	6	5	A-3	23		-	-	-	100	99	99	99	95	73	29	4
AB-36	2	4	2	A-8	25	7	-	-	-	-	-	-	-	-	-	-	21
AB-37	0	2	2	A-8	14	6	-	-	-	-	-	-	-	-	-	-	10
AB-37	2	4	4	A-2-4	14		-	-	-	-	-	-	-	-	-	-	10
AB-39	0	2	2a	A-2-4	20	4	-	-	-	100	87	78	69	58	42	21	11
AB-39	2	4	4	A-2-4	14	3	-	-	-	-	-	-	-	-	-	-	7
AB-40	0	2	2a	A-2-4	16	4	-	-	-	-	-	-	-	-	-	-	
AB-40	2	4	4	A-2-4	14		-	-	-	-	-	-	-	-	-	-	10
AB-41	2	4	6	A-2-4	10		-	-	-	-	-	-	-	-	-	-	12

GCES
GEOTECHNICAL CONSTRUCTION & ENGINEERING SOLUTIONS

TABLE 2C: Summary of Laboratory Testing Results

Client: City of Doral
Project Name: Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.
Project Location: City of Doral, FL
Project #: G10201017

BORING NUMBER	Sample Depth (Feet)		Stratum No.	AASHTO Group	Natural Moisture Content (%)	Organic Content (%)	Atterberg Limits			Sieve Analysis (Percent Passing)							
	From	To					LL (%)	PL (%)	PI (%)	3/4"	3/8"	#4	#10	#40	#60	#80	#200
AB-43	2	4	4	A-2-4	17	-	-	-	-	-	-	-	-	-	-	-	8
AB-44	2	4	5	A-2-4	19	1	-	-	-	-	-	-	-	-	-	-	6
AB-47	2	4	6	A-2-4	17	4	-	-	-	-	-	-	-	-	-	-	-
AB-48	2	4	3a	A-1-b	18	2	-	-	-	-	-	-	-	-	-	-	3
AB-48	4	6	4	A-2-4	21	-	-	-	-	-	-	-	-	-	-	-	8
AB-50	2	4	5	A-2-4	15	-	-	-	-	-	-	-	-	-	-	-	3
AB-50	4	6	6	A-2-4	28	-	-	-	-	92	91	89	84	75	60	33	15
AB-51	2	4	4	A-2-4	21	-	-	-	-	-	-	-	-	-	-	-	6
AB-52	2	4	5	A-2-4	14	-	-	-	-	95	80	72	68	62	46	23	15

GCES
GEOTECHNICAL CONSTRUCTION & ENGINEERING SOLUTIONS

TABLE 2C: Summary of Laboratory Testing Results (Continue)

Client: City of Doral
Project Name: Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.
Project Location: City of Doral, FL
Project #: G10201017

BORING NUMBER	Sample Depth (Feet)		Stratum No.	AASHTO Group	Natural Moisture Content (%)	Organic Content (%)	Atterberg Limits			Sieve Analysis (Percent Passing)							
	From	To					LL (%)	PL (%)	PI (%)	3/4"	3/8"	#4	#10	#40	#60	#80	#200
AB-53	2	4		A-1-b	25		-	-	-	-	-	-	-	-	-	-	17
AB-54	0	2		A-1-b	9		-	-	-	90	67	56	46	34	29	20	14
AB-54	2	4		A-1-b	17	1	-	-	-	-	-	-	-	-	-	-	10
AB-54	4	6		A-1-a	19		-	-	-	-	-	-	-	-	-	-	7
							-	-	-	-		-	-	-	-	-	-
							-	-	-	-		-	-	-	-	-	-
							-	-	-	-		-	-	-	-	-	-
							-	-	-	-		-	-	-	-	-	-
							-	-	-	-		-	-	-	-	-	-
							-	-	-	-		-	-	-	-	-	-

GCES
GEOTECHNICAL CONSTRUCTION & ENGINEERING SOLUTIONS

Table 3 - Pavement Coring Data

Client: City of Doral
Report Date: 10/8/2020

Project Name: Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.
Date Sampled: 9/12/2020

Project Location: City of Doral, FL
Date Tested: 9/23/2020

Project #: G10201017
Technician: A53066091

Core No.	Core Diameter (inches)	Pavement Layer Type (in)				Height Measurements (Inches)				*Lift Thickness Measuments (inches)	Base (in)	Subgrade (in)	Core Condition				Comments
		F95	FC-5	Type S-1	**	H1	H2	H3	H4		LIMESTONE	SB40	Crack	Depth (in)	Type	Condition	
C-1	5.65	-	-	-	-	2.00	2.04	2.06	1.83	1.98	-	-	N	-	-	G	Located on NW 54 Street
C-2	5.62	-	-	-	-	2.48	2.20	2.13	2.27	2.27	-	-	N	-	-	G	Located on NW 54 Street
C-3	5.61	-	-	-	-	2.65	2.75	2.76	2.74	2.72	-	-	N	-	-	G	Located on NW 54 Street
C-4	5.08	-	-	-	-	4.16	4.32	3.83	4.22	4.13	-	-	Y	0.2	-	G	Located on NW 56 Street
C-5	5.65	-	-	-	-	3.17	3.75	3.49	3.65	3.51	-	-	Y	0.3	-	F	Located on NW 56 Street
C-6	5.66	-	-	-	-	2.57	2.54	2.47	2.54	2.53	-	-	N	-	-	G	Located on NW 56 Street
C-7	5.63	-	-	-	-	3.76	3.76	3.14	3.21	3.47	-	-	N	-	-	G	Located on NW 84 Street
C-8	5.64	-	-	-	-	2.70	2.79	2.62	2.77	2.72	-	-	N	-	-	G	Located on NW 84 Street
C-9	5.62	-	-	-	-	2.61	2.64	2.49	2.53	2.57	-	-	Y	0.4	-	G	Located on NW 82 Street
C-10	5.63	-	-	-	-	3.02	3.04	2.96	3.03	3.01			Y	0.17		G	Located on NW 82 Street

Notes:

* Lift Thickness Measurements = (H1 + H2 + + H3 + H4)/4
** To be determined

G = Good
F = Fair
P = Poor
B = Bad

Table 4: Summary of Exfiltration Test Results

Client:	City of Doral
Project Name:	Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.
Project Location:	City of Doral, FL
Project #:	G10201017

Test Number	Date Perfomed	Diameter		Depth of Hole (Feet)	Depth to Groundwater Level Below Ground Surface (Feet)		Saturated Hole Depth Ds (Feet)	Average Flow Rate (gpm)	K, Hydraulic Conductivity (cfs/ft-ft head)
		Casing (inches)	Hole (inches)		Prior to Test	During Test			
EX-1	9/24/2020	4	6	20	3.8	3.7	16.2	50.0	1.56E-03
EX-2	9/23/2020	4	6	20	3.8	3.7	16.3	50.0	1.56E-03
EX-3	9/24/2020	4	6	20	3.7	3.6	16.3	50.0	1.59E-03
EX-4	9/24/2020	4	6	20	4.0	3.9	16.0	48.0	1.41E-03
EX-5	9/24/2020	4	6	20	4.0	3.9	16.0	48.0	1.41E-03
EX-6	9/24/2020	4	6	20	3.8	3.7	16.3	50.0	1.56E-03
EX-7	9/23/2020	4	6	20	4.5	4.4	15.5	50.0	1.33E-03
EX-8	9/24/2020	4	6	20	3.8	3.7	16.3	47.0	1.46E-03
EX-9	9/24/2020	4	6	20	4.0	3.9	16.0	50.0	1.47E-03
EX-10	9/23/2020	4	6	20	4.1	0.0	15.9	2.5	7.23E-05

Table 5.- Soil Boring Information With GWT

Client: City of Doral

Project Name: Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.

Project Location: City of Doral, FL

Project #: G10201017

BORING No.	INFORMATION		DATE RECORDED	APPROXIMATE TEST LOCATION		ROAD C/L CONST.	GROUND SURFACE ELEVATION (Feet)
	Depht of Boring (Feet)	GWT Depth (Feet)		LATITUDE	LONGITUDE		
AB- 1	2.0	N/R	9/12/2020	25.822638	-80.337539	NW 54 ST	N/A
AB- 2	1.5	N/R	9/12/2020	25.822652	-80.336936	NW 54 ST	N/A
AB- 3	2.0	N/R	9/22/2020	25.822642	-80.336324	NW 54 ST	N/A
AB- 4	2.0	N/R	9/22/2020	25.822637	-80.335712	NW 54 ST	N/A
AB- 5	2.0	N/R	9/22/2020	25.822649	-80.335092	NW 54 ST	N/A
AB- 6	1.0	N/R	9/22/2020	25.822637	-80.334518	NW 54 ST	N/A
AB- 7	10.0	N/R	9/23/2020	25.822645	-80.333997	NW 54 ST	N/A
AB- 8	1.0	N/R	10/6/2020	25.822671	-80.333638	NW 54 ST	N/A
AB- 9	0.5	N/R	10/8/2020	25.822668,	-80.333255	NW 54 ST	N/A
AB- 10	1.0	N/R	10/6/2020	25.822653	-80.332776	NW 54 ST	N/A
AB- 11	1.0	N/R	10/6/2020	25.822651	-80.332136	NW 54 ST	N/A
AB- 12	10.0	4.0	9/23/2020	25.822655	-80.331533	NW 54 ST	N/A
AB- 13	0.5	N/R	10/8/2020	25.822640	-80.330937	NW 54 ST	N/A
AB- 14	1.0	N/R	10/6/2020	25.822655	-80.330270	NW 54 ST	N/A
AB- 15	10.0	4.5	9/15/2020	25.822659	-80.329587	NW 54 ST	N/A
AB- 16	1.0	N/R	9/12/2020	25.822662	-80.329088	NW 54 ST	N/A
AB- 17	2.0	N/R	10/6/2020	25.822655	-80.328637	NW 54 ST	N/A
AB- 18	1.0	N/R	9/12/2020	25.822653	-80.327720	NW 54 ST	N/A
AB- 19	0.5	N/R	10/6/2020	25.822657	-80.327218	NW 54 ST	N/A
AB- 20	1.5	N/R	9/12/2020	25.822646	-80.326643	NW 54 ST	N/A
AB- 21	1.5	N/R	9/12/2020	25.822640	-80.326041	NW 54 ST	N/A
AB- 22	10.0	3.2	9/14/2020	25.824338	-80.33738	NW 56 ST	N/A
AB- 23	6.0	3.3	9/14/2020	25.824452	-80.336788	NW 56 ST	N/A
AB- 24	6.0	3.3	9/14/2020	25.824462	-80.336268	NW 56 ST	N/A
AB- 25	4.0	3.8	9/14/2020	25.824484	-80.335803	NW 56 ST	N/A
AB- 26	6.0	3.9	9/14/2020	25.824516	-80.335121	NW 56 ST	N/A
AB- 27	6.0	4.2	9/14/2020	25.824470	-80.334370	NW 56 ST	N/A
AB- 28	10.0	3.4	9/14/2020	25.824472	-80.333895	NW 56 ST	N/A
AB- 29	6.0	3.5	9/14/2020	25.824459	-80.333658	NW 56 ST	N/A
AB- 30	6.0	3.8	9/14/2020	25.824453	-80.332985	NW 56 ST	N/A
AB- 31	10.0	4.2	9/14/2020	25.824488	-80.332283	NW 56 ST	N/A
AB- 32	6.0	4.1	9/14/2020	25.824341	-80.331833	NW 56 ST	N/A
AB- 33	6.0	3.9	9/14/2020	25.824459	-80.331168	NW 56 ST	N/A
AB- 34	10.0	3.8	9/14/2020	25.824341	-80.330369	NW 56 ST	N/A
AB- 35	6.0	3.8	9/14/2020	25.824460	-80.329874	NW 56 ST	N/A
AB- 36	6.0	3.8	9/15/2020	25.824336	-80.329676	NW 56 ST	N/A
AB- 37	10.0	4.3	9/15/2020	25.824345	-80.329076	NW 56 ST	N/A
AB- 38	6.0	3.8	9/15/2020	25.824340	-80.328389	NW 56 ST	N/A
AB- 39	10.0	3.3	9/15/2020	25.824400	-80.327845	NW 56 ST	N/A
AB- 40	6.0	3.1	9/15/2020	25.824354	-80.327158	NW 56 ST	N/A
AB- 41	6.0	3.8	9/15/2020	25.824448	-80.326520	NW 56 ST	N/A
AB- 42	6.0	3.8	9/15/2020	25.82431	-80.326029	NW 56 ST	N/A
AB- 43	10.0	3.4	9/15/2020	25.826077	-80.333735	NW 84 ST	N/A
AB- 44	6.0	3.6	9/15/2020	25.825376	-80.333845	NW 84 ST	N/A
AB- 45	6.0	4.6	9/15/2020	25.824785	-80.333687	NW 84 ST	N/A
AB- 46	10.0	4.8	9/15/2020	25.824785	-80.333687	NW 84 ST	N/A
AB- 47	6.0	3.7	9/15/2020	25.823490	-80.333683	NW 84 ST	N/A
AB- 48	6.0	3.7	9/15/2020	25.822814	-80.333806	NW 84 ST	N/A
AB- 49	10.0	3.7	9/15/2020	25.826022	-80.329704	NW 82 ST	N/A
AB- 50	6.0	4.2	9/15/2020	25.825340	-80.329726	NW 82 ST	N/A
AB- 51	6.0	4.2	9/15/2020	25.824644	-80.329824	NW 82 ST	N/A
AB- 52	10.0	4.0	9/15/2020	25.824086	-80.329674	NW 82 ST	N/A
AB- 53	6.0	4.1	9/15/2020	25.823476	-80.329769	NW 82 ST	N/A
AB- 54	6.0	3.8	9/15/2020	25.822817	-80.329641	NW 82 ST	N/A

