CITY OF DELAND
REGULAR MEETING OF THE PLANNING BOARD
JUNE 11, 2025 AT 5:00 PM
CITY HALL, COMMISSION CHAMBERS
120 SOUTH FLORIDA AVENUE

AGENDA

CALL TO ORDER

PLEDGE OF ALLEGIANCE

ROLL CALL

VERBAL REPORT ON CITY COMMISSION MEETINGS

MINUTES

1. Approval of the April 9, 2025 meeting minutes.
2. Approval of the May 14, 2025 meeting minutes.
3. Approval of the May 20, 2025 Planning Board Special Meeting - Workshop minutes.

VARIANCE OLD BUSINESS

VARIANCE NEW BUSINESS

PUBLIC PARTICIPATION PROCEEDINGS

PLANNING - OLD BUSINESS

1. *CONTINUED FROM MAY 14, 2025 MEETING*
   Applicant Name: City of DeLand
   Project Number: LDR25-41
   Project Location: City-wide
   Project Description: Update Land Development Regulations to Allow for Urban or Backyard Chickens - 33-27.06 Urban or Backyard Chickens
   Staff Planner: Carol Kuhn

PLANNING - NEW BUSINESS

1. Applicant Name: Shanda Turner - 2816 DeLand LLC
   Project Number: SP24-198 – Site Plan for DeLand Dupont Warehouse
   Project Location: ±16.109 acres located at 2500 Eidson Drive
   Project Description: Development of 41,800 sq. ft. warehouse building including all utility and stormwater infrastructure
   Project Planner: Emily Kunkel

2. Applicant Name: Russell Skinner, Sr. - Deland Arborcultural Partnership Ltd.
   Project Number: SSB25-048
   Project Location: 2500 Eidson Dr.

Project Description: Subdivision Sketch for DeLand Airport Parcels 17 & 18
Staff Planner: Emily Kunkel

3. Applicant Name: Jessica Gow, CobbCole
Project Number: Z25-079
Project Location: S. Woodland Blvd., east of Firehouse Rd.
Project Description: Rezone ±7.35 acres from Mainstreet Townhomes PD to C-2 General Commercial
Staff Planner: Kendall Story

OTHER BUSINESS

ADJOURNMENT

Revised 5/14/2025 to add the vote for Z24-231.

CITY OF DELAND
PLANNING BOARD REGULAR MEETING

MINUTES

WEDNESDAY, APRIL 9, 2025 - 5:00 P.M.

CITY HALL

CALL TO ORDER

The meeting began at 5:12 p.m.

PLEDGE OF ALLEGIANCE

Pledge of Allegiance – Mr. Hill, Chairperson

ROLL CALL

Henry Thiry	Absent
Nora Lewis	Present
Albert Neumann	Present
Don Liska	Present
Troy Baumgartner	Absent
Harper Hill, *Vice Chairperson*	Present
Jeremy Owens, *Chairperson*	Absent

Quorum: Yes

Present – Darren Elkind, City Attorney; Carol Kuhn, Planning Director; Kendall Story, Senior Planner; Belinda Williams-Collins, Senior Planner; Chris Carson, Senior Planner; Vivian Ford, Administrative Coordinator; applicants; and members of the public.

VERBAL REPORT ON CITY COMMISSION MEETINGS

Ms. Kuhn provided a verbal report.

MINUTES

1. The board unanimously voted to approve the March 12, 2025 Meeting Minutes.

VARIANCE OLD BUSINESS

None.

VARIANCE NEW BUSINESS

None.

PUBLIC PARTICIPATION PROCEEDINGS

Mr. Hill read the Public Participation procedures.

PLANNING – OLD BUSINESS

1. *CONTINUED FROM THE MARCH 12TH MEETING*
   Applicant Name: Ben Friel
   Project Number: Z24-231 - Rezoning to Planned Development
   Project Location: 450 N McDonald Ave.
   Project Description: Rezoning of ±18.3 acres of property from Multiple-Family Dwelling District (R-12) to McDonald Property Planned Development (PD)
   Project Planner: Kendall Story

Mark Karat, on behalf of the applicant, spoke and answered questions from the board and the public.

Eric Knowlton asked as to the purpose of breaking down the parcel into 4 sections. Mr. Karat stated it would help with compliance for the loans to break down the parcels based on their uses; however, it will continue to operate as a whole.

Ms. Lewis moved to recommend approval, with staff's recommendations. Mr. Neumann seconded the motion. The motion to recommend approval passed unanimously.

PLANNING – NEW BUSINESS

1. *CONTINUE TO MAY 14, 2025 MEETING*
   Applicant Name: City of DeLand
   Project Number: LDR25-9
   Project Location: City-wide
   Project Description: Update Land Development Regulations to Allow for Urban or Backyard Chickens - 33-27.06 Urban or Backyard Chickens - Request for Continuance
   Staff Planner: Carol Kuhn

Ms. Kuhn was present as assigned project planner and available for questions to the board.

Ms. Lewis moved to continue this item to the May 14, 2025 meeting. Mr. Liska seconded the motion. The motion to continue passed unanimously.

OTHER BUSINESS

1. Presentation of new zoning map.

ADJOURNMENT

The meeting ended at 5:29 p.m.

CITY OF DELAND
PLANNING BOARD REGULAR MEETING
MINUTES
WEDNESDAY, MAY 14, 2025 - 5:00 P.M.
CITY HALL

CALL TO ORDER

The meeting began at 5:06 p.m.

PLEDGE OF ALLEGIANCE

Pledge of Allegiance – Mr. Owens, Chairperson

ROLL CALL

Henry Thiry	Absent
Nora Lewis	Present
Albert Neumann	Absent
Don Liska	Present
Troy Baumgartner	Present
Harper Hill, *Vice Chairperson*	Present
Jeremy Owens, *Chairperson*	Present

Quorum: Yes

Present – Aerial McCann, Associate City Attorney; Carol Kuhn, Planning Director; Deborah Glick, Development Services Manager; Kendall Story, Senior Planner; Chris Carson, Senior Planner; Vivian Ford, Administrative Coordinator; Tyler Figenscher, Planning Intern; applicants; and members of the public.

MINUTES

1. Mr. Liska expressed no vote was recorded for item Z24-231 and requested a review of the April 9, 2025 before approval. The board unanimously voted to continue the approval of the Meeting Minutes to the June 9, 2025 meeting.

VARIANCE OLD BUSINESS

None.

VARIANCE NEW BUSINESS

1. Applicant Name: Danny Ball
   Project Number: V25-045

Project Location: 101 Parkhurst Lane
Project Description: To allow a six-foot fence within the street-side setback area where a maximum of four-feet is allowed.
Project Planner: Samuel Nelson

Danny Ball, as applicant, spoke and answered questions from the board.

Mr. Hill moved to approve this item, with the condition that upon the road being built out, the property will either comply with reducing to a 4 ft. fence or otherwise move the fence 10 ft. towards the home. Ms. Lewis seconded the motion.

The applicant indicated he accepts this condition. The motion to approve, with conditions, passed unanimously.

PUBLIC PARTICIPATION PROCEEDINGS

Mr. Owens read the Public Participation procedures.

OLD BUSINESS

1. *CONTINUED FROM THE APRIL 9TH MEETING*
   Applicant Name: City of DeLand
   Project Number: LDR25-41
   Project Location: City-wide
   Project Description: Update Land Development Regulations to Allow for Urban or Backyard Chickens - 33-27.06 Urban or Backyard Chickens - Request for Continuance
   Staff Planner: Carol Kuhn

Carol Kuhn, on behalf of the City, requested a continuance to the June 11, 2025 meeting, and a discussion on chickens to be added to this meeting under "Other Business".

Mr. Hill moved to continue this item to the June 11, 2025 meeting, and to add a chicken discussion to the agenda under Other Business. Ms. Lewis seconded the motion. The motion to continue passed unanimously.

PLANNING – NEW BUSINESS

1. Applicant Name: Mark Watts, Cobb Cole
   Project Number: AN24-180 - Annexation for Delaney Trinity Reserve
   Project Location: 1290 W. Plymouth Ave.
   Project Description: Annex ±10.64 acres
   Project Planner: Kendall Story

Mark Watts, as applicant, was present and available to answer questions from the board.

Ms. Lewis moved to recommend approval for this item. Mr. Liska seconded the motion. The motion to recommend approval passed unanimously.

2. Applicant Name: Mark Watts, Cobb Cole
   Project Number: SMLU24-181 - Comprehensive Plan Amendment
   Project Location: 1290 W. Plymouth Ave.
   Project Description: Land Use Change for ±10.14 acres

Project Planner: Kendall Story

Mark Watts, as applicant, was present and available to answer questions from the board.

Mr. Liska moved to recommend approval for this item. Ms. Lewis seconded the motion. The motion to recommend approval passed unanimously.

3. Applicant Name: Mark Watts, Cobb Cole
   Project Number: Z24-179 - Rezoning for Delaney Trinity Reserve
   Project Location: 1290 W. Plymouth Ave.
   Project Description: Rezone ±10.14 acres from Volusia County A-3 and A-3A to City of DeLand Delaney Trinity Reserve Planned Development, a Residential Townhome Development
   Project Planner: Kendall Story

Mark Watts, as applicant, was present and answered questions from the board and the public.

Mr. Hill stated concerns with school capacity. Mr. Owens stated the desire for increased front yard setbacks and on-street parking.

Sara Newcomer is against the project due to concerns for the animals in the area and the area currently being a country road in comparison to the heavy traffic nearby, especially during the school rush hour. John Newcomer is against the project. Christine Wise is against the project due to concerns about the project not being ADA friendly and bringing traffic into the area.

Mr. Hill moved to recommend approval for this item. Mr. Liska seconded the motion. The motion to recommend approval passed unanimously.

4. Applicant Name: Michael Woods, Cobb Cole
   Project Number: Z25-038 - Taylor Ridge PD Amendment
   Project Location: 1298 S. Blue Lake Ave.
   Project Description: A Request to Amend the Taylor Ridge PD to Modify the Tree Mitigation Language
   Project Planner: Kendall Story

Michael Woods, as applicant, was present and available to answer questions from the board.

Mr. Owens would like to add: “and agreed upon by the city forester”.

Tom Torpey spoke for the project as the area needs to be cleaned up. Christine Wise spoke against the project.

Ms. Lewis moved to recommend approval for this item, with the addition of “and agreed upon by the city forester” as a condition when determining the health of a tree deemed to be in poor health or unable to be restored. Mr. Hill seconded the motion. The motion to recommend approval passed 4 to 1, with Mr. Liska dissenting.

5. Applicant Name: City of DeLand
   Project Number: SMLU24-215
   Project Location: 1100 S. Garfield Ave.

Project Description: Land use change for ±6.36 acres of property from Volusia County Urban Medium Intensity (UMI) to City of DeLand Low Density Residential (LDR)
Project Planner: Kendall Story

Kendall Story, on behalf of applicant, was present and available to answer questions from the board.

Ms. Lewis moved to recommend approval for this item. Mr. Hill seconded the motion. The motion to recommend approval passed unanimously.

6. Applicant Name: City of DeLand
   Project Number: SMLU24-216
   Project Location: 1200 S. Garfield Ave.
   Project Description: Land use change for ±49.37 acres of property to add the Institutional Overlay
   Project Planner: Kendall Story

Kendall Story, on behalf of applicant, was present and answered questions from the board.

Mr. Liska moved to recommend approval for this item. Ms. Lewis seconded the motion. The motion to recommend approval passed unanimously.

7. Applicant Name: City of DeLand
   Project Number: Z24-211 Rezoning
   Project Location: 1101 S. Amelia Ave.
   Project Description: Rezone ±46.97 acres of property from Volusia County R-4 (Urban Single Family) and City of DeLand R-1 (Single-Family Residential) to City of DeLand Single-Family Residential (R-1B)
   Project Planner: Kendall Story

Kendall Story, on behalf of applicant, was present and available to answer questions from the board.

Mr. Liska moved to recommend approval for this item. Ms. Lewis seconded the motion. The motion to recommend approval passed unanimously.

8. Applicant Name: City of DeLand
   Project Number: LDR25-68
   Project Location: City-wide
   Project Description: Update Land Development Regulations to Modify Section 33-17.23 - Allowed Uses in Commercial and Industrial Zoning Districts
   Staff Planner: Carol Kuhn

Carol Kuhn, on behalf of applicant, was present and available to answer questions from the board.

Mr. Liska moved to recommend approval for this item, with the removal of the wording that states that the City shall provide a 21-day notice to the applicants. Ms. Lewis seconded the motion. The motion to recommend approval passed unanimously.

OTHER BUSINESS

1. **Chickens.**

Discussion as to proposed chicken ordinance. The board asked the city to consider lowering the limit of chickens allowed, limiting the chicken coop height, and setbacks.

2. Planning Board Special Meeting.

Code discussion with consultant, Inspire Placemaking Collective, shall take place on Tuesday, May 20, 2025 at 5:00p.m.

VERBAL REPORT ON CITY COMMISSION MEETINGS

Ms. Kuhn provided a verbal report.

ADJOURNMENT

The meeting ended at 7:49 p.m.

CITY OF DELAND
PLANNING BOARD REGULAR MEETING
MINUTES
WEDNESDAY, MAY 20, 2025 - 5:00 P.M.
CITY HALL

CALL TO ORDER

The meeting began at 5:00 p.m.

ROLL CALL

Henry Thiry	Present
Nora Lewis	Present
Don Liska	Absent
Troy Baumgartner	Present
Harper Hill, *Vice Chairperson*	Present
Jeremy Owens, *Chairperson*	Present

Quorum: Yes

Present – David Henning, Esq., of Inspire Placemaking Collective; Leslie Sharpe, Esq., of Inspire Placemaking Collective; Rick Werbiskis, Community Development Director; Carol Kuhn, Planning Director; Deborah Glick, Development Services Manager; Chris Carson, Senior Planner; and Vivian Ford, Administrative Coordinator.

PLANNING – NEW BUSINESS

1. Discussion re: Update to the Land Development Regulations Project.

   a. Topic 1: HOUSING TOPICS

      Board comments: Gentle density needs to include ADA friendly projects as part of the missing middle.

   b. Topic 2: ADAPTIVE REUSE & INFILL

      Board comments: Look at adaptive use buildings: e.g. Trinity Square. Main challenge for downtown and historical areas are the reuse of spaces. Building and fire codes present challenges, especially for second stories, so regulations would need to be less strict to get more use.

   c. Topic 3: FORM-BASED REGULATIONS

   d. DISCUSSION

Code Updates:

1. Consideration of main challenges when reviewing Planning applications, including parking challenges in Downtown DeLand and potential shared parking;
2. Consideration for minor variance requests (minor setback exception or properties that would otherwise be unbuildable) to have more leeway and potentially be handled administratively, however those required to be heard by the Planning Board would then have more stringent requirements;
3. Provide examples, including visuals, for applicants to understand what the city is and is not looking for;
4. Define smart growth;
5. Clearly differentiate between application types and what they each encumber, including a cheat sheet (e.g. annexation vs. land use change vs. rezoning); and
6. Clearer code that allows all users to find the information they are looking for and understand it.

Community Outreach:

1. Seek opportunities to maximize community outreach;
2. Inform what this update entails, scope of the feedback being sought, and any limitations and challenges, include examples;
3. Educate the public on how the update will be beneficial to the community, limitations from regulations, and consequences of not allowing proper development;
4. Provide examples, including visuals, to get conversations started with the community, of previous projects and their success, as well as potential projects in the community; and
5. Inform of the feedback received and how it was implemented.

OTHER BUSINESS

ADJOURNMENT

The meeting ended at 6:25 p.m.

PLANNING STAFF REPORT
CITY OF DELAND PLANNING BOARD
June 11, 2025

APPLICATION NO: LDR25-41 Text Amendment to Land Development Regulations

APPLICANT: City of DeLand

STAFF PLANNER: Carol Kuhn, AICP, Planning Director

REQUEST: City-Initiated Land Development Regulations Text Amendment to Modify Section 33-27.05 – Low Intensity Agriculture to clarify where urban or backyard chickens are permitted; add a new Section, 33-27.06 titled Urban or Backyard Chickens to allow the keeping of a small number of hens in some of the single-family residential zoning districts, add specific performance standards for the keeping of urban chickens, and add an urban chicken permit process; and amend Section 33-12, Definitions, to include several new definitions pertaining to the keeping of urban or backyard chickens.

APPLICABLE ORDINANCES: *Sec. 33-135. Procedure for text amendments.*

> *33-135.01(a)* Amendments to the text of this chapter may be initiated by the city or upon application of any interested person.
>
> *33-135.12(b)* The Planning Board shall review proposed changes in this chapter, which shall make a recommendation to the City Commission prior to final action adopting or not adopting the amendment. However, at the request of the Planning Board or the City Commission, or in the discretion of the City Manager, proposed amendments may be taken directly to the City Commission for action.

LOCATION: City-wide

STAFF SUMMARY:
The City's current Land Development Regulations (LDRs) do not allow the keeping of chickens within the single-family residential zoning districts. Many cities within Volusia County allow for the keeping of urban or backyard chickens, through a permit process. These cities place limitations on the number of chickens, prohibit roosters, and set standards for the size and type of coops and enclosures that may constructed. As such, planning staff has drafted regulations to allow a limited number of female chickens (hens) within some of the single-family zoning districts within the City.

Section 4-6. Keeping of livestock, fowl or wild animals specifies that livestock may be permitted in certain zoning districts, as set forth in the land development regulations. Specifically,

> *"No person shall own, keep or maintain any horse, mule, ass, goat, sheep, bull, steer, cow, hog, chicken, goose, turkey, duck, or any wild animal within the corporate limits of the City of DeLand; provided, however, that the keeping of livestock shall be allowed in*

certain zoning districts as set forth in the land development regulations of the City of DeLand. Any person found in violation of this section shall be subject to the penalties prescribed in section 4-26 of this chapter."

However, exceptions to this prohibition are specified in Section 33-27.05, Low Intensity Agriculture. Staff is proposing an amendment to Section 33-27.05 to allow Urban or Backyard Chickens in some of the residential zoning districts. Staff is also proposing to add a new section, Section 33-27.06, to the Accessory Use section of the Land Development Regulations to allow urban or backyard chickens, provided specific criteria and performance standards are met.

These regulations set standards for the number of chickens based on the size of the property – a maximum of 4 chickens for single-family residential properties; prohibit roosters, ducks, and other fowl; limit the size of the coops and enclosures; establish criteria for a chicken permit; prohibit the slaughter of chickens; restrict the sale and breeding of chickens; and require routine maintenance and cleaning of the coops and enclosures to help reduce the impacts to adjacent property owners.

It is important to note that these standards are not intended to override or supersede any home owners' association standards, or restrictions pertaining to the keeping of chickens.

These proposed amendments to allow urban chickens was scheduled for the May 14, 2025 Planning Board meeting, but was continued to the June 11, 2025 meeting to allow staff additional time to work through the enforcement details. At the May meeting, the Planning Board did vote to have a general discussion regarding the Board's desire for urban chickens within DeLand. During this discussion, the Planning Board offered some direction for staff regarding the size, location, and number of urban or backyard chickens. This feedback has been included in the staff report and the attached draft regulations.

One citizen submitted an email in opposition to allowing urban chickens within the City of DeLand. This email is attached to the staff report.

33-27.05. *Low intensity agriculture.*

(a) Generally. Low intensity agriculture is permitted only as an accessory to single-family dwellings. The uses in this category include the raising of crops, citrus, or fern; and the keeping of livestock, including aviaries, and pisciculture. ~~and apiaries~~.

(b) Urban or backyard chickens are permitted, subject to the standards outlined in Section 33-27.06.

(c) ~~(b)~~ Low intensity agricultural uses are restricted to properties, which are located in either the R-R or R-R1 zoning districts. Low intensity agricultural land uses may be permitted in other single-family zoning districts, provided that the property is at least two acres in area and that a minimum of a Class C landscape buffer is provided along the perimeter of the property.

(d) ~~*(c)*~~ *Where allowed.* Low intensity agricultural uses which are an accessory use to a single-family residence may be located in any of the following zoning districts, provided

that the use is consistent with the Comprehensive Plan and the requirements of this section are met: R-R, R-R1, R-1AA, R-1A, R-1B, and R-1.

(e) ~~*(d)*~~ *Other applicable regulations.* The primary use shall comply with all applicable local, regional, state, and federal regulations for the district in which the primary use is located.

(f) ~~*(e)*~~*Nonconforming uses.* Property which does not meet the minimum required lot size or minimum setback requirements of the specific zoning district in which the structure is located shall not be permitted to have low intensity agriculture as an accessory use.

33-27.06 Urban or Backyard Chickens

(a) *Generally*. The keeping of urban or backyard chickens for personal use may be permitted in the R-R, R-R1, R-1AA, R-1A, R-1B, and R-1 zoning districts, as an accessory use, subject to specific requirements and upon issuance of an Urban Chicken Permit, provided the following criteria are met:

1. No more than four (4) chickens may be kept on any single-family residential property.
2. Roosters are prohibited.
3. Ducks, geese, turkeys, peafowl, or any other poultry or fowl are prohibited under the provisions of this section.
4. The coop and enclosure shall not total more than 100 square feet.
5. Chickens and associated activities shall be kept for personal use only. Selling chickens, eggs, or chicken manure, is prohibited.
6. The breeding of chickens is prohibited.
7. The coop and enclosure shall be located in the rear yard, as defined by the City's Land Development Regulations.
8. No coop or enclosure shall be allowed in any front, side, or street-side yard.
9. Chickens shall be kept in an enclosed area with an immobile coop and enclosure; chickens are not permitted to be free-range.
10. Chicken tractors and mobile coops are prohibited.
11. The coop and enclosure shall be easily accessible for cleaning and maintenance.
12. The coop shall be covered and ventilated, and an enclosure run is required. The coop must be completely secured from predators, including all openings, ventilation holes, doors, and gates and shall meet the requirements specified by the University of Florida (UF) Institute of Food and Agricultural Sciences (IFAS), publication AN239.
13. Coops and enclosures shall include chicken wire or other barriers, buried 12-18 inches in an L-shape at the perimeter of the structure to deter predators.
14. All stored feed must be kept in a rodent-and predator-proof container.
15. The slaughtering of chickens is prohibited.
16. Chickens shall not be permitted to create a nuisance consisting of odor, noise, or pests, or contribute to any other nuisance condition.
17. Chicken coops and enclosures shall be maintained in a clean and sanitary condition at all times.

18. No manure may be allowed to accumulate on the floor of the coop or ground. Urban Chicken Permit holders must implement a manure management program, whereby the coop and enclosure are cleaned regularly. A fly-tight bin for storage of manure must be utilized; the size of which must be sufficient to contain all accumulations of manure. The fly-tight bin must be kept at least 20 feet away from all property lines.
19. Persons granted an Urban Chicken permit are encouraged to attend an appropriate training session made available by the University of Florida (UF) Institute of Food and Agricultural Sciences (IFAS) to learn safe chicken and egg practices.

(b) Standards

1. Maximum number of chickens: four (4)
2. Total maximum size of enclosure and coup: 100 square feet
    a. Setbacks:
        1. Rear: 10 feet
        2. No coop or enclosure shall be located within the front, side or street-side yard.
    b. Maximum height of coop and enclosure: eight (8) feet

(c) *Procedures for the granting of Urban Chicken Permits.* The Planning Division shall administer the Urban Chicken Permit. A separate Building Permit is required for all non-pre-fabricated coops or enclosures. An Urban Chicken Permit is required for chickens to be kept, harbored, raised, or maintained in chicken coops and enclosures as hens for eggs as an accessory use to a single-family residential structure, subject to the chicken permit process below:

1. An Urban Chicken Permit may be issued once a complete application has been submitted, reviewed, and approved.
2. Failure to maintain the coop or enclosure may be subject to fine(s) and revocation of the Urban Chicken Permit, pursuant to Chapter 1 – General Provisions, Article II – Citation Procedures - of the City's Code of Ordinances. The city will not be held responsible or liable for any losses to the applicant if such Urban Chicken Permit is revoked.
3. The coop and enclosure may be subject to an annual inspection to ensure that the area is being maintained in a manner that is safe and sanitary for the animal(s) and does not create a nuisance.

(d) Urban Chicken Permit Submittal Requirements. An Urban Chicken Permit application must include the following:

1. A completed Urban Chicken Permit application.
2. Applicable fee. The fee will be reduced by 50% for applicants who have successfully completed the training session made available by the University of Florida (UF) Institute of Food and Agricultural Sciences (IFAS) to learn safe chicken and egg practices.

3. A signed affidavit acknowledging that the Urban Chicken Permit shall comply with 33-27.06 and may be revoked for any violation of 33-27.06.

4. A survey of the property which shows the proposed location of the coop and enclosure. Such survey shall include dimensions and details which demonstrate compliance with the requirements for urban or backyard chickens. Upon approval by the Planning Division, an acceptable alternative such as a plot plan or other detailed dimensioned drawing may substitute for a survey, provided all dimensions and details are shown and the alternative clearly demonstrates compliance with the dimensional and locational requirements.

5. Dimensioned and detailed drawings depicting and demonstrating the method for securing and anchoring the coop and enclosure as well as a detail for the buried barrier.

6. Details, plans, and specifications for the coop, enclosure, and fly-tight storage bin.

(e) Separate building permit required:

1. Pre-fabricated or pre-designed coops or enclosures do not require a building permit; a building permit is required for all other types of coops or enclosures.

To supplement these proposed standards and to allow for clarity and ease-of-use, staff is proposing the following new definitions be added to Section 33-12:

33-12 Definitions

Agricultural animals shall mean animals considered accessory to an agricultural use, whether used for personal enjoyment or for commercial purposes, including horses, mules, burros, sheep, cattle, rabbits, chickens, ducks, geese, pigs, goats, ostrich, emu, or rhea.

Agriculture, commercial shall mean the production principally for the sale to others of plants, animals, or their products, including but not limited to: forage and sod crops, grain and feed crops, dairy animals, and dairy products; livestock, including dairy and beef cattle, poultry, sheep, swine, horses, ponies, mules, and goats; including the breeding and grazing of all such animals; bees and apiary products; fruits of all kinds including grapes, nuts, and berries; vegetables; nursery, floral ornamental and greenhouse products, and other commodities. Commercial agricultures shall not include poultry or swine production or animal feedlot operations.

Chickens, backyard. See Chickens, Urban

Chickens, Urban shall mean a limited number of female chickens permitted as a limited accessory use on single-family residential properties for the purpose of providing eggs for single-family resident; roosters are prohibited. Also known as hens. Also known as backyard chickens. See Urban Chicken Regulations.

Fowl means a bird of the Galliformes that is kept for its fresh eggs and flesh.

Poultry means any animal belonging to the family of Phasianidae, including, but not limited to chickens, roosters, turkeys, peacocks, and any animal belonging to the family Anatidae, including, but not limited to, geese and ducks.

STAFF ANALYSIS AND FINDINGS: Staff finds that these revisions will provide additional options for residents in a single-family residential zoning districts and would allow residents to keep a limited number of chickens for personal use.

STAFF RECOMMENDATION: Staff recommends that the Planning Board forward these proposed text amendments, project number LDR25-41, to Modify Section 33-27.05 – Low Intensity Agriculture to clarify where urban or backyard chickens are permitted; add a new Section, 33-27.06 titled Urban or Backyard Chickens to allow the keeping of a small number of hens in some of the single-family residential zoning districts, add specific performance standards for the keeping of urban chickens, and add an urban chicken permit process; and amend Section 33-12, Definitions, to include several new definitions pertaining to the keeping of urban or backyard chickens; to the City Commission for review and approval.

Urban or Backyard Chicken Regulations

33-27.05

33-27.05. *Low intensity agriculture.*

(a) Generally. Low intensity agriculture is permitted only as an accessory to single-family dwellings. The uses in this category include the raising of crops, citrus, or fern; and the keeping of livestock, including aviaries, and pisciculture.~~, and apiaries~~.

(b) Urban or backyard chickens are permitted, subject to the standards outlined in Section 33-27.06.

(c) ~~(b)~~ Low intensity agricultural uses are restricted to properties, which are located in either the R-R or R-R1 zoning districts. Low intensity agricultural land uses may be permitted in other single-family zoning districts, provided that the property is at least two acres in area and that a minimum of a Class C landscape buffer is provided along the perimeter of the property.

(d) ~~*(c)*~~ *Where allowed.* Low intensity agricultural uses which are an accessory use to a single-family residence may be located in any of the following zoning districts, provided that the use is consistent with the Comprehensive Plan and the requirements of this section are met: R-R, R-R1, R-1AA, R-1A, R-1B, and R-1.

(e) ~~*(d)*~~ *Other applicable regulations.* The primary use shall comply with all applicable local, regional, state, and federal regulations for the district in which the primary use is located.

(f) ~~*(e)*~~*Nonconforming uses.* Property which does not meet the minimum required lot size or minimum setback requirements of the specific zoning district in which the structure is located shall not be permitted to have low intensity agriculture as an accessory use.

33-27.06 Urban or Backyard Chickens

(a) *Generally*. The keeping of urban or backyard chickens for personal use may be permitted in the R-R, R-R1, R-1AA, R-1A, R-1B, and R-1 zoning districts, as an accessory use, subject to specific requirements and upon issuance of an Urban Chicken Permit, provided the following criteria are met:

1. No more than four (4) chickens may be kept on any single-family residential property.
2. Roosters are prohibited.
3. Ducks, geese, turkeys, peafowl, or any other poultry or fowl are prohibited under the provisions of this section.
4. The coop and enclosure shall not total more than 100 square feet.
5. Chickens and associated activities shall be kept for personal use only. Selling chickens, eggs, or chicken manure, is prohibited.
6. The breeding of chickens is prohibited.
7. The coop and enclosure shall be located in the rear yard, as defined by the City's Land Development Regulations.

8. No coop or enclosure shall be allowed in any front, side, or street-side yard.
9. Chickens shall be kept in an enclosed area with an immobile coop and enclosure; chickens are not permitted to be free-range.
10. Chicken tractors and mobile coops are prohibited.
11. The coop and enclosure shall be easily accessible for cleaning and maintenance.
12. The coop shall be covered and ventilated, and an enclosure run is required. The coop must be completely secured from predators, including all openings, ventilation holes, doors, and gates and shall meet the requirements specified by the University of Florida (UF) Institute of Food and Agricultural Sciences (IFAS), publication AN239.
13. Coops and enclosures shall include chicken wire or other barriers, buried 12-18 inches in an L-shape at the perimeter of the structure to deter predators.
14. All stored feed must be kept in a rodent-and predator-proof container.
15. The slaughtering of chickens is prohibited.
16. Chickens shall not be permitted to create a nuisance consisting of odor, noise, or pests, or contribute to any other nuisance condition.
17. Chicken coops and enclosures shall be maintained in a clean and sanitary condition at all times.
18. No manure may be allowed to accumulate on the floor of the coop or ground. Urban Chicken Permit holders must implement a manure management program, whereby the coop and enclosure are cleaned regularly. A fly-tight bin for storage of manure must be utilized; the size of which must be sufficient to contain all accumulations of manure. The fly-tight bin must be kept at least 20 feet away from all property lines.
19. Persons granted an Urban Chicken permit are encouraged to attend an appropriate training session made available by the University of Florida (UF) Institute of Food and Agricultural Sciences (IFAS) to learn safe chicken and egg practices.

(b) Standards

1. Maximum number of chickens: four (4)
2. Total maximum size of enclosure and coup: 100 square feet
    a. Setbacks:
        1. Rear: 10 feet
        2. No coop or enclosure shall be located within the front, side or street-side yard.
    b. Maximum height of coop and enclosure: eight (8) feet

(c) *Procedures for the granting of Urban Chicken Permits.* The Planning Division shall administer the Urban Chicken Permit. A separate Building Permit is required for all non-pre-fabricated coops or enclosures. An Urban Chicken Permit is required for chickens to be kept, harbored, raised, or maintained in chicken coops and enclosures as hens for eggs as an accessory use to a single-family residential structure, subject to the chicken permit process below:

1. An Urban Chicken Permit may be issued once a complete application has been submitted, reviewed, and approved.

2. Failure to maintain the coop or enclosure may be subject to fine(s) and revocation of the Urban Chicken Permit, pursuant to Chapter 1 – General Provisions, Article II – Citation Procedures - of the City's Code of Ordinances. The city will not be held responsible or liable for any losses to the applicant if such Urban Chicken Permit is revoked.
3. The coop and enclosure may be subject to an annual inspection to ensure that the area is being maintained in a manner that is safe and sanitary for the animal(s) and does not create a nuisance.

(d) Urban Chicken Permit Submittal Requirements. An Urban Chicken Permit application must include the following:

1. A completed Urban Chicken Permit application.
2. Applicable fee. The fee will be reduced by 50% for applicants who have successfully completed the training session made available by the University of Florida (UF) Institute of Food and Agricultural Sciences (IFAS) to learn safe chicken and egg practices.
3. A signed affidavit acknowledging that the Urban Chicken Permit shall comply with 33-27.06 and may be revoked for any violation of 33-27.06.
4. A survey of the property which shows the proposed location of the coop and enclosure. Such survey shall include dimensions and details which demonstrate compliance with the requirements for urban or backyard chickens. Upon approval by the Planning Division, an acceptable alternative such as a plot plan or other detailed dimensioned drawing may substitute for a survey, provided all dimensions and details are shown and the alternative clearly demonstrates compliance with the dimensional and locational requirements.
5. Dimensioned and detailed drawings depicting and demonstrating the method for securing and anchoring the coop and enclosure as well as a detail for the buried barrier.
6. Details, plans, and specifications for the coop, enclosure, and fly-tight storage bin.

(e) Separate building permit required:

1. Pre-fabricated or pre-designed coops or enclosures do not require a building permit; a building permit is required for all other types of coops or enclosures.

To supplement these proposed standards and to allow for clarity and ease-of-use, staff is proposing the following new definitions be added to Section 33-12:

33-12 Definitions

Agricultural animals shall mean animals considered accessory to an agricultural use, whether used for personal enjoyment or for commercial purposes, including horses, mules, burros, sheep, cattle, rabbits, chickens, ducks, geese, pigs, goats, ostrich, emu, or rhea.

Agriculture, commercial shall mean the production principally for the sale to others of plants, animals, or their products, including but not limited to: forage and sod crops, grain and feed crops, dairy animals, and dairy products; livestock, including dairy and beef cattle, poultry, sheep, swine, horses, ponies, mules, and goats; including the breeding and grazing of all such animals; bees and apiary products; fruits of all kinds including grapes, nuts, and berries; vegetables; nursery, floral ornamental and greenhouse products, and other commodities. Commercial agricultures shall not include poultry or swine production or animal feedlot operations.

Chickens, backyard. See Chickens, Urban

Chickens, Urban shall mean a limited number of female chickens permitted as a limited accessory use on single-family residential properties for the purpose of providing eggs for single-family resident; roosters are prohibited. Also known as hens. Also known as backyard chickens. See Urban Chicken Regulations.

Fowl means a bird of the Galliformes that is kept for its fresh eggs and flesh.

Poultry means any animal belonging to the family of Phasianidae, including, but not limited to chickens, roosters, turkeys, peacocks, and any animal belonging to the family Anatidae, including, but not limited to, geese and ducks.

Archived: Friday, June 6, 2025 10:37:53 AM
From: Keith Barrett
Mail received time: Sat, 24 May 2025 11:35:19
Sent: Sat, 24 May 2025 11:35:07
To: Carol Kuhn Chris Cloudman Jessica Davis Kevin Reid Richard Paiva
Subject: Speaking against chickens in DeLand.
Importance: Normal
Sensitivity: None

The purpose of this email is to support Section 4-6 of DeLand's Code of Ordinances.
No person should keep or maintain any horse, mule, ass, goat, sheep, bull, steer, cow, hog, **chicken**, goose, turkey, duck, or any wild animal within the corporate limits of the City of DeLand.
These animals were likely originally banned from DeLand because they were noisy, smelly, unsightly, created a health hazard, and reduced property values.
Today the animals are still noisy, smelly, unsightly, create a health hazard, and reduce property values.

Years ago the wise civic leaders of DeLand planned for the future of DeLand and decided Section 4-6 of DeLand's Code of Ordinances was a good idea.
In 2025, banning these animals it is still a good idea.

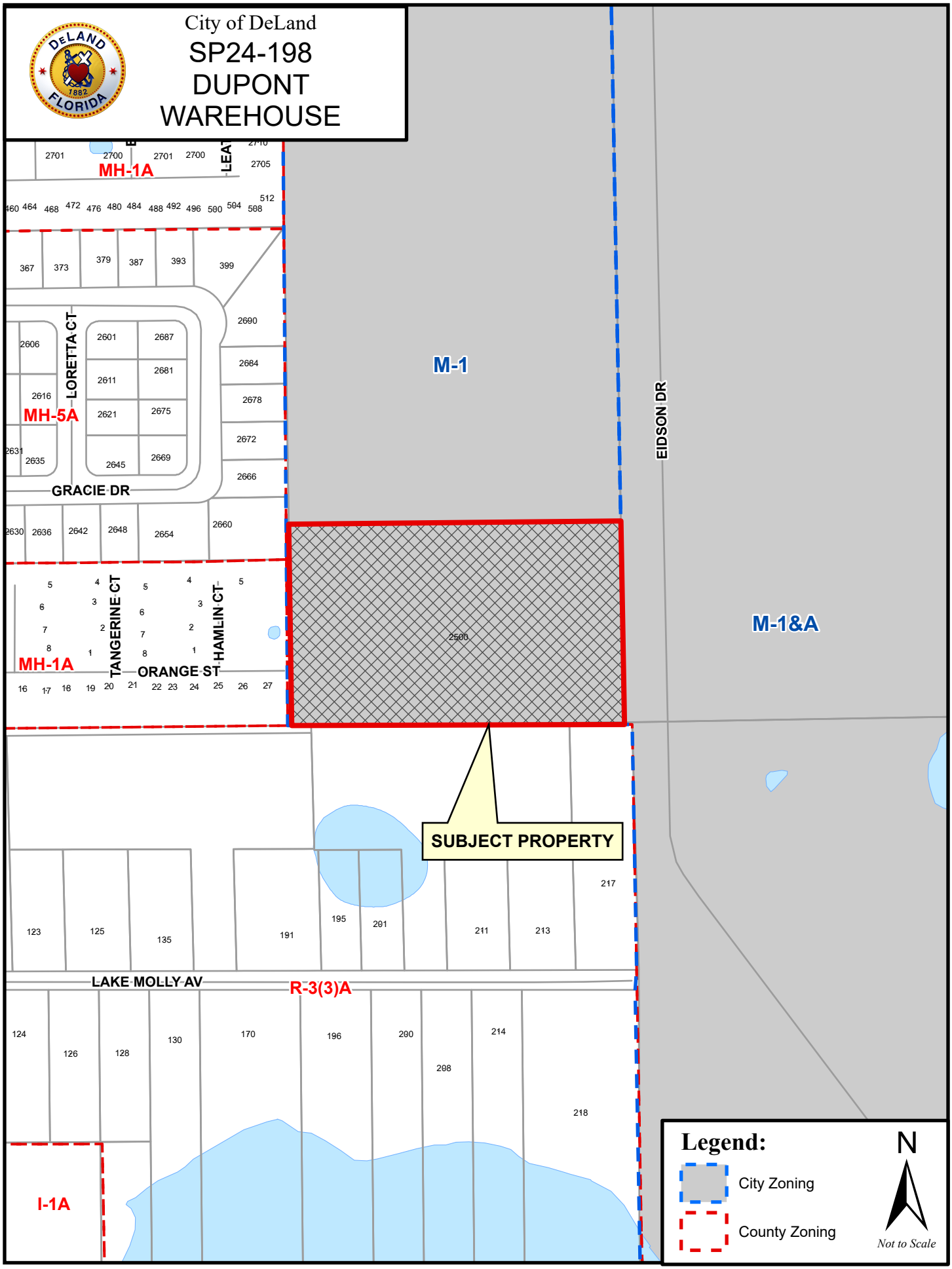
Today there are over 45,000 residents in Deland. Are we going to subject 98.7% of the residents to the negatives of allowing chickens within the city limits to satisfy the *wants* of the 1.3% of people who allegedly signed the petition(s)? Residents desirous of raising livestock should've purchased rural or agriculturally zoned property when they moved from Lake Helen.
They should not move to the city of DeLand and then demand agrarian rights.

We request that today's DeLand civic leaders show the same courage and vision that was shown in the past.
We ask that you hold firm on Section 4-6 of DeLand's Code of Ordinances and do not make exception for chickens.
Do not return DeLand to a time when DeLand was noisier, smellier, unsightly, unhealthy, and had lower property values.
Think ahead.
Please don't return us to the past.

Respectfully,

Keith and Christine Barrett
1543 Lambrook Drive
Deland, FL


City of DeLand
SP24-198
DUPONT
WAREHOUSE
GRACIE DR
MH-5A
2684
2678
2672
2666
2660
M-1
2500
EIDSON DR
M-1&A
5
HAMLIN CT
MH-1A
ORANGE ST
26
27
SUBJECT PROPERTY
217
R-3(3)A
195
201
191
211
213
LAKE MOLLY AV
170
196
214
208
Legend:
City Zoning
County Zoning
N
Not to Scale


City of DeLand
SP24-198
DUPONT
WAREHOUSE
MH-1A
MH-5A
MH-1A
M-1
M-1&A
EIDSON DR
LORETTA CT
GRACIE DR
TANGERINE CT
HAMLIN CT
ORANGE ST
2500
SUBJECT PROPERTY
LAKE MOLLY AV
R-3(3)A
I-1A
Legend:
City Zoning
County Zoning
N
Not to Scale

PLANNING DIVISION STAFF REPORT
TO
THE CITY OF DELAND PLANNING BOARD

June 11, 2025

A. APPLICATION NO.: SP24-198

PROJECT: Class III Site Plan – Dupont Warehouse

PARCEL NUMBER: 602800000052

STAFF PLANNER: Emily Kunkel, *Senior Planner*

APPLICANT: Zev Cohen & Associates

REQUEST: Class III Site Plan – New Construction of a 41,800 sq. ft. warehouse facility

A. APPLICABLE REGULATIONS:

Article XII **Procedure for review of development plans**

Comprehensive Plan **Airport Overlay**

B. SITE FACTORS:

Location: 2500 Eidson Drive
Parcel Size: ± 6.03 Acres
Existing Zoning: M-1 (Industrial District)
Existing Land Use: IND – Industrial & Airport Overlay

REQUIRED MINIMUM SETBACKS IN FEET			
	Front	**Rear**	**Side**
Required:	35’	25’	10’
Provided:	96.09’	30’	30’

Impervious Surface & Tree Preservation Area			
	Impervious	**Pervious**	**TPA**
Required:	*2.56ac (70% maximum per LDR)*	1.81ac (30%)	0.90ac *(15% overall site)*
Proposed:	2.56ac (42.5%)	3.46ac (57.5%)	1.18ac (19.56%)

B. HISTORY: The ± 6.03-acre undeveloped site is located within the Airport overlay, and is zoned M-1, industrial. The applicant is requesting to construct a 41,800 ft² warehouse building and associated office space. The site plan provides on-site parking, stormwater management, and tree protection.

C. ANALYSIS: Since this project has a total floor area greater than 40,000 ft² but not more than 80,000 ft², it is being processed as a Class III site plan which is subject to review by the Technical Review Committee and Planning Board. The project area is zoned Industrial and designated as Industrial on the Future Land Use Map. An industrial facility is permitted within this zoning

district and consistent with the intent of the Industrial land use designation. The project is located northwest of the DeLand Municipal Airport, and is located within the Airport Overlay.

D. **ENVIRONMENTAL:** The proposal is compliant with the Comprehensive Plan and the Land Development Regulations. In May 2024, an environmental assessment was completed on the subject property. Per the report, the proposed project is not likely to adversely affect any protected species or require any additional permitting beyond the potential gopher tortoise relocation permit. The proposed project area is part of a larger 81-acre property that has a valid Formal Wetland Determination (FWD) and Conceptual Environmental Resource Permit (ERP) with the St. Johns River Water Management District (SJRWMD). The remainer of the project area depicted on the FWD and ERP has yet to be developed, but in order to develop this project, a Construction ERP will be required to be obtained from SJRWMD that will depict the final site plan. The Land Development Regulations require that a minimum of 15% of the site be dedicated to Tree Preservation Area (TPA).

E. **STORMWATER:** The stormwater system has been designed to retain on-site a 100-year, 24-hour storm event, as required by the Land Development Regulations. The proposed project area is part of a master development, permitted under SJRWMD permit number 29815-34, which is undeveloped. This proposed stormwater system has been designed to meet and exceed all the requirements of the St. Johns River Water Management District (SJRWMD) and the City of DeLand, and will adhere to all stormwater regulations through a SJRWMD Environmental Resource permit.

F. **ARCHITECTURE:** The proposed building is 46-feet in height and will be constructed with site-cast, tilt-up panels. The applicant has proposed a trellis green wall system on a portion of the front façade, and incorporated a variety of colors, horizontal, and vertical elements in their architecture.

Prior to the issuance of a development order, the applicant shall submit revised elevations to address the outstanding planning division comment that all building and rooftop mechanical equipment shall be screened from pedestrian areas and from public view. The revised architectural plans will need to show how the roof top mechanical equipment will be screened and include a note detailing the material and dimensions for the screening. (LDR Sec. 33-94.03 (a)(4). The manufacturers' screening material paint must match the parapet wall colors and be manufacturer applied, not field applied. Otherwise, the height of the parapet wall must be increased to full screen the rooftop mechanical equipment. A condition of approval has been added to reflect this outstanding comment.

G. **LANDSCAPING:** A 15-ft type 'B' landscape buffer is proposed along Eidson Drive, the true south and west buffers shall be a 30-ft type 'D' buffer and true north buffer is not required, but is proposed as TPA, in accordance with Sec. 33-92.02 of the City's Land Development Regulations. Landscaping will utilize Florida-Friendly as defined by the University of Florida/Institute of Food and Agricultural Sciences (UF/IFAS).

Prior to the issuance of a development order, the applicant shall submit revised landscape plans to address the outstanding planning division comments on the landscape buffers size and type and the required screen wall along the true south and true west buffers. The true south and west buffers

shall be at least a 30-ft type 'D' buffer and include a 100% opaque screen wall or fence. The applicant has updated the plans show a 6-foot vinyl fence. However, no detail was provided. Such fence shall be 100% opaque to meet the screening requirements for industrial uses adjacent to residential use. Chain link fencing with fabric screening or vinyl slats is not permitted. A condition of approval has been added to reflect this outstanding comment.

The applicant has proposed the use of a cistern to provide temporary irrigation for the site. The cistern design must be reviewed and approved by the City's Engineering and Utilities Departments. A note also needs to be included to reflect the temporary nature of the cistern for irrigation and that, once the City's reclaimed system is available to the site, the applicant shall connect to this system. A condition of approval has been added to reflect this outstanding comment.

H. SCHOOL CONCURRENCY: For the purposes of public-school concurrency, nonresidential developments are deemed to be de minimis and are not subject to the public-school concurrency review, per Sec.33-41.07.

I. TRAFFIC: A Traffic Impact memo was completed on February 7, 2025. The analysis determined that the project will generate 70 average daily trips, 9 peak hour A.M. and P.M. hour trips. Per Sec. 33-41.04 of the code, a full Traffic Impact Analysis is not required for projects that generate less than 1,000 daily trips.

J. PARKING: The parking calculations are based upon the proposed square footage of the warehouse, manufacturing, and office uses, resulting in 46 parking spaces on-site per LDR Sec. 33-91.03(f).

K. TRC: The Technical Review Committee (TRC) continued the site plan on October 17, 2024 due to outstanding comments. A resubmittal was received and the item was placed on the March 20, 2025 TRC agenda, and the TRC continued the item again due to outstanding comments. Another resubmittal was received and the item was placed on the May 15, 2025 TRC agenda, and at this meeting, the committee recommended the item be placed on an upcoming Planning Board agenda once all comments have been addressed.

L. STAFF SUMMARY: Staff recommends that the Planning Board approve the Class III Site Plan (SP25-198) with the following five (5) conditions:

1. Prior to the issuance of a development order, the applicant shall submit revised elevations to address the outstanding planning division comment that all building and rooftop mechanical equipment shall be screened from pedestrian areas and from public view. The revised architectural plans will need to show how the rooftop mechanical equipment will be screened on all facades, and include a note detailing the material and dimensions for the screening. (LDR Sec. 33-94.03 (a)(4). The screening material shall match the parapet wall color and any painted metal surface shall be manufacturer-applied paint, not field-applied paint.
2. Prior to the issuance of a development order, the applicant shall submit revised landscape plans to address the outstanding planning division comments on the landscape buffers size

and type and the required screen wall along the true south and true west buffers. The true south and west buffers shall be at least a 30-ft type 'D' buffer and include a 100% opaque screen wall or fence.

3. Prior to issuance of a development order, the applicant shall provide a dimensioned detail for the proposed 6-foot vinyl fence. Such fence shall be 100% opaque to serve as the required screening material between industrial and residential uses.
4. Prior to the issuance of a development order, the applicant shall submit the proposed cistern design for review and approval by the City Engineering and Utilities Departments.
5. Prior to the issuance of a development order, the applicant shall submit an irrigation plan that includes reclaimed lines. The irrigation plans shall include a note stating that the proposed cistern may serve as a temporary irrigation method until such time as reclaimed water is available to the site; the property owner shall connect to the City's reclaimed system once reclaimed water is available to serve the site.

DELAND DUPONT WAREHOUSE

CITY OF DELAND - VOLUSIA COUNTY, FL

FINAL ENGINEERING PLANS

OWNER:

UNIFIED INC.
225 DUPONT STREET
PLAINVIEW, NY 11803
PHONE NUMBER: (646) 327-4173
FAX NUMBER
CONTACT PERSON: ERIC CHEN
e-mail: echen@leatherracc.com

CIVIL ENGINEER:

ZEV COHEN & ASSOCIATES, INC.
300 INTERCHANGE BLVD, SUITE C
ORMOND BEACH, FL 32174
PHONE NUMBER: (386) 677-2482
FAX NUMBER: (386) 677-2505
e-mail: SPENCER KERSHAW, P.E.
e-mail: skershaw@zevcohen.com

SURVEYOR:

BLACKWELL & ASSOCIATES LAND SURVEYORS, INC
995 W VOLUSIA AVE
DELAND, FL 32720
PHONE NUMBER: (386) 734-8050
FAX NUMBER: (386) 734-7660
CONTACT PERSON: ROBERT R. EVERS
e-mail: info@blackwellsurveying.co

GEOTECHNICAL ENGINEER:

UNIVERSAL ENGINEERING SCIENCES
911 BEVILLE ROAD, SUITE 3
SOUTH DAYTONA, FL 32119
PHONE NUMBER: (386) 756-1105
FAX NUMBER: (386) 760-4067
CONTACT PERSON: MICHAEL MOHNEY
e-mail: mmohney@teamues.com

LANDSCAPE ARCHITECT:

ZEV COHEN & ASSOCIATES, INC.
300 INTERCHANGE BLVD, SUITE C
ORMOND BEACH, FL 32174
PHONE NUMBER: (386) 677-2482
FAX NUMBER: (386) 677-2505
CONTACT PERSON: JAKE STEHR, RLA
e-mail: jstehr@zevcohen.com

PROJECT DESCRIPTION:

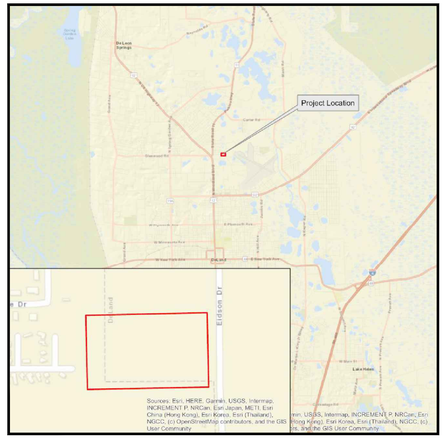
THIS PROJECT INCLUDES THE CONSTRUCTION OF A 41,800 SQUARE FOOT WAREHOUSE BUILDING WITH OFFICE SPACES.

SITE INFORMATION:	
SITE ADDRESS:	2500 EIDSON DRIVE, DELAND, FL 32724
PROJECT AREA:	6.03 AC
TAX PARCEL I.D. #:	602800000052
EXISTING ZONING:	M-1 INDUSTRIAL
PROPOSED ZONING:	M-1 INDUSTRIAL
EXISTING LAND USE:	INDUSTRIAL
PROPOSED LAND USE:	INDUSTRIAL
EXISTING FUTURE LAND USE:	INDUSTRIAL
SETBACKS:	
FRONT:	35 FT
SIDE:	10 FT
REAR:	25 FT
MAX IMPERVIOUS	70%
REQUIRED LANDSCAPE BUFFER(S):	15 FT - ALONG EIDSON DRIVE
	30 FT - ALONG SOUTH SIDE
	30 FT - ALONG REAR SIDE
MAXIMUM BUILDING HEIGHT	65 FT
UTILITIES:	PROVIDED BY DELAND UTILITIES

LAND USE TABLE:		
	ACREAGE / SF	PERCENTAGE
EXISTING CONDITIONS:		
WETLAND AREA	0 AC	0%
UPLAND AREA	6.03 AC / 262,666 SF	100%
PROPOSED IMPROVEMENTS:		
BUILDING(S)	0.960 AC / 41,800 SF	15.9%
PAVEMENT & SIDEWALK	1.605 AC / 69,931 SF	26.6%
POND AREA(S)	0.764 AC / 33,279 SF	12.7%
LANDSCAPE/OPEN SPACE	2.701 AC / 117,656 SF	44.8%
TOTAL PERVIOUS	3.465 AC / 150,935 SF	57.5%
TOTAL IMPERVIOUS	2.565 AC / 111,731 SF	42.5%

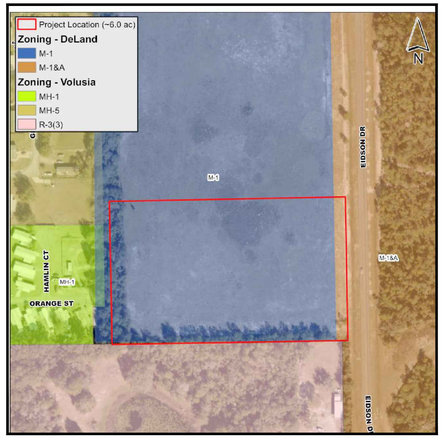
PARKING CALCULATIONS:			
USE	PARKING REQUIREMENT	SF	SPACES REQUIRED
WAREHOUSE	1 SPACE PER 1,000 SF FOR FIRST 20,000 SQ FT, PLUS 1 SPACE PER 2,000 SF FOR THE SECOND 20,000 SQ FT	37,050	29
MANUFACTURING	1 SPACE PER 625 SF OF NET FLOOR AREA	1,000	2
OFFICE	1 SPACE PER 250 SF OF NET FLOOR AREA	3,750	15
		TOTAL =	46
HANDICAP PARKING REQUIRED:		2	
HANDICAP PARKING PROVIDED:		2	
PARKING SPACES PROVIDED:		48	

NOTE: THE SCALE OF THESE PLANS MAY HAVE CHANGED DUE TO REPRODUCTION.



VICINITY MAP

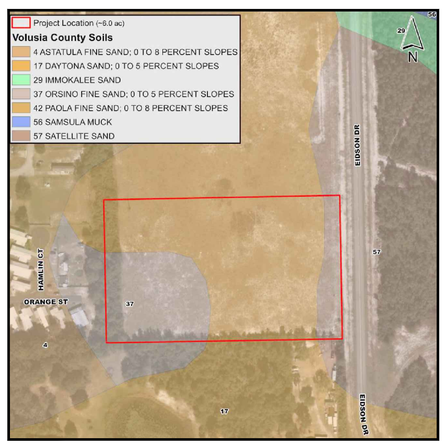
SCALE: 1" = 250'



ZONING MAP

SCALE: 1" = 250'

CURRENT ZONING FOR THIS SITE IS: M-1



SOILS MAP

SCALE: 1" = 250'

THE SITE LIES WITHIN THE FOLLOWING VOLUSIA COUNTY SOIL CLASSIFICATIONS:

FLOOD ZONE MAP

SCALE: 1" = 250'

THE PROPERTY LIES IN:
FLOOD ZONE X PER FEMA MAPS 12127C0460H

SHEET INDEX:

LEGAL DESCRIPTION:

THE SOUTH 400.0 FEET OF THE WEST ONE-HALF (W ½) OF GOVERNMENT LOT 12, IN SECTION 28, TOWNSHIP 16 SOUTH, RANGE 30 EAST, VOLUSIA COUNTY, FLORIDA.

ZEV COHEN & ASSOCIATES, INC.
300 INTERCHANGE BLVD., STE. C
ORMOND BEACH, FL 32174
WWW.ZEVCOHEN.COM

CIVIL ENGINEERING | LANDSCAPE ARCHITECTURE | ENVIRONMENTAL | PLANNING | TRANSPORTATION
(LC #2)
(EB 6516)

NO	DATE	BY	SUBMITTALS / REVISIONS
1	10-09-24	MH	CITY COMMENTS
2	10-21-24	MH	SJRWMD COMMENTS
3	02-25-25	MH	SJRWMD COMMENTS
4	04-10-25	MH	CLIENT REVISION

DELAND DUPONT WAREHOUSE
FINAL ENGINEERING PLANS
COVER SHEET

VOLUSIA COUNTY, FLORIDA
CITY OF DELAND

PROJECT NO: ZC 23310
DESIGNED BY: MW
DRAFTED BY: MH
CHECKED BY: SK
DRAWING FILE: 01_23310 COV

KRISTOPHER T. ROWLEY, P.E. NO. 84263
SPENCER H. KERSHAW, P.E. NO. 96663
NOT VALID WITHOUT SEAL

SHEET: C1 OF 12

R:\23310 DELAND AIRPORT PARCEL 17 & 18\FINAL ENGINEERING PLANS\CAD\MISC\01_23310 COV.DWG - PRINTED: 6/6/2025 4:17 PM

GENERAL NOTES

1. ALL CONSTRUCTION, DRAINAGE STRUCTURES AND OTHER SITE IMPROVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST EDITIONS OF FLORIDA DEPARTMENT OF TRANSPORTATION STANDARD PLANS AND SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION OR THE CITY OF DELAND'S LAND DEVELOPMENT CODE REQUIREMENTS, STANDARD CONSTRUCTION DETAILS & STANDARD SPECIFICATIONS, WHICHEVER IS MORE STRINGENT.
2. SHOP DRAWINGS AND CERTIFICATIONS FOR ALL MATERIALS AND STRUCTURES ARE REQUIRED. THE CONTRACTOR SHALL REVIEW AND SIGN SHOP DRAWINGS. THE CONTRACTOR SHALL SUBMIT REVIEWED SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL PRIOR TO ORDERING THE MATERIALS REQUIRED FOR CONSTRUCTION.
3. CONSTRUCTION SHALL BE IN ACCORDANCE WITH ALL REQUIRED PERMITS. THE CONTRACTOR SHALL MAINTAIN COPIES OF ALL RELEVANT PERMITS AND CONSTRUCTION DOCUMENTS AVAILABLE ON THE JOB SITE AT ALL TIMES.
4. CONTRACTOR TO MAINTAIN THE SITE IN A SAFE AND SECURE MANNER TO PROTECT PUBLIC SAFETY AND THE CONDITIONS OF THE IMPROVEMENTS.
5. THE CONTRACTOR SHALL MAINTAIN, AT THE JOB SITE, A RECORD COPY OF ALL CONSTRUCTION DRAWINGS AND SPECIFICATIONS ON WHICH ALL FIELD CHANGES ARE TO BE SHOWN. THESE CHANGES ARE TO BE INCORPORATED IN THE "AS-BUILT" SURVEY FURNISHED TO THE ENGINEER.
6. SHOULD CONDITIONS VARY FROM THOSE SHOWN ON THESE PLANS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF RECORD PRIOR TO CONTINUING CONSTRUCTION.
7. ANY FIELD MODIFICATIONS OR DEVIATIONS TO THESE CONSTRUCTION PLANS REQUIRES APPROVAL BY BOTH THE ENGINEER OF RECORD AND THE OWNER PRIOR TO PERFORMING THE WORK.
8. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE AN "AS-BUILT" SURVEY OF THE COMPLETED CONSTRUCTION. THE "AS-BUILT" SURVEY SHALL BE PREPARED IN ACCORDANCE WITH APPROPRIATE GOVERNMENTAL REGULATIONS AND ZCA REQUIREMENTS. THE "AS-BUILT" SURVEY SHALL BE PREPARED ON ZCA'S DESIGN/PERMITTED PLANS. ELECTRONIC AND PAPER COPIES OF THE AS-BUILT SURVEY SHALL BE PROVIDED TO THE ENGINEER OF RECORD. THE "AS-BUILT" SHALL BE SIGNED AND SEALED BY A FLORIDA REGISTERED PROFESSIONAL LAND SURVEYOR.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING VEHICULAR AND PEDESTRIAN TRAFFIC SAFELY THROUGH THE WORK ZONE AT ALL TIMES, IF APPLICABLE. ANY SIDEWALK, LANE OR ROAD CLOSURE REQUIRES REVIEW AND APPROVAL IN ADVANCE AND A SEVEN (7) DAY MINIMUM NOTICE TO THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REQUIRED COORDINATION.
10. MAINTENANCE OF TRAFFIC WILL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAY CONSTRUCTION, MAINTENANCE AND UTILITY OPERATIONS AND THE FLORIDA DEPARTMENT OF TRANSPORTATION STANDARD PLANS, LATEST EDITIONS.
11. CONTRACTOR TO NOTIFY THE REGULATORY AGENCIES FORTY EIGHT (48) HOURS PRIOR TO THE START OF CONSTRUCTION. CONTRACTOR SHALL SEND COPIES OF ALL TESTING REPORTS TO THE REGULATORY AGENCIES AND THE ENGINEER OF RECORD.
12. SURVEY INFORMATION PROVIDED BY BLACKWELL & ASSOCIATES LAND SURVEYORS, INC DATED 04/09/2024. ALL ELEVATIONS BASED ON **NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)** AND ARE SHOWN IN FEET. STATE PLANE COORDINATES ARE BASED UPON **NAD 88.**
13. ALL PUBLIC LAND CORNERS AND MONUMENTS WITHIN THE LIMITS OF CONSTRUCTION ARE TO BE PROTECTED. THE CONTRACTOR SHALL EMPLOY A SURVEYOR, REGISTERED IN THE STATE OF FLORIDA, TO REPLACE/RESTORE ANY PROPERTY OR LAND MARKERS DISTURBED BY CONSTRUCTION ACTIVITIES.
14. NO LAND SHALL BE CLEARED, EXCAVATED OR FILLED AND NO STRUCTURES SHALL BE ERECTED, REPAIRED OR DEMOLISHED WITHOUT PROPER PERMIT(S).
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS AS WELL AS THE REQUIREMENTS OF ST. JOHNS RIVER WATER MANAGEMENT DISTRICT AND E.P.A. (NPDES). CONTRACTOR SHALL ESTABLISH BEST MANAGEMENT PRACTICES AND EROSION CONTROL METHODS PRIOR TO COMMENCING ANY SITE CLEARING OR DEMOLITION AND SHALL MAINTAIN THOSE BARRIERS UNTIL FINAL ACCEPTANCE OF THE PROJECT.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROJECT'S NPDES PERMITTING, INSPECTION AND REPORTING, IF APPLICABLE.
17. THE EROSION, SEDIMENT AND TURBIDITY CONTROL MEASURES DELINEATED HEREON ARE THE MINIMUM REQUIRED. ADDITIONAL CONTROLS MAY BE NEEDED, DEPENDING UPON THE ACTUAL SITE CONDITIONS, JURISDICTIONAL AGENCY PERMIT REQUIREMENTS AND CONSTRUCTION OPERATIONS. STAKED SILT FENCE SHALL BE UTILIZED TO CONTROL EROSION AND RELEASE OF SUSPENDED SOLIDS. SEDIMENT TRACKING CONTROL DEVICES SHALL BE USED TO PREVENT THE OFFSITE TRANSPORT OF SEDIMENT BY MOTORIZED VEHICLES. IF CONTROL MEASURES DO NOT PROVE SATISFACTORY, WORK SHALL CEASE UNTIL NEW MEASURES ARE ADOPTED WITH SATISFACTORY RESULTS.
18. ALL EROSION AND SEDIMENT TRACKING CONTROL DEVICES SHALL BE INSPECTED DAILY AND IMMEDIATELY FOLLOWING A RAINFALL EVENT. REFER TO PROJECT'S STORMWATER POLLUTION PREVENT PLAN (SWPPP). ANY DEFICIENCIES FOUND IN THE EROSION CONTROL MEASURES SHALL BE REPAIRED IMMEDIATELY. THE CONTRACTOR SHALL KEEP A LOG BOOK DOCUMENTING THESE DAILY INSPECTIONS, DEFICIENCIES AND REMEDIAL ACTIONS.
19. ALL UNSUITABLE SOILS AND UNSUITABLE MATERIALS (SUCH AS CLAY, ORGANICS, ROCK, CEMENTED COQUINA, DEBRIS, ETC.) SHALL BE REMOVED, DISPOSED OF IN A LEGAL MANNER AND REPLACED WITH DRY COMPACTED GRANULAR MATERIAL SATISFACTORY TO THE OWNER. THE COST OF ALL WORK AND MATERIALS IS TO BE INCLUDED IN THE UNIT PRICE OF THE ASSOCIATED CONSTRUCTION ITEMS UNLESS OTHERWISE SHOWN IN THE PLANS.
20. IN THE EVENT THAT WATER IS ENCOUNTERED DURING CONSTRUCTION, DEWATERING SHALL BE PERFORMED AS NEEDED. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE DESIGN, PERMITTING, INSTALLATION, OPERATION AND SUBSEQUENT REMOVAL OF DEWATERING SYSTEMS AND THEIR SAFETY AND CONFORMITY WITH APPLICABLE CODES AND REGULATIONS.
21. PRIOR TO COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE APPROPRIATE ELECTRIC, TELEPHONE, GAS, CABLE TELEVISION, COMMUNICATIONS, ETC. COMPANIES TO DETERMINE THE TYPE AND LOCATION OF ALL UNDERGROUND FACILITIES IN THE AREA OF CONSTRUCTION.
22. ALL UNDERGROUND UTILITIES HAVE BEEN LOCATED HORIZONTALLY AND VERTICALLY BASED ON THE BEST INFORMATION AVAILABLE AND SHOULD BE CONSIDERED APPROXIMATE ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND VERIFYING ALL ELEVATIONS OF EXISTING UTILITIES (PUBLIC AND PRIVATE) SHOWN OR NOT SHOWN PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE VARIOUS UTILITY COMPANIES TO MAKE THE NECESSARY ARRANGEMENTS FOR ANY RELOCATION, DISRUPTION OF SERVICE OR CLARIFICATION OF ACTIVITY REGARDING SAID UTILITY. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHEN WORKING NEAR OR CROSSING A UTILITY, WHETHER SHOWN ON THESE PLANS OR FIELD LOCATED. THE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE AND NOTIFY THE UTILITY COMPANIES FOR UTILITIES WHICH NEED TO BE RELOCATED FOR THE PROPOSED CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE TO PAY FOR ANY REPAIR, RELOCATION OR TEMPORARY MEASURES NEEDED FOR EXISTING OR PROPOSED UTILITIES.
23. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE AND AVOID ALL UTILITIES, OTHER STRUCTURES AND OBSTRUCTIONS BOTH ABOVE AND BELOW GROUND. ALL DAMAGE RESULTING FROM THE CONTRACTOR'S FAILURE TO COMPLY WITH THIS REQUIREMENT SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
24. THE CONTRACTOR SHALL NOTIFY ALL UTILITY PROVIDERS AT LEAST TWO (2) BUSINESS DAYS PRIOR TO ANY CONSTRUCTION.
25. THE CONTRACTOR SHALL MAINTAIN UNINTERRUPTED SERVICE AT ALL SERVICE CONNECTIONS. THE MANNER IN WHICH THIS IS ACCOMPLISHED SHALL BE LEFT TO THE DISCRETION OF THE CONTRACTOR, SUBJECT TO THE REQUIREMENTS OF THE CONTRACT SPECIFICATIONS.
26. ALL EXISTING DRAINAGE STRUCTURES AND UTILITIES WITHIN THE CONSTRUCTION LIMITS SHALL REMAIN, UNLESS OTHERWISE NOTED IN PLANS.
27. ALL STATIONS AND OFFSETS REFER TO CENTERLINE CONSTRUCTION UNLESS OTHERWISE NOTED IN PLANS.
28. THE LENGTH OF ALL DRAINAGE PIPES AND LOCATION OF ALL DRAINAGE STRUCTURES ARE APPROXIMATE. THE LOCATION OF THE DRAINAGE STRUCTURE SHALL DETERMINE THE LENGTH OF PIPE.
29. THE TOP OF CASTING ELEVATIONS (TC) OF ALL STRUCTURES ARE SHOWN. HOWEVER, THE CONTRACTOR SHALL INSTALL ALL FRAMES SO AS TO PROVIDE A SMOOTH SURFACE FOR VEHICULAR AND/OR PEDESTRIAN TRAFFIC.
30. CONTRACTOR SHALL CONFIRM PROPOSED TOP OF CASTING (TC) ELEVATIONS WILL ALLOW POSITIVE DRAINAGE TO PROPOSED INLETS. IF POSITIVE DRAINAGE DOES NOT EXIST, CONTRACTOR TO COORDINATE WITH ENGINEER OF RECORD FOR SOLUTION AND ADJUST PROPOSED INLETS AS NECESSARY AT NO COST.
31. CONTRACTOR SHALL CONFIRM ELEVATION OF EXISTING GRADE PRIOR TO PLACING DRAINAGE OUTFALL STRUCTURES. CONTRACTOR SHALL NOTIFY ENGINEER OF RECORD IF EXISTING GRADE DOES NOT MATCH PROPOSED OUTFALL INVERT. CONTRACTOR SHALL ADJUST OUTFALL STRUCTURE INVERT AND/OR STRUCTURE LOCATION AS DIRECTED BY ENGINEER OF RECORD AT NO COST.
32. ANY DRAINAGE PROBLEMS CREATED BY CONSTRUCTION, OR EXISTING BEFORE CONSTRUCTION AND NOT ALLEVIATED, SHOULD BE BROUGHT TO THE ATTENTION OF THE ENGINEER OF RECORD AT THE TIME OF DISCOVERY.
33. ALL STORMWATER PIPES AND INLETS SHALL BE CLEANED OF DEBRIS AND ERODED MATERIALS AT LAST STAGES OF AND PRIOR TO COMPLETION OF CONSTRUCTION.