APPENDIX D

GRAIN SIZE ANALYSIS TEST RESULTS AND CURVES

EXFILTRATION TEST SHEETS

PAVEMENT CORE PHOTOGRAPHS

FIELD EXPLORATORY DESCRIPTION

LABORATORY TESTING PROCEDURE

UNIFIED SOIL CLASSIFICATION SYSTEM

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www.gces-usa.com

REPORT OF SIEVE ANALYSIS

Client: City of Doral
Project Name: Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.
Project Location: City of Doral, FL

Report Date: 10/07/20
Report #: 1A
Project #: G10201017

Material Information/Sample Identification:

Boring No: AB-3
Depth Interval: 1.0 to 1.5 (Feet)

Date Sampled: 09/22/20
Date Tested: 09/23/20

Laboratory Test Data:

			US Standard Sieve No.	Sieve Size (mm)	Percent Retained (%)	Percent Passing Sieve (%)
GRAVEL	Coarse	< 3" to > 3/4"	1 1/2"	37.500	0.0	100.0
			1"	25.000	0.0	100.0
			3/4"	19.000	8.0	92.0
	Fine	< 3/4" to > #4	3/8"	9.510	36.6	63.4
			No. 4	4.760	39.4	60.6
SAND	Coarse	< #4 to > #10	No 10	2.000	45.1	54.9
	Medium	< #10 to > #40	No. 40	0.420	51.9	48.1
	Fine	< #40 to > #200	No. 60	0.250	60.4	39.6
			No. 80	0.180	60.5	39.5
			No. 200	0.075	83.3	16.7
			PAN	N/A	100.0	0.0

Percent Garvel: 39 %
Percent Sand: 44 %
Percent Fine: 17 %

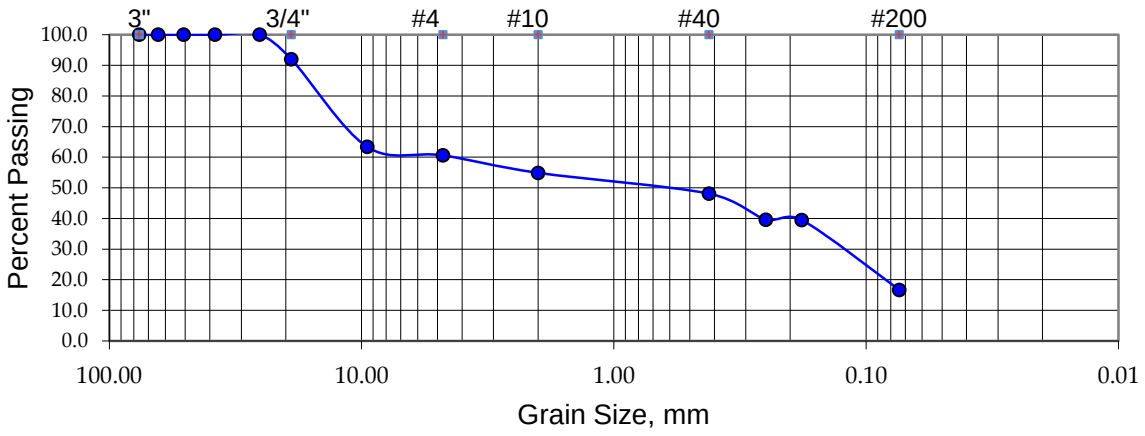
D10 (mm): N/A
D30 (mm): 0.13
D60 (mm): 6.5

Coefficient of Uniformity: Cu (D60/D10): N/A
Coefficient of Curvature: Cc (D30^2/(D10*D60)): N/A

Classification: Brown Silty Fine SAND with Limerock Fragmnets (FILL)

AASHTO: A-1-b **USCS:**

GRAIN SIZE DISTRIBUTION CURVE



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REPORT OF SIEVE ANALYSIS

Client: City of Doral
Project Name: Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.
Project Location: City of Doral, FL

Report Date: 10/07/20
Report #: 1B
Project #: G10201017

Material Information/Sample Identification:

Boring No: AB-4
Depth Interval: 1.5 to 2.0 (Feet)

Date Sampled: 09/22/20
Date Tested: 09/23/20

Laboratory Test Data:

			US Standard Sieve No.	Sieve Size (mm)	Percent Retained (%)	Percent Passing Sieve (%)
GRAVEL	Coarse	< 3" to > 3/4"	1 1/2"	37.500	0.0	100.0
			1"	25.000	0.0	100.0
			3/4"	19.000	0.0	100.0
	Fine	< 3/4" to > #4	3/8"	9.510	16.7	83.3
			No. 4	4.760	29.2	70.8
SAND	Coarse	< #4 to > #10	No 10	2.000	38.6	61.4
	Medium	< #10 to > #40	No. 40	0.420	46.4	53.6
	Fine	< #40 to > #200	No. 60	0.250	53.6	46.4
			No. 80	0.180	63.6	36.4
			No. 200	0.075	70.8	29.2
			PAN	N/A	100.0	0.0

Percent Gravel: 29 %
Percent Sand: 42 %
Percent Fine: 29 %

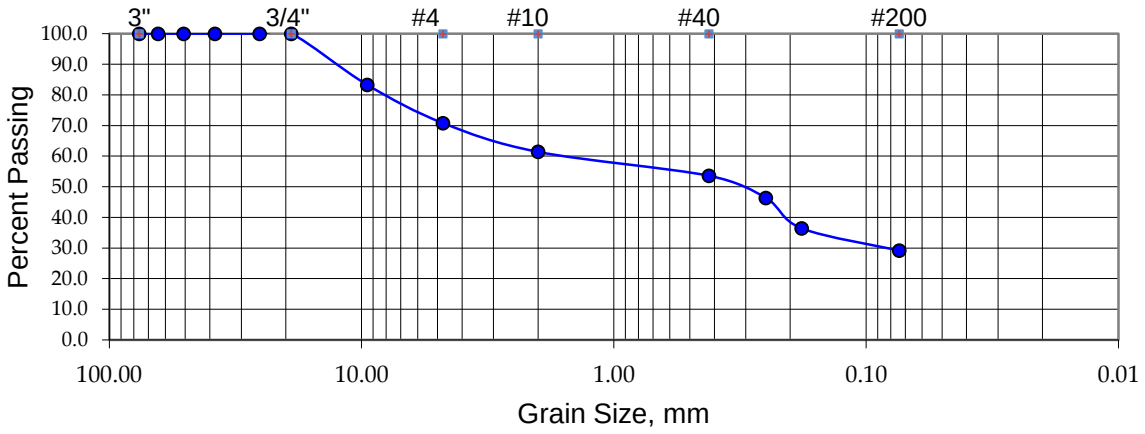
D10 (mm): N/A
D30 (mm): 0.09
D60 (mm): 1.8

Coefficient of Uniformity: Cu (D60/D10): N/A
Coefficient of Curvature: Cc (D30^2/(D10*D60)): N/A

Classification: Tan/Brown Silty Fine SAND with Limerock Fragments (FILL)

AASHTO: A-2-4 **USCS:**

GRAIN SIZE DISTRIBUTION CURVE



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REPORT OF SIEVE ANALYSIS

Client: City of Doral
Project Name: Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.
Project Location: City of Doral, FL

Report Date: 10/07/20
Report #: 1C
Project #: G10201017

Material Information/Sample Identification:

Boring No: AB-16
Depth Interval: 0.5 to 1.0 (Feet)

Date Sampled: 09/12/20
Date Tested: 09/15/20

Laboratory Test Data:

			US Standard Sieve No.	Sieve Size (mm)	Percent Retained (%)	Percent Passing Sieve (%)
GRAVEL	Coarse	< 3" to > 3/4"	1 1/2"	37.500	0.0	100.0
			1"	25.000	0.0	100.0
			3/4"	19.000	9.3	90.7
	Fine	< 3/4" to > #4	3/8"	9.510	27.7	72.3
			No. 4	4.760	40.6	59.4
SAND	Coarse	< #4 to > #10	No 10	2.000	48.5	51.5
	Medium	< #10 to > #40	No. 40	0.420	58.4	41.6
	Fine	< #40 to > #200	No. 60	0.250	66.0	34.0
			No. 80	0.180	77.4	22.6
			No. 200	0.075	85.7	14.3
			PAN	N/A	100.0	0.0

Percent Gravel: 41 %
Percent Sand: 45 %
Percent Fine: 14 %

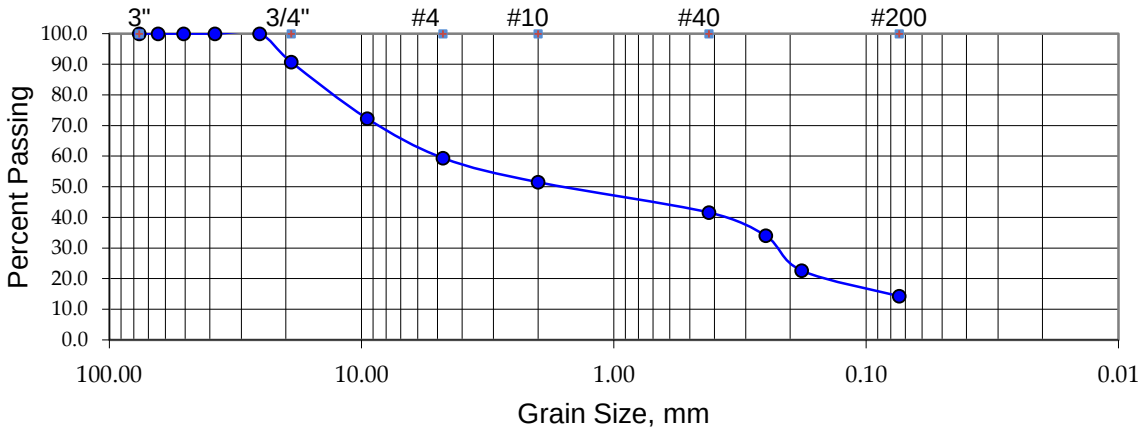
D10 (mm): N/A
D30 (mm): 0.24
D60 (mm): 4.99

Coefficient of Uniformity: Cu (D60/D10): N/A
Coefficient of Curvature: Cc (D30^2/(D10*D60)): N/A

Classification: Brown Silty Fine SAND with Limerock Fragmnets (FILL)