GENERAL NOTES

35. SPECIAL ATTENTION IS DIRECTED TO THE FACT THAT PORTIONS OF SOME DRAINAGE STRUCTURES MAY EXTEND INTO THE STABILIZED PORTION OF THE ROADBED. EXTREME CAUTION WILL BE NECESSARY DURING COMPACTION AND STABILIZATION OPERATIONS AT THESE LOCATIONS TO AVOID DAMAGE AND ACHIEVE THE REQUIRED COMPACTION.
36. DURING CONSTRUCTION, AN ALL-WEATHER ACCESSIBLE ROADWAY SHALL BE MAINTAINED AT ALL TIMES FOR FIRE ACCESS.
37. ALL REQUIRED FIRE LINES & HYDRANTS SHALL BE INSTALLED IN ACCORDANCE WITH LOCAL & STATE REQUIREMENTS AND OPERATIONAL PRIOR TO THE START OF VERTICAL CONSTRUCTION.
38. EXISTING DRIVEWAYS WITHIN THE LIMITS OF THIS PROJECT ARE TO BE REPLACED AT THE SAME LOCATION AND WIDTH WITH THE SAME TYPE OF MATERIAL, UNLESS OTHERWISE SHOWN IN THE PLANS.
39. ALL RAMPS, SIDEWALKS AND ACCESSIBLE ROUTES ARE TO BE IN COMPLIANCE WITH CURRENT A.D.A. REQUIREMENTS.
40. SIGNS THAT ARE REMOVED AND ARE TO BE RELOCATED SHALL BE STOCK PILED BY THE CONTRACTOR. ANY EXISTING SIGNS DAMAGED DURING CONSTRUCTION SHALL BE REPLACED BY THE CONTRACTOR AT HIS COST.
41. ROADWAY AND PARKING SIGNAGE AND MARKINGS SHALL BE IN CONFORMANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, CURRENT EDITION.
42. UNLESS OTHERWISE NOTED, PROPOSED GRADES SHOWN ARE FINISHED GRADES.
43. OPERATION AND MAINTENANCE OF THE STORMWATER SYSTEM WILL BE PROVIDED BY THE OWNER OF PROPERTY. MAINTENANCE IS TO INCLUDE BI-WEEKLY MOWING OF SIDE SLOPES FOR VEGETATION CONTROL AND MONTHLY INSPECTION/CLEANING OF CULVERTS & STORM SYSTEMS.
44. ALL DISTURBED AREAS SHALL BE SODDED, UNLESS OTHERWISE SHOWN, AND SHALL HAVE SOD/ VEGETATED COVER ESTABLISHED PRIOR TO THE INSPECTION FOR THE CERTIFICATE OF OCCUPANCY.
45. INSTALLATION OF THE REQUIRED STREET SIGNS, TRAFFIC SIGNS, PAVEMENT STRIPING, STREET LIGHTS AND SIDEWALKS ALONG WITH THE PAINTING OF THE FIRE HYDRANTS MUST BE COMPLETED PRIOR TO THE ISSUANCE OF THE CERTIFICATE OF COMPLETION.
46. CONTRACTOR IS RESPONSIBLE FOR INSPECTING AND PRE-TESTING PRIOR TO SCHEDULING A TEST OR WALK-THROUGH WITH THE UTILITY REPRESENTATIVES, MUNICIPAL REPRESENTATIVES AND ENGINEER OF RECORD. ANY COST ASSOCIATED WITH RETESTING SHALL BE PAID FOR BY THE CONTRACTOR.
47. THE ENGINEER OF RECORD AND LOCAL UTILITY SHALL BE GIVEN SEVENTY-TWO (72) HOURS NOTICE OF ALL REQUESTED MEETINGS AND/OR TESTING MEASURES.
48. CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE WITH THE REGULATORY REPRESENTATIVES TO DETERMINE THE INSPECTIONS NEED FOR THE PROJECT. CONTRACTOR SHALL PROVIDE PROPER NOTIFICATION TO INSPECTING AUTHORITIES BEFORE AND DURING CONSTRUCTION.
49. ZEV COHEN AND ASSOCIATES, INC (ZCA) LIABILITY SHALL BE LIMITED TO THE COMPANY'S DESIGN OF SPECIFIC IMPROVEMENTS AS DEPICTED ON THE SITE INFRASTRUCTURE CONSTRUCTION DOCUMENTS.

EROSION & SEDIMENT CONTROL NOTES

1. ALL DEMOLITION AND CONSTRUCTION ACTIVITIES SHALL INCORPORATE APPROPRIATE BEST MANAGEMENT PRACTICES (BMP'S) TO PREVENT EROSION, OFFSITE SEDIMENTATION, AND THE POTENTIAL FOR DOWNSTREAM WATER QUALITY IMPACTS.
2. THE SITE WORK/GRADING AND UTILITIES CONTRACTOR SHALL AT A MINIMUM, ENSURE IMPLEMENTATION OF AN APPROVED EROSION PREVENTION AND SEDIMENT CONTROL PLAN IN ACCORDANCE WITH FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION (FDEP) CONSTRUCTION ACTIVITY GUIDELINES.
3. A SITE SPECIFIC STORMWATER POLLUTION PREVENTION PLAN (SWPPP) SHALL BE SUBMITTED WITH THE PROPOSED SITE PLANS FOR REVIEW AND APPROVAL BY THE CITY PER THE CITY'S LAND DEVELOPMENT CODE (LDC) "ADDITIONAL APPLICATION REQUIREMENTS FOR SITE PLANS".
4. ALL APPLICABLE PERMITS, SWPPP, AND SITE SPECIFIC BMP'S SHALL BE INSPECTED BY THE CITY, PRIOR TO THE START OF ANY LAND DISTURBANCE ACTIVITIES. PRECONSTRUCTION EROSION CONTROL INSPECTIONS CAN BE SCHEDULED THROUGH ETRAKIT UNDER CODE 601 OR SCHEDULED THROUGH PERMITS AND LICENSING.
5. THE SITE WORK CONTRACTOR SHALL MINIMIZE DISTURBANCES OF EXISTING WETLANDS, VEGETATION AND DRAINAGE PATTERNS ON ADJACENT PROPERTIES TO THE MAXIMUM EXTENT PRACTICABLE DURING CONSTRUCTION ACTIVITIES.
6. STORMWATER RETENTION, DETENTION, STORAGE AND CONVEYANCE SYSTEMS MUST BE EXCAVATED TO ROUGH GRADE PRIOR TO BUILDING CONSTRUCTION OR PLACEMENT OF IMPERVIOUS SURFACE WITHIN THE AREA SERVED BY THOSE SYSTEMS. ADEQUATE BMP'S MUST BE IMPLEMENTED TO PREVENT SILTATION OF THESE TREATMENT SYSTEMS AND CONTROL STRUCTURES DURING CONSTRUCTION. SILTATION MUST BE REMOVED FROM THE STORMWATER SYSTEM WHEN HALF FULL AND IMMEDIATELY PRIOR TO FINAL GRADING AND STABILIZATION OF THE PROJECT.
7. THE OWNER AND OR CONTRACTOR(S) IS RESPONSIBLE FOR IMPLEMENTATION AND MAINTENANCE OF ALL EROSION PREVENTION AND SEDIMENT CONTROL MEASURES AND PROJECT SPECIFIC PERMIT REQUIREMENTS. BEST MANAGEMENT PRACTICES INSTALLED ONSITE SHALL BE INSPECTED AT LEAST ONCE EVERY SEVEN CALENDAR DAYS AND WITHIN 24 HOURS OF THE END OF A STORM EVENT THAT IS 0.50 INCHES OR GREATER (EVEN IF IT RAINS ON THE WEEKEND OR HOLIDAY). THE SITE SHALL BE INSPECTED AND THE INSPECTION DOCUMENTED BY A QUALIFIED INSPECTOR AND CORRECTIVE ACTIONS TAKEN AS NECESSARY.
8. THE SITE WORK/GRADING AND UTILITIES CONTRACTOR SHALL INITIATE STABILIZATION MEASURES WITHIN SEVEN CALENDAR DAYS AFTER CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED FOR ANY PORTION OF THE PROJECT. FINAL STABILIZATION IS DEFINED AS A UNIFORM PERENNIAL VEGETATIVE COVER WITH A DENSITY OF GROWTH OF AT LEAST 70% OR GREATER.
9. THE SITE WORK OWNER AND/OR CONTRACTOR(S) IS RESPONSIBLE FOR MAINTAINING THE PROJECT IN COMPLIANCE WITH ALL JURISDICTIONAL PERMITS AND THE CITY'S LAND DEVELOPMENT CODE REQUIREMENTS.
10. FOR ANY LAND DISTURBANCES OF ONE ACRE OR MORE, THE CONTRACTOR SHALL SUBMIT A COMPLETED NPDES CONSTRUCTION GENERIC PERMIT (CGP) NOTICE OF INTENT (NOI) TO THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION (FDEP) AT LEAST 2 CALENDAR DAYS PRIOR TO COMMENCEMENT OF CLEARING, GRADING, DEMOLITION, OR OTHER CONSTRUCTION RELATED LAND DISTURBANCE ACTIVITIES. THE NPDES CGP SHALL BE MAINTAINED UNTIL COMPLETION OF TALL CONSTRUCTION ACTIVITIES.
11. FOR PROJECTS THAT DISCHARGE STORMWATER INTO THE CITY'S MS4 STORMWATER CONVEYANCE SYSTEM, THE CITY'S MS4 MUST BE DESIGNATED AS A DISCHARGE LOCATION ON THE FDEP CGP NOI. IF DESIGNATED AS SUCH, A COPY OF THE NPDES CGP NOI OR ACKNOWLEDGEMENT LETTER MUST BE SUBMITTED TO THE CITY OF DELAND UTILITIES DEPARTMENT WITHIN 7 CALENDAR DAYS.

SITE CLEARING & GRADING NOTES

THE FOLLOWING REPRESENTS MINIMUM STANDARDS TO BE ADHERED TO BY THE CONTRACTOR THROUGHOUT THE CONSTRUCTION OF A PROJECT. THE CITY RESERVES THE RIGHT TO REQUIRE ADDITIONAL MEASURES TO BE EMPLOYED WHEN WARRANTED BY EXTREME CONDITIONS AND/OR THE FAILURE OF THE CONTRACTOR TO EMPLOY THE APPROPRIATE EROSION CONTROL BEST MANAGEMENT PRACTICES. FAILURE TO COMPLY WITH THESE PROVISIONS SHALL RESULT IN THE ISSUANCE OF A "STOP WORK ORDER".

1. NO DISTURBANCE OF EXISTING OR PROPOSED CONSERVATION EASEMENTS, NATURAL BUFFERS, OR WATER BODIES IS PERMITTED WITHOUT PRIOR APPROVAL FROM THE CITY ENGINEER OR DESIGNEE. THE CONTRACTOR SHALL LOCATE THESE AREAS ON SITE AND BARRICADE THEM TO AVOID ANY UNAUTHORIZED CLEARING. BARRICADES AND OTHER PROTECTIVE FENCING ARE TO BE LOCATED AT THE DRIP LINE OF EXISTING NATIVE TREES OR AT THE EDGE OF THE NATIVE UNDER-STORY HABITAT, WHICHEVER IS NEAREST TO THE CONSTRUCTION ACTIVITY.
2. SPECIMEN AND HISTORIC TREES, CONSERVATION EASEMENTS, NATURAL VEGETATION BUFFERS, AND SIMILAR AREAS MUST BE PROTECTED BY BARRICADES OR FENCING PRIOR TO CLEARING. BARRICADES ARE TO BE SET AT THE DRIP LINE OF THE TREES AND MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT. BARBED WIRE IS NOT PERMITTED AS A PROTECTIVE BARRIER.
3. WHERE A CHANGE OF GRADE OCCURS AT THE DRIP LINE OF A SPECIMEN TREE, SILT FENCE WILL BE REQUIRED DURING CONSTRUCTION AND RETAINING WALLS MUST BE INSTALLED PRIOR TO FINAL ACCEPTANCE BY THE CITY.
4. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE ALL PROTECTIVE VEGETATION BARRICADES AND EROSION CONTROL STRUCTURES AND MEASURES IN PLACE PRIOR TO THE COMMENCEMENT OF ANY EARTHWORK, INCLUDING PRELIMINARY GRUBBING. THESE MEASURES INCLUDE, BUT ARE NOT LIMITED TO, TEMPORARY CONSTRUCTION FENCES, SYNTHETIC JUTE BALES, SILT FENCES, AND FLOATING TURBIDITY BARRIERS. FURTHER, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN ALL EROSION CONTROL DEVICES THROUGHOUT THE DURATION OF THE ENTIRE PROJECT. MAINTENANCE SHALL INCLUDE PERIODIC INSPECTION AND REMOVAL OF DEBRIS ABUTTING EROSION CONTROL DEVICES IN ACCORDANCE WITH THE CITY'S UTILITY DEPARTMENT STANDARDS.
5. PRIOR TO THE INSTALLATION OF ANY FILL MATERIAL ON SUBJECT SITE, SILT FENCE SHALL BE INSTALLED:
   a. ALONG SUBJECT SITE BOUNDARY AND PROPERTY LINES.
   b. AT THE EDGE OF CONSERVATION EASEMENTS AND WETLANDS.
   c. ADJACENT TO NATURAL LANDSCAPE BUFFERS.
   d. AROUND THE PERIMETER OF EXISTING STORM WATER TREATMENT FACILITIES.
   e. AT ANY ADDITIONAL AREAS THAT THE CITY DEEMS NECESSARY TO BE PROTECTED FROM POTENTIAL EROSION IMPACTS DURING CONSTRUCTION. THESE CONDITIONS SHALL APPLY IN ALL INSTANCES WHERE FILL MATERIAL IS BEING INSTALLED WITHIN 25 FEET OF ANY OF THE AFOREMENTIONED LOCATIONS. WHILE THESE ITEMS REPRESENT THE MINIMUM REQUIREMENTS, THE CITY RESERVES THE RIGHT TO IMPOSE ADDITIONAL PROTECTIVE MEASURES, AS DETERMINED DURING ACTUAL SITE VISITS CONDUCTED AS PART OF THE STANDARD REVIEW OF THE SITE-SPECIFIC CLEARING PERMIT AND THROUGHOUT PROJECT CONSTRUCTION.
6. WHERE FILL MATERIAL IS INTENDED TO BE INSTALLED ADJACENT TO EXISTING VEGETATION WHICH IS INTENDED TO REMAIN NATURAL, THE CONTRACTOR MAY INSTALL SILT FENCING AS A TREE PROTECTION MEASURE, IN LIEU OF INSTALLING EITHER WOOD BRACING OR ORANGE MESH FENCING. THIS PRACTICE IS ENCOURAGED BY THE CITY. IF THE SILT FENCE FAILS TO PROVIDE ADEQUATE PROTECTION FROM IMPACT DUE TO CONSTRUCTION, THEN ADDITIONAL CONSTRUCTION FENCING OR WOOD BRACING SHALL BE REQUIRED.
7. AT A MINIMUM, THE CONTRACTOR SHALL SEED AND MULCH ALL DISTURBED AREAS. GRASS COVERAGE IS TO BE ESTABLISHED WITHIN THIRTY DAYS.
8. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR THROUGH SCHEDULING, TO MINIMIZE THE DISTURBANCE OF SITE AREAS THAT HAVE BEEN BROUGHT TO THEIR PROPOSED FINAL GRADE. WITHIN TWENTY DAYS OF BRINGING A SUBJECT AREA TO ITS FINAL GRADE, THE CONTRACTOR SHALL INSTALL SEED AND MULCH OR SOD AND WATERING, AS REQUIRED.
9. FOR INDIVIDUAL CONSTRUCTION PROJECTS INVOLVING MULTIPLE PHASES, UPON COMPLETION OF EACH PHASE OF THE PROJECT, SEEDING AND MULCHING AND OR/ SODDING IS TO BE PERFORMED PRIOR TO COMMENCING THE NEXT PHASE OF CONSTRUCTION.
10. ONCE AN AREA IS SEEDED OR SODDED, IT MUST BE MAINTAINED, INCLUDING WATERING AND TRIMMING BY THE CONTRACTOR TO ALLOW THE GRASS TO BECOME ESTABLISHED.
11. ALL BURNING OF CLEARED MATERIALS MUST BE APPROVED AND PERMITTED THROUGH THE FL FOREST SERVICE, BUNNELL OFFICE.
12. ABSOLUTELY NO BURYING OF CLEARED & GRUBBED MATERIALS IS PERMITTED.

SITE CLEARING & GRADING NOTES CONTINUED

13. THE REMOVAL OF ALL VEGETATION AND TOPSOIL ON THE FUTURE ROADWAY, PARKING AND BUILDING LOT AREAS IS REQUIRED TO BE COMPLETED PRIOR TO THE PLACEMENT OF FILL ON THOSE AREAS. THE TOPSOIL MAY BE TEMPORARILY STOCKPILED AND USED AS TOPSOIL OVER PROPOSED GREEN AREAS SUCH AS PLANT BEDS, SODDED AREAS, AND WHERE TREES ARE TO BE INSTALLED OR RELOCATED. TEMPORARY STOCKPILE SLOPES SHALL NOT EXCEED 4:1 (H:V).
14. A SIGNED, DATED, AND SEALED LETTER FROM A SOILS ENGINEER OR THE ENGINEER OF RECORD CERTIFYING THAT THE AREAS TO BE FILLED HAVE BEEN STRIPPED OF ORGANIC MATERIALS, MUST BE SUBMITTED TO THE CITY PRIOR TO FILLING.
15. FILL MATERIAL IS TO BE PLACED IN ONE FOOT LIFTS AND COMPACTED TO THE APPROPRIATE DENSITY (98% FOR PAVED AREAS AND 95% FOR BUILDING PADS AND ALL OTHER AREAS AS PER MODIFIED AASHTO T-180).
16. DURING SUBDIVISION DEVELOPMENT WHEN FUTURE BUILDING LOTS ARE FILLED AS PART OF THE OVERALL SUBDIVISION IMPROVEMENTS, COMPACTION TEST REPORTS MUST BE PERFORMED ON THESE LOTS AT 300' INTERVALS. THESE TESTS ARE TO BE PERFORMED IN 1' VERTICAL INCREMENTS. THE RESULTS OF THESE TESTS ARE TO BE SUBMITTED TO THE CITY UPON COMPLETION OF THE TESTS.
17. IF ANY MUCK OR ANY UNSUITABLE MATERIAL IS DISCOVERED, IT SHALL BE REMOVED AND REPLACED WITH A SUITABLE MATERIAL THAT IS PROPERLY BACKFILLED, COMPACTED AND TESTED USING AASHTO T-180 MODIFIED PROCTOR METHOD.
18. STOCKPILING IS NOT GENERALLY PERMITTED BY THE CITY. WHEN ALLOWED, STOCKPILES SHALL NOT EXCEED SIX FEET IN HEIGHT MEASURED FROM THE ORIGINAL GRADE. AT A MINIMUM, STOCK PILES THAT WILL REMAIN IN PLACE IN EXCESS OF FIVE DAYS SHALL BE COVERED OR WATERED TO MINIMIZE THE ADVERSE IMPACT ON ADJACENT PROPERTY OWNERS AT NO ADDITIONAL COST TO THE CITY OR OWNER. SEED AND MULCH IMMEDIATELY UPON PLACEMENT OF THE FINAL LIFT.
19. SOILS ARE TO BE STABILIZED BY WATER OR OTHER MEANS DURING CONSTRUCTION. THIS IS INTENDED TO REDUCE SOIL EROSION AND THE IMPACT TO NEIGHBORING COMMUNITIES. ADEQUATE WATERING METHODS SHOULD BE EMPLOYED TO ALLOW DAILY COVERAGE OF THE ENTIRE LIMITS OF ALL AREAS THAT DO NOT HAVE AN ESTABLISHED VEGETATIVE COVER. METHODS TO BE EMPLOYED INCLUDE, BUT ARE NOT LIMITED TO, WATER TRUCKS, PERMANENT IRRIGATION SYSTEMS, TEMPORARY SPRINKLER SYSTEMS OPERATED BY PUMPING UNITS CONNECTED TO WET RETENTION PONDS, WATER CANNONS, TEMPORARY IRRIGATION SYSTEMS MOUNTED ATOP STOCKPILE AREAS, AND OTHER METHODS AS DEEMED NECESSARY BY THE CITY.
20. ALL FILL MATERIALS LOCATED BENEATH STRUCTURES AND PAVEMENT SHALL CONSIST OF CLEAN GRANULAR SAND FREE FROM ORGANICS AND SIMILAR MATERIAL THAT COULD DECOMPOSE.
21. ALL FILL TO BE PLACED IN LANDSCAPED AREAS SHALL HAVE A PH RANGE BETWEEN 5.5 AND 7.5, BE ORGANIC IN NATURE, FREE OF ROCKS AND DEBRIS, OR MATCH NATIVE EXISTING SOILS.

STORMWATER CONSTRUCTION NOTES

1. ALL SITE SPECIFIC, EROSION PREVENTION AND SEDIMENT CONTROL (EPSC) MEASURES AT A MINIMUM SHALL BE INSTALLED PER APPROVED SITE PLANS AND STORMWATER POLLUTION PREVENTION PLANS (SWPPP). EPSC DESIGN, INSTALLATION AND MAINTENANCE SHALL BE IN ACCORDANCE WITH THE STATE OF FLORIDA EROSION AND SEDIMENT CONTROL DESIGNER AND REVIEWER MANUAL CURRENT EDITION.
2. THE SITE WORK CONTRACTOR SHALL ENSURE IMPLEMENTATION OF APPROVED SWPPP AND INSTALLATION OF ALL APPROVED EROSION PREVENTION AND SEDIMENT CONTROL PRACTICES. **A PRECONSTRUCTION EROSION CONTROL INSPECTION SHALL BE SCHEDULED WITH CITY PERSONNEL PRIOR TO COMMENCEMENT OF ANY LAND DISTURBANCE ACTIVITIES.**
3. THE SITE WORK CONTRACTOR SHALL ENSURE THAT THE NPDES CONSTRUCTION GENERIC PERMIT (CGP) NOTICE OF INTENT (NOI) AND ANY REQUIRED DEWATERING PERMITS HAVE BEEN OFTAINED OR SUBMITTED PRIOR TO ANY LAND DISTURBANCE ACTIVITIES.
4. A CODB DEWATERING PERMIT IS REQUIRED PRIOR TO ENGAGING IN ANY DEWATERING OR CONSTRUCTION ACTIVITY THAT CHANGES THE IMPERVIOUS AREA OF LAND. PERMITABLE DEWATERING ACTIVITIES INCLUDE; THE REMOVAL OF GROUND WATER FROM A CONSTRUCTION SITE, ENCLOSED VAULT, COFFERDAM, OR TRENCHES, ALLOWING CONSTRUCTION OR MAINTENANCE IN A DRY ENVIRONMENT. SITE SPECIFIC DEWATERING PERMITS REQUIRE PAYMENT OF A PER ACRE FEE BASED ON THE SIZE OF THE DEVELOPMENT AND GENERAL PURPOSE PERMITS REQUIRE AN ANNUAL FEE BASED ON A BIANNUAL SCHEDULE OF DEWATERING ACTIVITIES DISCHARGING DIRECTLY INTO THE CITY'S PHASE II MS4 STORMWATER CONVEYANCE SYSTEM. DEWATERING PERMITS MAY BE APPLIED FOR DIRECTLY THROUGH ETRAKIT. FEES ARE SUBJECT TO ARTICLE 7, SECTION 7.2 OF THE LAND DEVELOPMENT CODE AND MUST BE SUBMITTED WITH THE PERMIT APPLICATION PRIOR TO ANY USE OF THE CITY'S STORMWATER CONVEYANCE SYSTEM.
5. CONTRACTOR SHALL FOLLOW ALL OF THE CITY'S REQUIRED WASTE MANAGEMENT PRACTICES. ALL CONSTRUCTION, RENOVATION, AND DEMOLITION SITES ARE TO BE KEPT CLEAN AND FREE OF REFUSE, DEBRIS, AND LITTER DURING THE CONSTRUCTION, RENOVATION, OR DEMOLITION PROCESS. A CERTIFICATE OF OCCUPANCY FOR A NEWLY CONSTRUCTED OR RENOVATED BUILDING SHALL NOT BE ISSUED UNTIL ALL REFUSE AND LITTER CAUSED BY THE CONSTRUCTION OR REMODELING IS REMOVED FROM THE SITE PER THE DELAND CODE OF ORDINANCES CHAPTER 78 SECTION 78-5 AND 78-7.
6. ALL DEVELOPMENT PLANS SHALL BE CONSISTENT WITH THE DELAND LAND DEVELOPMENT CODE ARTICLE 6 DEVELOPMENT STANDARDS, SECTION 6.15, 6.18 AND ARTICLE 7 SUBDIVISION AND INFRASTRUCTURE, SECTION 7.2
7. STORMWATER MAINS SHALL HAVE A MINIMUM DRAINAGE MAINTENANCE EASEMENT AND ACCESS WIDTH OF 20 FEET. THE EASEMENT WIDTH MAY BE INCREASED DEPENDING UPON THE SIZE AND DEPTH OF PIPE.
8. CONCRETE EROSION CONTROL BMP'S MUST BE PROVIDED WHERE SWALES OR CULVERTS INTERCEPT DRAINAGE DITCHES.
9. IN GENERAL, ALL RETENTION/DETENTION STRUCTURES SHOULD BE CONSTRUCTED TO ROUGH GRADE PRIOR TO ANY ROAD, PARKING LOT, OR BUILDING CONSTRUCTION OR AS PERMIT CONDITIONS DICTATE. SEWER AND WATER MAINS MAY BE INSTALLED PRIOR TO CONSTRUCTION OF RETENTION/DETENTION IF DEWATERING IS NOT REQUIRED. ADDITIONAL BMP'S FOR EROSION AND SEDIMENT CONTROL SHALL BE IMPLEMENTED AS NECESSARY.
10. IT IS THE RESPONSIBILITY OF ALL CONTRACTOR'S TO REVIEW AND MAINTAIN COPIES OF THE SJRWMD, ERP, NPDES CGP, SITE SPECIFIC SWPPP, AND ALL OTHER APPLICABLE PERMITS AT THE CONSTRUCTION SITE AT ALL TIMES.
11. LANDSCAPE PLANS SHALL CLEARLY DEPICT THE DESIGN LOCATION OF TEMPORARY AND PERMANENT PLANTINGS RELATIVE TO THE LOCATION OF PUBLIC UTILITIES AND STORMWATER INFRASTRUCTURE IN ORDER TO EVALUATE POTENTIAL CONFLICTS.
12. THE MAXIMUM PERMISSIBLE SLOPE OF ANY NEW SITE GRADING IS 1:3 (VERTICAL:HORIZONTAL). THIS LIMIT APPLIES TO ALL AREAS EXCEPT STORMWATER CONVEYANCE AND TREATMENT SYSTEMS WHICH HAVE A MAXIMUM SIDE SLOPE OF 1:4 (EXCEPT BELOW THE WATER TABLE WHERE STEEPER SLOPES ARE PERMISSIBLE AND AS NOTED BELOW).
13. ALL SWALES AND DITCHES SHALL HAVE A MAXIMUM PERMITTED FRONT (SIDE) SLOPE NOT STEEPER THAN 1:4. THE MAXIMUM PERMITTED BACK (SIDE) SLOPE, SHALL BE 1:3, PROVIDED THAT A 5' WIDE BERM IS INSTALLED. DESIGN CENTERLINE AND TOP-OF-BANK ELEVATIONS SHALL BE NOTED AT INTERVALS OF 100' AND AT SIGNIFICANT GRADE CHANGES.
14. SWALES THAT ARE NORMALLY DRY AND INTENDED FOR CONVEYANCE OF STORMWATER RUNOFF AND ARE NOT INTENDED FOR RETENTION SHALL HAVE A MINIMUM DRAINAGE MAINTENANCE EASEMENT WIDTH MEASURING 15 FEET. SWALED AREAS INTENDED FOR RETENTION SHALL PROVIDE APPROPRIATE EASEMENT AREAS FOR ACCESS AND MAINTENANCE MEASURED UPLAND FROM THE TOP OF BANK. AT A MINIMUM, THE EASEMENT SHALL MEASURE 10 FEET IN WIDTH FROM THE TOP OF THE SWALE.
15. NORMAL ROADSIDE SWALES ARE PERMITTED TO BE CONSTRUCTED TO A MAXIMUM DEPTH OF 18" BELOW THE OUTSIDE EDGE OF PAVEMENT OR CONCRETE CURB.
16. WHEN CULVERTS ARE INSTALLED TO MAINTAIN THE FLOW OF EXISTING DRAINAGE WAYS WHERE NEWLY PROPOSED ROADS WOULD OTHERWISE SEVER THE DRAINAGE RIGHT-OF-WAY, CULVERTS CROSSING RIGHT-OF-WAYS SHALL EXTEND FROM RIGHT-OF-WAY LINE TO RIGHT-OF-WAY LINE UNDER THE ROADWAY. CULVERTS SHALL BE DESIGNED TO ACCOMODATE THE FLOW FROM THE 100 YEAR - 24 HOUR STORM EVENT WITHOUT FLOODING ADJACENT PROPERTY OR SURCHARGING THE SAID ROADWAY. 17. WET POND DEPTHS SHALL BE EIGHT FEET MINIMUM TO FIFTEEN FEET MAXIMUM, MEASURED FROM THE TOP OF BANK AND MEET SJRWMD CRITERIA.
18. WHEN A WET POND IS INCORPORATED WITHIN A SUBDIVISION AND IS ABUTTED BY LOTS, SUCH ABUTTING LOT LINES SHALL EXTEND INTO THE LAKE PROPORTIONATELY ENCOMPASSING ALL OF THE LAKE AREA.
19. WET POND INFLOW AND OUTLET STRUCTURES SHALL GENERALLY BE CONSTRUCTED WITH REINFORCED CONCRETE AND SHALL BE SUBJECT TO THE APPROVAL OF THE CITY. SKIMMERS FOR WET PONDS SHALL BE CONSTRUCTED SUCH THAT THE BOTTOM EXTENDS 6" BELOW THE NORMAL WATER LEVEL AND 6" ABOVE THE OVERFLOW. FOR DRY PONDS, THE SKIMMER BOTTOM SHALL BE SET 6" BELOW THE LOWEST OVERFLOW ELEVATION AND 6" ABOVE THE HIGHEST POINT OF OVERFLOW. ALL SKIMMERS SHALL BE CONSTRUCTED OF MINIMUM 1/4" THICK ALUMINUM OR CITY APPROVED EQUIVALENT AND BE ADEQUATELY SUPPORTED TO PREVENT DEFLECTION. ALL HARDWARE SHALL BE 316 STAINLESS STEEL.
20. THE CITY MAY REQUEST THE DEVELOPER SUBMIT A REPORT BY A QUALIFIED HYDROLOGIST OR HYDROGEOLOGIST ON THE IMPACT THE WET POND WILL HAVE ON NEIGHBORING WATER TABLE ELEVATIONS BOTH DURING CONSTRUCTION AND AFTER LAKE COMPLETION. THE CITY MAY REQUIRE GROUNDWATER MONITORING DURING THE LAKE EXCAVATION.
21. ADEQUATE MAINTENANCE BERMS, MINIMUM 10' IN WIDTH, SHALL BE PROVIDED AROUND THE ENTIRE PERIMETER OF ALL WET PONDS AND ASSOCIATED OUTFALLS DISCHARGING INTO AND OUT OF LAKES. APPLICABLE CROSS SECTIONS SHALL BE INCLUDED ON ALL FINAL DEVELOPMENT PLANS.
22. DEVELOPMENT PLANS FOR ALL STORMWATER MANAGEMENT SYSTEMS SHALL CONTAIN DISCHARGE DATA (OVERFLOW), BOTTOM ELEVATION, NORMAL WATER LEVELS, MEAN ANNUAL SEASONAL HIGH WATER TABLE ELEVATION, TREATMENT VOLUME AND CORRESPONDING ELEVATION, 25 YEAR/100 YEAR HIGH WATER LEVELS, AND THE DESIGN TAILWATER ELEVATION (IF APPLICABLE).
23. ALL STORM SEWERS AND CULVERTS LOCATED IN ROADWAY RIGHT-OF-WAYS AND ROADWAY EASEMENTS SHALL BE A MINIMUM OF CLASS III O-RING REINFORCED CONCRETE PIPE. OUTSIDE OF ROADWAY EASEMENTS AND R.O.W., PIPE MAY BE MADE OF ALTERNATE MATERIALS INCLUDING:
    A. SMOOTH INNER WALL HIGH DENSITY POLYETHYLENE (HDPE) IN ACCORDANCE WITH AASHTO M-294, AASHTO MP7, ASTM D3350 AND ASTM D2412 FOR SIZES UP TO 42" IN DIAMETER OR
    B. PVC IN ACCORDANCE WITH THE PROVISION NOTED IN THE "SEWER DETAILS" OF THESE SPECIFICATIONS.
24. ALL STORM SEWER PIPE JOINTS LOCATED IN ROADWAY RIGHT-OF-WAYS AND ROADWAY EASEMENTS SHALL BE ENTIRELY WRAPPED WITH NON-WOVEN FILTER FABRIC WITH A MINIMUM WIDTH OF 24" AND A MINIMUM OF 24" OVERLAP. GASKETS ARE NOT PERMITTED AS AN EQUIVALENT SUBSTITUTE FOR MEETING THIS REQUIREMENT. THIS PRACTICE IS ENCOURAGED ON PRIVATE SITES. ADDITIONALLY, ALL JOINTS SHALL BE RUBBER GASKETED FOR BOTH ROUND AND ELLIPTICAL PIPE.
25. DEPTH OF COVER MEASURED TO THE TOP OF PIPE (INCLUDING THE BELL JOINT) SHALL BE A MINIMUM OF 3 FEET OVER RCP. DEVIATION FROM THIS REQUIREMENT MAY BE ALLOWED BY INCREASING THE PIPE'S STRUCTURAL STRENGTH. IF AN ALTERNATE MATERIAL IS APPROVED, DEPTH OF COVER SHALL MEET MANUFACTURER'S RECOMMENDATION.
26. ALL STORM DRAINAGE PIPES LOCATED IN ROADWAY RIGHT-OF-WAYS AND ROADWAY EASEMENTS SHALL BE A MINIMUM OF FIFTEEN INCH (15") INSIDE DIAMETER OR EQUIVALENT. STORM DRAINAGE PIPES SMALLER THAN 15" ARE PERMITTED ON PRIVATE SITE PLANS PROVIDING THAT MAINTENANCE SHALL BE PERFORMED BY THE OWNER.
27. STORMWATER FORCE MAINS WILL USE NO. 12 INSULATED SINGLE STRAND COPPER WIRE SHALL BE ATTACHED TO ALL PIPES AND TERMINATED AT THE VALVES IN ACCORDANCE WITH RECLAIM WATER VALVE AND VALVE BOX DETAIL. TRACER WIRE SHALL BE TESTED FOR CONTINUITY UNDER SUPERVISION BY CITY REPRESENTATIVE AFTER INSTALLATION.
28. STORM INLETS, MANHOLES, AND CATCH BASINS SHALL BE FDOT COMPLIANT. EITHER POURED IN PLACE OR PRECAST REINFORCED CONCRETE STRUCTURES ARE REQUIRED AT EACH CHANGE OF PIPE SIZE OR CHANGE IN PIPE DIRECTION. ALL STRUCTURES SHALL COMPLY WITH ASTM C-478 AND SHALL HAVE 6" THICK WALLS. THINNER WALLS MAY BE PERMITTED PROVIDING THE DESIGN IS IN ACCORDANCE WITH FDOT STANDARD PLANS. THIS REQUIREMENT MUST BE REFLECTED ON BOTH THE SHOP DRAWING AND AS-BUILT PLANS. STRUCTURES PLACED IN HIGH TRAFFIC AREAS SHALL BE OF TRAFFIC BEARING CONSTRUCTION IN ACCORDANCE WITH FDOT STANDARDS.
29. STORM INLETS SHALL BE SPACED IN SUCH A MANNER AS TO ACCEPT ONE HUNDRED PERCENT OF THE DESIGN STORM RUNOFF WITHOUT IMPEDING THE FLOW OF TRAFFIC. FOR ROADWAY SECTIONS WITH DESIGN SPEEDS OF 45 MPH AND LESS AND WITHOUT FULL WIDTH SHOULDERS, SPREAD RESULTING FROM A RAINFALL INTENSITY OF FOUR INCHES PER HOUR SHALL NOT EXCEED ONE-HALF OF THE TRAVEL LANE ADJACENT TO THE GUTTER. FOR SITE PLANS, INLET SPACING SHALL BE DESIGNED TO ACCEPT ONE HUNDRED PERCENT OF THE RUNOFF FROM A RAINFALL INTENSITY OF FOUR INCHES (4") PER HOUR WITHOUT RESULTING IN PONDING OF WATER AROUND THE INLET.
30. FOR CONNECTIONS BETWEEN INLETS WITH PIPING 15" IN DIAMETER AND LARGER, THE MAXIMUM DISTANCES BETWEEN INLETS AND/OR CLEAN-OUT JUNCTION BOXES SHALL BE 300 FEET. CULVERTS SHALL BE SLOPED TO MAINTAIN A MINIMUM SELF-CLEANING VELOCITY OF 2.5 FEET PER SECOND USING A MANNING'S 'N' OF 0.012. SPACING FOR CLEAN-OUTS AND INLETS FOR SMALLER PIPING SHALL BE REDUCED AND EVALUATED ON A CASE BY CASE BASIS.

STORMWATER CONSTRUCTION NOTES CONTINUED

31. ALL STORMWATER INLETS SHALL MEET FDOT CRITERIA IN THE FDOT DESIGN STANDARD LATEST EDITION.
32. ALL GASKETS SHALL BE LUBRICATED BEFORE BEING INSTALLED.
33. ALL FITTINGS SHALL MEET THE MINIMUM RESTRAINED REQUIREMENTS PER ANSI/AWWA/EBAA, AND ALL PRESSURE PIPES UNDER THE ROADWAY SHALL BE RESTRAINED.

SANITARY SEWER CONSTRUCTION & DESIGN NOTES

1. THE CITY OF DELAND'S UTILITIES DEPARTMENT AND THE OWNER OR OWNER'S REPRESENTATIVE SHALL BE GIVEN A MINIMUM OF 2 BUSINESS DAYS ADVANCE NOTICE (NOT INCLUDING HOLIDAYS) PRIOR TO BEGINNING ANY SANITARY SEWER CONSTRUCTION.
2. A PERMIT SHALL BE REQUIRED PRIOR TO ENGAGING IN ANY DEWATERING ACTIVITIES, OR IN ACTIVITIES, OR IN ANY CONSTRUCTION ACTIVITY THAT CHANGES THE IMPERVIOUS AREA OF LAND. DEWATERING ACTIVITIES INCLUDE THE REMOVAL OF GROUND WATER FROM A CONSTRUCTION SITE, ENCLOSED VAULT, COFFERDAM, OR TRENCHERS, ALLOWING CONSTRUCTION OR MAINTENANCE TO BE ONE IN THE DRY, OR ANY ACTIVITY WHICH CHANGES THE IMPERVIOUS AREA OF LAND. SITE SPECIFIC DEWATERING PERMITS SHALL REQUIRE PAYMENT OF A PER ACRE FEE BASED ON THE SIZE OF THE DEVELOPMENT.
3. MAINLINE TOLERANCES FOR SANITARY SEWER VERTICAL DEFLECTION SHALL BE NO MORE THAN 0.5" IN DEPTH AND NOT EXCEEDING THREE (3) FEET IN LENGTH. SEE VIDEO GUIDELINES ON "PIG LAUNCH/ RECEIVING AND VIDEO GUIDELINES" DETAIL SHEET.
4. UPON COMPLETION, THE CONTRACTOR SHALL PROVIDE THE CITY UTILITIES DEPARTMENT AND THE OWNER OR OWNER'S REPRESENTATIVE WITH A CCTV INSPECTION LOG ON DVD AND A PRINTED REPORT FOR ALL GRAVITY MAINS AND LATERALS CONSTRUCTED. ALL WORK, WITH THE EXCEPTION OF FINAL GRADE ADJUSTMENT TO THE MANHOLES, SHALL BE COMPLETED PRIOR TO COMMENCING THE CCTV INSPECTION. THE CONTRACTOR SHALL COORDINATE THE CCTV INSPECTION TIME WITH THE CITY UTILITY INSPECTOR PRIOR TO INITIATING THE WORK. FINAL PAVING SHALL NOT COMMENCE UNTIL APPROVAL HAS BEEN RECEIVED FROM THE CITY UTILITY INSPECTOR. CCTV SEWER VIDEOS AND AS-BUILT DOCUMENTS MUST BE REVIEWED AND APPROVED BY THE EOR STATING COMPLIANCE WITH CITY STANDARDS PRIOR TO REVIEW BY THE CITY. CCTV MUST BE PERFORMED WITH CITY INSPECTOR AND/OR EOR PRESENT. CCTV TO BE PROVIDED TO THE CITY ON A THUMB DRIVE,
5. SEWER LATERALS LOCATIONS SHALL BE MARKED ALONG THE OUTSIDE OF THE CURB WITH A SAW CUT "S", OR BY A METAL TAB SET INTO THE PAVEMENT.
6. THE CONTRACTOR SHALL BE REQUIRED TO PIG ALL FORCE MAINS EQUAL TO OR GREATER THAN 6" IN DIAMETER AND PRIMARY TRANSMISSION MAINS LOCATED ON COLLECTOR AND ARTERIAL ROADWAYS. LAUNCHING AND EXTRACTION POINTS SHALL BE DETERMINED BY THE CITY.
7. WITH RESPECT TO TIE-IN CONNECTIONS AND CORING OPERATIONS, THE CITY RESERVES THE RIGHT TO REQUIRE CONNECTIONS TO BE PERFORMED DURING PERIODS OF LOW FLOW (MIDNIGHT TO 6:00 A.M.) IN ORDER TO MINIMIZE SERVICE DISRUPTION TO EXISTING CUSTOMERS.
8. ALL WORK PERFORMED UPON SANITARY SEWER FACILITIES OWNED OR PROPOSED TO BE OWNED BY THE CITY SHALL BE CONSTRUCTED BY A LICENSED UNDERGROUND UTILITY CONTRACTOR OR LICENSED GENERAL CONTRACTOR, WHO IS LICENSED IN THE STATE OF FLORIDA AND REGISTERED WITH THE CITY.
9. UPON CONSTRUCTION COMPLETION AND ACCEPTANCE OF THE SYSTEM, IT SHALL BE THE DESIGN ENGINEER'S RESPONSIBILITY TO ENSURE THAT THE SYSTEM IS PROPERLY CERTIFIED AND ACCEPTED BY THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION AND AS-BUILTS ARE PROVIDED TO THE CITY'S UTILITIES DEPARTMENT PRIOR TO ANY USE OF THE SYSTEM.
10. THE PLANS SHALL DIMENSION THE LOCATION OF ALL FORCE MAINS, VALVES, MANHOLES & LATERALS FROM THE BASELINE CONSTRUCTION AND FROM RIGHT-OF-WAY LINE.
11. LANDSCAPE PLANS SHALL CLEARLY DEPICT THE DESIGN LOCATION OF PLANTINGS RELATIVE TO THE LOCATION OF PUBLIC UTILITIES AND STORM WATER INFRASTRUCTURE.
12. THE CITY'S AS-BUILT DRAWING REQUIREMENTS ARE ATTACHED TO THE BACK OF THE UTILITIES DEPARTMENT'S STANDARD DETAILS.
13. ALL GRAVITY SANITARY SEWER MAINS SHALL BE A MINIMUM OF 8" DIAMETER. COMMERCIAL SERVICE LATERALS SHALL BE GREEN AND A MINIMUM OF 6" IN DIAMETER. OR LARGER. ALL SINGLE FAMILY RESIDENTIAL SERVICE LATERALS SHALL BE 6" SINGLE SERVICES WITH CLEAN OUTS INSTALLED AT PROPERTY LINES.
14. ALL GRAVITY SANITARY SEWER MAINS SHALL BE GREEN PVC SDR-26, ASTM D-3034, OR C-900 DR-18 MINIMUM PRESSURE CLASS 150. IN PLACES WHERE A MINIMUM COVER OF 4 FEET CANNOT BE MAINTAINED OR IN DEPTHS OF 10 FEET OR GREATER C-900 OR C-905 GREEN PVC DR-18, MINIMUM PRESSURE CLASS 150 SHALL BE USED.
15. FOR SINGLE FAMILY HOMES, SINGLE SIX INCH SEWER SERVICE LATERALS SHALL BE CONSTRUCTED AT EACH LOT OR UNIT AND LOCATED ON THE DOWNSTREAM SIDE OF THE LOT CENTER LINE. THESE SERVICES SHALL BE EXTENDED 4 FEET ABOVE GROUND AT THE PROPERTY LINE WITH A PVC RISER AND PLUG EASILY VISIBLE FROM THE ROAD. RUBBER SEAL FITTINGS SHALL BE USED ON ALL LINES. NO GLUED JOINTS ARE PERMITTED ON LATERALS.
16. FOR MULTI-FAMILY AND COMMERCIAL SITES, SIX INCH MINIMUM SEWER SERVICES AND CLEANOUTS SHALL BE PROVIDED AS APPROVED BY THE CITY.
17. FORCE MAINS LESS THAN 18" MAY USE PVC C900 OR C905 DR-18. FORCE MAINS 18" AND LARGER SHALL BE DUCTILE IRON PIPE (D.I.P.), CLASS 350, EPOXY LINED. ALL NON DUCTILE IRON PIPE HORIZONTAL DIRECTIONAL DRILL FORCE MAINS SHALL HAVE A MINIMUM WORKING PRESSURE OF 160 PSI. THE CITY MAY REQUIRE A HIGHER PRESSURE RATING DEPENDING ON SITE CONDITIONS. INSIDE DIAMETER OF NON D.I.P. HORIZONTAL DIRECTIONAL DRILL PIPE SHALL MATCH THE INSIDE DIAMETER OF CONNECTING PIPES. DIRECTIONAL DRILLS SHALL HAVE FUSED MJ ADAPTERS.
18. FORCE MAIN MINIMUM DEPTH OF COVER SHALL BE 48". ALL FORCE MAINS SHALL BE DISTINCTLY MARKED BY GREEN STRIPES OR COLORED GREEN.
19. ALL FITTINGS, VALVES, ECT. SHALL BE DUCTILE IRON (MJ OR FLANGED) AND RESTRAINED. ALL FORCE MAINS SHALL USE THRUST RESTRAINT AS CALCULATED BY A PROGRAM AVAILABLE AT (EBAA.COM). THE RESTRAINED JOINT LENGTHS SHALL BE SHOWN ON THE PLANS PROVIDED BY THE EOR.
20. ALL RESTRAINED PIPE BELL JOINTS SHALL USE BELL RESTRAINTS. GRIPPER TYPE GASKETS CAN BE USED FOR DUCTILE IRON PIPE JOINTS. CONCRETE THRUST BLOCKS ARE NOT PERMITTED.
21. AS A GENERAL RULE, THE NUMBER OF JOINTS SHALL BE LIMITED WHENEVER POSSIBLE. IN SPECIAL CASES WHERE A POINT REPAIR TO AN 8" TO 12" PVC SEWER MAIN IS REQUIRED, THE PROPER RIGID WRAP AROUND SLEEVE MAY BE ALLOWED BY CITY SPECIAL APPROVAL.
22. ALL IN-LINE SANITARY SEWER FORCE MAIN VALVES SHALL BE GATE VALVES UNLESS OTHERWISE NOTED. VALVES SHALL BE INSTALLED AT EACH END OF THE FORCE MAIN AND ON STUB OUTS.
23. ALL C-900 PVC PIPE REQUIREMENTS REFERENCE THE C-900 STANDARDS. DR UPGRADES FOR BURST PROTECTION MAY BE REQUIRED WHEN USING THE C-900 STANDARDS.
24. MINIMUM GRAVITY SANITARY SEWER SLOPES ARE AS FOLLOWS: 8" PIPE 0.40%, 10" PIPE 0.28%, 12" PIPE 0.22%, 15" PIPE 0.15%, OR OTHERWISE NOTED BY UTILITIES DEPT.
25. GRAVITY SANITARY SEWER LINES SHALL BE INSTALLED WHENEVER POSSIBLE UNDER PAVED AREAS WITHIN PUBLIC RIGHT-OF-WAYS. UTILITY EASEMENTS SHALL BE PROVIDED WHENEVER PUBLICLY-OWNED SEWER LINES ARE CONSTRUCTED OUTSIDE OF A PUBLIC RIGHT-OF-WAY.
26. GRAVITY SANITARY SEWER LINE CONSTRUCTION SHALL BE ACCOMPLISHED BY THE USE OF A LASER INSTRUMENT UNLESS ANOTHER METHOD IS APPROVED BY THE CITY.
27. DURING PIPE INSTALLATION DEWATER THE GROUND SUFFICIENTLY TO KEEP THE GROUNDWATER ELEVATION A MINIMUM OF 6" BELOW THE PIPE BEING INSTALLED WITHIN THE AREA OF THE TRENCH.
28. ALL PIPES SHALL BE INSTALLED ON A FIRM FOUNDATION. SOFT OR SPONGY BEDDING FOR PIPES IS NOT ACCEPTABLE. ANY UNSUITABLE MATERIAL SHALL BE REMOVED AND REPLACED WITH A DRY, COMPACTED, GRANULAR MATERIAL SATISFACTORY TO THE CITY.
29. ON ALL EXCAVATION AND BACKFILLING THE CONTRACTOR SHALL PROVIDE ADEQUATE SHEETING AND BRACING IN ORDER TO PROVIDE A SAFE WORKING ENVIRONMENT.
30. ALL TRENCHES SHALL BE BACKFILLED WITH ACCEPTABLE MATERIAL AND COMPACTED TO THE SPECIFIED MINIMUM COMPACTION (95% IN UNPAVED AREAS AND 98% IN PAVED AREAS) AND THE OPTIMUM DENSITY BASED ON THE AASHTO T-180 MODIFIED PROCTOR TEST.
31. ALL GASKETS SHALL BE LUBRICATED BEFORE INSTALLATION.
32. THE CONTRACTOR SHALL INSTALL A #10-GAUGE MINIMUM COPPER TRACER WIRE TAPED TO THE TOP OF THE PIPE AT INTERVALS NO GREATER THEN 4-FEET. COPPER WIRE SHALL HAVE A MIN. TENSILE STRENGTH/BREAK LOAD OF 452 LBS. AND REQUIRES APPROVAL BY THE CITY FOR THE FULL LENGTH OF ALL SEWER FORCE MAINS. THE PIPE LOCATOR TAPE SHALL BE INSTALLED BETWEEN 15" AND 24" BELOW FINISHED GRADE OR AS DIRECTED BY THE MANUFACTURER. TAPE SHALL BE COLOR CODED GREEN FOR FORCE MAINS. LOCATER WIRE SHALL TERMINATE AT A LOCATION AND IN A MANNER CONVENIENT FOR CITY LOCATER STAFF.
33. TRACER WIRE SHALL BE TESTED FOR CONTINUITY UNDER SUPERVISION OF A CITY REPRESENTATIVE AFTER INSTALLATION.
34. ALL SEWER LINES CONSTRUCTED OUTSIDE OF PUBLIC RIGHT-OF-WAYS WITHIN SIDE YARDS, BACKYARDS, AND OTHER POORLY ACCESSIBLE AREAS SHALL BE CONSTRUCTED OF GREEN C-900 PVC. ABSOLUTELY NO USE OF PLASTIC STYRENE FITTINGS SHALL BE ALLOWED.
35. ALL LOCAL COLLECTION SANITARY SEWER MANHOLES SHALL BE PRECAST WITH A MINIMUM INSIDE DIAMETER OF 4 FEET. MANHOLES OVER 6 FEET DEEP SHALL HAVE A MINIMUM 4 FT TALL PRE-CAST BOTTOM SECTION.
36. STANDARD MANHOLES SHALL BE LOCATED AT INTERVALS NOT EXCEEDING 400 FEET.
27. MANHOLE RIMS SHALL BE FLUSH WITH THE FINISH GRADE ELEVATION IN PAVED AREAS AND A MINIMUM OF 0.5 FEET AND MAXIMUM OF 1.0 FOOT ABOVE GRADE IN UNPAVED AREAS.
38. THE CONTRACTOR SHALL CONSTRUCT SANITARY SEWER MANHOLES IN SUCH A WAY THAT SEWER LINES DO NOT INTERSECT SEALED JOINTS BETWEEN SECTIONS OF THE MANHOLE.
39. INDIVIDUAL SANITARY SERVICES SHALL NOT BE CONNECTED DIRECTLY INTO MANHOLES AND MUST BE CONNECTED TO SEWER MAINS BY USE OF WYE CONNECTIONS UNLESS OTHERWISE APPROVED BY THE CITY.
40. SANITARY SEWER DROP MANHOLES SHALL ONLY BE USED UNDER SPECIAL CONDITIONS AS APPROVED BY THE CITY. DROPS LESS THAN 3.0' ARE NOT ALLOWED. INSIDE DROPS ARE NOT ALLOWED.
41. SANITARY SEWER MANHOLES WITH SEWER FORCE MAINS DISCHARGING DIRECTLY INTO THEM SHALL BE FIBERGLASS OR POLY-ETHYLENE LINED. RETRO-FITTING OF MANHOLES WITH LINERS IS REQUIRED WHEN NEW CONNECTIONS ARE MADE. FIBERGLASS SHALL BE A MINIMUM 1/2" THICK UNLESS APPROVED OTHERWISE BY THE CITY. OTHER LINING METHODS AND MATERIALS MAY BE CONSIDERED ON A CASE BY CASE BASIS. UNDER CIRCUMSTANCES WHERE HYDROGEN SULFIDE IS A SIGNIFICANT CONCERN, MANHOLES UPSTREAM AND/OR DOWNSTREAM OF THE FORCE MAIN TIE-IN MAY BE REQUIRED TO HAVE LININGS INSTALLED.
42. EZ-WRAP PLASTIC, AS MANUFACTURED BY PRESS SEAL GASKET CORPORATION, SHALL BE USED ON THE OUTSIDE OF ALL MANHOLE AND WETWELL JOINTS. APPLY ONE LAYER OF 9" WRAP CENTERED ON EACH JOINT. A CITY INSPECTOR SHALL INSPECT ALL JOINT SEALS PRIOR TO BACKFILLING OPERATIONS. 42. CONTRACTOR FOR DEVELOPMENTS WITH THE POTENTIAL TO DISCHARGE INDUSTRIAL OR COMMERCIAL WASTE INTO THE SEWER SYSTEM SHALL CONSTRUCT AND MAINTAIN AT THE OWNER'S EXPENSE A SUITABLE CONTROL MANHOLE OR MANHOLES DOWNSTREAM OF ANY TREATMENT, STORAGE, OR OTHER APPROVED WORKS, PRIOR TO THE CITY OF DELAND'S COLLECTION SYSTEM TO FACILITATE OBSERVATION, MEASUREMENT, AND SAMPLING OF ALL WASTE, INCLUDING ALL DOMESTIC SEWAGE FROM THE ESTABLISHMENT.
43. CONTROL MANHOLE OR MANHOLES SHALL BE CONSTRUCTED AT LOCATIONS EASILY ACCESSIBLE AT ALL TIMES TO CITY PERSONNEL FOR SAMPLING.
44. SANITARY SEWER LIFT STATIONS AND FORCE MAINS SHALL BE APPROVED BY THE CITY. LIFT STATIONS SHALL BE CONSTRUCTED WITH A MINIMUM WET WELL AS SHOWN IN THE LIFT STATION DETAIL.
45. IT SHALL BE THE RESPONSIBILITY OF THE DESIGN ENGINEER TO PREPARE AND SUBMIT FLOTATION CALCULATIONS TO SIZE THE BASE OF THE WET WELL, AND ANY MANHOLES AS DEEMED NECESSARY BY THE CITY.
46. ALL FITTINGS SHALL MEET THE MINIMUM RESTRAINT REQUIREMENTS PER ANSI/AWWA/DIPRA, AND ALL PRESSURE PIPES UNDER ROADWAYS SHALL BE RESTRAINED.

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NO.	DATE	BY	SUBMITTALS / REVISIONS
1	10-09-24	MH	CITY COMMENTS
2	10-21-24	MH	SJRWMD COMMENTS
3	02-25-25	MH	SJRWMD COMMENTS

DELAND DUPONT WAREHOUSE FINAL ENGINEERING PLANS CONSTRUCTION NOTES

CITY OF DELAND
VOLUSIA COUNTY, FLORIDA

PROJECT NO: ZC 23310
DESIGNED BY: MW
DRAFTED BY: MH
CHECKED BY: SK
DRAWING FILE: 02-04_23310 NOT

KRISTOPHER ROWLEY LICENSE No 84263 STATE OF FLORIDA PROFESSIONAL ENGINEER
Digitally signed by Kristopher T Rowley
Date: 2025.06.06 16:25:46-04'00'

KRISTOPHER T. ROWLEY, P.E. NO. 84263
SPENCER H. KERSHAW, P.E. NO. 96663
NOT VALID WITHOUT SEAL

SHEET: C2 OF 12

R:\23310 DELAND AIRPORT PARCEL 17 & 18\FINAL ENGINEERING PLANS\CADDWGS\02-04_23310 NOT.DWG - PRINTED 6/6/2025 4:17 PM

SANITARY SEWER CONSTRUCTION & DESIGN STANDARDS TESTING REQUIREMENTS

1. THE CONTRACTOR SHALL EMPLOY AN INDEPENDENT TESTING LABORATORY AT HIS OWN EXPENSE TO INSURE COMPACTION OF ALL FILL MATERIAL IS COMPLETED PROPERLY. TESTS SHALL BE DONE ONE FOOT ABOVE THE PIPE AND AT ONE FOOT VERTICAL INTERVALS UNTIL FINAL GRADE IS REACHED. TESTS SHALL BE COMPLETED A MINIMUM FREQUENCY OF ONE SET OF TESTS EACH 300 FOOT LENGTH OF PIPING AND ONE ADDITIONAL SET OF TESTS AT EVERY MANHOLE. IDENTIFICATION OF TEST LOCATIONS SHALL BE CLEARLY INDICATED ON TEST REPORTS. TEST RESULTS SHALL BE FORWARDED PROMPTLY TO THE CITY'S DESIGNATED SITE INSPECTOR.
2. ALL TESTING REQUIRED BY THE CITY SHALL BE PAID FOR BY THE CONTRACTOR / DEVELOPER.
3. THE CITY OF DELAND RESERVES THE RIGHT TO REQUIRE THE DEVELOPER TO PERFORM VACUUM TESTING OF ALL SANITARY MANHOLES AND TO AIR TEST SEWER MAINS.
4. ALL PROPOSED SEWER FORCE MAINS SHALL BE FLUSHED, PRESSURE TESTED AND CLEARED FOR SERVICE IN ACCORDANCE WITH THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION PROTECTION REQUIREMENTS. THE CONTRACTOR SHALL NOTIFY THE CITY'S DESIGNATED SITE INSPECTOR AT LEAST 3 BUSINESS DAYS PRIOR TO BEGINNING A FULL-DIAMETER FLUSH OF THE MAINS FOR PRESSURE TESTING.
5. SANITARY SEWER FORCE MAINS SHALL BE PRESSURE TESTED TO 100 PSI FOR 2 HOURS WITH ALLOWABLE LEAKAGE BASED ON THE TABLE BELOW.

ALLOWABLE LEAKAGE PER 1000 FT. OF PIPELINE * –GPH

AVERAGE TEST PRESSURE (PSI)	NOMINAL PIPE DIAMETER – INCHES																		AVERAGE TEST PRESSURE (PSI)
	3	4	6	8	10	12	14	16	18	20	24	30	36	42	48	54	60	64	
450	0.48	0.64	0.95	1.27	1.59	1.91	2.23	2.55	2.87	3.18	3.82	4.78	5.73	6.69	7.64	8.60	9.56	10.19	450
400	0.45	0.60	0.90	1.20	1.50	1.80	2.10	2.40	2.70	3.00	3.60	4.50	5.41	6.31	7.21	8.11	9.01	9.61	400
350	0.42	0.56	0.84	1.12	1.40	1.69	1.97	2.25	2.53	2.81	3.37	4.21	5.06	5.90	6.74	7.58	8.43	8.99	350
300	0.39	0.52	0.78	1.04	1.30	1.56	1.82	2.08	2.34	2.60	3.12	3.90	4.68	5.46	6.24	7.02	7.80	8.32	300
275	0.37	0.50	0.75	1.00	1.24	1.49	1.74	1.99	2.24	2.49	2.99	3.73	4.48	5.23	5.98	6.72	7.47	7.97	275
250	0.36	0.47	0.71	0.95	1.19	1.42	1.66	1.90	2.14	2.37	2.85	3.56	4.27	4.99	5.70	6.41	7.12	7.60	250
225	0.34	0.45	0.68	0.90	1.13	1.35	1.58	1.80	2.03	2.25	2.70	3.38	4.05	4.73	5.41	6.03	6.76	7.21	225
200	0.32	0.43	0.64	0.85	1.06	1.28	1.48	1.70	1.91	2.12	2.55	3.19	3.82	4.46	5.09	5.73	6.37	6.80	200
175	0.30	0.40	0.59	0.80	0.99	1.19	1.39	1.59	1.79	1.98	2.38	2.98	3.58	4.17	4.77	5.36	5.96	6.36	175
150	0.28	0.37	0.55	0.74	0.92	1.10	1.29	1.47	1.66	1.84	2.21	2.76	3.31	3.86	4.41	4.97	5.52	5.88	150
125	0.25	0.34	0.50	0.67	0.84	1.01	1.18	1.34	1.51	1.68	2.01	2.52	3.02	3.53	4.03	4.53	5.04	5.37	125
100	0.23	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	1.50	1.80	2.25	2.70	3.15	3.60	4.05	4.50	4.80	100

** IF THE PIPELINE UNDER TEST CONTAINS SECTIONS OF VARIOUS DIAMETERS, THE ALLOWABLE LEAKAGE WILL BE THE SUM OF THE COMPUTED LEAKAGE FOR EACH SIZE.*

$$L = \frac{SD\sqrt{P}}{133,200}$$

WHERE:
L = ALLOWABLE LEAKAGE, IN GALLONS PER HOUR
S = LENGTH OF PIPE TESTED, IN FEET
D = NOMINAL DIAMETER OF PIPE, IN INCHES
P = AVERAGE TEST PRESSURE DURING THE LEAKAGE TEST, IN POUNDS PER SQUARE INCH (GAUGE)

POTABLE WATER CONSTRUCTION & DESIGN NOTES

1. THE CITY'S UTILITIES DEPARTMENT AND THE OWNER OR OWNER'S REPRESENTATIVE SHALL BE GIVEN A MINIMUM OF 3 BUSINESS DAYS ADVANCE NOTICE (NOT INCLUDING HOLIDAYS OR WEEKENDS) PRIOR TO BEGINNING ANY POTABLE WATER SYSTEM CONSTRUCTION.
2. A PERMIT SHALL BE REQUIRED PRIOR TO ENGAGING IN ANY DEWATERING OR CONSTRUCTION ACTIVITY
3. THAT CHANGES THE IMPERVIOUS AREA OF LAND. DEWATERING ACTIVITIES INCLUDE THE REMOVAL OF GROUND WATER FROM A CONSTRUCTION SITE, ENCLOSED VAULT, COFFERDAM, OR TRENCHES, ALLOWING CONSTRUCTION OR MAINTENANCE IN A DRY ENVIRONMENT. SITE SPECIFIC DEWATERING PERMITS SHALL REQUIRE PAYMENT OF A PER ACRE FEE BASED ON THE SIZE OF THE DEVELOPMENT.
4. ALL WORK PERFORMED ON POTABLE WATER FACILITIES OWNED OR PROPOSED TO BE OWNED BY THE CITY SHALL BE CONSTRUCTED BY AN UNDERGROUND UTILITY CONTRACTOR OR GENERAL CONTRACTOR LICENSED IN THE STATE OF FLORIDA AND REGISTERED WITH THE CITY.
5. UPON CONSTRUCTION COMPLETION AND ACCEPTANCE OF THE SYSTEM, IT IS THE DESIGN ENGINEER'S RESPONSIBILITY TO ENSURE THAT THE SYSTEM IS PROPERLY CERTIFIED AND ACCEPTED BY THE DEPARTMENT OF HEALTH, AND THAT AS-BUILT DRAWINGS MEETING THE CITY'S REQUIREMENTS ARE PROVIDED TO THE CITY AND ACCEPTED PRIOR TO ANY USE OF THE SYSTEM.
6. THE WATER DISTRIBUTION SYSTEM SHALL BE DESIGNED TO COMPLY WITH THE CITY'S FIRE (WATER) FLOW CODE.
7. EACH WATER SERVICE TERMINATION SHALL BE MARKED WITH 2" X 4" PRESSURE TREATED LUMBER EXTENDING 4' ABOVE GRADE DIRECTLY IN FRONT OF THE METER BOX WITH 3' OF ENDOTRACE POLY-TUBE OR APPROVED EQUAL COILED AND CAPPED WITH AN ELSTER HYDROSERT CAP INSIDE EACH METER BOX.
8. ALL WATER SERVICES SHALL BE MARKED WITH A "W" SAW CUT INTO THE CURB.
9. ALL WATER VALVES SHALL BE MARKED WITH AN "W" SAW CUT INTO THE CURB.
10. ALL TAPPING OF MAINS (12" OR SMALLER) SHALL BE PERFORMED BY CITY PERSONNEL. SCHEDULING OF THESE CONNECTIONS REQUIRES A MINIMUM OF 3 BUSINESS DAYS ADVANCE NOTICE AND SHALL BE COORDINATED WITH THE CITY INSPECTOR.
11. THE PLANS SHALL INCLUDE RIGHT OF WAY LINES AND STATIONING AND OFFSETS FROM THE CENTER LINE OF CONSTRUCTION.
12. DEWATERING ACTIVITIES SHALL KEEP THE GROUNDWATER ELEVATION A MINIMUM OF 6 INCHES BELOW THE WATER MAIN BEING INSTALLED.
13. ALL WATER MAINS SHALL BE INSTALLED ON A FIRM UNYIELDING FOUNDATION WITH ALL UNSUITABLE MATERIAL (MUCK, ROCK, COQUINA, ETC.) REMOVED AND REPLACED WITH CLEAN GRANULAR MATERIAL.
14. TRENCHES SHALL BE BACKFILLED WITH MATERIAL ACCEPTABLE TO THE CITY WITH A MINIMUM COMPACTION OF 98% IN PAVED AREAS AND 95% IN UNPAVED AREAS IN ACCORDANCE WITH AASHTO T-180 MODIFIED PROCTOR TEST.
15. WHERE POTABLE WATER AND SANITARY SEWER MAINS CROSS WITH LESS THAN TWELVE (12) INCHES OF VERTICAL CLEARANCE OR WHERE THE SEWER MAIN IS ABOVE THE WATER MAIN, MEDIATION MUST BE REVIEWED AND APPROVED BY FDEP.
16. WATER MAINS SHALL BE CONSTRUCTED A MINIMUM OF 4 FEET BEHIND THE BACK OF CURB OR THE EDGE OF ROADWAY PAVEMENT, WHICHEVER IS GREATER, AS MEASURED FROM OUTSIDE WALL OF THE WATER MAIN.
17. 3 INCH METALIZED PIPE LOCATION TAPE SHALL BE LOCATED 15 INCHES TO 24 INCHES BELOW FINISHED GRADE OR AS SPECIFIED BY THE MANUFACTURER FOR ALL WATER LINES. BLUE TRACER WIRE SHALL BE ATTACHED TO ALL PIPES. WIRE RUNS SHALL BE CONNECTED WITH SILICONE FILLED WIRE CONNECTORS. SERVICES SHALL BE CONNECTED TO THE MAIN WIRE WITH SILICONE FILLED WIRE CONNECTORS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE AND TEST FOR CONTINUITY (SEE CITY SPECIFICATION TRACER WIRE AND ALARMING TAPE). TRACER WIRE SHALL BE TESTED FOR CONTINUITY UNDER THE SUPERVISION OF A CITY REPRESENTATIVE AFTER INSTALLATION. IF A METER BOX IS NOT WITHIN 200 FEET OF A VALVE AND VALVE BOX AN ADDITIONAL VALVE BOX FOR TRACER WIRE IS REQUIRED.
18. SINGLE RESIDENTIAL WATER SERVICES SHALL BE A MINIMUM 1-INCH ENDOT, ENDOTRACE OR APPROVED EQUAL POLY-TUBE (MEETING THE SPECIFICATIONS OF NSF-14, AND AWWA C901.)
19. ALL WATER MAINS SHALL BE NSF-APPROVED FOR POTABLE WATER USE AND HAVE A MINIMUM COVER OF 36-INCHES.
20. WATER MAINS LESS THAN 18" MAY USE POLYVINYL CHLORIDE (PVC) C900, OR C905, SHALL MEET AWWA REQUIREMENTS AND HAVE A MINIMUM DIMENSION RATIO (DR-18) PRESSURE CLASS 150. WATER MAINS 18" AND LARGER SHALL BE DUCTILE IRON PIPE (D.I.P.), CLASS 350, CEMENT LINED. ALL NON-DUCTILE IRON PIPE HORIZONTAL DIRECTIONAL DRILL WATER MAINS SHALL HAVE A MINIMUM WORKING PRESSURE 160 PSI. THE CITY MAY REQUIRE A HIGHER PRESSURE RATING BASED ON SITE CONDITIONS. INSIDE DIAMETER OF NON D.I.P. HORIZONTAL DIRECTIONAL DRILL PIPE SHALL MATCH THE INSIDE DIAMETER OF CONNECTING PIPES. ALL GASKETS SHALL BE LUBRICATED BEFORE INSTALLATION.
21. DIRECTIONAL DRILLS SHALL HAVE FUSED MJ ADAPTERS.
22. ALL POTABLE WATER MAINS SHALL USE THRUST RESTRAINT AS CALCULATED BY A PROGRAM AVAILABLE AT EBAA.COM. THE RESTRAINED JOINT LENGTHS SHALL BE SHOWN ON PLANS PROVIDED BY EOR.
23. ALL FITTINGS, VALVES, ETC. SHALL BE DUCTILE IRON (MJ OR FLANGED) AND SHALL BE RESTRAINED.
24. ALL RESTRAINED PIPE BELL JOINTS SHALL USE BELL RESTRAINTS OR GRIPPER TYPE GASKETS CAN BE USED FOR DUCTILE IRON PIPE JOINTS. CONCRETE THRUST BLOCKS ARE NOT PERMITTED.
25. WATER VALVES SHALL BE INSTALLED AT ALL STREET INTERSECTIONS AND AT A MAXIMUM SPACING OF 750 FEET. SPACING OF VALVES ON PRIMARY TRANSMISSION MAINS WILL BE DETERMINED BY THE CITY.
26. VALVES SHALL BE INSTALLED ON ALL LEGS OF WATER MAIN TEES EXCEPT ONE.
27. ALL FITTINGS SHALL MEET MINIMUM RESTRAINT REQUIREMENTS PER ANSI/AWWA/EBAA, AND ALL PRESSURE PIPES UNDER THE ROADWAYS SHALL BE RESTRAINED.
28. METER LENGTHS REQUIRED FOR WATER METERS INSTALLATION ARE AS FOLLOWS: 3/4" TO 2" METER REQUIRES 6', 4" METER REQUIRES 12', 6" AND 8" METER REQUIRES 14',AND A 10" METER REQUIRES 20'.
29. ALL WATER VALVE BOXES SHALL BE ADJUSTED, INCLUDING DEBRIS CAP, AND CONCRETE COLLAR TO FINISHED GRADE. VALVE BOX LIDS SHALL BE PAINTED BLUE TO MAKE THEM CLEARLY VISIBLE.
30. UPON FINAL ACCEPTANCE OF NEW WATER SYSTEMS, WATER VALVES SHALL BE COMPLETELY OPENED BY CONTRACTOR. THE CONTRACTOR SHALL NOT OPERATE ANY EXISTING VALVES WITHOUT A CITY REPRESENTATIVE PRESENT.
31. ALL VALVES 2 INCHES AND SMALLER SHALL BE CURB STOPS. VALVES LARGER THAN 2 INCHES SHALL BE GATE VALVES.
32. A MINIMUM OF ONE FIRE HYDRANT SHALL BE LOCATED AT EVERY INTERSECTION. OTHER FIRE HYDRANTS SHALL BE LOCATED TO PRODUCE A MAXIMUM 500 FOOT RADIUS OF COVERAGE. ALL FIRE HYDRANTS SHALL BE INSTALLED IN EASILY ACCESSIBLE LOCATIONS FOR FIRE PERSONNEL. THE PRIMARY HYDRANT PORT ISHALL FACE THE STREET.
33. THE CONTRACTOR SHALL PIG ALL PIPES 6 INCHES OR LARGER IN DIAMETER. LAUNCHING AND EXTRACTION POINTS SHALL BE DETERMINED BY THE CONTRACTOR AND CITY REPRESENTATIVE.
34. FOR PIPE FLUSHING, PIGGING, TESTING, AND TIE-IN CONNECTIONS, THE CITY RESERVES THE RIGHT TO REQUIRE WORK TO BE PERFORMED DURING PERIODS OF LOW FLOW (MIDNIGHT TO 8 A.M.) THE CONTRACTOR SHALL COORDINATE WITH THE CITY REPRESENTATIVE AND WATER PLANT OPERATIONS TO SCHEDULE THE DATE AND TIME FOR THESE ACTIVITIES.
35. THE CITY RESERVES THE RIGHT TO PERFORM THE SAMPLING AND ANALYSIS FOR BACTERIOLOGICAL CLEARANCE OF THE WATER MAIN. ANY RETESTING WILL BE AT THE CONTRACTORS EXPENSE.
36. POTABLE WATER LINES SHALL NOT BE USED OR PLACED INTO SERVICE UNTIL CLEARANCE IS ACCEPTED BY VOLUSIA COUNTY HEALTH DEPARTMENT AND THE CITY OF DELAND.
37. BACKFLOW PREVENTERS (BFP) SHALL BE PLACED ON ALL POTABLE AND FIRE LINES SERVING COMMERCIAL AND RESIDENTIAL PROPERTIES. THE TYPE OF BACKFLOW PREVENTERS REQUIRED ARE AS FOLLOWS:
    POTABLE WATER SERVICE; REDUCED PRESSURE ZONE (RPZ)(BFP)
    FIRE LINE SERVICING A FIRE SPRINKLER SYSTEM AND/OR PRIVATE FIRE HYDRANT; DOUBLE CHECK VALVE ASSEMBLY
    FIRE LINE; DOUBLE CHECK VALVE ASSEMBLY
    IN CASES WHERE A WATER LINE SERVES BOTH DOMESTIC AND FIRE SERVICES, A REDUCED PRESSURE ZONE BFP IS REQUIRED.
38. ALL JACK & BORES REQUIRED FOR COMMERCIAL DEVELOPMENT SHALL BE PERFORMED AT THE SOLE COST OF THE OWNER\DEVELOPER.
39. ALL C-900 DR-18 PVC PIPE REQUIREMENTS REFERENCE TO THE C-900 STANDARDS.
40. CHLORINATED WATER MUST BE DECHLORINATED PRIOR TO DISCHARGE INTO ANY JURISDICTIONAL WETLAND OR WATER BODY PER AWWA STANDARD, ANSI/AWWA C655.