AASHTO: A-1-b **USCS:**

GRAIN SIZE DISTRIBUTION CURVE



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REPORT OF SIEVE ANALYSIS

Client: City of Doral
Project Name: Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.
Project Location: City of Doral, FL

Report Date: 10/07/20
Report #: 1D
Project #: G10201017

Material Information/Sample Identification:

Boring No: AB-21
Depth Interval: 0.5 to 1.0 (Feet)

Date Sampled: 09/12/20
Date Tested: 09/15/20

Laboratory Test Data:

			US Standard Sieve No.	Sieve Size (mm)	Percent Retained (%)	Percent Passing Sieve (%)
GRAVEL	Coarse	< 3" to > 3/4"	1 1/2"	37.500	0.0	100.0
			1"	25.000	15.6	84.4
			3/4"	19.000	22.9	77.1
	Fine	< 3/4" to > #4	3/8"	9.510	28.7	71.3
			No. 4	4.760	33.7	66.3
SAND	Coarse	< #4 to > #10	No 10	2.000	39.4	60.6
	Medium	< #10 to > #40	No. 40	0.420	44.4	55.6
	Fine	< #40 to > #200	No. 60	0.250	52.3	47.7
			No. 80	0.180	65.0	35.0
			No. 200	0.075	72.0	28.0
			PAN	N/A	100.0	0.0

Percent Garvel: 34 %
Percent Sand: 38 %
Percent Fine: 28 %

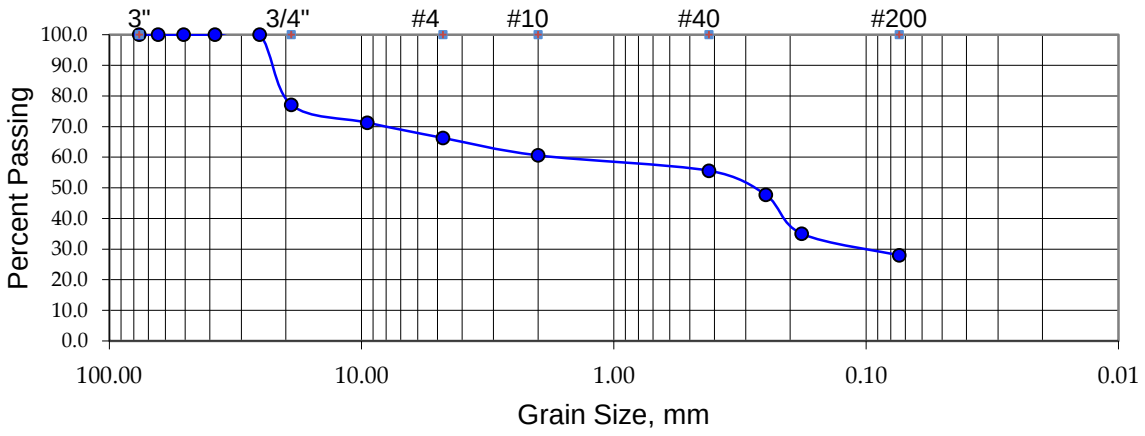
D10 (mm): N/A
D30 (mm): 0.1
D60 (mm): 2.0

Coefficient of Uniformity: Cu (D60/D10): N/A
Coefficient of Curvature: Cc (D30^2/(D10*D60)): N/A

Classification: Dark Brown Silty Fine SAND, Trace Limnrock Fragments

AASHTO: A-2-4 **USCS:**

GRAIN SIZE DISTRIBUTION CURVE



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REPORT OF SIEVE ANALYSIS

Client: City of Doral
Project Name: Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.
Project Location: City of Doral, FL

Report Date: 10/07/20
Report #: 2B
Project #: G10201017

Material Information/Sample Identification:

Boring No: B-28
Depth Interval: 6.0 to 8.0 (Feet)

Date Sampled: 09/14/20
Date Tested: 09/15/20

Laboratory Test Data:

			US Standard Sieve No.	Sieve Size (mm)	Percent Retained (%)	Percent Passing Sieve (%)
GRAVEL	Coarse	< 3" to > 3/4"	1 1/2"	37.500	0.0	100.0
			1"	25.000	21.8	78.2
			3/4"	19.000	30.9	69.1
	Fine	< 3/4" to > #4	3/8"	9.510	61.8	38.2
			No. 4	4.760	72.6	27.4
SAND	Coarse	< #4 to > #10	No 10	2.000	77.6	22.4
	Medium	< #10 to > #40	No. 40	0.420	82.4	17.6
	Fine	< #40 to > #200	No. 60	0.250	85.5	14.5
			No. 80	0.180	90.3	9.7
			No. 200	0.075	93.6	6.4
			PAN	N/A	100.0	0.0

Percent Gravel: 73 %
Percent Sand: 21 %
Percent Fine: 6 %

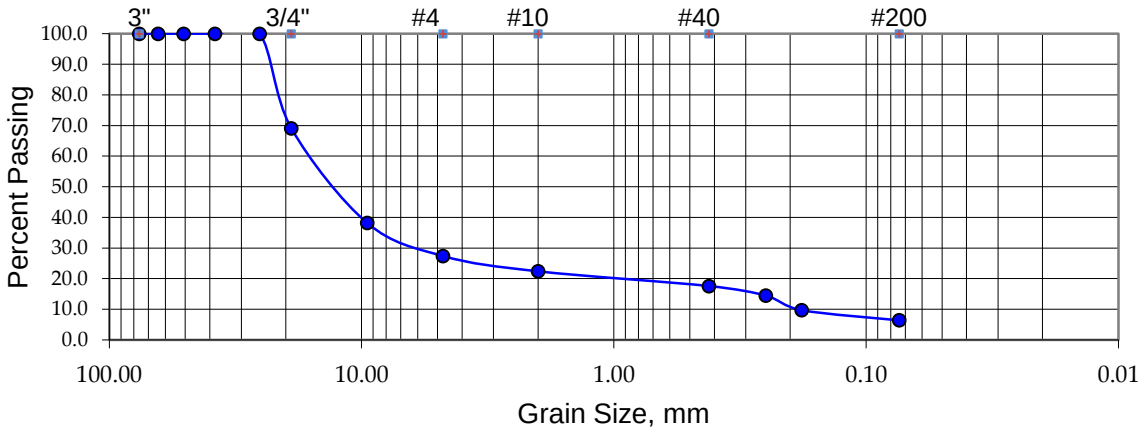
D10 (mm): 0.18
D30 (mm): 6.50
D60 (mm): 16.00

Coefficient of Uniformity: Cu (D60/D10): 88.9
Coefficient of Curvature: Cc (D30^2/(D10*D60)): 14.67

Classification: Brown/Tan Fine SAND with Silt, with Limerock Fragments (FILL)

AASHTO: A-1-a **USCS:**

GRAIN SIZE DISTRIBUTION CURVE



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REPORT OF SIEVE ANALYSIS

Client: City of Doral
Project Name: Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.
Project Location: City of Doral, FL

Report Date: 10/07/20
Report #: 2C
Project #: G10201017

Material Information/Sample Identification:

Boring No: B-29
Depth Interval: 0.0 to 2.0 (Feet)

Date Sampled: 09/14/20
Date Tested: 09/15/20

Laboratory Test Data:

			US Standard Sieve No.	Sieve Size (mm)	Percent Retained (%)	Percent Passing Sieve (%)
GRAVEL	Coarse	< 3" to > 3/4"	1 1/2"	37.500	0.0	100.0
			1"	25.000	9.4	90.6
			3/4"	19.000	9.4	90.6
	Fine	< 3/4" to > #4	3/8"	9.510	27.2	72.8
			No. 4	4.760	32.4	67.6
SAND	Coarse	< #4 to > #10	No 10	2.000	35.7	64.3
	Medium	< #10 to > #40	No. 40	0.420	39.3	60.7
	Fine	< #40 to > #200	No. 60	0.250	48.3	51.7
			No. 80	0.180	66.1	33.9
			No. 200	0.075	78.6	21.4
			PAN	N/A	100.0	0.0

Percent Gravel: 32 %
Percent Sand: 46 %
Percent Fine: 21 %

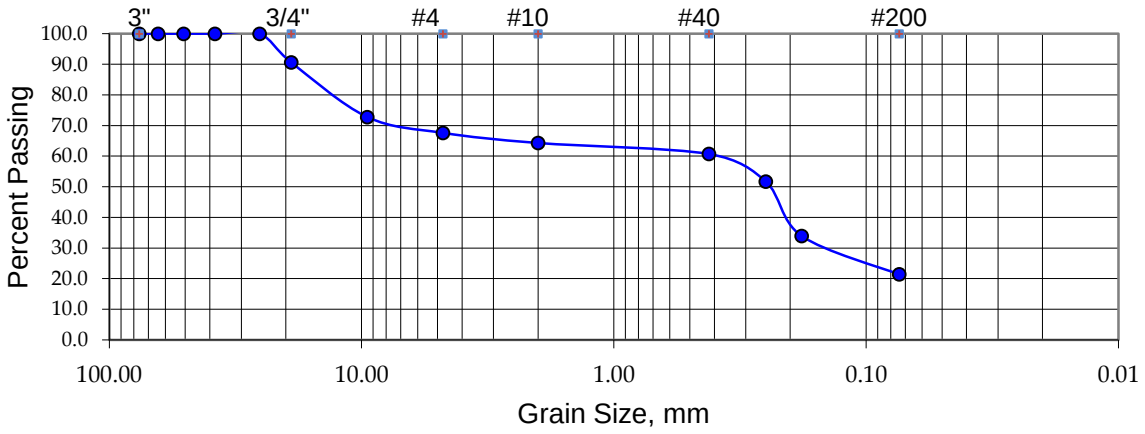
D10 (mm): N/A
D30 (mm): 0.16
D60 (mm): 0.41

Coefficient of Uniformity: Cu (D60/D10): N/A
Coefficient of Curvature: Cc (D30^2/(D10*D60)): N/A

Classification: Brown Silty Fine SAND trace Limerock Fragments (FILL)

AASHTO: A-2-4 **USCS:**

GRAIN SIZE DISTRIBUTION CURVE



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REPORT OF SIEVE ANALYSIS

Client: City of Doral
Project Name: Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.
Project Location: City of Doral, FL

Report Date: 10/07/20
Report #: 2D
Project #: G10201017

Material Information/Sample Identification:

Boring No: B-35
Depth Interval: 4.0 to 6.0 (Feet)

Date Sampled: 09/14/20
Date Tested: 09/15/20

Laboratory Test Data:

			US Standard Sieve No.	Sieve Size (mm)	Percent Retained (%)	Percent Passing Sieve (%)
GRAVEL	Coarse	< 3" to > 3/4"	1 1/2"	37.500	0.0	100.0
			1"	25.000	0.0	100.0
			3/4"	19.000	0.0	100.0
	Fine	< 3/4" to > #4	3/8"	9.510	0.6	99.4
			No. 4	4.760	1.2	98.8
SAND	Coarse	< #4 to > #10	No 10	2.000	1.5	98.5
	Medium	< #10 to > #40	No. 40	0.420	5.3	94.7
	Fine	< #40 to > #200	No. 60	0.250	26.6	73.4
			No. 80	0.180	71.3	28.7
			No. 200	0.075	96.0	4.0
			PAN	N/A	100.0	0.0