POTABLE WATER CONSTRUCTION & DESIGN STANDARDS TESTING REQUIREMENTS

1. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE TRENCH COMPACTION TESTS AT POINTS 12 INCHES ABOVE THE PIPE AND AT 12-INCH VERTICAL INTERVALS TO FINISHED GRADE AT A MAXIMUM HORIZONTAL SPACING OF 300 FEET. TEST RESULTS ARE TO BE PROVIDED TO THE CITY ON ALL PUBLIC UTILITIES.
2. ON ALL PROJECTS OTHER THAN THOSE INITIATED BY THE CITY THE CONTRACTOR SHALL EMPLOY AN INDEPENDENT TESTING LABORATORY AT HIS OWN EXPENSE TO INSURE THAT COMPACTION OF ALL FILL MATERIAL IS COMPLETED PROPERLY. ON ALL CITY PROJECTS THE TESTING WILL BE DONE IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. IDENTIFICATION OF TEST LOCATIONS SHALL BE CLEARLY INDICATED ON TEST REPORTS. TEST RESULTS SHALL BE FORWARDED PROMPTLY TO THE CITY'S INSPECTOR.
3. ALL POTABLE WATER MAINS SHALL BE FLUSHED, DISINFECTED, PRESSURE TESTED AND BACTERIOLOGICALLY CLEARED FOR SERVICE WHEN APPROPRIATE IN ACCORDANCE WITH THE LATEST AWWA STANDARDS AND THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION REQUIREMENTS. THE CONTRACTOR SHALL NOTIFY THE CITY'S DESIGNATED INSPECTOR WHO SHALL COORDINATE WITH CITY PERSONNEL AT THE WATER TREATMENT PLANT AT LEAST 3 BUSINESS DAYS PRIOR TO BEGINNING FLUSHING THE MAINS BEFORE PRESSURE TESTING. THE CITY MAY REQUIRE WORK TO BE PERFORMED DURING PERIODS OF LOW FLOW (MIDNIGHT TO 8 AM). THE DATE AND TIME SCHEDULE FOR FLUSHING AND PIGGING MUST BE APPROVED BY THE WATER PLANT OPERATIONS. NO HOSE OR FIRE HYDRANT SHALL BE USED IN THE COLLECTION OF BACTERIOLOGICAL SAMPLES. THE SAMPLING TAP MUST BE DEDICATED, CLEAN, DISINFECTED AND FLUSHED PRIOR TO SAMPLING. SAMPLING TAP SHALL BE SMOOTH, UNTHREADED 1/2 INCH HOSE BIB. DISINFECTION AND SAMPLING SHALL BE SCHEDULED AT THE CITY'S CONVENIENCE.
4. PRESSURE TEST FOR TAPPING SADDLES AND VALVES FOR A MINIMUM OF 30 MINUTES AT 150 PSI OR 30 MINUTES AT MANUFACTURER'S RECOMMENDED TESTING PRESSURE.
5. WATERMAINS SHALL BE PRESSURE TESTED AT 150 PSI FOR 3 HOURS. TESTING SHALL BE IN ACCORDANCE WITH AWWA C-600 AND AWWA C-605 AS APPLICABLE WITH ALLOWABLE LEAKAGE TO BE BASED ON THE TABLE BELOW.

ALLOWABLE LEAKAGE PER 1000 FT. OF PIPELINE * –GPH

AVERAGE PRESSURE TEST (PSI)	NOMINAL PIPE DIAMETER – INCHES																		AVERAGE TEST PRESSURE (PSI)
	3	4	6	8	10	12	14	16	18	20	24	30	36	42	48	54	60	64	
450	0.48	0.64	0.95	1.27	1.59	1.91	2.23	2.55	2.87	3.18	3.82	4.78	5.73	6.69	7.64	8.60	9.56	10.19	450
400	0.45	0.60	0.90	1.20	1.50	1.80	2.10	2.40	2.70	3.00	3.60	4.50	5.41	6.31	7.21	8.11	9.01	9.61	400
350	0.42	0.56	0.84	1.12	1.40	1.69	1.97	2.25	2.53	2.81	3.37	4.21	5.06	5.90	6.74	7.58	8.43	8.99	350
300	0.39	0.52	0.78	1.04	1.30	1.56	1.82	2.08	2.34	2.60	3.12	3.90	4.68	5.46	6.24	7.02	7.80	8.32	300
275	0.37	0.50	0.75	1.00	1.24	1.49	1.74	1.99	2.24	2.49	2.99	3.73	4.48	5.23	5.98	6.72	7.47	7.97	275
250	0.36	0.47	0.71	0.95	1.19	1.42	1.66	1.90	2.14	2.37	2.85	3.56	4.27	4.99	5.70	6.41	7.12	7.60	250
225	0.34	0.45	0.68	0.90	1.13	1.35	1.58	1.80	2.03	2.25	2.70	3.38	4.05	4.73	5.41	6.03	6.76	7.21	225
200	0.32	0.43	0.64	0.85	1.06	1.28	1.48	1.70	1.91	2.12	2.55	3.19	3.82	4.46	5.09	5.73	6.37	6.80	200
175	0.30	0.40	0.59	0.80	0.99	1.19	1.39	1.59	1.79	1.98	2.38	2.98	3.58	4.17	4.77	5.36	5.96	6.36	175
150	0.28	0.37	0.55	0.74	0.92	1.10	1.29	1.47	1.66	1.84	2.21	2.76	3.31	3.86	4.41	4.97	5.52	5.88	150
125	0.25	0.34	0.50	0.67	0.84	1.01	1.18	1.34	1.51	1.68	2.01	2.52	3.02	3.53	4.03	4.53	5.04	5.37	125
100	0.23	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	1.50	1.80	2.25	2.70	3.15	3.60	4.05	4.50	4.80	100

** IF THE PIPELINE UNDER TEST CONTAINS SECTIONS OF VARIOUS DIAMETERS, THE ALLOWABLE LEAKAGE WILL BE THE SUM OF THE COMPUTED LEAKAGE FOR EACH SIZE.*

$$L = \frac{SD\sqrt{P}}{133,200}$$

WHERE:
L = ALLOWABLE LEAKAGE, IN GALLONS PER HOUR
S = LENGTH OF PIPE TESTED, IN FEET
D = NOMINAL DIAMETER OF PIPE, IN INCHES
P = AVERAGE TEST PRESSURE DURING THE LEAKAGE TEST, IN POUNDS PER SQUARE INCH (GAUGE)

RECLAIMED WATER CONSTRUCTION & DESIGN NOTES

1. THE CITY'S UTILITIES DEPARTMENT OWNER OR OWNER'S REPRESENTATIVE SHALL BE GIVEN A MINIMUM OF THREE BUSINESS DAYS NOTICE (NOT INCLUDING HOLIDAYS) PRIOR TO BEGINNING ANY RECLAIMED WATER SYSTEM CONSTRUCTION.
2. A PERMIT SHALL BE REQUIRED PRIOR TO ENGAGING IN ANY DEWATERING OR CONSTRUCTION ACTIVITY
3. THAT CHANGES THE IMPERVIOUS AREA OF LAND. DEWATERING ACTIVITIES INCLUDE THE REMOVAL OF GROUND WATER FROM A CONSTRUCTION SITE, ENCLOSED VAULT, COFFERDAM, OR TRENCHES, ALLOWING CONSTRUCTION OR MAINTENANCE IN A DRY ENVIRONMENT. SITE SPECIFIC
4. RECLAIMED WATER SERVICE ENDINGS SHALL BE SECURED BY WIRE TO 2" X 4" PRESSURE TREATED STAKES, APPROXIMATELY 2' ABOVE GRADE OR MAY BE PLACED IN RECLAIMED WATER METER BOXES PROVIDED BY THE CONTRACTOR AT THE TIME OF FINAL SUBDIVISION INSPECTION.
5. FOR PIPE FLUSHING, PIGGING, TESTING, AND TIE-IN CONNECTIONS, THE CITY RESERVES THE RIGHT TO REQUIRE WORK TO BE PERFORMED DURING PERIODS OF LOW FLOW (MIDNIGHT TO 8 A.M.) IN ORDER TO MINIMIZE SERVICE DISRUPTION TO EXISTING CUSTOMERS. THE CONTRACTOR SHALL COORDINATE AND SCHEDULE WITH THE CITY REPRESENTATIVE THE DATE AND TIME, THAT MUST BE APPROVED BY WATER PLANT OPERATIONS.
6. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SUPPLY "AS-BUILT DRAWINGS" TO THE CITY PRIOR TO ANY USE OF THE SYSTEM. **SEE CITY OF DELAND AS-BUILT REQUIREMENTS.**
7. ALL RECLAIMED WATER SERVICES SHALL BE MARKED ALONG THE OUTSIDE EDGE OF CURB WITH A "◊" OR BY METAL TABS SET INTO PAVEMENT. VALVES AND BLOW-OFFS FOR RECLAIMED WATER MAINS SHALL BE MARKED BY A "+" SET INTO THE PAVEMENT AND PAINTED WITH PURPLE ENAMEL.
8. RECLAIMED WATER SERVICES SHALL BE LOCATED AT SIDE LOT LINES ALTERNATING WITH POTABLE WATER SERVICE LOCATIONS. IN INSTANCES WHERE RECLAIMED WATER SERVICES MUST BE OFFSET, THE SERVICES MAY BE OFFSET FROM THE LOT LINE A MAXIMUM DISTANCE OF 2 FEET.
9. ALL RECLAIMED WATER HAND-OPERATED CONNECTIONS AND OUTLETS SHALL BE CONTAINED IN UNDER-GROUND SERVICE VAULTS AND APPROPRIATELY TAGGED OR LABELED TO WARN THE PUBLIC AND EMPLOYEES THAT THE WATER IS NOT INTENDED FOR DRINKING OR SWIMMING. ANY SIGNIFICANT IRRIGATION SITE UTILIZING RECLAIMED WATER, SUCH AS AN ATHLETIC FIELD, GOLF COURSE, PARK OR POND, IS REQUIRED TO POST A 12" x 12" RECLAIMED WATER SIGN WARNING THE PUBLIC AND EMPLOYEES THAT RECLAIMED WATER IS NOT INTENDED FOR DRINKING OR SWIMMING. THIS SIGN SHALL BE PLACED AT THE ENTRANCE TO THE SITE AND THE LOCATION OF THE PRIVATE REUSE SYSTEM. SEE 'RECLAIMED WATER IN USE' DETAIL.
10. VAULTS FOR OUTLETS SHALL BE LOCKED OR REQUIRE A SPECIAL TOOL FOR OPERATION.
11. A 75 FOOT SETBACK DISTANCE SHALL BE PROVIDED FROM PUBLIC ACCESS RECLAIMED WETTED AREAS TO PUBLIC OR PRIVATE POTABLE WATER SUPPLY WELLS.
12. LOW TRAJECTORY NOZZLES ARE REQUIRED WITHIN 100 FEET OF PUBLIC EATING, DRINKING OR BATHING FACILITIES.
13. ALL RECLAIMED WATER MAINS SHALL BE INSTALLED ON A FIRM FOUNDATION WITH ALL UNSUITABLE MATERIAL (MUCK, ROCK, COQUINA, ETC.) REMOVED AND REPLACED WITH CLEAN GRANULAR MATERIAL.
14. TRENCHES SHALL BE BACKFILLED WITH MATERIAL ACCEPTABLE TO THE CITY WITH A MINIMUM COMPACTION OF 95% IN UNPAVED AREAS AND 98% IN PAVED AREAS IN ACCORDANCE WITH AASHTO T-180.
15. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE TRENCH COMPACTION TESTS AT POINTS 12 INCHES ABOVE THE PIPE AND AT 12 INCHES VERTICAL INTERVALS TO FINISH GRADE AT A MAXIMUM SPACING OF EVERY 300 FEET.
16. 3" NEUTRALIZED PIPE LOCATION TAPE SHALL BE INSTALLED 15" TO 24" BELOW FINISHED GRADE OR AS SPECIFIED BY MANUFACTURER FOR ALL PVC LINES, AND A SINGLE STRAND INSULATED COPPER TRACER WIRE SHALL BE ATTACHED TO ALL PVC PIPE. WIRE RUNS SHALL BE CONNECTED WITH SILICONE FILLED WIRE CONNECTORS. EACH RUN SHALL TERMINATE AT EVERY VALVE. SEE STANDARD DETAIL "MAIN VALVE BOX" FOR INSTALLATION OF WIRE ON RISER PIPE. SERVICES SHALL BE CONNECTED TO THE MAIN WIRE WITH SILICONE FILLED CONNECTORS. IT IS THE CONTRACTOR'S RESPONSIBLY TO ENSURE CONTINUITY AND TEST FOR CONTINUITY (SEE CITY SPECIFICATIONS #15049 TRACER WIRE AND ALARMING TAPE).
17. ALL SINGLE RESIDENTIAL WATER SERVICES SHALL BE 1". SERVICES SHALL BE CTS 3408 HIGH DENSITY POLYETHYLENE TUBING RATED FOR A MINIMUM OF 200 PSI WITH SODR 9 (CTS). THE TUBING SHALL HAVE A VIRGIN HIGH DENSITY POLYETHYLENE CENTER FOR WHICH THE MANUFACTURER SHALL FURNISH A CERTIFICATE OF PURITY. THE TUBING SHALL BE PURPLE IN COLOR AND SHALL HAVE THE WORDS "RECLAIMED WATER" PERMANENTLY PRINTED ON THE OUTSIDE. THE TUBING SHALL HAVE U.V. PROTECTION AND SHALL NOT BE AFFECTED BY DIRECT SUNLIGHT. THE TUBING SHALL COMPLY WITH OR EXCEED THE APPLICABLE STANDARDS OF A.S.T.M. D1248, D3350, D2239, D2737, N.S.F.-14 AND A.W.W.A. C901 AND SHALL COME WITH A LIFETIME WARRANTY. APPROVED SIZES: 1" AND 2" DIAMETERS.
18. RECLAIMED WATER MAINS SHALL BE INSTALLED 4 FEET OFF THE BACK OF THE CURB ON THE OPPOSITE SIDE OF THE ROAD OF THE POTABLE WATER MAINS, OR AS APPROVED BY THE CITY. RECLAIMED WATER MAINS SHOULD NOT BE INSTALLED UNDER SIDEWALK.
19. ALL RECLAIMED WATER MAINS SHALL HAVE A MINIMUM COVER OF 36 INCHES. IN SPECIAL CASES WHERE IT IS IMPOSSIBLE OR INAPPROPRIATE TO PROVIDE ADEQUATE COVE, DUCTILE IRON PRESSURE CLASS 350 OR CONCRETE ENCASEMENT/PROTECTIVE SLAB MAY BE USED AT THE DISCRETION OF THE UTILITIES DEPARTMENT. ALL DIP SHALL HAVE 2" PURPLE STRIPES PAINTED AT 12 O'COLCK,3 O'CLOCK, 6 O'CLOCK AND 9 O'CLOCK FOR THE FULL LENGTH OF PIPE. NON PAINTED RECLAIMED PIPE OR PIPES SHALL BE PAINTED WITH AN EPOXY PAINT (PANTONE PURPLE) TO CLEARLY MARK THE RECLAIM PIPE OR PIPES.
   RECLAIMED WATER MAINS SHALL BE PURPLE PVC, DR-18 AWWA CLASS C-900 OR C-905, CL 150, OR DIP PRESSURE CLASS 350, STANDARD CEMENT LINED (PAINTED PANTONE PURPLE) UNLESS APPROVED OTHERWISE BY THE CITY. ALL HORIZONTAL DIRECTIONAL DRILLS SHALL HAVE A MINIMUM WORKING PRESSURE OF 160 PSI. THE CITY MAY REQUIRE A HIGHER PRESSURE RATING BASED ON SITE CONDITIONS. INSIDE DIAMETER OF HORIZONTAL DIRECTIONAL DRILL PIPE SHALL MATCH THE INSIDE DIAMETER OF CONNECTING PIPES. ALL GASKETS SHALL BE LUBRICATED BEFORE INSTALLATION.
19. DIRECTIONAL DRILLS SHALL HAVE FUSSED MJ ADAPTERS.
20. ALL RECLAIMED WATER MAINS SHALL USE THRUST RESTRAINT AS CALCULATED BY A PROGRAM AVAILABLE AT EBAA.COM. THE RESTRAINED JOINT LENGTHS SHALL BE SHOWN ON PLANS PROVIDED BY EOR.
21. ALL FITTINGS, VALVES, ECT. SHALL BE DUCTILE IRON (MJ OR FLANGED) AND SHALL BE RESTRAINED.
22. BELL RESTRAINTS OR GRIPPER TYPE GASKETS SHALL BE USED FOR ALL RESTRAINED PIPE BELL JOINTS. CONCRETE THRUSTS BLOCKS ARE NOT PERMITTED.
23. VALVES SHALL BE PLACED AT ALL STREET INTERSECTIONS AND AT MAXIMUM SPACING OF 750 FEET.
24. VALVES SHALL BE INSTALLED ON ALL LEGS EXCEPT ONE AT ALL RECLAIMED WATER MAIN TEES AND CROSSES.
25. ALL VALVES SHALL BE ADJUSTED TO FINISH GRADE AND CAPS SHALL BE PAINTED PURPLE.
26. THE CONTRACTOR IS REQUIRED TO PIG ALL RECLAIMED WATER MAINS EQUAL TO OR GREATER THAN 6" IN DIAMETER AND PRIMARY DISTRIBUTION MAINS LOCATED ON COLLECTOR AND ARTERIAL ROADWAYS. LAUNCHING AND EXTRACTION POINTS SHALL BE DETERMINED BY THE CONTRACTOR.
27. IN AREAS WHERE RECLAIMED WATER IS AVAILABLE, RECLAIMED WATER WILL BE UTILIZED IN THE PRESSURE TESTING OF NEW NON-POTABLE WATER LINES.
28. RECLAIMED WATER MAINS SHALL NOT BE PLACED IN SERVICE UNTIL A PRESSURE TEST AT 150 PSI FOR 3 HOURS HAS PASSED AND THE RESULTS ARE FORWARDED TO THE CITY.
29. THE CONTRACTOR SHALL PERFORM RECLAIMED WATER TAPS WITH A CITY REPRESENTATIVE PRESENT.
30. WITH RESPECT TO TIE-IN CONNECTIONS, THE CITY RESERVES THE RIGHT TO REQUIRE CONNECTIONS TO BE PERFORMED DURING PERIODS OF LOW FLOW.
31. THE PLANS SHALL INCLUDE THE PROPOSED LOCATIONS OF ALL RECLAIMED WATER MAINS MEASURED FROM THE BACK OF CURB (EDGE OF PAVEMENT IF NO CURB EXISTS) AND THE RIGHT_OF_WAY LINE.
32. 32. LANDSCAPE PLANS SHALL CLEARLY DEPICT THE DESIGN LOCATION OF PLANTINGS RELATIVE TO THE LOCATION OF PUBLIC UTILITIES AND STORM WATER INFRASTRUCTURE.
33. THE RECLAIMED WATER MAIN SHALL NOT BE PLACED IN SERVICE UNTIL AN APPROVED BACKFLOW PREVENTER HAS BEEN INSTALLED ON THE CUSTOMER'S POTABLE SERVICE LINE.

RECLAIMED WATER CONSTRUCTION & DESIGN NOTES (CONT'D)

34. PRESSURE TESTS FOR TAPPING SADDLES AND VALVES SHALL BE A MINIMUM OF 30 MINUTES AT 150 PSI OR 30 MINUTES AT THE MANUFACTURER'S RECOMMENDED TESTING PRESSURE.
35. 3 INCH METALIZED PIPE LOCATION TAPE SHALL BE LOCATED 15 INCHES TO 24 INCHES BELOW FINISHED GRADE OR AS SPECIFIED BY THE MANUFACTURER FOR ALL WATER LINES. BLUE TRACER WIRE SHALL BE ATTACHED TO ALL PIPES. WIRE RUNS SHALL BE CONNECTED WITH SILICONE FILLED WIRE CONNECTORS. SERVICES SHALL BE CONNECTED TO THE MAIN WIRE WITH SILICONE FILLED WIRE CONNECTORS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE AND TEST FOR CONTINUITY (SEE CITY SPECIFICATION #15049 TRACER WIRE AND ALARMING TAPE). TRACER WIRE SHALL BE TESTED FOR CONTINUITY UNDER THE SUPERVISION OF A CITY REPRESENTATIVE AFTER INSTALLATION. IF A METER BOX IS NOT WITHIN 200 FEET OF A VALVE AND VALVE BOX AN ADDITIONAL VALVE BOX FOR TRACER WIRE IS REQUIRED.
36. ALL FITTINGS SHALL MEET MINIMUM RESTRAINT REQUIREMENTS PER ANSI/AWWA/EBAA, AND ALL PRESSURE PIPES UNDER THE ROADWAYS SHALL BE RESTRAINED.
37. IN AREAS WHERE RECLAIMED WATER IS NOT AVAILABLE, THE CONTRACTOR IS REQUIRED TO USE THE NECESSARY BACKFLOW PREVENTION DEVICES TO TRANSFER POTABLE WATER TO NON-POTABLE WATER LINES TO PERFORM THE REQUIRED PRESSURE TEST.
38. WHERE POTABLE WATER MAINS, RECLAIMED WATER MAINS, FORCE MAINS, SANITARY SEWER MAINS OR STORMWATER MAINS CROSS WITH LESS THAN 12 INCHES OF VERTICAL CLEARANCE OR WHERE THE SEWER OR THE RECLAIMED WATER MAIN IS ABOVE THE WATER MAIN, MEDIATION MUST BE REVIEWED AND APPROVED BY FDEP.

ROADWAY CONSTRUCTION NOTES

ALL MATERIALS AND INSTALLATION METHODS USED FOR LAND DEVELOPMENT CODE REQUIRED IMPROVEMENTS FOR SUBDIVISIONS AND SITE PLANS SHALL BE IN CONFORMANCE WITH THE CITY'S DESIGN STANDARDS, FDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION (LATEST EDITION), AND THE FDOT DESIGN STANDARDS (LATEST EDITION).

1. ALL RIGHT-OF-WAY OTHER THAN ROADWAY AREAS SHALL BE GRASSED AND MULCHED OR SODDED. ALL SLOPES STEEPER THAN 6:1 SHALL REQUIRE SODDING. THE CITY RESERVES THE RIGHT TO REQUIRE SODDING IN SPECIAL AREAS WHERE EROSION IS A CONCERN.
2. THE FOLLOWING WILL BE THE STANDARD PROTECTION FOR DITCHES UNLESS DRAINAGE CALCULATIONS INDICATE OTHERWISE:

SWALE PROFILE GRADES	PROTECTION REQUIRED
0.2% – 1.0%	GRASSING AND MULCHING
1.0% – 4.0%	SODDING
4.0% AND GREATER	DITCH PAVING

3. THE PAVEMENT, BASE, AND SUBBASE THICKNESS PRESENTED ON DETAILS REPRESENTS THE MINIMUM REQUIREMENTS FOR LOCAL PUBLIC STREETS AND PRIVATE PARKING LOTS. THE CITY RESERVES THE RIGHT AT ITS' DISCRETION TO INCREASE THESE REQUIREMENTS FOR COLLECTOR AND ARTERIAL ROADWAYS AND PRIVATE PARKING LOTS SUBJECTED TO HEAVY VEHICULAR COMMERCIAL TRAFFIC.
4. THE DEVELOPER SHALL PROVIDE AT THEIR OWN EXPENSE A CERTIFIED SOILS ENGINEERING LABORATORY TO PERFORM ALL FIELD AND LABORATORY TESTING REQUIRED TO VERIFY THAT THE CONSTRUCTION IS IN COMPLIANCE WITH THE CITY'S MINIMUM STANDARDS. IT IS THE RESPONSIBILITY OF THE DEVELOPER TO ENSURE THAT COPIES OF ALL TEST REPORTS ARE PROVIDED TO THE CITY'S DESIGNATED SITE INSPECTOR PRIOR TO THE PROJECT FINAL INSPECTION IN ORDER TO ALLOW PROJECT ACCEPTANCE BY THE CITY.
5. THE LIMITS OF STABILIZED SUBBASE SHALL EXTEND TO A DEPTH OF TWELVE INCHES (12") BELOW THE BOTTOM OF THE BASE AND OUTWARD TO TWELVE INCHES (12") BEYOND THE CURB.
6. THE STABILIZING MATERIAL, IF REQUIRED, SHOULD BE A HIGH BEARING VALUE SOIL, SAND-CLAY, LIMEROCK, RECYCLED CONCRETE, SHELL, OR OTHER MATERIAL AS APPROVED BY THE CITY'S ENGINEER OR DESIGNEE AND A LICENSED SOILS ENGINEER.
7. COMPACTION, STABILITY AND DENSITY TESTING FOR PAVEMENT, BASE AND SUB-BASE ARE TO BE DONE IN ACCORDANCE WITH FDOT STANDARD SPECIFICATIONS FOR ROADWAY & BRIDGE CONSTRUCTION, LATEST EDITION.
8. FOR ROADWAYS, TESTS FOR SUBBASE BEARING CAPACITY AND COMPACTION SHALL BE DONE AT A MINIMUM OF EVERY 300 FEET AND SHALL BE STAGGERED TO THE LEFT, RIGHT, AND AT CENTER LINE OF THE ROADWAY. FOR SITE PLANS, TEST SHALL BE PERFORMED FOR EVERY 600 SQUARE YARDS OF STABILIZED AREA, OR PORTIONS THEREOF.
9. CEMENT DELIVERY TICKETS SHALL BE PROVIDED TO THE CITY'S DESIGNATED SITE INSPECTOR AT THE TIME OF PLACEMENT. IF THE INSPECTOR IS NOT ON SITE THROUGHOUT THE ENTIRE INSTALLATION, ACCUMULATED DELIVERY TICKETS CAN BE PROVIDED TO THE INSPECTOR BY THE CONTRACTOR ON THE FOLLOWING DAY.
10. TESTING OF THE IN-PLACE BASE SHALL BE DONE AT INTERVALS EQUIVALENT TO SUBGRADE TESTING AND SHALL CONSIST OF, AS A MINIMUM, A MOISTURE CONTENT AND COMPACTION TEST.
11. PORTLAND CEMENT CONCRETE, LIMEROCK, RECYCLED CONCRETE, OR FULL DEPTH ASPHALT PAVEMENT MAY BE USED IN PLACE OF SOIL CEMENT BASE. ALL BASE AND ROADWAY DESIGNS SHALL BE SUBJECT TO THE APPROVAL OF THE CITY.
12. RECYCLED CONCRETE CAN BE USED AS A BASE MATERIAL PROVIDED THE MATERIAL IS A MINIMUM OF 60% CARBONATE OF CALCIUM AND MAGNESIUM. THE MATERIAL SHALL BE LIMITED TO MAXIMUM OF 3% OF WATER SENSITIVE CLAY MATERIAL, LIQUID LIMIT SHALL NOT EXCEED 35 AND BE NON-PLASTIC, AND THE PLASTICITY INDEX SHALL NOT EXCEED 10. THE MATERIAL SHALL NOT CONTAIN ORGANIC MATERIAL, CHERTY OR OTHER EXTREMELY HARD PIECES, LUMPS, BALLS OR POCKETS OF SAND SIZE MATERIAL OF A QUANTITY AS TO BE DETRIMENTAL TO THE PROPER BONDING, FINISHING, OR STRENGTH OF THE RECYCLED CONCRETE BASE. FOR BASE APPLICATIONS, AT LEAST 97% (BY WEIGHT) OF THE MATERIAL SHALL PASS A 1" SIEVE AND FOR SUBBASE APPLICATIONS, AT LEAST 97% (BY WEIGHT) OF THE MATERIAL SHALL PASS A 1-½" SIEVE. FOR BOTH APPLICATIONS, THE MATERIAL SHALL BE GRADED UNIFORMLY DOWN TO DUST AND THE MINIMUM LBR VALUES ARE TO BE NOT LESS THAN 120. COARSE AGGREGATE USED IN THE RECYCLED CONCRETE SHALL HAVE A MAXIMUM LOSS OF 45% PER LOS ANGELES ABRASION TEST. ALL MATERIALS SHALL BE WELL GRADED N ACCORDANCE WITH REQUIREMENTS SET FORTH IN SECTION 204, F.D.O.T., STANDARD SPEC. FOR ROAD AND BRIDGE CONSTRUCTION (LATEST EDITION).
13. RECYCLED CONCRETE OR LIMEROCK FOR BASE OR SUBBASE APPLICATIONS SHALL BE ALLOWED ON CITY ROADWAYS ONLY WHERE THE LOWEST ELEVATION OF THE ROADWAY SUBBASE IS A MINIMUM OF 6" ABOVE THE SEASONAL HIGH GROUNDWATER TABLE AS CERTIFIED BY A FLORIDA LICENSED PROFESSIONAL SOILS ENGINEER AND SUBSEQUENTLY APPROVED FOR BY THE CITY. ALL CRUSHING OF RECYCLED CONCRETE SHALL BE DONE PRIOR TO THE MATERIAL BEING PLACED IN THE ROADWAY. TESTING SHALL HAVE THE SAME REQUIREMENTS AND BE PERFORMED AT THE SAME LOCATION AND INTERVALS AS REQUIRED FOR LIMEROCK.
14. DESIGN MIXES AND PRODUCT GRADATION INFORMATION FOR ALL MATERIALS TO BE INSTALLED AS PART OF THE LAND DEVELOPMENT CODE REQUIRED IMPROVEMENTS SHALL BE SUBMITTED TO THE CITY'S DESIGNATED SITE INSPECTOR FOR ACCEPTANCE BY THE CITY. THE INFORMATION SHALL BE SUBMITTED NO LESS THAN THREE (3) WORKING DAYS PRIOR TO ANY CONSTRUCTION. SUBMITTALS SHALL INCLUDE, BUT NOT BE LIMITED TO, INFORMATION TO EVALUATE THE MATERIALS PROPOSED FOR INSTALLATION AS SUBBASE, BASE, AND PAVEMENT FOR ALL ROADWAY AND PARKING AREA SURFACES AS WELL AS SIMILAR INFORMATION FOR ALL OTHER CONCRETE SIDEWALKS, CURBING, AND COMPARABLE STRUCTURES AND APPLICATIONS.
15. PRIOR TO PLACEMENT FLORIDA STATE CERTIFIED BATCH PLANTS MUST CERTIFY TO THE CITY'S RESIDENT PROJECT INSPECTOR THAT THE ASPHALT DELIVERED TO THE SITE IS IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS.
16. EXTRACTION AND GRADATION TESTS ON ASPHALT MIXES SHALL BE PROVIDED TO THE CITY'S DESIGNATED SITE INSPECTOR FOR EVERY 2500 SQUARE YARDS OF ASPHALT, OR PART THEREOF, TO ENSURE THAT DESIGN MIXES MEET THE CITY STANDARD SPECIFICATIONS AT NO ADDITIONAL COST TO THE CITY.
17. ASPHALT PAVEMENT TESTING IS TO BE DONE IN ACCORDANCE WITH FDOT STANDARD SPECIFICATIONAS FOR ROAD & BRIDGE CONSTRUCTION TABLE 334-5, LATEST EDITION.
18. IN ADDITION TO THE FIELD DENSITY TESTS NOTED, THE CITY RESERVES THE RIGHT TO REQUIRE CORE SAMPLES OF PAVEMENT SECTIONS EXTRACTED AND TESTED BY A CERTIFIED SOILS ENGINEERING LABORATORY AT THE DEVELOPER'S EXPENSE. THE CITY'S DESIGNATED SITE INSPECTOR SHALL DESIGNATE THE LOCATIONS OF THE TEST CORE LOCATIONS.
19. THE ROADWAY CROWN SHALL HAVE A STANDARD ONE QUARTER INCH (¼") PER FOOT CROSS SLOPE.
20. ALL ROADWAYS WITH CURB AND GUTTER SECTIONS SHALL HAVE AS A STANDARD A MINIMUM LONGITUDINAL SLOPE OF 0.30%. THE ROADWAY CENTERLINE SHALL BE CLEARLY MARKED ON THE DESIGN PLANS. AT A MINIMUM, DESIGN ROADWAY CENTERLINE ELEVATIONS SHALL BE NOTED AT ALL GRADE CHANGES AND AT 50' min. INTERVALS ALONG THE ROADWAY PROFILE ON BOTH THE DESIGN PLANS AND AS-BUILT DRAWINGS.
21. THE FINISHED PAVEMENT EDGE SHALL BE WITHIN ONE EIGHTH INCH (⅛") ABOVE THE ADJACENT CONCRETE CURB FOR CURBS COLLECTING AND CONVEYING STORMWATER.
22. CONCRETE CURBS SHALL BE PROVIDED ON BOTH SIDES OF ALL STREETS AND ALL CONCRETE CURBS SHALL BE CONSTRUCTED WITH 3500 P.S.I. CONCRETE AT 28 DAYS.
23. CONTROL JOINTS IN CONCRETE CURBING, SIDEWALKS, PAVEMENT AND SIMILAR CONCRETE AREAS SHALL BE SAW CUT WITHIN 4 TO 18 HOURS OF PLACEMENT. SAW CUTS SHALL BE ¼" IN WIDTH TO A DEPTH OF ONE FORTH OF THE TOTAL DEPTH OF CONCRETE OR 1-½", WHICHEVER IS LESS. SAW CUTS SHALL BE LOCATED AT INTERVALS OF TEN FEET (10') FOR CURBING & FIVE FEET (5') FOR SIDEWALKS WITH EXPANSION JOINTS AT STREET INTERSECTIONS, RADIUS POINTS, STRUCTURES, AND ALONG CURVES AT SIXTY FEET (60') INTERVALS. ALL EXPANSION JOINT MATERIAL IS REQUIRED TO BE INSTALLED THROUGH THE ENTIRE DEPTH OF THE CONCRETE CURB. FOR LINEAL SECTIONS OF CURBS, EXPANSION JOINTS SHALL BE LOCATED AT A MAXIMUM SPACING OF FIVE-HUNDRED FEET (500') AND SHALL BE ½" IN WIDTH.
24. AN "X" SHALL BE CUT IN THE CURB TO MARK THE LOCATION OF WATER DISTRIBUTION SYSTEM VALVE.
25. A "V" SHALL BE CUT IN THE CURB TO MARK THE LOCATION OF ALL SEWER SERVICES.
26. A "Λ" SHALL BE CUT IN THE CURB TO MARK THE LOCATION OF ALL RECLAIMED WATER SERVICES.
27. A "◊ " SHALL BE CUT IN THE CURB TO MARK THE LOCATION OF ALL POTABLE WATER SERVICES.
28. THREE (3) CONCRETE CYLINDERS SHALL BE TAKEN AND TESTED (1 IN 14 DAYS, 1 IN 28 DAYS & 1 IN 56 DAYS) FOR EVERY FIFTY (50) CUBIC YARDS OF CONCRETE OR LESS PLACED. TEST RESULTS SHALL THEN BE PROVIDED TO THE CITY'S DESIGNATED SITE INSPECTOR AS THEY BECOME AVAILABLE.
29. A CONCRETE SLUMP TEST SHALL BE REQUIRED WITHIN THE FIRST 30 CUBIC YARDS OF CONCRETE. THEREAFTER, SLUMP TESTS SHALL BE REQUIRED FOR EVERY FIFTY (50) CUBIC YARDS OF CONCRETE, OR FRACTION THEREOF, WITH COPIES OF THE RESULTS PROVIDED TO THE CITY'S DESIGNATED SITE INSPECTOR. THE SLUMP TEST SHALL MEET THE REQUIRED MIX DESIGN ON EACH LOAD DELIVERED.
30. THE DEVELOPER SHALL PROVIDE ALL REQUIRED PAVEMENT MARKINGS ON ALL ROADWAYS PER CITY, COUNTY, AND STATE REQUIREMENTS. CENTERLINE STRIPES SHALL BE PROVIDED ON EXTENSIONS OF CITY COLLECTOR OR ARTERIAL ROADS, COUNTY ROADS, STATE HIGHWAYS, AND ALONG LOCAL STREETS IN THE VICINITY OF THEIR INTERSECTION WITH THE ABOVE MENTIONED ROADWAYS.
31. 31. A FDOT APPROVED STOP SIGN AND A 24"-WIDE WHITE THERMOPLASTIC STOP BAR ARE REQUIRED AT ALL ROADWAY INTERSECTIONS.
32. ALL TRAFFIC CONTROL DEVICES PLACED AT INTERSECTIONS, PRIVATE STREETS, PUBLIC STREETS, COUNTY ROADS, AND STATE HIGHWAYS WITHIN THE CITY LIMITS SHALL BE INSTALLED ACCORDING TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION. THE MAINTENANCE-OF-TRAFFIC (MOT) INSTALLATION AND SUBSEQUENT OPERATION SHALL BE OVERSEEN BY A CONTRACTOR CERTIFIED BY THE AMERICAN TRAFFIC SAFETY SERVICES ASSOCIATION, OR EQUIVALENT CERTIFICATION RECOGNIZED BY FDOT.
33. THE DEVELOPER IS RESPONSIBLE FOR PAYING FEES FOR TRAFFIC CONTROL DEVICES TO THE CITY FOR INSTALLATION. STREET SIGNS AND STOP SIGNS SHALL BE PLACED AT ALL INTERSECTIONS, INCLUDING BUT NOT LIMITED TO PRIVATE STREETS, PUBLIC STREETS, COUNTY ROADS, AND STATE HIGHWAYS WITHIN THE CITY LIMITS.
34. THE DEVELOPER IS RESPONSIBLE FOR PAYING FEES FOR ALL STREET LIGHTS PRIOR TO ACCEPTANCE OF THE PROJECT BY THE CITY.
35. FIVE FOOT min. (5') WIDE SIDEWALKS SHALL BE PROVIDED ON BOTH SIDES OF ALL RESIDENTIAL STREETS. PER THE CITY &/OR FDOT DESIGN STANDARDS, LATEST EDITION.
36. 36. EIGHT FOOT min. (8') WIDE BIKE PATHS SHALL BE ALONG ARTERIAL HIGHWAYS AS DIRECTED BY THE CITY. PER THE CITY &/OR FDOT DESIGN STANDARDS, LATEST EDITION.