Percent Garvel: 1 %
Percent Sand: 95 %
Percent Fine: 4 %

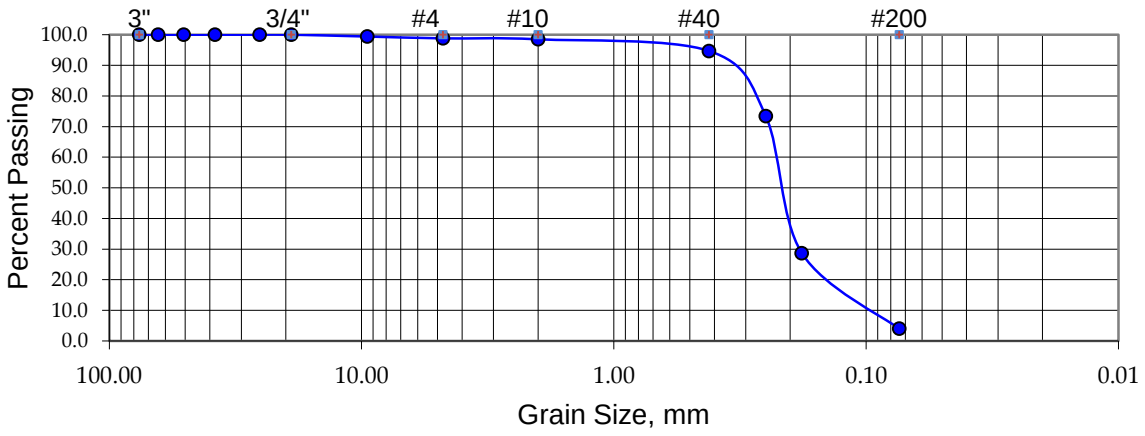
D10 (mm): 0.10
D30 (mm): 0.18
D60 (mm): 0.24

Coefficient of Uniformity: Cu (D60/D10): 2.4
Coefficient of Curvature: Cc (D30^2/(D10*D60)): 1.35

Classification: Brown Fine SAND

AASHTO: A-3 **USCS:**

GRAIN SIZE DISTRIBUTION CURVE



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REPORT OF SIEVE ANALYSIS

Client: City of Doral
Project Name: Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.
Project Location: City of Doral, FL

Report Date: 10/07/20
Report #: 2E
Project #: G10201017

Material Information/Sample Identification:

Boring No: B-39
Depth Interval: 0.0 to 2.0 (Feet)

Date Sampled: 09/15/20
Date Tested: 09/16/20

Laboratory Test Data:

			US Standard Sieve No.	Sieve Size (mm)	Percent Retained (%)	Percent Passing Sieve (%)
GRAVEL	Coarse	< 3" to > 3/4"	1 1/2"	37.500	0.0	100.0
			1"	25.000	0.0	100.0
			3/4"	19.000	0.0	100.0
	Fine	< 3/4" to > #4	3/8"	9.510	13.4	86.6
			No. 4	4.760	22.4	77.6
SAND	Coarse	< #4 to > #10	No 10	2.000	31.0	69.0
	Medium	< #10 to > #40	No. 40	0.420	42.4	57.6
	Fine	< #40 to > #200	No. 60	0.250	58.3	41.7
			No. 80	0.180	78.7	21.3
			No. 200	0.075	89.2	10.8
			PAN	N/A	100.0	0.0

Percent Garvel: 22 %
Percent Sand: 67 %
Percent Fine: 11 %

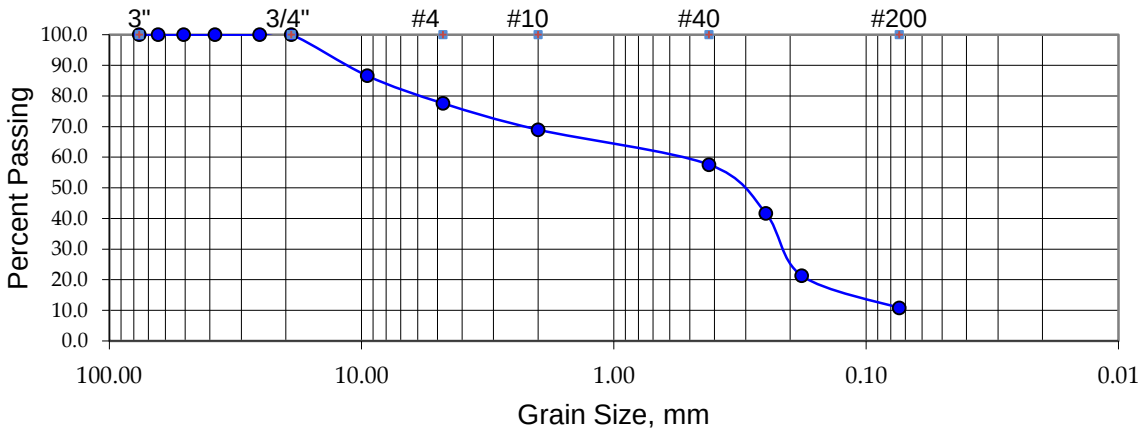
D10 (mm): 0.07
D30 (mm): 0.22
D60 (mm): 0.55

Coefficient of Uniformity: Cu (D60/D10): 7.7
Coefficient of Curvature: Cc (D30^2/(D10*D60)): 1.24

Classification: Dark Brown and Brown Silty Fine SAND Trace Organics and Limerock Fragments (FILL)

AASHTO: A-2-4 **USCS:**

GRAIN SIZE DISTRIBUTION CURVE



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REPORT OF SIEVE ANALYSIS

Client: City of Doral
Project Name: Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.
Project Location: City of Doral, FL

Report Date: 10/07/20
Report #: 2F
Project #: G10201017

Material Information/Sample Identification:

Boring No: B-40
Depth Interval: 0.0 to 2.0 (Feet)

Date Sampled: 09/15/20
Date Tested: 09/16/20

Laboratory Test Data:

			US Standard Sieve No.	Sieve Size (mm)	Percent Retained (%)	Percent Passing Sieve (%)
GRAVEL	Coarse	< 3" to > 3/4"	1 1/2"	37.500	0.0	100.0
			1"	25.000	0.0	100.0
			3/4"	19.000	9.5	90.5
	Fine	< 3/4" to > #4	3/8"	9.510	11.2	88.8
			No. 4	4.760	13.2	86.8
SAND	Coarse	< #4 to > #10	No 10	2.000	15.5	84.5
	Medium	< #10 to > #40	No. 40	0.420	17.2	82.8
	Fine	< #40 to > #200	No. 60	0.250	31.8	68.2
			No. 80	0.180	59.2	40.8
			No. 200	0.075	76.7	23.3
			PAN	N/A	100.0	0.0

Percent Garvel: 13 %
Percent Sand: 64 %
Percent Fine: 23 %

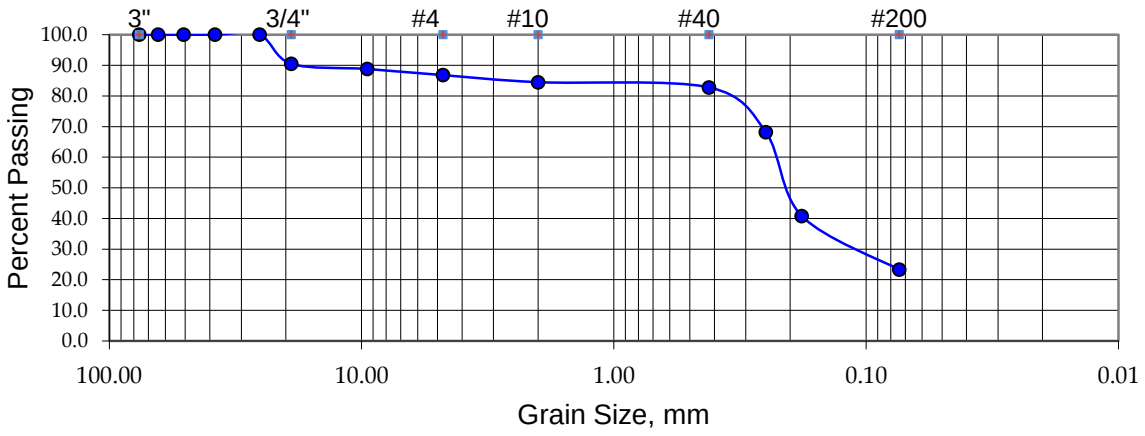
D10 (mm): N/A
D30 (mm): 0.12
D60 (mm): 0.2

Coefficient of Uniformity: Cu (D60/D10): N/A
Coefficient of Curvature: Cc (D30^2/(D10*D60)): N/A

Classification: Dark Brown and Brown Silty Fine SAND Trace Organics and Limerock Fragments (FILL)

AASHTO: A-2-4 **USCS:**

GRAIN SIZE DISTRIBUTION CURVE



GCES
GEOTECHNICAL CONSTRUCTION & ENGINEERING SOLUTIONS

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REPORT OF SIEVE ANALYSIS

Client: City of Doral
Project Name: Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.
Project Location: City of Doral, FL

Report Date: 10/07/20
Report #: 3A
Project #: G10201017

Material Information/Sample Identification:

Boring No: B-50
Depth Interval: 4.0 to 6.0 (Feet)

Date Sampled: 09/15/20
Date Tested: 09/16/20

Laboratory Test Data:

			US Standard Sieve No.	Sieve Size (mm)	Percent Retained (%)	Percent Passing Sieve (%)
GRAVEL	Coarse	< 3" to > 3/4"	1 1/2"	37.500	0.0	100.0
			1"	25.000	0.0	100.0
			3/4"	19.000	7.7	92.3
	Fine	< 3/4" to > #4	3/8"	9.510	8.7	91.3
			No. 4	4.760	11.0	89.0
SAND	Coarse	< #4 to > #10	No 10	2.000	15.7	84.3
	Medium	< #10 to > #40	No. 40	0.420	24.6	75.4
	Fine	< #40 to > #200	No. 60	0.250	39.6	60.4
			No. 80	0.180	66.7	33.3
			No. 200	0.075	84.7	15.3
			PAN	N/A	100.0	0.0

Percent Garvel: 11 %
Percent Sand: 74 %
Percent Fine: 15 %

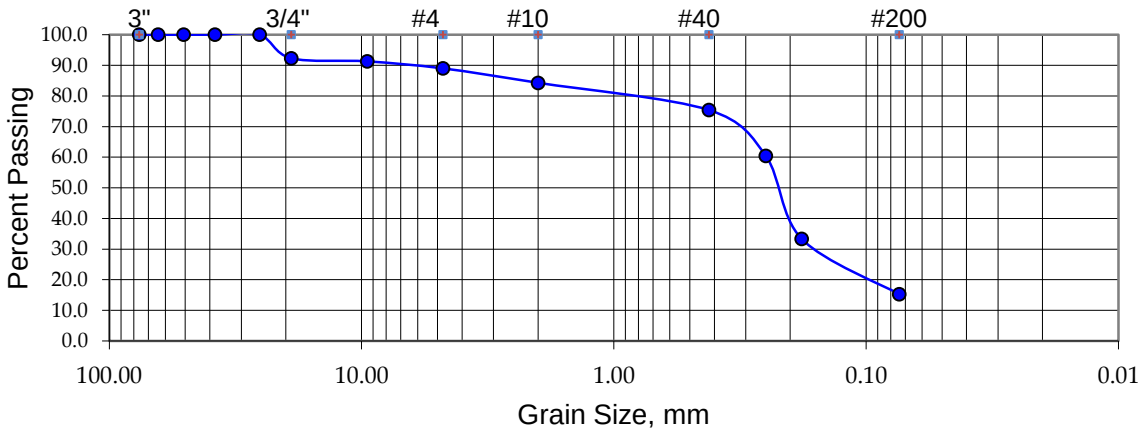
D10 (mm): N/A
D30 (mm): 0.17
D60 (mm): 0.26

Coefficient of Uniformity: Cu (D60/D10): N/A
Coefficient of Curvature: Cc (D30^2/(D10*D60)): N/A

Classification: Tan Silty Fine SAND with Liimestone Fragments

AASHTO: A-2-4 **USCS:**

GRAIN SIZE DISTRIBUTION CURVE



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REPORT OF SIEVE ANALYSIS

Client: City of Doral
Project Name: Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.
Project Location: City of Doral, FL

Report Date: 10/07/20
Report #: 3B
Project #: G10201017

Material Information/Sample Identification:

Boring No: B-52
Depth Interval: 2.0 to 4.0 (Feet)

Date Sampled: 09/15/20
Date Tested: 09/16/20

Laboratory Test Data:

			US Standard Sieve No.	Sieve Size (mm)	Percent Retained (%)	Percent Passing Sieve (%)
GRAVEL	Coarse	< 3" to > 3/4"	1 1/2"	37.500	0.0	100.0
			1"	25.000	0.0	100.0
			3/4"	19.000	4.7	95.3
	Fine	< 3/4" to > #4	3/8"	9.510	20.2	79.8
			No. 4	4.760	28.0	72.0
SAND	Coarse	< #4 to > #10	No 10	2.000	32.2	67.8
	Medium	< #10 to > #40	No. 40	0.420	38.2	61.8
	Fine	< #40 to > #200	No. 60	0.250	54.0	46.0
			No. 80	0.180	76.7	23.3
			No. 200	0.075	85.1	14.9
			PAN	N/A	100.0	0.0

Percent Gravel: 28 %
Percent Sand: 57 %
Percent Fine: 15 %

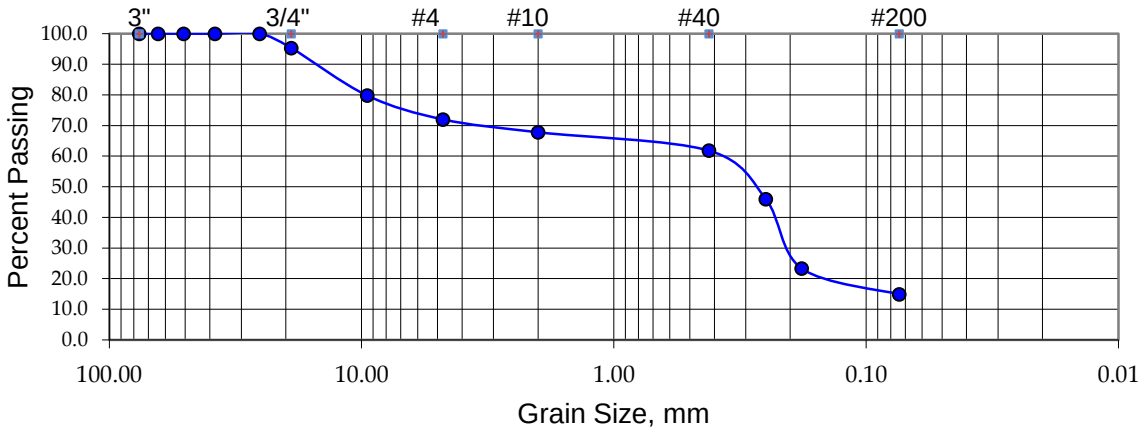
D10 (mm): N/A
D30 (mm): 0.2
D60 (mm): 0.39

Coefficient of Uniformity: Cu (D60/D10): N/A
Coefficient of Curvature: Cc (D30^2/(D10*D60)): N/A

Classification: Tan Silty Fine SAND with Liimestone Fragments

AASHTO: A-2-4 **USCS:**

GRAIN SIZE DISTRIBUTION CURVE



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REPORT OF SIEVE ANALYSIS

Client: City of Doral
Project Name: Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.
Project Location: City of Doral, FL

Report Date: 10/07/20
Report #: 3C
Project #: G10201017

Material Information/Sample Identification:

Boring No: B-54
Depth Interval: 0.0 to 2.0 (Feet)

Date Sampled: 09/15/20
Date Tested: 09/16/20

Laboratory Test Data:

			US Standard Sieve No.	Sieve Size (mm)	Percent Retained (%)	Percent Passing Sieve (%)
GRAVEL	Coarse	< 3" to > 3/4"	1 1/2"	37.500	0.0	100.0
			1"	25.000	0.0	100.0
			3/4"	19.000	9.6	90.4
	Fine	< 3/4" to > #4	3/8"	9.510	32.7	67.3
			No. 4	4.760	43.9	56.1
SAND	Coarse	< #4 to > #10	No 10	2.000	53.9	46.1
	Medium	< #10 to > #40	No. 40	0.420	65.8	34.2
	Fine	< #40 to > #200	No. 60	0.250	71.1	28.9
			No. 80	0.180	79.9	20.1
			No. 200	0.075	86.5	13.5
			PAN	N/A	100.0	0.0

Percent Gravel: 44 %
Percent Sand: 43 %
Percent Fine: 14 %

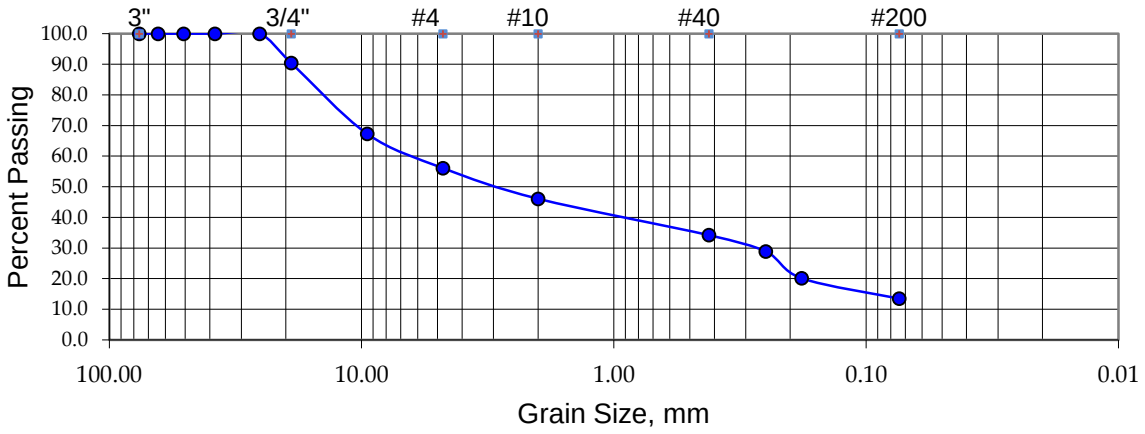
D10 (mm): N/A
D30 (mm): 0.25
D60 (mm): 6.5

Coefficient of Uniformity: Cu (D60/D10): N/A
Coefficient of Curvature: Cc (D30^2/(D10*D60)): N/A

Classification: Brown/Tan Silty Fine SAND with Limerock Fragments (FILL)

AASHTO: A-1-b **USCS:**

GRAIN SIZE DISTRIBUTION CURVE



EXFILTRATION TEST LOG
EX-1

Client:	City of Doral	**GCES Job #:**	G10201017
Project Name:	Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.	**Date:**	9/24/2020
Project Location:	City of Doral, FL	**Test #:**	EX-1
Test:	Usual Type Open Hole Exfiltration Test		
Surface Elevation:	Ground Surface	**Groundwater table (GWT) from ground surface (ft):**	3.8

Casing Diameter:	4	inches
Hole Diameter:	6	inches
Tube Depth:	20	Ft
GWT Prior to Test:	3.8	Ft
GWT During Test:	3.7	Ft

One Minute Increment	Pumping Rate in Gal/Min
1	50.00
2	50.00
3	50.00
4	50.00
5	50.00
6	50.00
7	50.00
8	50.00
9	50.00
10	50.00

Sample Location: As shown on Field Test Location Diagram

Subsurface Profile:

Depth (ft)	Soil Description (Based on Soil Boring)
0.0 - 0.2	Asphalt
0.2 - 8.0	Light Brown LIMEROCK Fragments (Fill)
8.0 - 10.5	Light Brown LIMESTONE with Sand
10.5 - 20.0	Brown Fine SAND

$$K = \frac{4Q}{\Pi d(2H_2^2 + 4H_2Ds + H_2d)} \times \frac{1}{448.83}$$

(Conversion Factor gpm to csf)

K =	Hydraulic Conductivity (cfs/ft2ft - head)		
Q =	"Stabilized" Flow Rate (gpm)	=	50.0
d =	Diameter of Test Hole (inches)	=	4
H_2 =	Depth to Water Table (feet)	=	3.8
Ds =	Saturated Hole Depth(feet)	=	16.2
D =	Depth of Hole (feet)	=	20.0

K = 1.53E-03 cfs/ft^{2}ft - head

EXFILTRATION TEST LOG
EX-2

Client:	City of Doral	**GCES Job #:**	G10201017
Project Name:	Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.	**Date:**	9/23/2020
Project Location:	City of Doral, FL	**Test #:**	EX-2
Test:	Usual Type Open Hole Exfiltration Test		

Surface Elevation: Ground Surface

Groundwater table (GWT) from ground surface (ft): 3.8

Casing Diameter:	4	inches
Hole Diameter:	6	inches
Tube Depth:	20	Ft
GWT Prior to Test:	3.8	Ft
GWT During Test:	3.7	Ft

One Minute Increment	Pumping Rate in Gal/Min
1	50.00
2	50.00
3	50.00
4	50.00
5	50.00
6	50.00
7	50.00
8	50.00
9	50.00
10	50.00

Sample Location: As shown on Field Test Location Diagram

Subsurface Profile:

Depth (ft)	Soil Description (Based on Soil Boring)
0.0 - 0.2	Asphalt
0.2 - 4.0	Light Brown LIMEROCK Fragments (Fill)
4.0 - 10.0	Light Brown LIMESTONE with Sand
10.0 - 20.0	Brown Fine SAND

$$K = \frac{4Q}{\Pi d(2H_2^{\,2} + 4H_2Ds + H_2d)} \times \frac{1}{448.83}$$

(Conversion Factor gpm to csf)

K =	Hydraulic Conductivity (cfs/ft2ft - head)		
Q =	"Stabilized" Flow Rate (gpm)	=	50.0
d =	Diameter of Test Hole (inches)	=	4
H_2 =	Depth to Water Table (feet)	=	3.8
Ds =	Saturated Hole Depth(feet)	=	16.3
D =	Depth of Hole (feet)	=	20.0

K = 1.56E-03 cfs/ft^{2}ft - head

EXFILTRATION TEST LOG
EX-3

Client:	City of Doral	**GCES Job #:**	G10201017
Project Name:	Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.	**Date:**	9/24/2020
Project Location:	City of Doral, FL	**Test #:**	EX-3
Test:	Usual Type Open Hole Exfiltration Test		

Surface Elevation: Ground Surface

Groundwater table (GWT) from ground surface (ft): 3.7

Casing Diameter:	4	inches
Hole Diameter:	6	inches
Tube Depth:	20	Ft
GWT Prior to Test:	3.7	Ft
GWT During Test:	3.6	Ft

One Minute Increment	Pumping Rate in Gal/Min
1	50.00
2	50.00
3	50.00
4	50.00
5	50.00
6	50.00
7	50.00
8	50.00
9	50.00
10	50.00

Sample Location: As shown on Field Test Location Diagram

Subsurface Profile:

Depth (ft)	Soil Description (Based on Soil Boring)
0.0 - 0.2	Asphalt
0.2 - 4.0	Light Brown LIMEROCK Fragments (Fill)
4.0 - 10.0	Light Brown LIMESTONE with Sand
10.0 - 20.0	Brown Fine SAND

$$K = \frac{4Q}{\Pi d(2H_2^2 + 4H_2Ds + H_2d)} \times \frac{1}{448.83}$$

(Conversion Factor gpm to csf)

K =	Hydraulic Conductivity (cfs/ft2ft - head)		
Q =	"Stabilized" Flow Rate (gpm)	=	50.0
d =	Diameter of Test Hole (inches)	=	4
H_2 =	Depth to Water Table (feet)	=	3.7
Ds =	Saturated Hole Depth(feet)	=	16.3
D =	Depth of Hole (feet)	=	20.0

K = 1.59E-03 cfs/ft^{2}ft - head

EXFILTRATION TEST LOG
EX-4

Client:	City of Doral	**GCES Job #:**	G10201017
Project Name:	Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.	**Date:**	9/24/2020
Project Location:	City of Doral, FL	**Test #:**	EX-4
Test:	Usual Type Open Hole Exfiltration Test		

Surface Elevation: Ground Surface

Groundwater table (GWT) from ground surface (ft): 4.0

Casing Diameter:	4	inches
Hole Diameter:	6	inches
Tube Depth:	20	Ft
GWT Prior to Test:	4.0	Ft
GWT During Test:	3.9	Ft

One Minute Increment	Pumping Rate in Gal/Min
1	48.00
2	48.00
3	48.00
4	48.00
5	48.00
6	48.00
7	48.00
8	48.00
9	48.00
10	48.00

Sample Location: As shown on Field Test Location Diagram

Subsurface Profile:

Depth (ft)	Soil Description (Based on Soil Boring)
0.0 - 0.2	Asphalt
0.2 - 4.0	Light Brown LIMEROCK Fragments (Fill)
4.0 - 11.0	Light Brown LIMESTONE with Sand
11.0 - 20.0	Brown Fine SAND

$$K = \frac{4Q}{\Pi d(2H_2^2 + 4H_2Ds + H_2d)} \times \frac{1}{448.83}$$

(Conversion Factor gpm to csf)

K =	Hydraulic Conductivity (cfs/ft2ft - head)		
Q =	"Stabilized" Flow Rate (gpm)	=	48.0
d =	Diameter of Test Hole (inches)	=	4
H_2 =	Depth to Water Table (feet)	=	4.0
Ds =	Saturated Hole Depth(feet)	=	16.0
D =	Depth of Hole (feet)	=	20.0

K = 1.41E-03 cfs/ft^{2}ft - head

EXFILTRATION TEST LOG
EX-5

Client: City of Doral
GCES Job #: G10201017
Project Name: Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.
Date: 9/24/2020
Project Location: City of Doral, FL
Test #: EX-5
Test: Usual Type Open Hole Exfiltration Test

Surface Elevation: Ground Surface
Groundwater table (GWT) from ground surface (ft): 4.0

Casing Diameter:	4	inches
Hole Diameter:	6	inches
Tube Depth:	20	Ft
GWT Prior to Test:	4.0	Ft
GWT During Test:	3.9	Ft

One Minute Increment	Pumping Rate in Gal/Min
1	48.00
2	48.00
3	48.00
4	48.00
5	48.00
6	48.00
7	48.00
8	48.00
9	48.00
10	48.00

Sample Location: As shown on Field Test Location Diagram

Subsurface Profile:

Depth (ft)	Soil Description (Based on Soil Boring)
0.0 - 0.3	Asphalt
0.3 - 4.0	Light Brown LIMEROCK Fragments (Fill)
4.0 - 10.0	Light Brown LIMESTONE with Sand
10.0 - 20.0	Light Brown Fine SAND

$$K = \frac{4Q}{\Pi d(2H_2^2 + 4H_2Ds + H_2d)} \times \frac{1}{448.83}$$

(Conversion Factor gpm to csf)

K =	Hydraulic Conductivity (cfs/ft2ft - head)		
Q =	"Stabilized" Flow Rate (gpm)	=	48.0
d =	Diameter of Test Hole (inches)	=	4
H_2 =	Depth to Water Table (feet)	=	4.0
Ds =	Saturated Hole Depth(feet)	=	16.0
D =	Depth of Hole (feet)	=	20.0

K = 1.41E-03 cfs/ft^{2}ft - head

EXFILTRATION TEST LOG
EX-6

Client:	City of Doral	**GCES Job #:**	G10201017
Project Name:	Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.	**Date:**	9/24/2020
Project Location:	City of Doral, FL	**Test #:**	EX-6
Test:	Usual Type Open Hole Exfiltration Test		
Surface Elevation:	Ground Surface	**Groundwater table (GWT) from ground surface (ft):**	3.8

Casing Diameter:	4	inches
Hole Diameter:	6	inches
Tube Depth:	20	Ft
GWT Prior to Test:	3.8	Ft
GWT During Test:	3.7	Ft

One Minute Increment	Pumping Rate in Gal/Min
1	50.00
2	50.00
3	50.00
4	50.00
5	50.00
6	50.00
7	50.00
8	50.00
9	50.00
10	50.00

Sample Location: As shown on Field Test Location Diagram

Subsurface Profile:

Depth (ft)	Soil Description (Based on Soil Boring)
0.0 - 0.2	Asphalt
0.2 - 2.0	Light Brown LIMEROCK Fragments (Fill)
2.0 - 10.0	Light Brown LIMESTONE with Sand
10.0 - 20.0	Light Brown SAND

$$K = \frac{4Q}{\Pi d(2H_2^2 + 4H_2Ds + H_2d)} \times \frac{1}{448.83}$$

(Conversion Factor gpm to csf)

K =	Hydraulic Conductivity (cfs/ft2ft - head)		
Q =	"Stabilized" Flow Rate (gpm)	=	50.0
d =	Diameter of Test Hole (inches)	=	4
H_2 =	Depth to Water Table (feet)	=	3.8
Ds =	Saturated Hole Depth(feet)	=	16.3
D =	Depth of Hole (feet)	=	20.0

K = 1.56E-03 cfs/ft^{2}ft - head

EXFILTRATION TEST LOG
EX-7

Client:	City of Doral	**GCES Job #:**	G10201017
Project Name:	Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.	**Date:**	9/23/2020
Project Location:	City of Doral, FL	**Test #:**	EX-7
Test:	Usual Type Open Hole Exfiltration Test		

Surface Elevation: Ground Surface

Groundwater table (GWT) from ground surface (ft): 4.5

Casing Diameter:	4	inches
Hole Diameter:	6	inches
Tube Depth:	20	Ft
GWT Prior to Test:	4.5	Ft
GWT During Test:	4.4	Ft

Sample Location: As shown on Field Test Location Diagram

Subsurface Profile:

Depth (ft)	Soil Description (Based on Soil Boring)
0.0 - 0.2	Asphalt
0.2 - 2.0	Light Brown LIMEROCK Fragments (Fill)
2.0 - 12.0	Light Brown LIMESTONE and Fine SAND
12.0 - 20.0	Light Brown Fine SAND

One Minute Increment	Pumping Rate in Gal/Min
1	50.00
2	50.00
3	50.00
4	50.00
5	50.00
6	50.00
7	50.00
8	50.00
9	50.00
10	50.00

$$K = \frac{4Q}{\Pi d(2H_2^2 + 4H_2Ds + H_2d)} \times \frac{1}{448.83}$$

(Conversion Factor gpm to csf)

K =	Hydraulic Conductivity (cfs/ft2ft - head)		
Q =	"Stabilized" Flow Rate (gpm)	=	50.0
d =	Diameter of Test Hole (inches)	=	4
H_2 =	Depth to Water Table (feet)	=	4.5
Ds =	Saturated Hole Depth(feet)	=	15.5
D =	Depth of Hole (feet)	=	20.0

K = 1.33E-03 cfs/ft^{2}ft - head

EXFILTRATION TEST LOG
EX-8

Client:	City of Doral	**GCES Job #:**	G10201017
Project Name:	Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.	**Date:**	9/24/2020
Project Location:	City of Doral, FL	**Test #:**	EX-8
Test:	Usual Type Open Hole Exfiltration Test		

Surface Elevation: Ground Surface

Groundwater table (GWT) from ground surface (ft): 3.8

Casing Diameter:	4	inches
Hole Diameter:	6	inches
Tube Depth:	20	Ft
GWT Prior to Test:	3.8	Ft
GWT During Test:	3.7	Ft

One Minute Increment	Pumping Rate in Gal/Min
1	47.00
2	47.00
3	47.00
4	47.00
5	47.00
6	47.00
7	47.00
8	47.00
9	47.00
10	47.00

Sample Location: As shown on Field Test Location Diagram

Subsurface Profile:

Depth (ft)	Soil Description (Based on Soil Boring)
0.0 - 0.2	Asphalt
0.2 - 2.0	Light Brown LIMEROCK Fragments (Fill)
2.0 - 10.5	Light Brown LIMESTONE and Fine SAND
10.5 - 20.0	Light Brown SAND

$$K = \frac{4Q}{\Pi d(2H_2^2 + 4H_2Ds + H_2d)} \times \frac{1}{448.83}$$

(Conversion Factor gpm to csf)

K =	Hydraulic Conductivity (cfs/ft2ft - head)		
Q =	"Stabilized" Flow Rate (gpm)	=	47.0
d =	Diameter of Test Hole (inches)	=	4
H_2 =	Depth to Water Table (feet)	=	3.8
Ds =	Saturated Hole Depth(feet)	=	16.3
D =	Depth of Hole (feet)	=	20.0

K = 1.46E-03 cfs/ft^{2}ft - head

EXFILTRATION TEST LOG
EX-9

Client:	City of Doral	**GCES Job #:**	G10201017
Project Name:	Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.	**Date:**	9/24/2020
Project Location:	City of Doral, FL	**Test #:**	EX-9
Test:	Usual Type Open Hole Exfiltration Test		

Surface Elevation: Ground Surface

Groundwater table (GWT) from ground surface (ft): 4.0

Casing Diameter:	4	inches
Hole Diameter:	6	inches
Tube Depth:	20	Ft
GWT Prior to Test:	4.0	Ft
GWT During Test:	3.9	Ft

Sample Location: As shown on Field Test Location Diagram

Subsurface Profile:

Depth (ft)	Soil Description (Based on Soil Boring)
0.0 - 0.2	Asphalt
0.2 - 2.0	Light Brown LIMEROCK Fragments (Fill)
2.0 - 12.0	Light Brown LIMESTONE and Fine SAND
12.0 - 20.0	Light Brown SAND

One Minute Increment	Pumping Rate in Gal/Min
1	50.00
2	50.00
3	50.00
4	50.00
5	50.00
6	50.00
7	50.00
8	50.00
9	50.00
10	50.00

$$K = \frac{4Q}{\Pi d(2H_2^2 + 4H_2Ds + H_2d)} \times \frac{1}{448.83}$$

(Conversion Factor gpm to csf)

K =	Hydraulic Conductivity (cfs/ft2ft - head)		
Q =	"Stabilized" Flow Rate (gpm)	=	50.0
d =	Diameter of Test Hole (inches)	=	4
H_2 =	Depth to Water Table (feet)	=	4.0
Ds =	Saturated Hole Depth(feet)	=	16.0
D =	Depth of Hole (feet)	=	20.0

K = 1.47E-03 cfs/ft^{2}ft - head

EXFILTRATION TEST LOG
EX-10

Client:	City of Doral	**GCES Job #:**	G10201017
Project Name:	Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.	**Date:**	9/23/2020
Project Location:	City of Doral, FL	**Test #:**	EX-10
Test:	Usual Type Open Hole Exfiltration Test		

Surface Elevation: Ground Surface

Groundwater table (GWT) from ground surface (ft): 4.1

Casing Diameter:	4	inches
Hole Diameter:	6	inches
Tube Depth:	20	Ft
GWT Prior to Test:	4.1	Ft
GWT During Test:	0	Ft

One Minute Increment	Pumping Rate in Gal/Min
1	2.50
2	2.50
3	2.50
4	2.50
5	2.50
6	2.50
7	2.50
8	2.50
9	2.50
10	2.50

Sample Location: As shown on Field Test Location Diagram

Subsurface Profile:

Depth (ft)	Soil Description (Based on Soil Boring)
0.0 - 0.2	Asphalt
0.2 - 2.0	Light Brown LIMEROCK Fragments (Fill)
2.0 - 12.0	Light Brown Fine SAND, Trace Limestone
12.0 - 20.0	Light Brown SAND

$$K = \frac{4Q}{\Pi d(2H_2^2 + 4H_2Ds + H_2d)} \times \frac{1}{448.83}$$

(Conversion Factor gpm to csf)

K =	Hydraulic Conductivity (cfs/ft2ft - head)		
Q =	"Stabilized" Flow Rate (gpm)	=	2.5
d =	Diameter of Test Hole (inches)	=	4
H_2 =	Depth to Water Table (feet)	=	4.1
Ds =	Saturated Hole Depth(feet)	=	15.9
D =	Depth of Hole (feet)	=	20.0

K = 7.23E-05 cfs/ft^{2}ft - head

EXFILTRATION TEST LOG
EX- 2

Client: _____ **GCES Job #:** G10201017
Project: _____ **Date:** _____
Address: _____ **Test #:** EX-1
Test: Usual Type Open Hole Exfiltration Test

Surface Elevation: Ground Surface **Groundwater table (GWT) from ground surface (ft):** 9.5

Casing Diameter:	3	inches
Hole Diameter:	4	inches
Tube Depth:	10	Ft
GWT Prior to Test:	9.5	Ft
GWT During Test:	0	Ft