ROADWAY CONSTRUCTION NOTES (CONT'D)

37. STANDARD TURNING RADII FOR INTERSECTIONS:

RESIDENTIAL STREETS WITH STATE & COUNTY ROADWAYS, OR MAJOR THOROUGHFARES WITHIN THE CITY;	35–50 FT.
ENTRANCES TO COMMERCIAL SITES OFF OF CITY STREETS;	35 FT.
INTERSECTIONS INTERIOR IN SUBDIVISIONS;	35 FT.

    SHOULD VOLUSIA COUNTY OR THE FLORIDA DEPARTMENT OF TRANSPORTATION (F.D.O.T.) DETERMINE THAT LARGER RADII ARE WARRANTED WITHIN THEIR RIGHT-OF-WAY, THE LARGER RADII SHALL PREVAIL.
38. CONSTRUCTION METHODS AND DESIGN FOR CONCRETE PAVEMENT SHALL CONFORM TO FDOT STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION.
39. ALL CONTRACTORS THAT ARE PERFORMING THE CONSTRUCTION OF LAND DEVELOPMENT CODE REQUIRED IMPROVEMENTS (INCLUDING WATER MAINS, SANITARY SEWER MAINS, RECLAIMED WATER MAINS, STORM WATER PIPES AND INLETS, ROADWAYS, AND PARKING FACILITIES) SHALL BE CERTIFIED WITH THE STATE OF FLORIDA BOARD OF PROFESSIONAL REGULATIONS (BPR) FOR THE TYPE OF WORK THAT THEY PERFORM.
40. ALL CONTRACTORS THAT ARE PERFORMING THE CONSTRUCTION WORK OF LAND DEVELOPMENT CODE REQUIRED IMPROVEMENTS SHALL BE LICENSED BY THE STATE OF FLORIDA AND REGISTERED WITH THE CITY OF DELAND. THE LICENSE AND REGISTRATION SHALL PERTAIN DIRECTLY TO THE TYPE OF WORK BEING PERFORMED.
41. EXCEPT AS PROVIDED IN THE LAND DEVELOPMENT CODE, ALL ELECTRIC, TELEPHONE, TELEVISION LINES AND SIMILAR UTILITIES ARE REQUIRED TO BE INSTALLED UNDERGROUND AT THE EXPENSE OF THE OWNER, DEVELOPER, AND BUILDER.
42. UTILITY DEPTH:
    A. HIGH VOLTAGE UTILITIES SUCH AS POWER (FEEDER, SERVICE, AND DROPS) SHALL BE BURIED A MINIMUM OF 30 INCHES IN DEPTH.
    B. LOW VOLTAGE UTILITIES SUCH AS PHONE AND CABLE TV SHALL BE BURIED A MINIMUM OF 18 INCHES IN DEPTH FOR FEEDER AND SERVICES. SERVICE DROPS SHALL BE BURIED A MINIMUM OF 12 INCHES IN DEPTH.
    C. IN NO INSTANCE SHALL THE DEPTH OF COVER BE LESS THAN 36" FROM FINISHED GRADE TO THE TOP OF PIPE FOR POTABLE WATER MAINS, SANITARY SEWER MAINS, AND RECLAIMED WATER MAINS. HOWEVER, IN THE EVENT THAT THIS CONDITION CANNOT BE MET DUE TO UNANTICIPATED CONFLICTS DURING THE CONSTRUCTION PROCESS, DUCTILE IRON PRESSURE CLASS 350 OR CONCRETE ENCASEMENT MAY BE USED AS APPROVED BY THE CITY PUBLIC UTILITIES DEPARTMENT.
43. LANDSCAPE PLANS SHALL CLEARLY DEPICT THE DESIGN LOCATION OF PLANTINGS RELATIVE TO THE LOCATION OF UNDERGROUND AND OVERHEAD PUBLIC UTILITIES AND STORMWATER INFRASTRUCTURE IN ORDER TO ELIMINATE ANY POTENTIAL CONFLICTS.

TRAFFIC CONTROL NOTES

1. CONTRACTOR SHALL PERFORM ALL PROJECT WORK IN ACCORDANCE WITH FDOT DESIGN STANDARDS, LATEST EDITION. NO LANE CLOSURES ARE PERMITTED BETWEEN THE HOURS OF 7 A.M. AND 7 P.M. NIGHT WORK MAY BE SCHEDULED TO LESSEN TRAFFIC IMPACT & INCONVENIENCE TO GENERAL PUBLIC AND MUST BE APPROVED BY CITY ENGINEER PRIOR TO COMMENCEMENT OF WORK.
2. CONTRACTOR SHALL OBTAIN PRIOR APPROVAL OF HIS MAINTENANCE OF TRAFFIC (MOT) PLANS FOR ANY LANE CLOSURES FROM THE CITY TRAFFIC ENGINEERING DIVISION AT LEAST TWO (2) WEEKS IN ADVANCE OF ANY LANE CLOSURE.
3. EXISTING SIGNING AND PAVEMENT MARKINGS TO BE MAINTAINED UNLESS SHOWN OTHERWISE IN THESE PLANS.
4. TWO (2) WAY TRAFFIC SHALL BE MAINTAINED AT ALL TIMES THROUGHOUT ENTIRE LENGTH OF PROJECT.
5. TWO (2) WAY ACCESS TO BUSINESSES AND PRIVATE DRIVEWAYS SHALL BE MAINTAINED AT ALL TIMES. TEMPORARY DRIVEWAY CLOSURES MAY BE ALLOWED IF SHARED ACCESS IS AVAILABLE OR IF WRITTEN AUTHORIZATION FROM THE PROPERTY OWNER IS PROVIDED TO CITY PRIOR TO COMMENCEMENT OF WORK ACTIVITIES.
6. VARIABLE MESSAGE BOARDS SHALL BE INSTALLED 48 HOURS PRIOR TO LANE CLOSURES. CONTRACTOR IS RESPONSIBLE FOR ADEQUATE NUMBER OF BOARDS AND LOCATIONS, TO BE VERIFIED PRIOR TO COMMENCEMENT OF WORK.
7. ALL TRAFFIC CONTROL SIGN AND PAVEMENT MARKINGS SHALL COMPLY WITH THE F.D.O.T. ROADWAY AND TRAFFIC DESIGN STANDARDS AND THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, CURRENT EDITION.
8. CONTRACTOR TO MAINTAIN TRAFFIC AND PROPER DROP OFF CRITERIA PER INDEX 600. CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING PROPER DEVICES WHEN A DROP OFF CONDITION CANNOT BE AVOIDED.
9. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE GENERAL PUBLIC AND PUBLIC AGENCIES OF ROAD CLOSURES AT LEAST 48 HOURS IN ADVANCE.
10. AFFECTED ROADWAYS SHALL BE RESTORED AND NO LANE CLOSURES WILL BE PERMITTED DURING CITY SPECIAL EVENT PERIOD UNLESS PRIOR WRITTEN NOTIFICATION IS OBTAINED FROM CITY TRAFFIC ENGINEERING DIVISION.

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NO.	DATE	BY	SUBMITTALS / REVISIONS
1	10-09-24	MH	CITY COMMENTS
2	10-21-24	MH	SJRWMD COMMENTS
3	02-25-25	MH	SJRWMD COMMENTS

DELAND DUPONT WAREHOUSE FINAL ENGINEERING PLANS CONSTRUCTION NOTES

CITY OF DELAND
VOLUSIA COUNTY, FLORIDA

PROJECT NO: ZC 23310
DESIGNED BY: MW
DRAFTED BY: MH
CHECKED BY: SK
DRAWING FILE: 02-04_23310 NOT

KRISTOPHER ROWLEY LICENSE No 84263 STATE OF FLORIDA PROFESSIONAL ENGINEER

KRISTOPHER T. ROWLEY, P.E. NO. 84263
SPENCER H. KERSHAW, P.E. NO. 96663
NOT VALID WITHOUT SEAL

SHEET: C3 OF 12

R:\23310 DELAND AIRPORT PARCEL 17 & 18\FINAL ENGINEERING PLANS\CADDWGS\02-04_23310 NOT.DWG – PRINTED 6/6/2025 4:17 PM

SITE PLAN TESTING

A. MATERIALS:
THE INSPECTION AND TESTING OF MATERIALS AND FINISHED ARTICLES TO BE INCORPORATED IN THE WORK SHALL BE MADE BY BUREAUS, LABORATORIES, OR AGENCIES APPROVED BY THE ENGINEER OF RECORD. THE CONTRACTOR SHALL SUBMIT SUCH SAMPLES OR TEST PIECES OF MATERIALS AS THE ENGINEER OF RECORD MAY REQUIRE. THE CONTRACTOR SHALL NOT INCORPORATE ANY MATERIAL OR FINISHED ARTICLE INTO THE WORK UNTIL THE RESULTS OF THE INSPECTIONS OR TESTS ARE KNOWN AND THE CONTRACTOR HAS BEEN NOTIFIED BY THE ENGINEER OF RECORD THAT THE MATERIAL OR FINISHED ARTICLE IS ACCEPTED. ALL MATERIALS MUST BE OF THE SPECIFIED QUALITY AND BE EQUAL TO THE APPROVED SAMPLE IF A SAMPLE HAS BEEN SUBMITTED. CERTIFIED COPIES OF ALL TESTS MADE SHALL BE SUBMITTED TO THE ENGINEER OF RECORD AS WELL AS TO THE CITY'S DESIGNATED SITE INSPECTOR. THE CITY'S DESIGNATED SITE INSPECTOR MUST RECEIVE COPIES OF ALL TESTING REPORTS AND CERTIFICATES PRIOR TO THE ENGINEER OF RECORD REQUESTING A FINAL PROJECT INSPECTION FROM THE CITY.

B. LABORATORY CONTROL AND CERTIFICATES:
1. SPECIFICATIONS: SAMPLING, TESTING, AND LABORATORY METHODS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS OF THE AASHTO OR ASTM. WHERE AASHTO OR ASTM SPECIFICATIONS ARE USED, THE REFERENCE SHALL BE CONSTRUED TO BE THE MOST RECENT STANDARD SPECIFICATIONS OR TENTATIVE SPECIFICATIONS OF THE AASHTO OR ASTM IN FORCE ON THE DATE OF THE TEST.
2. TEST & CERTIFICATES: THE CONTRACTOR SHALL ENGAGE AN APPROVED TESTING LABORATORY TO PROVIDE THE FOLLOWING TESTS AND CERTIFICATIONS SIGNED BY A REGISTERED ENGINEER OF THE STATE OF FLORIDA. ALL TECHNICIANS PERFORMING THE TESTS SHALL BE STATE CERTIFIED FOR THE TESTING PERFORMED. ADDITIONAL TESTS THAT MAY BE REQUIRED BY EITHER THE ENGINEER OF RECORD OR THE CITY SHALL ALSO BE PROVIDED BY THE CONTRACTOR, AND THE FOLLOWING SHALL NOT BE TAKEN AS A COMPLETE AND EXHAUSTIVE LIST OF THE CONTRACTOR'S TESTING RESPONSIBILITIES.
   a. SOIL ANALYSIS FOR STRUCTURAL FILL MATERIAL PRIOR TO INSTALLATION. SOIL ANALYSIS FOR STRUCTURAL FILL MATERIAL PRIOR TO INSTALLATION.
   b. PROCTOR DENSITIES, MOISTURE CONTENT, COMPACTED FIELD DENSITIES AND ATTERBERG LIMITS.
   c. ANALYSIS OF RECYCLED CONCRETE BASE MATERIAL PRIOR TO INSTALLATION.
   d. SPHALT MIX DESIGN, BITUMEN CONTENT, SIEVE ANALYSIS, HUBBARD FIELD STABILITY TESTS, NUCLEAR DENSITY TESTS (BACKSCATTER METHOD), AND ANALYSIS OF CORE SAMPLES.
   e. CONCRETE MIX DESIGNS FOR ALL APPLICATIONS INCLUDING PAVEMENT, CAST–IN–PLACE STRUCTURES, CURBING, GUTTERS, SIDEWALKS, BIKE PATHS, APRONS AND DRIVEWAYS.
   f. COMPRESSIVE TEST CYLINDERS AND SLUMP TESTS FOR ALL APPLICATIONS OF CONCRETE, INCLUDING PAVEMENT, CAST–IN–PLACE STRUCTURES, CURBING, GUTTERS, SIDEWALKS, BIKE PATHS, APRONS, AND DRIVEWAYS.
   g. ALL UNDERGROUND UTILITY TESTING TO BE COMPLETED IN ACCORDANCE WITH THE CITY'S UTILITIES DEPARTMENT DESIGN STANDARDS.

AS–BUILT DRAWING REQUIREMENTS

IN ORDER TO ENSURE THAT NEW SUBDIVISIONS AND SITE PLANS ARE CONSTRUCTED SUBSTANTIALLY IN ACCORDANCE WITH CITY REGULATIONS AND THE APPROVED DRAWINGS, THE FOLLOWING INFORMATION IS REQUIRED ON ALL AS–BUILT DRAWINGS.

1. PAVEMENT AND CURB WIDTHS SHALL BE VERIFIED AND DIMENSIONED FOR EACH STREET AT EACH BLOCK. (FOR SUBDIVISIONS) AND AS APPROPRIATE TO CONFIRM PAVING LIMITS (ON SITE PLANS).
2. ALL RADII AT INTERSECTIONS SHALL BE VERIFIED AND DIMENSIONED. THIS INFORMATION IS TO BE CLEARLY INDICATED ON THE AS–BUILTS.
3. ROADWAY ELEVATIONS SHALL BE RECORDED AT ALL GRADE CHANGES, 100' INTERVALS ALONG ROADWAY, AND OTHER INTERVALS AS NEEDED ALONG ALL STREETS. STREET CENTERLINE AND CURB INVERT ELEVATIONS SHALL BE RECORDED AS NOTED. THE AS–BUILT CENTERLINE PROFILE OF ALL STREETS SHALL ALSO BE SHOWN ON THE PLAN AND PROFILE SO IT MAY BE COMPARED TO THE DESIGN PROFILE GRADE LINES. IN THE EVENT THAT THE AS–BUILT CENTERLINE LONGITUDINAL GRADE DOES NOT MEET THE CITY MINIMUM STANDARDS, ADDITIONAL LONGITUDINAL GRADES OF THE ADJACENT CURBING AND SIMILAR ROADWAY CROSS–SECTION SURVEYS TO VERIFY THAT THE SYSTEM WILL FUNCTION AS ORIGINALLY DESIGNED.
4. ALL APPLICABLE TOPOGRAPHIC INFORMATION PERTINENT TO THE ON–SITE DRAINAGE SYSTEM, SUCH AS DITCHES, SWALES, LAKES, CANALS, ETC. THAT ARE DEEMED NECESSARY BY THE CITY TO VERIFY THE FUNCTIONAL PERFORMANCE OF THE STORM WATER SYSTEM, SHALL BE NOTED. NORMALLY, RECORDING ELEVATIONS EVERY 100 FEET AT THE TOP OF BANK AND TOE OF SLOPE WILL BE REQUIRED. MEASUREMENTS SHALL BE TAKEN AND RECORDED IN ORDER TO ACCURATELY TIE DOWN THESE FEATURES TO THE ROADWAY CENTERLINES AND TO PLAT LINES. WHENEVER POSSIBLE, CONTOUR LINES SHALL BE UTILIZED TO GRAPHICALLY DESCRIBE THESE TOPOGRAPHIC FEATURES.
5. RETENTION AREAS SHALL HAVE THEIR TOP–OF–BANK AND BOTTOM ELEVATIONS RECORDED. ACTUAL MEASUREMENTS SHALL BE TAKEN AND DIMENSIONS RECORDED OF THE SIZE OF ALL RETENTION AREAS. MEASUREMENTS SHALL BE DONE FROM TOP–OF–BANK TO TOP–OF–BANK WITH SIDE SLOPES INDICATED. SEPARATE CALCULATIONS SHALL BE SUBMITTED TO INDICATE REQUIRED AND PROVIDED RETENTION VOLUMES.
6. ACTUAL MATERIALS USED AND ELEVATIONS AND DIMENSIONS OF OVERFLOW WEIR STRUCTURES AND SKIMMERS SHALL BE NOTED ON THE AS–BUILT.
7. STORM DRAINAGE SWALE CENTERLINES SHALL BE LOCATED AND ELEVATIONS OF FLOW LINE AND TOP OF BANK SHALL BE RECORDED EVERY 100 FEET OR CHANGE IN GRADE. SIDE SLOPES SHALL ALSO BE INDICATED.
8. FOR SUBDIVISIONS, PROPOSED DESIGN FINISHED FLOOR ELEVATIONS SHALL APPEAR ON ALL SUBDIVISION LOTS ON THE APPROPRIATE PLAN AND PROFILE SHEET AS WELL AS ON THE MASTER DRAINAGE PLAN.
9. ANY SPECIAL FEATURES SUCH AS, CONCRETE FLUMES, LAKE BANKS, WALLS, FENCING, ETC., WHICH WERE A PART OF THE APPROVED CONSTRUCTION DRAWINGS SHOULD ALSO BE LOCATED AND DIMENSIONED.
10. IF AN APPROVED SUBDIVISION PLAT OR SITE PLAN SHOWS A CONSERVATION EASEMENT, THE PROJECT SURVEYOR SHOULD PROVIDE THE EXACT LOCATION OF THE SPECIMEN TREE(S) FROM THE RIGHT–OF–WAY OR PROPERTY LINES AND PROPOSED EASEMENT BOUNDARIES ON THE AS–BUILT DRAWING. THE AS–BUILT LOCATION OF THESE TREES WILL HELP VERIFY THE SUFFICIENCY OF THE CONSERVATION EASEMENT PRIOR TO PLAT RECORDING OR CERTIFICATE OF OCCUPANCY.
11. AS BUILT DRAWINGS ARE TO BE PREPARED BY A FLORIDA LICENSED SURVEYOR AND SHALL INCLUDE A SIGNED CERTIFICATION STATEMENT BY THE FLORIDA LICENSED ENGINEER OF RECORD. TWO (2) SIGNED & SEALED PAPER SETS OF AS–BUILT RECORD DRAWINGS SHALL BE PROVIDED ALONG WITH A DIGITAL COPY IN BOTH, A COMPATIBLE AutoCAD FORMAT & PDF FORMAT.

AS–BUILTS/RECORD DOCUMENTS

PART 1 – GENERAL
1.1 SCOPE OF WORK:
A. THIS SECTION SETS FORTH THE REQUIREMENTS FOR PREPARING AS–BUILT/RECORD DRAWINGS AND DOCUMENTS FOR VERIFICATION OF CONSTRUCTION AND ARCHIVING.

CONTRACTOR SHALL SECURE THE SERVICES OF A FLORIDA LICENSED SURVEYOR TO COLLECT DATA AND PREPARE AS–BUILT/RECORD DRAWINGS IN ACCORDANCE WITH CITY OF DELAND UTILITIES STANDARDS AS FOLLOWS:

1.2 REFERENCE:
A. THE PREPARATION WORK SHALL BE IN ACCORDANCE WITH THIS SECTION AND SUPPLEMENTARY DETAILS IN THE CITY OF DELAND UTILITIES DEPARTMENT STANDARD DETAILS, LATEST EDITION.

1.3 AS–BUILTS/RECORD DRAWINGS AND DOCUMENTS:
IN ORDER TO ENSURE THAT THE PROJECT RECORDS ARE MAINTAINED TO THE HIGHEST STANDARDS AND THE INFORMATION CAN EASILY BE ADDED TO THE CITY'S ELECTRONIC RECORDS THE FOLLOWING INFORMATION IS REQUIRED ON ALL AS–BUILT/RECORD DRAWINGS.
A. THE INTENT OF THESE DETAILS FOR AS–BUILT/RECORD DRAWINGS ARE REQUIRED FOR ALL PUBLIC FACILITIES CONSTRUCTED. PRIOR TO CONSTRUCTION COMPLETION THESE AS–BUILT/RECORD REQUIREMENTS WILL BE REVIEWED TO BE CERTAIN THE CONTRACTOR'S SURVEYOR HAS A CLEAR UNDERSTANDING OF WHAT IS REQUIRED FOR COMPLETION OF THIS WORK.
   1. PAVEMENT AND CURB WIDTHS SHALL BE VERIFIED AND DIMENSIONED FOR EACH STREET AT EACH BLOCK (FOR SUBDIVISIONS) AND AS APPROPRIATE TO CONFIRM PAVING LIMITS (ON SITE PLANS).
   2. ALL RADII AT INTERSECTIONS SHALL BE VERIFIED AND DIMENSIONED. THIS INFORMATION IS TO BE CLEARLY INDICATED ON THE AS–BUILT/RECORD DRAWINGS.
   3. ROADWAY ELEVATION SHALL BE RECORDED AT ALL GRADE CHANGES, 100' INTERVALS ALONG ROADWAY, AND OTHER INTERVALS AS NEEDED ALONG ALL STREETS. STREET CENTERLINE AND CURB INVERT ELEVATIONS SHALL BE RECORDED AS NOTED. THE AS–BUILT CENTERLINE PROFILE OF ALL STREETS SHALL ALSO BE SHOWN ON THE PLAN AND PROFILE SO IT MAY BE COMPARED TO THE DESIGN PROFILE GRADE LINES. IN THE EVENT THAT THE AS–BUILT CENTERLINE LONGITUDINAL GRADE DOES NOT MEET THE CITY MINIMUM STANDARDS, ADDITIONAL LONGITUDINAL GRADES OF THE ADJACENT CURBING AND SIMILAR ROADWAY CROSS–SECTION SURVEYS TO VERIFY THE CORRECT CROSS SLOPE, SHALL BE REQUIRED TO VERIFY THAT THE SYSTEM WILL FUNCTION AS ORIGINALLY DESIGNED.
   4. STORM DRAINAGE STRUCTURES SHALL BE LOCATED AND/OR DIMENSIONED FROM CENTERLINES OR LOT LINES AS APPROPRIATE. EACH STRUCTURE SHALL BE LOCATED BY SUB–METER GPS WITH STATION & OFFSET, NORTHERLY & EASTERLY, LATITUDE, LONGITUDE, AND ELEVATION DATA.
   5. STORM DRAINAGE PIPE INVERT AND INLET ELEVATION SHALL BE RECORDED AND CLEARLY DENOTED AS AS–BUILT INFORMATION. DESIGN ELEVATION SHALL BE CROSSED OUT AND AS–BUILT INFORMATION WRITTEN NEXT TO IT.
   6. STORM DRAINAGE PIPE MATERIAL, LENGTH, SIZE SHALL BE MEASURED AND/OR VERIFIED. THIS INFORMATION IS TO BE CLEARLY INDICATED AS BEING AS–BUILT INFORMATION.
   7. ALL APPLICABLE TOPOGRAPHIC INFORMATION PERTINENT TO THE ON–SITE DRAINAGE SYSTEM, SUCH AS DITCHES, SWALES, LAKES, CANALS, ETC. THAT ARE DEEMED NECESSARY BY THE CITY TO VERIFY THE FUNCTIONAL PERFORMANCE OF THE STORM SYSTEM, SHALL BE NOTED. NORMALLY, RECORDING ELEVATION EVERY 100 FEET AT THE TOP OF BANK TO TOE OF SLOPE WILL BE REQUIRED. MEASUREMENTS SHALL BE TAKEN AND RECORDED IN ORDER TO ACCURATELY TIE DOWN THESE FEATURES TO THE ROADWAY CENTERLINES AND TO PLAT LINES. WHENEVER POSSIBLE, CONTOUR LINES SHALL BE UTILIZED TO GRAPHICALLY DESCRIBE THESE TOPOGRAPHIC FEATURES.
   8. RETENTION AREAS SHALL HAVE THEIR TOP OF BANK AND BOTTOM ELEVATIONS RECORDED. ACTUAL MEASUREMENTS SHALL BE TAKEN AND DIMENSIONS RECORDED OF THE SIZE OF ALL RETENTION AREAS. MEASUREMENTS SHALL BE DONE FROM TOP OF BANK WITH SIDE SLOPES INDICATED. SEPARATE CALCULATIONS SHALL BE SUBMITTED TO INDICATE REQUIRED AND PROVIDED RETENTION VOLUMES.
   9. ACTUAL MATERIALS USED AND ELEVATIONS AND DIMENSIONS OF OVERFLOW WEIR STRUCTURES AND SKIMMERS SHALL BE NOTED ON THE AS–BUILT.
   10. STORM DRAINAGE SWALES CENTERLINES SHALL BE LOCATED AND ELEVATIONS OF FLOW LINE AND TOP OF BANK SHALL BE RECORDED EVERY 100 FEET. SIDE SLOPES SHALL ALSO BE INDICATED..
   11. SANITARY SEWER MANHOLES SHALL BE VERIFIED AND DIMENSIONED FROM STREET CENTERLINES OR LOT LINES AS APPROPRIATE. EACH STRUCTURE SHALL BE LOCATED BY SUB–METER GPS WITH STATION & OFFSET, NORTHERLY & EASTERLY, LATITUDE, LONGITUDE, AND ELEVATION DATA. ALL RIM AND INVERT ELEVATION SHALL BE VERIFIED AND RECORDED. THIS INFORMATION SHALL BE CLEARLY INDICATED AS BEING AS–BUILT INFORMATION. DESIGN ELEVATIONS SHALL BE CROSSED OUT AND AS–BUILT INFORMATION WRITTEN NEXT TO IT.
   12. FOR SUBDIVISIONS, PROPOSED DESIGN FINISH FLOOR ELEVATIONS SHALL APPEAR ON ALL SUBDIVISION LOTS ON THE APPROPRIATE PLAN AND PROFILE SHEET AS WELL AS ON THE MASTER DRAINAGE PLAN.
   13. SANITARY SEWER LINE LENGTHS, SIZES, MATERIAL, SLOPE, ETC., SHALL BE VERIFIED AND RECORDED, THIS INFORMATION IS TO BE CLEARLY INDICATED AS BEING AS–BUILT INFORMATION.
   14. SEWER LATERALS SHALL BE VERIFIED AND RECORDED AT THE CLEAN OUT LOCATIONS, STATIONING AND OFFSET DISTANCES SHALL BE MEASURED FROM UPSTREAM MANHOLES TOWARDS DOWNSTREAM MANHOLES. INVERT INFORMATION AT CLEAN OUT SHALL BE PROVIDED AND BE LOCATED BY SUB–METER GPS WITH STATION & OFFSET, NORTHERLY & EASTERLY, LATITUDE, LONGITUDE, AND ELEVATION DATA.
   15. LIFT STATION AND FORCEMAIN SHALL BE VERIFIED AND DIMENSIONED FROM STREET CENTERLINES OR LOT LINES AS APPROPRIATE. FORCEMAIN DEPTH AND LOCATION INCLUDING VALVES WILL BE PROVIDED AND TIED TO PERMANENT ABOVE GRADE FEATURES. DIMENSIONAL AND ELEVATION INFORMATION INDICATED ON THE APPROVED PLAN SHALL BE VERIFIED AND RECORDED. THIS INFORMATION SHALL BE CLEARLY INDICATED AS BEING AS–BUILT INFORMATION. BURIED POTABLE WATER LINES AND ELECTRICAL SERVICE LINES SHALL BE CLEARLY DIMENSIONED, LOCATED AND LABELED. EACH LIFT STATION SHALL BE LOCATED BY SUB–METER GPS WITH STATION & OFFSET, NORTHERLY & EASTERLY, LATITUDE, LONGITUDE AND ELEVATION DATA.
   16. CURB CUTS OR METAL TABS, USED TO MARK SEWER LATERALS, WATER SERVICES AND WATER VALVES, SHALL BEE VERIFIED FOR PRESENCE AND ACCURACY OF LOCATION.
   17. POTABLE AND RECLAIMED WATER MAIN LINES SHALL BE DIMENSIONED OFF THE BASELINE CONSTRUCTION. WATER MAIN LINE MATERIAL SIZE, LENGTH AND DEPTH, PLACED SHALL BE NOTED. LOCATIONS OF VALVES SHALL ALSO BE TIED TO BASELINE CONSTRUCTION. THIS INFORMATION SHALL BE CLEARLY INDICATED AS BEING AS–BUILT INFORMATION.
   18. POTABLE AND RECLAIMED WATER VALVES, TEES, BENDS, ALL SERVICES, AND FIRE HYDRANTS SHALL BE LOCATED BY TYING THEM TO BASELINE CONSTRUCTION (STA. & OFFSET). SIMILARLY, FORCE MAIN VALVES, TEES, AND BENDS SHALL BE LOCATED IN THE SAME MANNER. STATIONING AND OFFSET DISTANCES SHALL BE MEASURED FROM UPSTREAM MANHOLES TO DOWNSTREAM MANHOLES. ALL SERVICES, VALVES, TEES, BENDS, AND HYDRANTS SHALL BE LOCATED BY SUB–METER GPS WITH STATION & OFFSET, NORTHERLY & EASTERLY, LATITUDE, LONGITUDE AND ELEVATION DATA.
   19. FOR PERPENDICULAR CROSSINGS OF STORM WATER, SANITARY SEWER, POTABLE WATER, OR RECLAIMED WATER, THE AS–BUILT PLANS SHALL CLEARLY INDICATE WHICH UTILITIES ARE LOCATED OVER OR UNDER OTHER UTILITIES, AS NECESSARY.
   20. ANY SPECIAL FEATURES SUCH AS, CONCRETE FLUMES, LAKE BANKS, WALLS, FENCING, ETC. WHICH ARE A PART OF THE APPROVED CONSTRUCTION DRAWINGS SHOULD ALSO BE LOCATED AND DIMENSIONED.
   21. IF AN APPROVED SUBDIVISION PLAT OR SITE PLAN SHOWS A CONSERVATION EASEMENT, THE PROJECT SURVEYOR SHOULD PROVIDE THE EXACT LOCATION OF THE SPECIMEN TREE(S) FROM THE RIGHT–OF–WAY OR PROPERTY LINES AND PROPOSED EASEMENT BOUNDARIES ON THE AS–BUILT DRAWING. THE AS–BUILT LOCATION OF THESE TREES WILL HELP VERIFY THE SUFFICIENCY OF THE CONSERVATION EASEMENT PRIOR TO PLAT RECORDING OR CERTIFICATE OF OCCUPANCY.
   22. WHEN STORM WATER, POTABLE WATER, RECLAIMED WATER, OR SANITARY SEWER IMPROVEMENTS ARE LOCATED WITHIN AN EASEMENT, THE AS–BUILT DRAWING WILL ACCURATELY DEPICT THE LOCATION OF THE EASEMENT ITSELF AS WELL AS THE EXACT LOCATION OF THE IMPROVEMENTS WITHIN THE EASEMENT. THIS IS REQUIRED IN ORDER TO VERIFY THAT THE IMPROVEMENTS HAVE BEEN PROPERLY LOCATED AND TO ENSURE THAT FUTURE SUBSURFACE EXCAVATION TO PERFORM REMEDIAL REPAIR CAN BE ACCOMPLISHED WITHOUT DISTURBANCE BEYOND THE EASEMENT.
   23. RECORDED DRAWINGS ARE TO BE BASED ON CONSTRUCTION DRAWINGS AND INCLUDE BOTH DESIGNED AND CONSTRUCTED DATA , SIGNED AND SEALED BY A FLORIDA LICENSED SURVEYOR. THE CITY WILL REQUIRE THE FOLLOWING ITEMS TO BE SENT EMAILED AND BY HARD COPIES. ITEM 1. TWO PDF (ONE PDF AS–BUILT DRAWINGS SHALL ALSO BE ELECTRON SIGNED AND SEALED BY A THE SURVEYOR. THE SECOND ONE NOT LOCKED OR SIGNED.), 2. THE AS–BUILT DRAWINGS TO BE PROVIDED,ON A CD WITH A DIGITAL COPY IN A COMPATIBLE AUTOCAD FORMAT, AND PDF FORMAT.
   24. ELEVATIONS SHALL BE REFERENCED TO NAVD 1988 DATA. AS–BUILT SURVEY INFORMATION SHALL BE REFERENCED TO AT LEAST TWO FLORIDA STATE PLANE EAST COORDINATES NAD 83.
   25. BENCHMARK DATUM UTILIZES MONUMENTATION FROM THE NORTH AMERICAN VERTICAL DATUM OF 1929 WITH ELEVATIONS ADJUSTED TO NGVD 1988 DATA. ANY NAVD 1929 MONUMENT WITH THE LIMITS OF CONSTRUCTION IS TO BE PROTECTED.
   26. NEW CONDUITS THAT ARE INSTALLED SHALL SHOW LOCATION OF TEES AND BENDS AND RECORD ELEVATIONS EVERY 100'. ALL SHALL BE LOCATED BY TYING THEM TO BASELINE/CENTERLINE CONSTRUCTION (STA. & OFFSET). SIMILARLY, WATER MAINS, TEES AND BENDS SHALL BE LOCATED IN THE SAME MANNER. ALL BENDS AND TEES SHALL BE LOCATED BY SUB–METER GPS WITH STATION & OFFSET, NORTHERLY & EASTERLY, LATITUDE & LONGITUDE AND ELEVATION DATA.