One Minute Increment	Pumping Rate in Gal/Min
1	50.00
2	50.00
3	50.00
4	50.00
5	50.00
6	50.00
7	50.00
8	50.00
9	50.00
10	50.00

Sample Location: As shown on Field Test Location Diagram

Subsurface Profile:

Depth (ft)	Soil Description (Based on Soil Boring)
0.0 - 0.2	Topsoil
0.2 - 2.0	Dark Brown Fine Silty SAND, Trace Limerock Fragments
2.0 - 4.0	Light Brown Fine SAND
4.0 - 6.0	Dark Brown Silty Fine SAND
6.0 - 12.0	Brown to Tan LIMESTONE, with Silty Fine Sand
12.0 - 15.0	Ligth Brown Fine SAND, Trace Limerock Fragments

$$K = \frac{4Q}{\Pi d(2H_2^2 + 4H_2Ds + H_2d)} \times \frac{1}{448.83}$$

(Conversion Factor gpm to csf)

K =	Hydraulic Conductivity (cfs/ft2ft - head)		
Q =	"Stabilized" Flow Rate (gpm)	=	50.0
d =	Diameter of Test Hole (inches)	=	3
H_2 =	Depth to Water Table (feet)	=	9.5
Ds =	Saturated Hole Depth(feet)	=	0.5
D =	Depth of Hole (feet)	=	10.0

K = 2.81E-03 cfs/ft^{2}ft - head

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EXFILTRATION TEST LOG
EX- 1

Client:	The Corradino Group	GCES Job #	G10161004
Project:	SR 934/NW 74St from SR 826 / Palmetto Expressway to SR 251	Date:	9/29/2016
	Okeechobee Road.	Test #	1A
Adress:	Miami Dade County, FL		
Test:	FDOT		

Surface Elevation: Ground Surface

Groundwater table (GWT) from ground surface (ft): 3.5

			Correction Depht of Hole	
Casing Diameter:	6	inches		
Hole Diameter:	6 3/4	inches		
Depth of Hole	10	Ft		
Tube Depth:	10	Ft	7.5	Ft
GWT Prior to Test:	3.5	Ft	1.0	Ft
GWT During Test:	2.5	Ft	0	Ft

One Minute Increment	Pumping Rate in Gal/Min
1	10.8
2	10.7
3	10.8
4	10.4
5	10.4
6	10.2
7	10.1
8	10.1
9	10.1
10	10.0

Sample Location: As shown on Field Test Location Diagram

Subsurface Profile:

Depth (ft)		Soil Description
0.0 -	0.4	ASPHALT Pavement
0.4 -	2.5	Brown Sligthly Silty SAND with Trace of Limerock Fragments
2.5 -	4.0	Brown SAND
4.0	10.0	Brown SAND with some Limestone Fragments

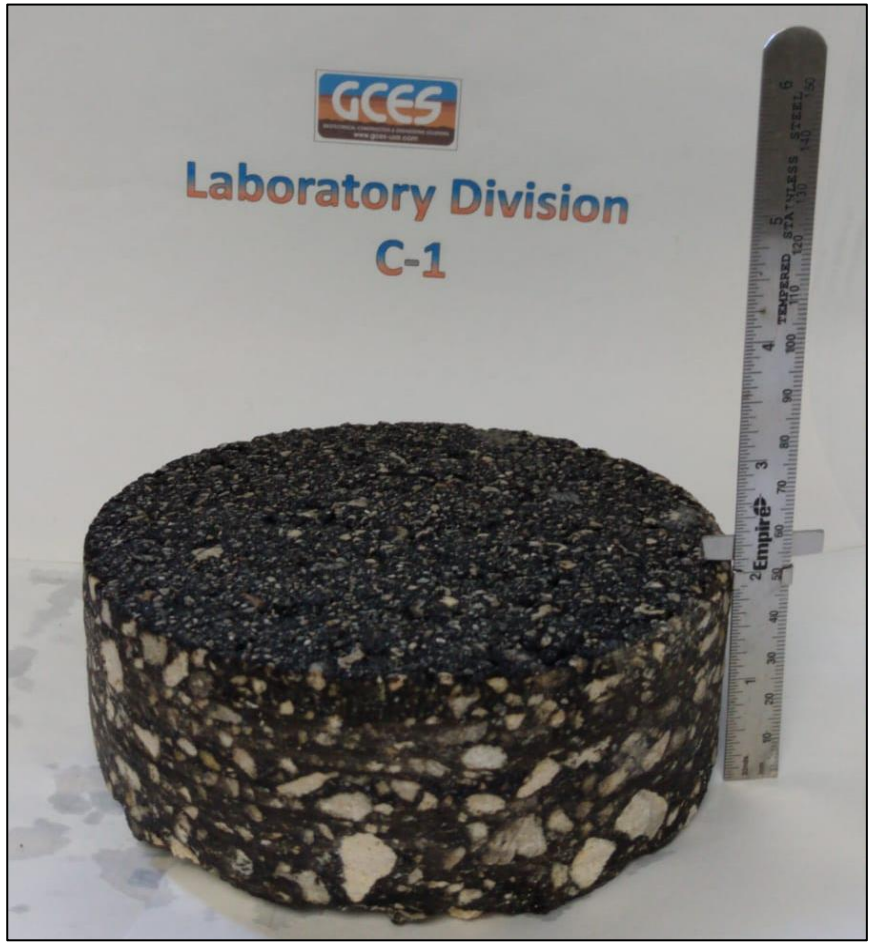
$$K = \frac{4Q}{\Pi d(2H_2^2 + 4H_2Ds + H_2d)} \times \frac{1}{448.83}$$

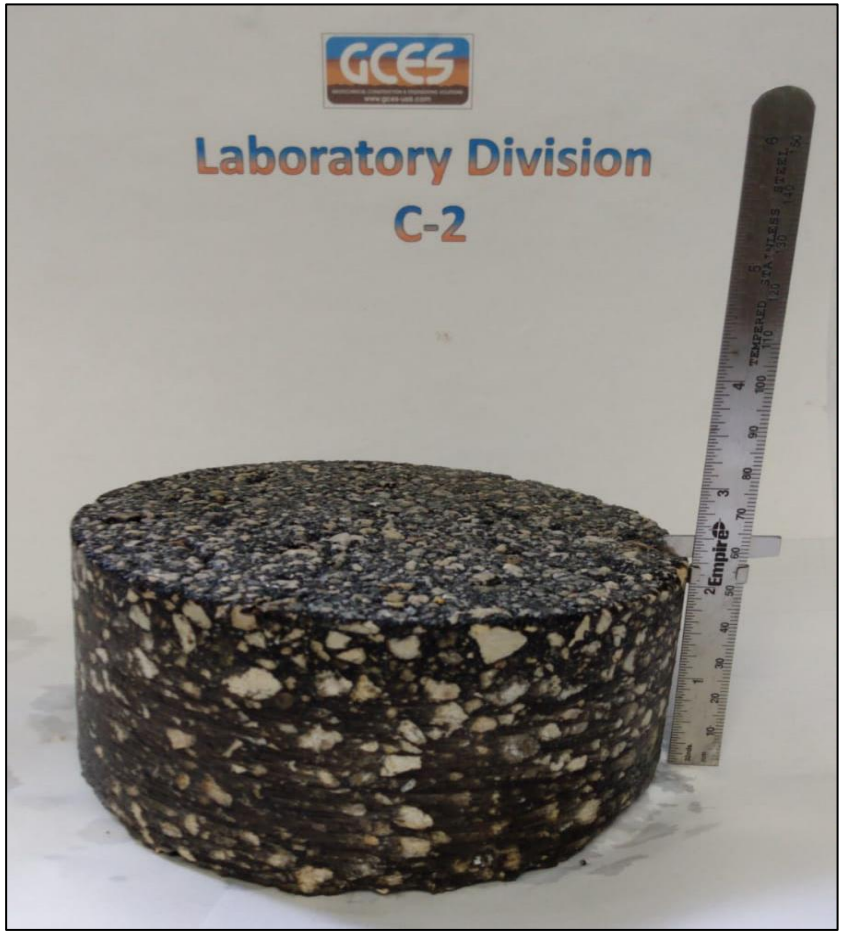
(Conversion Factor gpm to csf)

K =	Hydraulic Conductivity (cfs/ft2ft - head)		
Q =	"Stabilized" Flow Rate (gpm)	=	10.4
d =	Diameter of Test Hole (inches)	=	6
H_2 =	Depth to Water Table (feet)	=	1.0
Ds =	Saturated Test Hole Depth(feet)	=	6.5
D =	Depth of Test Hole (feet)	=	7.5

K = 2.06E-03 cfs/ft^{2}ft - head

Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.
City of Doral, FL





Pavement Cores

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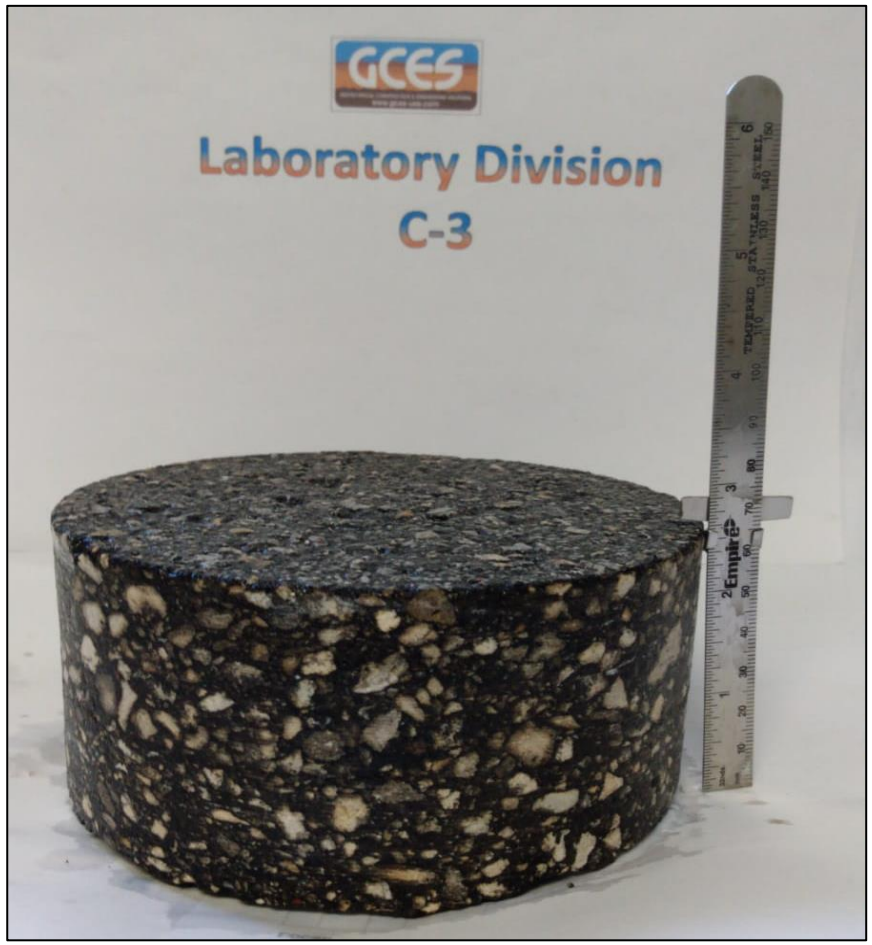
Roadway Improvements at NW 84th Ave, NW 82nd Ave, NW 54th St and NW 56th St.
City of Doral, FL



Pavement Cores

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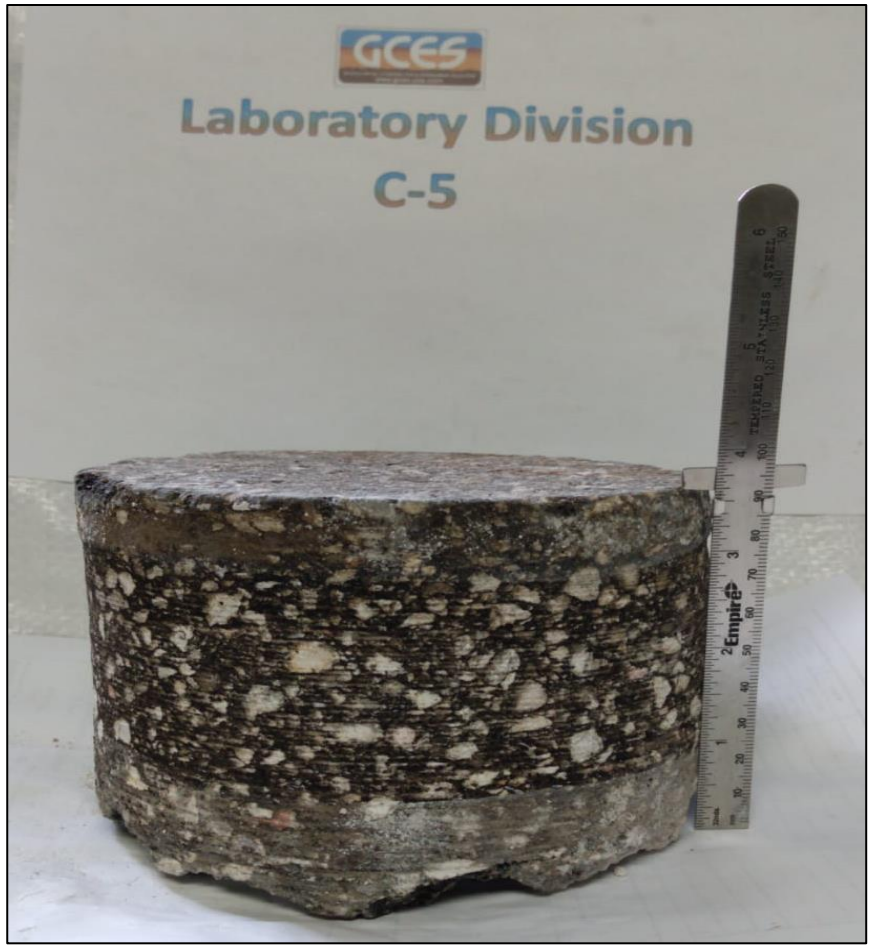

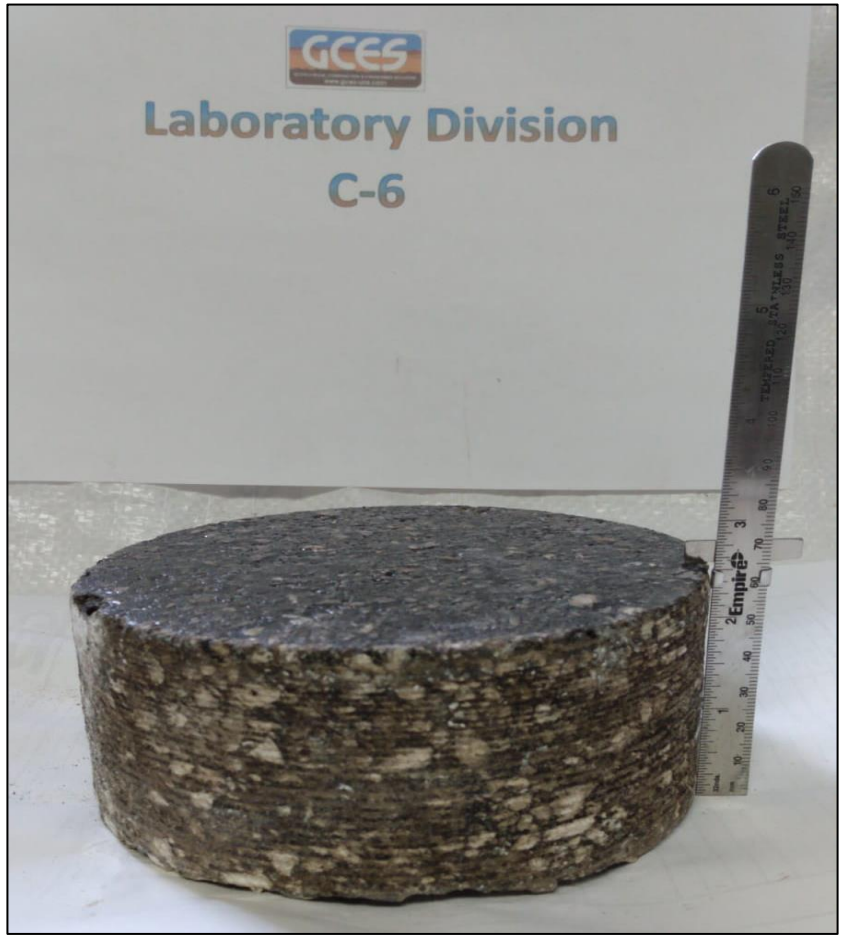

Pavement Cores

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Pavement Cores

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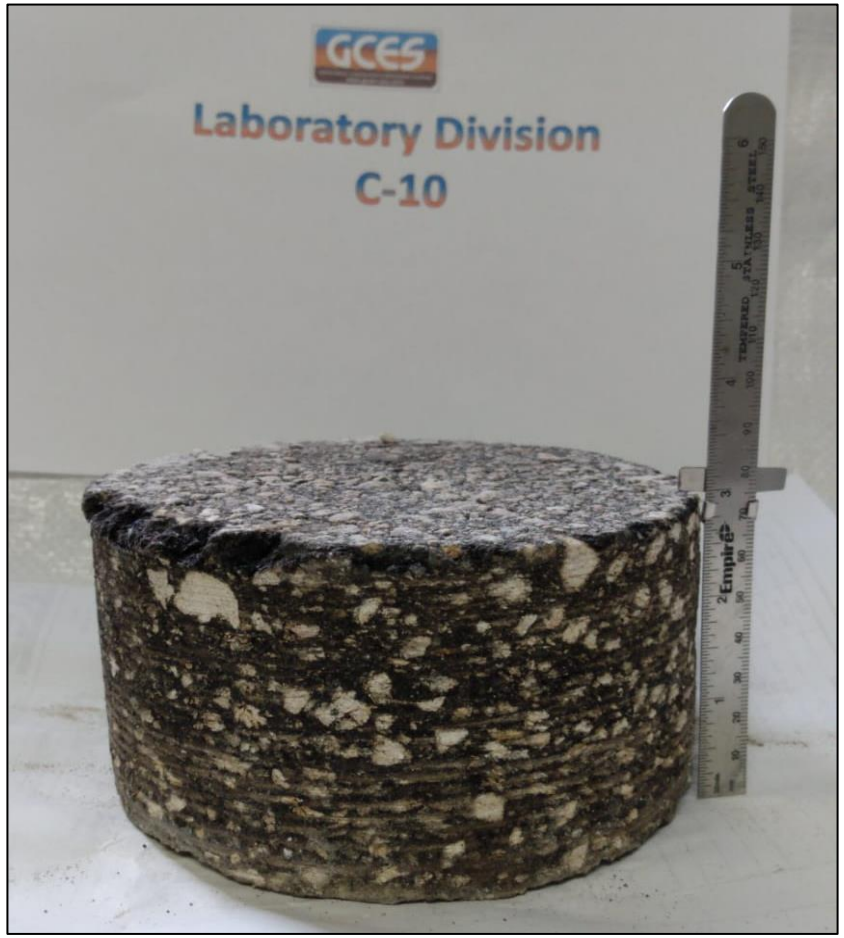

Pavement Cores

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FIELD EXPLORATORY DESCRIPTION

Standard Penetration Test (SPT)

Soil samples were obtained by the split spoon sampling procedure in general accordance with the Standard Penetration Test (SPT) procedure ASTM Standard D-1586. The SPT procedure consists of driving a split-barrel sampler to obtain a soil sample and to measure the resistance (N-value) of the soil to penetration of the sampler. In the split barrel sampling procedure, the number of blows required to advance a standard 2 inch O.D. split barrel sampler the last 12 inches of an 18-inch penetration or the middle 12 inches of a 24-inch penetration by means of a 140 pound hammer with a free fall of 30 inches, is the standard penetration resistance value (N).

The N-values provide a measure of the relative density of cohesionless soils (sands) and the consistency of cohesive soils (clays) sampled during drilling. Engineering properties of the soils are inferred from SPT N-values and index property soil classification, based on published empirical correlations.

The N-values also provide a general indication of hardness for rock formations such as the limestone commonly encountered in the Southeast Florida area. Where limestone is encountered, the Standard Penetration Test is used as a general indication of hardness. Where low blows per foot are encountered, it is assumed that solution cavities filled with loose sands or soft silt soils are present within the limestone formation.

LABORATORY TESTING PROCEDURE

Percent Passing No. 200 Sieve

The grain size analysis were conducted in general accordance with FDOT test Designation (FM-1-T88 (ASTM Designation D-422, tilted "Particle Side Analysis of Soils"). The grain-size analysis test measures the percentage passing the No. 200 Sieve. In this manner, the grain-size distribution of a soil is measured. The percentage by weight passing the No. 200 Sieve is the amount of silt and clay sized particles. Other samples were analyzed for fines content only by measuring the percentage by weight of dry soil sample passing a U.S. standard No. 200 sieve in general accordance with ASTM-D1140.

Moisture Content

In order to determine the moisture content of soil samples, test specimens were dried in an oven to constant mass in general accordance with ASTM-D2216. The water content is then calculated using the mass of the water and the mass of the dry specimen. The water content is used to express the phase relationship of air, water, and solid in a given volume of material. In fine grained soils, the consistency of a given soil type depends on its water content.

Organic Content

In order to determine the compressibility of soil over time, organic content tests were performed on soil sample collected from soil layers suspected of containing significant amounts of organic materials. Organic content is determined by methods similar to those employed to find water content. The dry test specimen is burnt in a hot oven until it reaches a constant mass. The loss of mass due to burning is considered to be organic materials in the soil. The organic soil content is then calculated using the mass of the organics and the mass of the burnt specimen.

UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests[A]					Soil Classification	
					Group Symbol	Group Name[B]
Coarse Grained Soils	Gravels	Clean Gravels	$Cu \geq 4$ and $1 \leq Cc \leq 3$[E]		GW	Well-graded gravel[F]
More than 50% retained	More than 50% of coarse fraction retained on No. 4 sieve	Less than 5% fines[C]	$Cu < 4$ and/or $1 > Cc > 3$[E]		GP	Poorly graded gravel[F]
on No. 200 sieve		Gravels with Fines	Fines classify as ML or MH		GM	Silty gravel[F,G,H]
		More than 12% fines[C]	Fines classify as CL or CH		GC	Clayey gravel[F,G,H]
	Sands	Clean Sands	$Cu \geq 6$ and $1 \leq Cc \leq 3$[E]		SW	Well-graded sand[I]
	50% or more of coarse fraction passes No. 4 sieve	Less than 5% fines[D]	$Cu < 6$ and/or $1 > Cc > 3$[E]		SP	Poorly graded sand[I]
		Sands with Fines	Fines classify as ML or MH		SM	Silty sand[G,H,I]
		More than 12% fines[D]	Fines Classify as CL or CH		SC	Clayey sand[G,H,I]
Fine-Grained Soils	Silts and Clays	inorganic	PI > 7 and plots on or above "A" line[J]		CL	Lean clay[K,L,M]
50% or more passes the No. 200 sieve	Liquid limit less than 50		PI < 4 or plots below "A" line[J]		ML	Silt[K,L,M]
		organic	Liquid limit - oven dried	< 0.75	OL	Organic clay[K,L,M,N]
			Liquid limit - not dried			Organic silt[K,L,M,O]
	Silts and Clays	inorganic	PI plots on or above "A" line		CH	Fat clay[K,L,M]
	Liquid limit 50 or more		PI plots below "A" line		MH	Elastic Silt[K,L,M]
		organic	Liquid limit - oven dried	< 0.75	OH	Organic clay[K,L,M,P]
			Liquid limit - not dried			Organic silt[K,L,M,Q]
Highly organic soils	Primarily organic matter, dark in color, and organic odor				PT	Peat

[A] Based on the material passing the 3-in. (75-mm) sieve

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.