1.4 SUBMITTALS:
A. CONTRACTOR SHALL SUBMIT EACH MONTH TO CITY THE PROJECT ACTIVITY SUMMARY THAT SHOWS CURRENT CONSTRUCTION ACTIVITIES AND A COPY OF NOTICES TO AGENCIES INCLUDING THE CITY REGARDING ROAD CLOSURES; PLUS A RECORD OF EVENTS THAT WILL BE NEEDED IN THE FUTURE.
B. CONTRACTOR SHALL SUBMIT TO CITY AS REQUIRED THE PROPOSED SHUT–OFF SCHEDULE, CAPPING, TEMPORARY SERVICE SCHEDULING, RECORD OF NOTICES TO CUSTOMERS AND PROPOSED ROADWAY CLOSINGS.
C. CONTRACTOR SHALL SUBMIT COPIES OF PUBLISHED NOTICES.
D. CONTRACTOR SHALL SUBMIT FINAL RECORD DRAWINGS FOR EACH UTILITY INCLUDED IN THE PLANS. (WATER, REUSE, SEWER, FORCEMAIN, AND STORMWATER). CONTRACTOR WILL NEED TO UPLOAD TO THE CITY'S SHAREPOINT A COPY OF THE AUTOCAD, XREF'S, AND PFD'S FILES FOR A REVIEW BEFORE SENDING THE CD TO THE CITY. ONCE REVIEWED WITH NO COMMENTS, THE CONTRACTOR WILL NEED TO EMAIL A REQUEST FOR THE SHAREPOINT FILE INFORMATION TO BE ABLE TO UPLOAD THE RECORDED DRAWINGS MATERIALS. THE FINAL SUBMITTAL SHALL INCLUDE TWO (2) PFD'S; ONE THAT IS ELECTRONICALLY SIGNED AND SEALED, THE OTHER UNRESTRICTED, ON A CD WITH WORKING AUTOCAD, XREF'S FILES, AND A SET OF PDF FILES. (PAPER COPIES WILL ARE NO LONGER BE REQUIRED). WHEN THE RECORDED DRAWINGS ARE DELIVERED FOR CLEARANCE OF WATER LINE, THEY WILL BE REVIEWED AND ARE APPROVED, AND THEN CAN BE SCHEDULED FOR CHLORINATION. CITY WILL NOT RELEASE THE DRINKING WATER BACTERIOLOGICAL LABORATORY REPORT, AND CLEARANCE APPLICATION TO VOLUSIA COUNTY HEALTH DEPARTMENT UNTIL THE AS–BUILT / RECORDED DRAWINGS INFORMATION MEETS CITY REQUIREMENTS. CONTRACTOR WLL HAVE 60 DAYS FROM THE TIME THAT THE BACTERIOLOGICAL SAMPLES ARE COLLECTED TO SUBMIT ANY CORRECTION THAT NEEDED TO BE DONE TO THE AS–BUILT AND CD TO CITY. IF CONTRACTOR GOES PAST THE 60 DAYS RE–CHLORINATION WILL BE REQUIRED AND PAY FOR THE BACTERIOLOGICAL LABORATORY REPORT WILL BE REQUIRED.

AS–BUILTS/RECORD DOCUMENTS (CONT'D)

E. HERE ARE EXAMPLES OF HOW TO DISPLAY AND LABEL VALVES, FITTINGS, AND PIPES ON THE PLANS IN MODEL SPACE. INCLUDE A LOCATION ARROW GOING TO THE IDENTIFIED OBJECT:

VALVE EXAMPLE:
20" GATE VALVE
STA. 22+23 (LT.55.0')
LAT. 29°12'53.009
LONG.=81°04'03.355"W
N = 1,774,373.4058
E= 634,602.7566
TOP OF NUT ELEV. = 27.50
GROUND ELEV. = 30.50

20" DIP WATER MAIN
STA. 22+00 (RT.55.0')
LAT.=29°12'50.009"N
LONG.=81°04'26.355"W
N = 1,774,373.4058
E= 634,602.7566
TOP OF PIPE ELEV. = 27.50
GROUND ELEV. = 30.50

MANHOLE EXAMPLE:
MANHOLE NO. 25
STA. 22+23 (LT.55.0')
LAT. 29°12'53.009
LONG. = 81°04'03.355"W
N = 1,774,373.4058
E= 634,602.7566
RIM ELEV. = 27.50
NORTH 15" RCP ELEV. = 8.50
WEST 24" CMP ELEV. = 7.50
BOTTOM ELEV. = 9.30

2" PVC CONDUIT
STA. 22+00 (RT.55.0')
LAT.=29°12'50.009"N
LONG.=81°04'26.355"W
N = 1,774,373.4058
E= 634,602.7566
TOP OF PIPE ELEV. = 27.50
GROUND ELEV. = 30.50

(ALL BENCH MARKS USED MUST BE SHOWN ON THE PLANS) BENCH MARK EXAMPLE:

BM#13
STA. 20+33 (LT. 85.5')
3/4" IRON ROD WITH PLASTIC CAP...
N= 1,774,373.4058
E = 634,602.7566
LAT. = 29°04'53.355"W
LONG. = 81°04'53.355"W
ELEV.= 32.55

PART 2– EXECUTION
2.1 GENERAL:
ALL DRAWINGS SHALL BE PREPARED TO TRUE STATE PLANE COORDINATES. CONTRACTOR SHALL PROVIDE ALL MATERIALS, EQUIPMENT, LABOR NEEDED TO PREPARE AND SUBMIT ACCURATE AS–BUILT/RECORD DRAWINGS.
A. IT IS ACCEPTABLE TO CITY IF THE SURVEYOR UTILIZES AN AFTER THE FACT APPROACH TO COLLECTING AND VERIFYING THE LOCATION AND DEPTH BY VERTICAL PVC PIPES PLACED BY THE CONTRACTOR AS MARKERS FOR THIS PURPOSE. THE SURVEYOR SHALL VERIFY TO THE ACCURACY DEFINED IN FLORIDA STATUES THE AS–BUILT CONDITIONS AND CERTIFY THE RECORD DRAWINGS.
B. CITY SHALL NOT BE CONSIDERED THE BEST SOURCE OF INFORMATION FOR VALVE LOCATIONS THAT MAY HAVE BEEN LOST DURING FINAL GRADING, THE SURVEYOR OR CONTRACTOR SHALL EXCAVATE AND PROPERLY MARK ALL VALVE BOXES AND EACH VALVE SHALL HAVE A TAG OR COLOR CODED TO DEFINE WATER, SEWER, OR REUSE WATER VALVES. THE USE OF TEMPORARY PVC PIPE MARKERS COLOR CODED IS ACCEPTABLE SO LONG AS CROSS REFERENCES ARE PROVIDED ON THE RECORD DRAWINGS TO PREVENT THE TOPS FROM A WATER VALVE BEING PLACED ON A SEWER VALVE.
C. THE CONTRACTOR SHALL PROVIDE THE UTILITIES DEPARTMENT ENGINEERING DIVISION THE FINAL AS BUILT/RECORD DRAWINGS ON CD. THE AS BUILT /RECORD DRAWINGS SHALL BE PREPARED USING AUTOCAD FORMAT 2010 OR LATER IN MODEL SPACE. THE DRAWING (LABELING AND LINE WORK SHALL BE ON SEPARATE LAYERS). THE DRAWINGS SHALL BE IN FL83–EF (NAD83 FLORIDA STATE PLANES, EAST ZONE, US FOOT) STATE PLANE COORDINATES AND SHALL BE ABLE TO BE INSERTED INTO THE CITY'S OVERALL GIS SYSTEM. THE RECORD DRAWINGS SHALL ALSO BE PRINTED, SIGNED AND SEALED AS ALLOWED BY STATE OF FLORIDA REGULATIONS. A DISCLAIMER MAY BE NOTED IN A TRANSMITTAL LETTER PLUS THE SURVEYOR MAY ADD A SPECIAL NOTICE ON EACH SHEET REGARDING THE LOCATION OF THE TRUE ORIGINAL RECORD DRAWINGS OR PLACE LIMITS ON RESPONSIBILITY SHOULD SOMEONE IN THE FUTURE NEED TO MODIFY THE DRAWINGS.
D. IDENTIFY THE SOURCE MARKERS FOR THE SURVEY USED FOR RECORD DRAWINGS.

Know what's below. Call before you dig.

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300 INTERCHANGE BLVD., STE. C
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WWW.ZEVCOHEN.COM
(EB 6516)

CIVIL ENGINEERING
LANDSCAPE ARCHITECTURE
ENVIRONMENTAL
PLANNING
TRANSPORTATION
(LC 42)

NO	DATE	BY	SUBMITTALS / REVISIONS
1	10-09-24	MH	CITY COMMENTS
2	10-21-24	MH	SJRWMD COMMENTS
3	02-25-25	MH	SJRWMD COMMENTS

DELAND DUPONT WAREHOUSE
FINAL ENGINEERING PLANS
CONSTRUCTION NOTES

VOLUSIA COUNTY, FLORIDA
CITY OF DELAND

PROJECT NO: ZC 23310
DESIGNED BY: MW
DRAFTED BY: MH
CHECKED BY: SK
DRAWING FILE: 02-04_23310 NOT

KRISTOPHER T. ROWLEY, P.E. NO. 84263
SPENCER H. KERSHAW, P.E. NO. 96653
NOT VALID WITHOUT SEAL

SHEET: C4 OF 12

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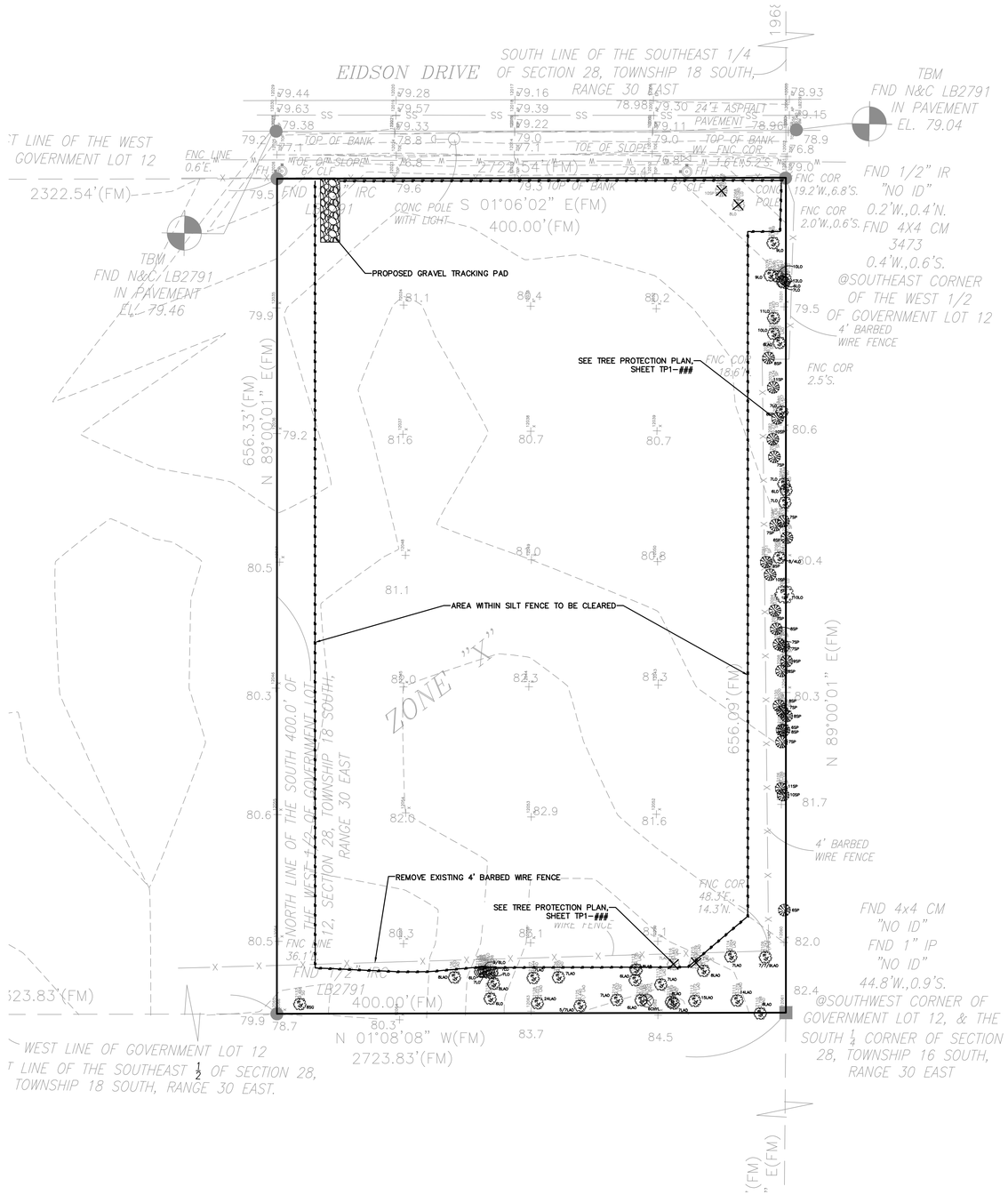


0 25 50 75 100

SCALE : 1" = 50'

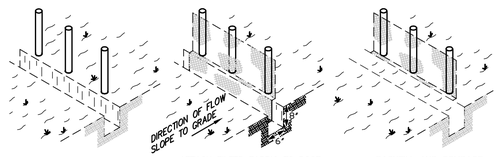
LEGEND:

- SF — PROPOSED SILT FENCE
- X — PROPOSED TEMPORARY CONSTRUCTION FENCE
- SOIL BORING LOCATION (REFER TO GEOTECHNICAL REPORT)
- PROPOSED DEMOLITION/ CLEARING AREA

NOTES:
1. SEE TREE PROTECTION PLAN BEFORE CLEARING
2. WETLAND SIGNS SHALL BE PLACED NO FURTHER THAN 50 FEET APART OR EVERY CHANGE IN DIRECTION, WHICHEVER IS LESS, LANDWARD OF THE UPLAND BUFFER BOUNDARIES WITH ROADS, COMMON AREA, OR LOTS.

NOTES:
1. MATERIALS, CONSTRUCTION METHODS AND MAINTENANCE SHALL BE IN ACCORDANCE WITH THE FLORIDA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS AND DESIGN STANDARDS CURRENT EDITION.
2. CONTRACTOR SHALL PROVIDE SILT FENCES, TURBIDITY BARRIERS OR APPROVED BARRIERS AT ALL STORMWATER DISCHARGE POINTS FOR EROSION CONTROL AND SEDIMENT CONTROL DURING CONSTRUCTION. DEPENDING UPON FLOW VELOCITIES AND VOLUME, REDUNDANT (MULITPLE) PARALLEL FENCES MAY BE NEEDED.
3. CONTRACTOR SHALL ROUGH GRADE STORMWATER SWALES AND RETENTION AREAS IN COMPLIANCE WITH BEST MANAGEMENT PRACTICES PRIOR TO CONSTRUCTION OF SITE IMPROVEMENTS.
4. CONTRACTOR SHALL MEET ALL PERMIT CONDITIONS AS ESTABLISHED BY THE CITY OF DELAND AND ALL OTHER APPLICABLE AGENCIES, INCLUDING BUT NOT LIMITED TO COUNTY, FDOT, STATE, FEDERAL, AND THE SJRWMD.

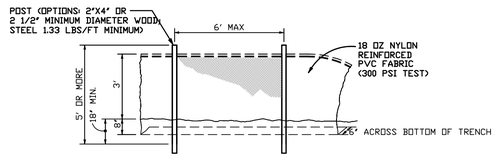
STAKED SILT FENCE DETAIL
NTS



SET POST AND EXCAVATE A TRENCH

ATTACH FILTER FABRIC TO POST ALLOWING 1 FT EXTENSION INTO THE TRENCH AS SHOWN (8" DOWN TRENCH WALL AND 6" ACROSS BOTTOM).

BACKFILL AND COMPACT EXCAVATED SOIL



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(LC #2)
(EB 6515)

NO	DATE	BY	SUBMITTALS / REVISIONS
1	10-09-24	MH	CITY COMMENTS
2	10-21-24	MH	SJRWMD COMMENTS
3	02-25-25	MH	SJRWMD COMMENTS

DELAND DUPONT WAREHOUSE
FINAL ENGINEERING PLANS
DEMOLITION & EROSION CONTROL PLAN

CITY OF DELAND — VOLUSIA COUNTY, FLORIDA

PROJECT NO: ZC 23310
DESIGNED BY: MW
DRAFTED BY: MH
CHECKED BY: SK
DRAWING FILE: 05_23310 ECP
XREF'S: 23310_BAS.DWG
XREF'S: 23310_SURV.DWG

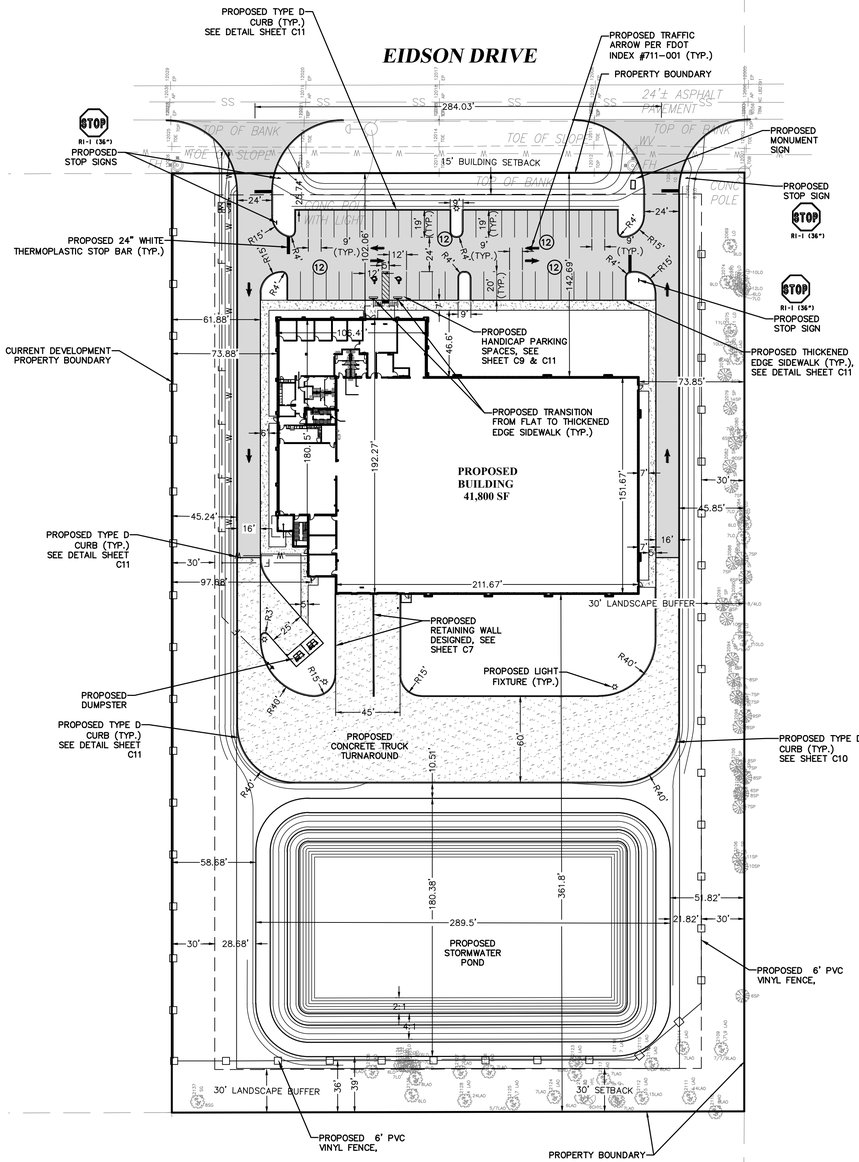
KRISTOPHER T. ROWLEY, P.E. NO. 84263
SPENCER H. KERSHAW, P.E. NO. 96663
NOT VALID WITHOUT SEAL

SHEET: C5 OF 12

R:\23310 DELAND AIRPORT PARCEL 17 & 18\FINAL ENGINEERING PLANS\CAD\MICRO\05_23310 ECP.DWG – PRINTED 6/6/2025 4:18 PM

LAND USE TABLE:		
	ACREAGE / SF	PERCENTAGE
EXISTING CONDITIONS:		
WETLAND AREA	0 AC	0%
UPLAND AREA	6.03 AC / 262,666 SF	100%
PROPOSED IMPROVEMENTS:		
BUILDING(S)	0.960 AC / 41,800 SF	15.9%
PAVEMENT & SIDEWALK	1.605 AC / 69,931 SF	26.6%
POND AREA(S)	0.764 AC / 33,279 SF	12.7%
LANDSCAPE/OPEN SPACE	2.701 AC / 117,656 SF	44.8%
TOTAL PERVIOUS	3.465 AC / 150,935 SF	57.5%
TOTAL IMPERVIOUS	2.565 AC / 111,731 SF	42.5%

PARKING CALCULATIONS:			
USE	PARKING REQUIREMENT	SF	SPACES REQUIRED
WAREHOUSE	1 SPACE PER 1,000 SF FOR FIRST 20,000 SQ FT, PLUS 1 SPACE PER 2,000 SF FOR THE SECOND 20,000 SQ FT	37,050	29
MANUFACTURING	1 SPACE PER 625 SF OF NET FLOOR AREA	1,000	2
OFFICE	1 SPACE PER 250 SF OF NET FLOOR AREA	3,750	15
		TOTAL =	46
HANDICAP PARKING REQUIRED:		2	
HANDICAP PARKING PROVIDED:		2	
PARKING SPACES PROVIDED:		48	



0 25 50 75 100

SCALE : 1" = 50'

LEGEND:

- PROPOSED HEAVY DUTY CONCRETE SEE DETAIL SHEET C11
- PROPOSED ASPHALT PAVEMENT SEE DETAIL SHEET C11
- PROPOSED SIDEWALK CONCRETE SEE DETAIL SHEET C11
- (3) PROPOSED PARKING COUNT
- PROPOSED HANDICAP PARKING SPACE
- PROPOSED STREET LIGHT

NOTES:
1. ALL HANDICAP RAMPS ARE TO BE CONSTRUCTED PER FDOT INDEX NO. 522-002, LATEST EDITION.
2. ALL SIGNAGE TO BE COORDINATED WITH PROJECT SIGNAGE PACKAGE FOR AESTHETIC PURPOSES.

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PLANNING
TRANSPORTATION

(LC #2)
(EB 6516)

NO	DATE	BY	SUBMITTALS / REVISIONS
1	10-09-24	MH	CITY COMMENTS
2	10-21-24	MH	SJRWMD COMMENTS
3	02-25-25	MH	SJRWMD COMMENTS

DELAND DUPONT WAREHOUSE FINAL ENGINEERING PLANS OVERALL SITE PLAN

VOLUSIA COUNTY, FLORIDA
CITY OF DELAND

PROJECT NO: ZC 23310

DESIGNED BY: MW

DRAFTED BY: MH

CHECKED BY: SK

DRAWING FILE: 07_23310 GSS
XREF'S: 23310_BAS.DWG
XREF'S: 23310_SURV.DWG

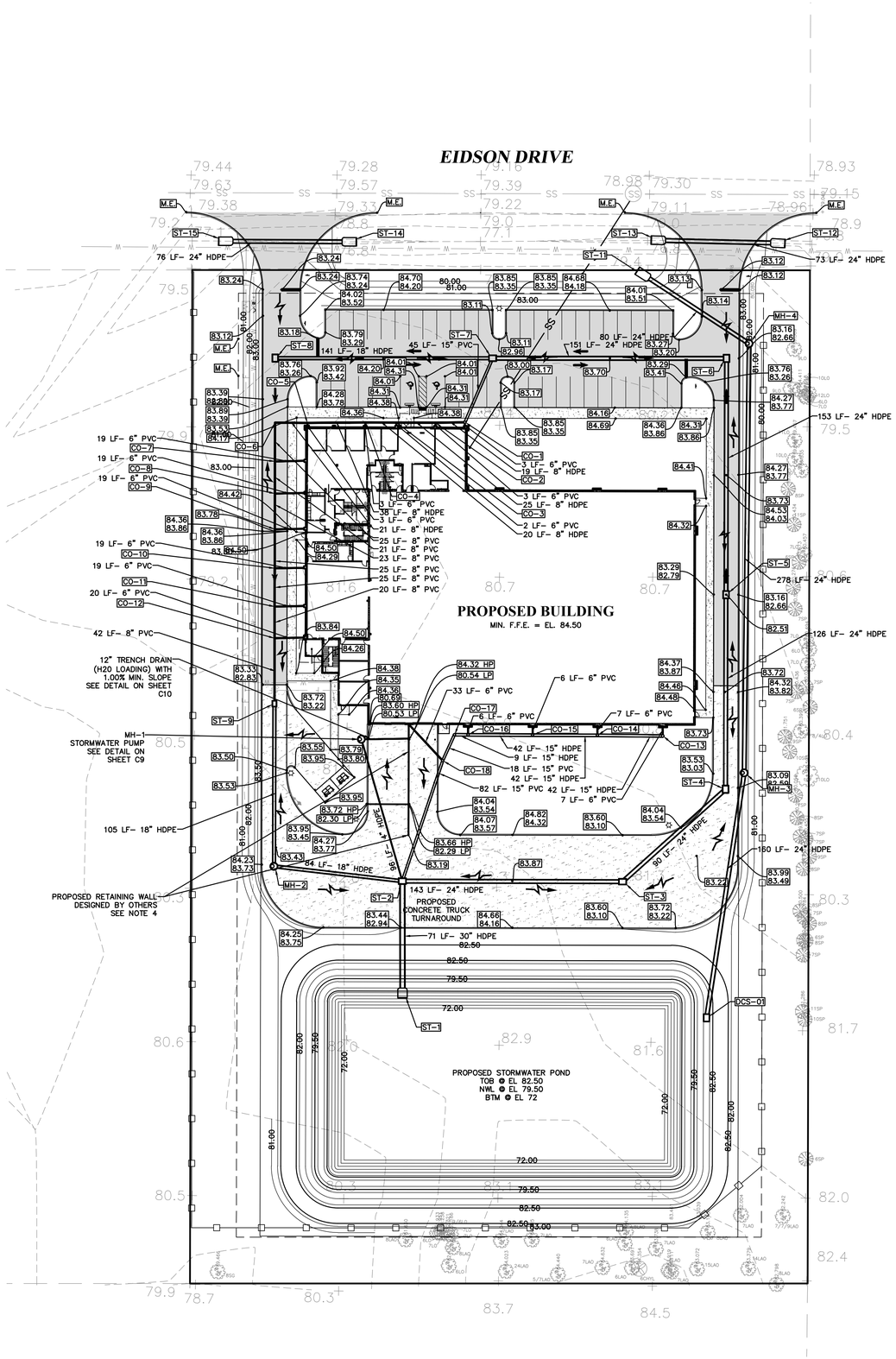
KRISTOPHER T. ROWLEY, P.E. NO. 84263
SPENCER H. KERSHAW, P.E. NO. 96663
NOT VALID WITHOUT SEAL

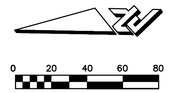
SHEET: C6 OF 12

R:\23310 DELAND AIRPORT PARCEL 17 & 18\FINAL ENGINEERING PLANS\CAD\MISC\07_23310 GSS.DWG -- PRINTED 6/6/2025 4:18 PM

STORMWATER STRUCTURE TABLE			
STRUCTURE NUMBER	STRUCTURE TYPE	STRUCTURE T.C.	PIPE INVERT(S), DIRECTION(S), SIZE(S)
CO-1	15" CLEAN OUT	84.38	76.50 (N) 8" HDPE 76.50 (E) 15" PVC 76.50 (W) 6" PVC
CO-2	6" CLEAN-OUT	84.38	76.70 (N) 8" HDPE 76.70 (S) 8" HDPE 76.70 (W) 6" PVC
CO-3	8" CLEAN OUT	84.38	76.95 (N) 8" HDPE 76.95 (S) 8" HDPE 76.95 (W) 6" PVC
CO-4	8" CLEAN OUT	84.38	77.15 (N) 8" HDPE 77.15 (S) 8" HDPE 77.15 (W) 6" PVC
CO-5	8" CLEAN OUT	84.35	77.55 (N) 8" HDPE 77.55 (S) 8" HDPE 77.55 (W) 6" PVC
CO-6	6" CLEAN-OUT	83.48	78.34 (W) 8" PVC 77.76 (S) 8" HDPE
CO-7	6" CLEAN-OUT	83.76	78.09 (S) 6" PVC 78.09 (W) 8" PVC 78.09 (E) 8" PVC
CO-8	6" CLEAN-OUT	83.99	77.88 (S) 6" PVC 77.88 (E) 8" PVC 77.88 (W) 8" PVC
CO-9	6" CLEAN-OUT	83.80	77.64 (E) 8" PVC 77.64 (W) 8" PVC 77.64 (S) 6" PVC
CO-10	6" CLEAN-OUT	84.02	77.39 (S) 6" PVC 77.39 (E) 8" PVC 77.39 (W) 8" PVC
CO-11	6" CLEAN-OUT	83.58	77.14 (S) 6" PVC 77.14 (E) 8" PVC 77.14 (W) 8" PVC
CO-12	6" CLEAN-OUT	83.36	76.94 (S) 6" PVC 76.94 (E) 8" PVC 76.94 (W) 8" PVC
CO-13	15" CLEAN OUT	82.40	78.06 (E) 6" PVC 78.06 (N) 15" HDPE
CO-14	15" CLEAN OUT	84.42	77.63 (S) 15" HDPE 77.63 (N) 15" HDPE 77.63 (E) 6" PVC
CO-15	15" CLEAN OUT	84.42	77.21 (S) 15" HDPE 77.21 (N) 15" HDPE 77.21 (E) 6" PVC
CO-16	15" CLEAN OUT	84.42	76.79 (S) 15" HDPE 76.79 (N) 15" HDPE 76.79 (E) 6" PVC
CO-17	15" CLEAN OUT	84.42	76.71 (S) 15" HDPE 76.71 (NW) 15" PVC
CO-18	15" CLEAN OUT	84.33	76.53 (SE) 15" PVC 76.53 (W) 15" PVC 76.53 (NE) 6" PVC
DCS-01	TYPE D INLET – INDEX NO. 425-052	82.50	77.85 (E) 24" HDPE
MH-1	MANHOLE (24" DIA.) SEE SHEET C9 FOR DETAILS	84.00	80.00 (W) 4" HDPE 80.50 (S) 4" PVC

STORMWATER STRUCTURE TABLE			
STRUCTURE NUMBER	STRUCTURE TYPE	STRUCTURE T.C.	PIPE INVERT(S), DIRECTION(S), SIZE(S)
MH-2	MANHOLE (48" DIA.) – INDEX NO. 425-001	83.63	76.20 (E) 18" HDPE 76.20 (S) 18" HDPE
MH-3	MANHOLE (48" DIA.) – INDEX NO. 425-001	81.99	77.45 (W) 24" HDPE 77.45 (E) 24" HDPE
MH-4	MANHOLE (48" DIA.) – INDEX NO. 425-001	82.31	76.99 (W) 24" HDPE 76.99 (NE) 24" HDPE
ST-1	MES (30") – INDEX NO. 430-021	77.95	74.85 (E) 30" HDPE
ST-2	TYPE D INLET – INDEX NO. 425-052	82.50	75.95 (N) 18" HDPE 75.05 (S) 24" HDPE 78.90 (E) 4" HDPE 75.71 (E) 15" PVC 75.00 (W) 30" HDPE
ST-3	TYPE D INLET – INDEX NO. 425-052	82.50	75.33 (SE) 24" HDPE 75.33 (N) 24" HDPE
ST-4	TYPE D INLET – INDEX NO. 425-052	82.50	75.51 (E) 24" HDPE 75.51 (NW) 24" HDPE
ST-5	TYPE D INLET – INDEX NO. 425-052	82.50	75.76 (E) 24" HDPE 75.76 (W) 24" HDPE
ST-6	TYPE D INLET – INDEX NO. 425-052	82.51	76.07 (N) 24" HDPE 76.07 (W) 24" HDPE
ST-7	TYPE D INLET – INDEX NO. 425-052	82.51	76.37 (S) 24" HDPE 76.37 (N) 18" HDPE 76.37 (W) 15" PVC
ST-8	TYPE D INLET – INDEX NO. 425-052	82.50	76.79 (S) 18" HDPE
ST-9	TYPE C INLET – INDEX NO. 425-052	82.50	76.52 (E) 8" PVC 76.52 (W) 18" HDPE
ST-11	MES (24") – INDEX NO. 430-021	78.97	76.80 (SW) 24" HDPE
ST-12	MES (24") – INDEX NO. 430-021	78.97	76.80 (N) 24" HDPE
ST-13	MES (24") – INDEX NO. 430-021	78.97	76.80 (S) 24" HDPE
ST-14	MES (24") – INDEX NO. 430-021	78.97	76.80 (N) 24" HDPE
ST-15	MES (24") – INDEX NO. 430-021	79.27	77.10 (S) 24" HDPE





LEGEND:

- PROPOSED HEAVY DUTY CONCRETE SEE DETAIL SHEET C11
- PROPOSED ASPHALT PAVEMENT SEE DETAIL SHEET C11
- PROPOSED SIDEWALK CONCRETE SEE DETAIL SHEET C11
- OR — PROPOSED STORMWATER INLET
- PROPOSED STORMWATER MANHOLE
- PROPOSED MES
- PROPOSED YARD DRAIN
- 38.20 — PROPOSED GRADE
- M.E.G. — PROPOSED MATCH EXISTING GRADE LABEL
- E.G. — EXISTING GRADE LABEL
- FFE — PROPOSED FINISHED FLOOR ELEVATION
- PROPOSED FLOW DIRECTION
- A — PROPOSED LOT GRADING TYPE
- PROPOSED STREET LIGHT

NOTES:
1. SEE THIS SHEET FOR STORMWATER STRUCTURE TABLES.
2. CONTRACTOR TO REFER TO GEOTECHNICAL REPORT FOR SOIL REQUIREMENTS AND RECOMMENDATIONS.
3. MINIMUM FINISHED FLOOR ELEVATIONS SHALL COMPLY WITH LDC.
4. RETAINING WALL TO BE DESIGNED BY OTHERS UTILIZING PROPOSED GRADES. TOP WALL ELEVATION (HP), BOTTOM WALL ELEVATION (LP)

ZEV COHEN & ASSOCIATES, INC.
300 INTERCHANGE BLVD., STE. C
ORMOND BEACH, FL 32174
WWW.ZEVCOHEN.COM

CIVIL ENGINEERING
LANDSCAPE ARCHITECTURE
ENVIRONMENTAL
PLANNING
TRANSPORTATION
(LC 42)
(EB 6516)

NO	DATE	BY	SUBMITTALS / REVISIONS
1	10-09-24	MH	CITY COMMENTS
2	10-21-24	MH	SJRWMD COMMENTS
3	02-25-25	MH	SJRWMD COMMENTS
4	04-10-25	MH	CLIENT REVISION

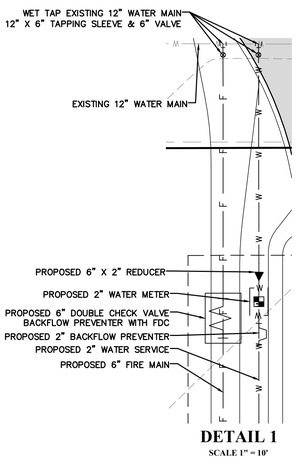
DELAND DUPONT WAREHOUSE
FINAL ENGINEERING PLANS
PAVING, GRADING & DRAINAGE PLAN

VOLUSIA COUNTY, FLORIDA
CITY OF DELAND

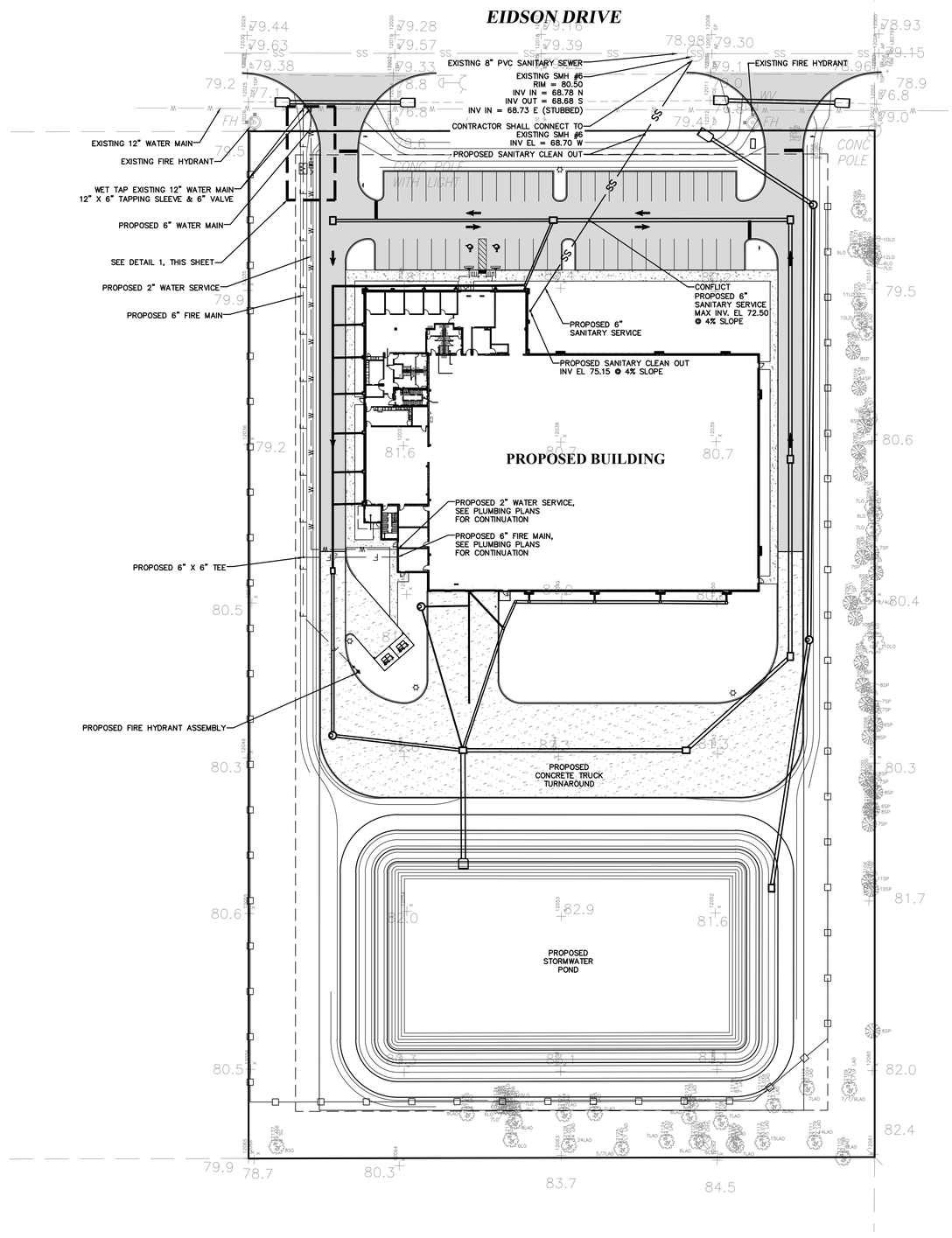
PROJECT NO: ZC 23310
DESIGNED BY: MW
DRAFTED BY: MH
CHECKED BY: SK
DRAWING FILE: 08_23310 PGD
XREF'S: 23310_BAS.DWG
XREF'S: 23310_SURV.DWG

KRISTOPHER T. ROWLEY, P.E. NO. 84263
SPENCER H. KERSHAW, P.E. NO. 96563
NOT VALID WITHOUT SEAL

SHEET: C7 OF 12



DETAIL 1
SCALE 1" = 10'



0 20 40 60 80
SCALE : 1" = 40'

LEGEND:

- PROPOSED HEAVY DUTY CONCRETE SEE DETAIL SHEET C10
- PROPOSED ASPHALT PAVEMENT
- PROPOSED SIDEWALK CONCRETE SEE DETAIL SHEET C10
- PROPOSED SANITARY MAIN AND MANHOLE
- SS — PROPOSED SANITARY SERVICE
- W — PROPOSED WATERMAIN
- F — PROPOSED FIRE MAIN
- R — PROPOSED RECLAIMED WATERMAIN
- FM — PROPOSED FORCEMAIN
- PROPOSED FIRE HYDRANT ASSEMBLY
- PROPOSED GATE VALVE
- PROPOSED FIRE DEPARTMENT CONNECTION
- PROPOSED STREET LIGHT

ZEV COHEN & ASSOCIATES, INC.
300 INTERCHANGE BLVD., STE. C
ORMOND BEACH, FL 32174
WWW.ZEVCOHEN.COM

CIVIL ENGINEERING
LANDSCAPE ARCHITECTURE
ENVIRONMENTAL
PLANNING
TRANSPORTATION
(LC #2)
(EB 6516)

NO	DATE	BY	SUBMITTALS / REVISIONS

DELAND DUPONT WAREHOUSE
FINAL ENGINEERING PLANS
UTILITY PLAN

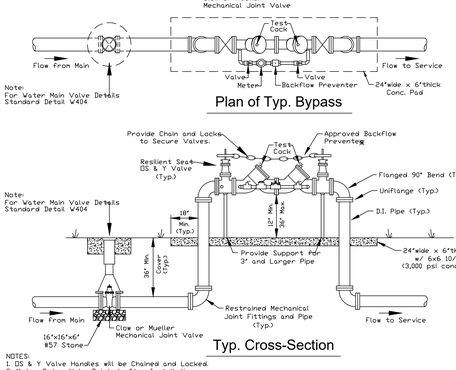
CITY OF DELAND — VOLUSIA COUNTY, FLORIDA

PROJECT NO: ZC 23310
DESIGNED BY: MW
DRAFTED BY: MH
CHECKED BY: SK
DRAWING FILE: 09_23310 UTL
XREF'S: 23310_BAS.DWG
XREF'S: 23310_SURV.DWG

KRISTOPHER T. ROWLEY
LICENSE
No 84263
STATE OF FLORIDA
PROFESSIONAL ENGINEER

KRISTOPHER T. ROWLEY, P.E. NO. 84263
SPENCER H. KERSHAW, P.E. NO. 96663
NOT VALID WITHOUT SEAL

SHEET: C8 OF 12



Plan of Typ. Bypass

Typ. Cross-Section

NOTES:
1. DS & Y Valve Handles will be Chained and Locked.
2. Meter Sets will be Painted after Installation.
3. Bypass Pipe & Fittings shall be Threaded Brass, Copper or Ductile Iron. (No PVC).
4. Installation Requirements: No P.V.C. Piping above Ground.
5. Device shall be Properly Supported.
6. Device shall be Protected From Freezing.
7. All Installations shall be Approved by City Engineer.
8. Device shall be Installed Level, Tested and Certified.
9. Certification of testing shall be placed in Permit Box for Inspector's verification.
10. Consult local Fire Authority for location site & requirements for Fire Dept. connections.
10. All fittings shall be Lead Free.
11. All concrete shall have a minimum strength of 3,000 psi at 28 days.

✱APPROVED R.P. DEVICES
Wilkins 975XL2
Watts Model LF909 or LF009
Conbraco 40LF-200-03

✱APPROVED DOUBLE-CHECK VALVES
Wilkins 350A
Watts Model LF709 or LF007
Conbraco 40LF-100-03

DATE: 11/07/2023 **DOUBLE DETECTOR CHECK VALVE ASSEMBLY - 4" THRU 12"** **W413**

City of DeLand - Standard Details

LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH F.A.C. RULE 62-555.314

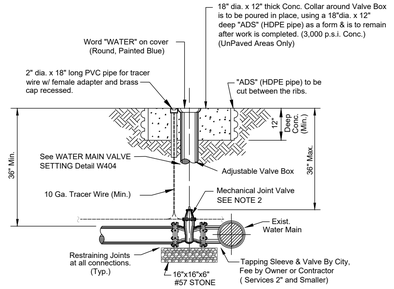
Other pipe	Horizontal Separation	Crossings (1)	Joint Spacing @ Crossing (Full Joint Centered)
Storm Sewer Stormwater Force Main, Reclaimed Water (2)	WATER MAIN 3 ft. minimum	WATER MAIN 12 inches is the minimum except for storm sewer,then 6 inches is the minimum and 12 inches is preferred	Alternate 3' ft. minimum WATER MAIN
Vacuum Sanitary Sewer	WATER MAIN 10 ft. preferred 3 ft. minimum	WATER MAIN 12 inches preferred 6 inches minimum	Alternate 3' ft. minimum WATER MAIN
Gravity Sewer Sanitary Sewer, Sanitary Sewer Force Main, Reclaimed Water (4)	WATER MAIN 10 ft. preferred 6 ft. minimum (3)	WATER MAIN 12 inches is the minimum except for gravity sewer,then 6 inches is the minimum and 12 inches is preferred	Alternate 6' ft. minimum WATER MAIN
On-Site Sewage Treatment & Disposal System(4)	10 ft minimum	---	---

(1) Water Main Should Cross Above other pipe. When Water Main Must Be Below Other Pipe,the Minimum Separation is 12" Inches.
(2) Reclaimed Water Regulated Under Part III of chapter 62-610, F.A.C.
(3) 3 ft. for Gravity Sanitary sewer where the Bottom of the Water Main is laid at least 6 inches above the top of gravity sanitary sewer.
(4) Reclaimed water not regulated under Part III of Chapter 62-160, F.A.C.

DATE: 11/07/2023 **WATER PIPE SEPERATION REQUIREMENTS** **W420**

City of DeLand - Standard Details

Notes:
1. All tracer wire shall be UV-stabilized 10 gauge. Directional bores require to have two 10 gauge wires that are pulled with directional drill. Open cut may use only one 10 gauge wire.

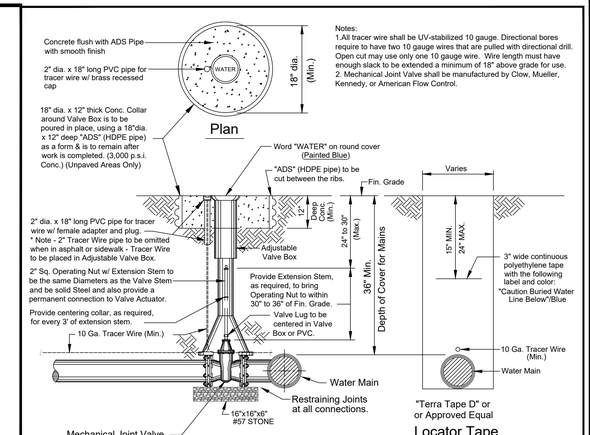


Notes:
1. For Wet Taps larger than 2", Sleeves & Valves will be furnished and installed by the contractor in the presence of the city inspector. Tapping sleeve shall be Ford, Romac, or JCM stainless steel only.
2. Mechanical Joint Valve shall be manufactured by Clow, Mueller, Kennedy, or American Flow Control.

DATE: 11/07/2023 **TAPPING SLEEVE & VALVE** **W407**

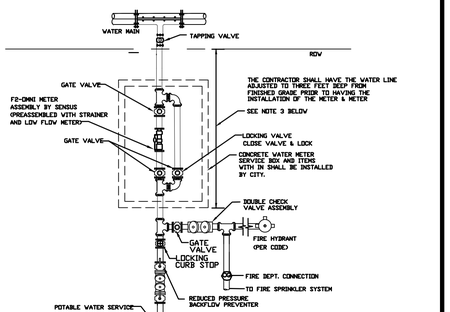
City of DeLand - Standard Details

Notes:
1.All tracer wire shall be UV-stabilized 10 gauge. Directional bores require to have two 10 gauge wires that are pulled with directional drill. Open cut may use only one 10 gauge wire. Wire length must have enough slack to be extended a minimum of 18" above grade for use.
2. Mechanical Joint Valve shall be manufactured by Clow, Mueller, Kennedy, or American Flow Control.



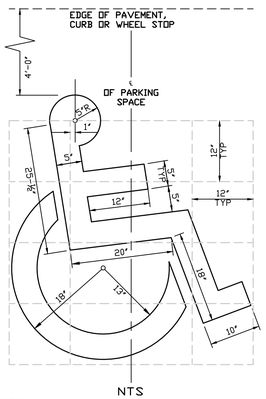
DATE: 11/07/2023 **WATER MAIN VALVE SETTING** **W404**

City of Deland - Standard Details



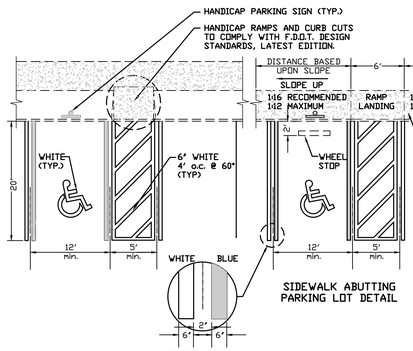
NOTES:
1. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER'S ENGINEER TO DETERMINE THE APPROPRIATE SIZE OF THE SERVICE CONNECTION AND TO COORDINATE THE LOCATION OF THE FIRE DEPARTMENT CONNECTION W/CITY FIRE DEPARTMENT PERSONNEL.
2. CONTRACTOR IS RESPONSIBLE FOR UNCOVERING THE WATERMAIN, INSTALLING THE TAPPING SADDLE/TAPPING VALVE & BOX (ON ANY SERVICE LARGER THAN 2").
3. METER LENGTHS REQUIRED FOR INSTALLATION OF WATER METER AND METER VAULT
   4" METER REQUIRES 12 FEET
   6" AND 8" METERS REQUIRE 14 FEET
   10" METER REQUIRES 20 FEET

FIRE/DOMESTIC/IRRIGATION
CONNECTION
DETAIL



NOTE:
1. PAVEMENT SYMBOL SHALL BE SOLID WHITE IN COLOR AND COMPLY WITH FDOT STANDARD PLANS FOR ROAD CONSTRUCTION, LATEST EDITION.

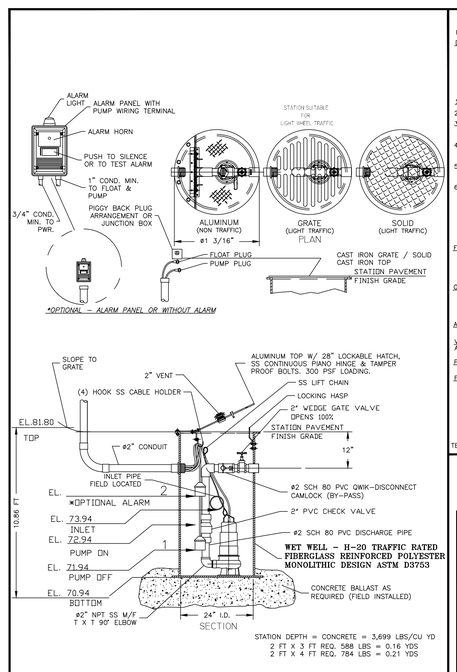
HANDICAP PARKING PAVEMENT SYMBOL DETAIL
NTS



STRIPE DETAIL
NTS

NOTES:
1. ALL HANDICAP PARKING STALLS, 5' ACCESS AISLES, HANDICAP RAMPS AND ACCESSIBLE ROUTES SHALL BE PAVED.
2. PERPENDICULAR AND DIAGONAL HANDICAP PARKING STALLS WILL BE 12'-0" WIDE AND 20'-0" LONG WITH A 5'-0" min. WIDE ACCESS AISLE ADJACENT TO EACH STALL. THE 5' ACCESS AISLE MAY BE SHARED BY TWO ADJACENT HANDICAP PARKING STALLS.
3. PARALLEL HANDICAP PARKING STALLS WILL BE 12'-0" WIDE AND 22'-0" LONG WITH A 5'-0" min. WIDE ACCESS AISLE ADJACENT TO EACH STALL.
4. ALL HANDICAP RAMPS SHALL BE OF 5'-0" min. WIDE EXCLUSIVE OF THE FLARED SIDES WITH A MAXIMUM SLOPE OF 1:21. HANDICAP RAMPS AND CURB CUTS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH FDOT DESIGN STANDARDS, LATEST EDITION.
5. BLUE STRIPING SHALL BE BLUE TINT TO MATCH SHADE 15180 OF FEDERAL STANDARD 595a.
6. WHEN FDOT TYPE 'D' CURB IS USED IN LIEU OF WHEEL STOPS, SIDEWALK ABUTTING CURB SHALL BE WIDENED BY 18" min. SO THAT THE TOTAL SIDEWALK WIDTH IS 72" min. ALLOWING FOR 54" min. CLEAR ACCESSIBLE ROUTE.
7. 6' WHEEL STOPS ARE TO BE CENTERED SIDE TO SIDE IN EACH PARKING STALL, REFER TO COD STANDARD DETAIL M-1 (dbM-1.dwg).
8. ACCESSIBLE PARKING SPACES AND ACCESS AISLES SHALL BE LEVEL WITH SURFACE SLOPES NOT EXCEEDING 1:50 (2%) IN ALL DIRECTIONS.
9. DIMENSIONS ARE CENTERLINE OF PAVEMENT MARKINGS.
10. FOR COMPLETE DETAIL OF HANDICAP SIGN INSTALLATION, REFER TO COD STANDARD DETAIL M-6 (dbM-6.dwg).

HANDICAP PARKING SPACE STRIPING DETAIL
NTS



STATION DEPTH = CONCRETE = 3,699 LBS/CU YD
2 FT X 3 FT REQ. 588 LBS = 0.16 YDS
2 FT X 4 FT REQ. 784 LBS = 0.21 YDS

TSC PRE-FAB PUMP SOLUTIONS© MODEL
24" DRAINAGE SUMP WELL TSC1-24.0 R21.dwg©

JOB:
QS:

1. CONCRETE BALLAST AS REQUIRED FIELD INSTALLED BY CONTRACTOR

GENERAL NOTES

FURNISH AND INSTALL EBARA SUBMERSIBLE PUMP:

DESIGN CONDITION:

MODEL	50 DWXU 6.4S	1/2	HP
GPM			FT/TDH
VOLTAGE	115	SINGLE	PHASE
DISCHARGE	2"	FULL DIAMETER	IMPELLER

SEWAGE PUMP: 1. RATED FOR TWENTY (20) STARTS PER HOUR.
2. AIR FILLED MOTOR DESIGNED FOR SEWAGE APPLICATION WITH CLASS F INSULATION.
3. DUAL MECHANICAL SHAFT SEALS (SILICON CARBIDE / SILICON CARBIDE) LOCATED OUT OF THE PUMPAGE, IN A SEPARATE OIL FILLED CHAMBER.
4. HIGH TEMPERATURE BALL BEARINGS, SEALED OR SHIELDED, UPPER AND LOWER BEARINGS – SINGLE ROW TYPE.
5. PUMP SHAFT HORSEPOWER (BHP) SHALL NOT EXCEED MOTOR RATED HORSEPOWER THROUGHOUT THE ENTIRE OPERATING RANGE OF THE PUMP PERFORMANCE CURVE.
6. PUMP SHALL BE INTERNAL SPLIT CAPACITOR DESIGN, CONSTRUCTED OF 304 STAINLESS STEEL AND OPERATE EITHER FULLY OR PARTIALLY SUBMERGED. THE PUMP IS CAPABLE OF PASSING 2" SOLIDS OR SEWAGE MATERIAL. THE IMPELLER SHALL BE VORTEX OR SINGLE VANE. THE PUMP SHALL HAVE A DISCHARGE SIZE OF 2".

FIBERGLASS WET WELL: SHALL BE A ONE PIECE UNIT WITH INTEGRAL BOTTOM, WALL AND UPPER FLANGE. THE ENTIRE FIBERGLASS WET WELL SHALL HAVE A DYNAMIC LOAD RATING OF 16,000 FT/LBS. EACH UNIT MUST BE SERIAL NUMBERED TO IDENTIFY THE TEST PROCEDURE. ASTM D 3753 & H-20 SPECIFICATIONS SHALL BE REQUIRED AS MINIMUM.

OPTIONAL HATCH: TSC MODEL-28C (28") ROUND GRATE OR SOLID CAST IRON TOP, REINFORCED FOR LIGHT TRAFFIC LOADS. TSC MODEL-28R (28") ROUND LOCKABLE HINGED TOP, REINFORCED FOR LOAD RATING OF 300 LBS/FT. OPENS 180° WITH LOCKING DEVICE FOR HASP TYPE PADLOCK AND STAINLESS STEEL HARDWARE.

ACCESSORIES: #304 S/S – PUMP LIFTING CABLE AND HARDWARE.

VALVES: SHALL BE SEWAGE SERVICE DESIGN SWING CHECK VALVE AND BRASS WEDGE GATE VALVE OPEN 100%.

PIPING: 2" SCHEDULE 80 PVC.

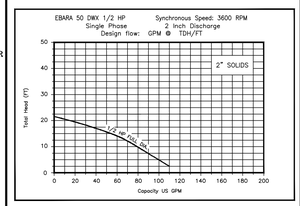
FLOAT SWITCHES: UL LISTED SJ ELECTRO MODEL SJ 20 JUNIOR MERCURY FLOAT

PUMP SUPPLIER SHALL PROVIDE SUBMERSIBLE PUMP, ALARM PANEL, ALARM FLOAT, PUMP SWITCH, WET WELL, HATCH AND ACCESSORIES TO INSURE PROPER OPERATION AND WARRANTY.

THE COMPLETE PACKAGE STATION SHALL HAVE DISCHARGE PIPING ASSEMBLED BY TECHNICAL SALES CORPORATION READY TO SHIP FOR FIELD INSTALLATION.

THE MANUFACTURER OF PRE-FAB PUMP SOLUTIONS®:
TECHNICAL SALES CORPORATION, 4621 N. HALE AVE TAMPA, FL 33614 (813)876-9256

Ebara Submersible Pumps



PUMP PERFORMANCE CURVE

ALARM PANEL - SHALL BE MANUFACTURED BY A "UL" LISTED SHOP

ALARM PANEL SHALL BE TSC MODEL # SJTAXT IN A TYPE 3R THERMOPLASTIC EXTERIOR ENCLOSURE. THE PANEL SHALL INCORPORATE A TERMINAL STRIP USED AS A JUNCTION BOX FOR PUMP, PUMP SWITCH AND FLOAT WIRE CONNECTIONS.

PANEL, PUMP SWITCH AND ALARM FLOAT SHALL BE UL LISTED AND ALL PANEL COMPONENTS SHALL BE UL LISTED.

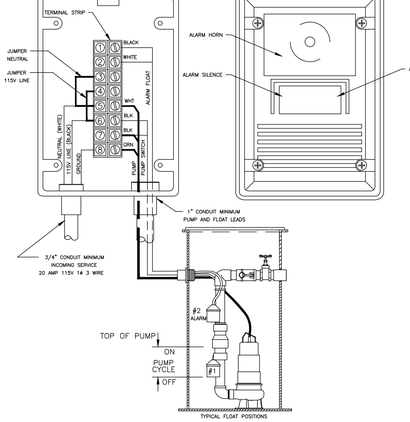
ELECTRICAL CONTRACTOR TO PROVIDE SERVICE DISCONNECT PER LOCAL CODES.

THE ALARM PANEL SHALL BE SUITABLY INSTALLED IN AN ADVANTAGEOUS LOCATION.

ALARM PANEL LAYOUT

TSC SJTAXT – 115V 1Ø

INCOMING SERVICE SHOWN FROM (1) SINGLE POLE BREAKER



TSC SIMPLEX PUMP STATION
FIBERGLASS WET WELL

TECHNICAL SALES
CORPORATION
TSC PRE-FAB PUMP SOLUTIONS©
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4621 N. HALE AVENUE PH (813)876-9256
TAMPA, FL 33614 FAX (813)874-1194
EMAIL: Sales@TSCTampa.com
REV-21 SCALE: N.T.S.

24" DRAINAGE SUMP WELL WITH PUMP CONTROL SWITCH AND OPTIONAL ALARM TSCE1-24.0 R21©

ZEV COHEN & ASSOCIATES, INC.
300 INTERCHANGE BLVD., STE. C
ORMOND BEACH, FL 32174
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CIVIL ENGINEERING
LANDSCAPE ARCHITECTURE
ENVIRONMENTAL
PLANNING
TRANSPORTATION
(LC 42)
(EB 6516)

NO	DATE	BY	SUBMITTALS/ REVISIONS
1	10-08-24	MH	CITY COMMENTS
2	10-21-24	MH	SJRWMD COMMENTS
3	02-25-25	MH	SJRWMD COMMENTS

DELAND DUPONT WAREHOUSE
FINAL ENGINEERING PLANS
CONSTRUCTION DETAILS

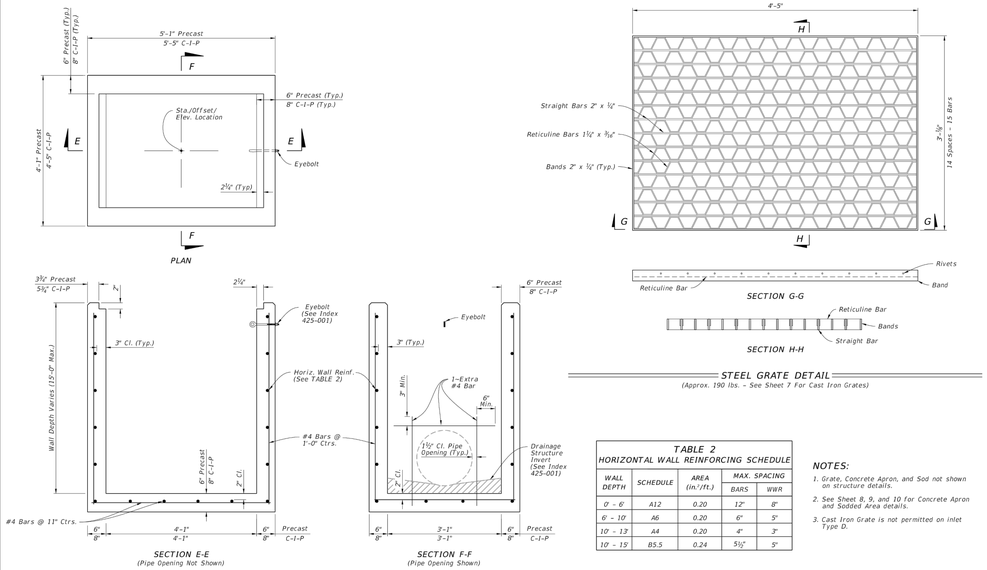
VOLUSIA COUNTY, FLORIDA
CITY OF DELAND

PROJECT NO: ZC 23310
DESIGNED BY: MW
DRAFTED BY: MH
CHECKED BY: SK
DRAWING FILE: 10-12_23310 DET

KRISTOPHER T. ROWLEY, P.E. NO. 84263
SPENCER H. KERSHAW, P.E. NO. 96663
NOT VALID WITHOUT SEAL

SHEET: C9 OF 12

R:\23310 DELAND AIRPORT PARCEL 17 & 18\FINAL ENGINEERING PLANS\CAD\WS\10-12_23310 DET.DWG – PRINTED: 6/4/2025 4:19 PM



STEEL GRATE DETAIL

(Approx. 190 lbs. - See Sheet 7 For Cast Iron Grates)

DIMENSIONAL AND REINFORCING DETAILS

TABLE 2
HORIZONTAL WALL REINFORCING SCHEDULE

WALL DEPTH	SCHEDULE	AREA (in.²/ft.)	MAX. SPACING	
			BARS	WWR
0' – 6'	A12	0.20	12"	8"
6' – 10'	A6	0.20	6"	5"
10' – 13'	A4	0.20	4"	3"
10' – 15'	B5.5	0.24	5½"	5"

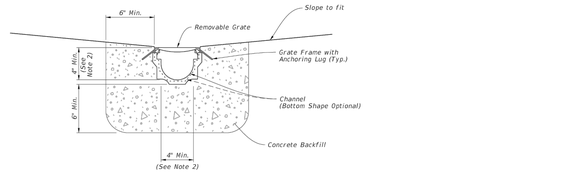
NOTES:

1. Grate, Concrete Apron, and Sod not shown on structure details.
2. See Sheet 8, 9, and 10 for Concrete Apron and Sodded Area details.
3. Cast Iron Grate is not permitted on inlet Type D.

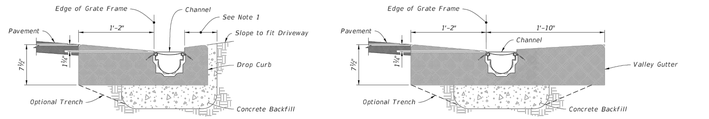
10/30/2022 8:45:19 AM

TYPE D - DIMENSIONAL, REINFORCING, AND STEEL GRATE DETAILS

LAST REVISION	DESCRIPTION:	FDOT	FY 2023-24 STANDARD PLANS	DITCH BOTTOM INLET TYPES C, D, E, AND H	INDEX	SHEET
10/01/20					425-052	3 of 14



PREFORMED CHANNEL WITH REMOVABLE GRATE



TYPICAL LOCATIONS

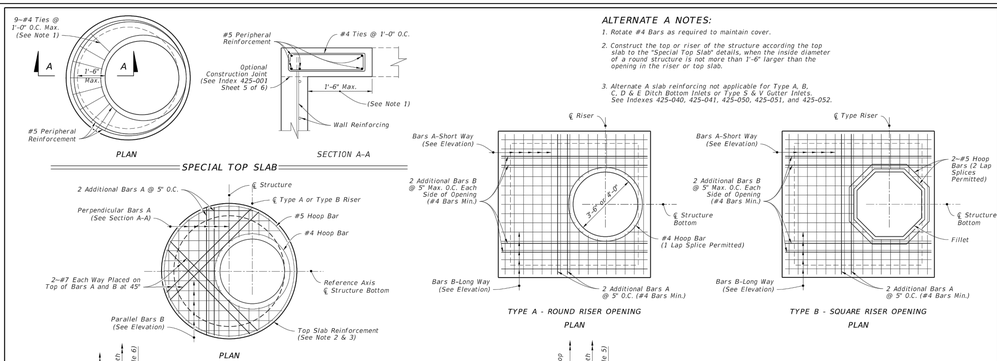
NOTES:

1. Provide minimum 6" of concrete on this side of the drain.
2. 4" Minimum unless otherwise shown in Plans.

10/27/2023 8:56:06 AM

TYPE II - REMOVABLE GRATE

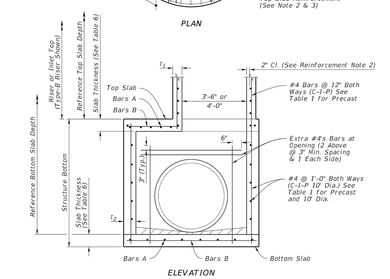
LAST REVISION	DESCRIPTION:	FDOT	FY 2024-25 STANDARD PLANS	TRENCH DRAIN	INDEX	SHEET
11/01/19					436-001	3 of 3

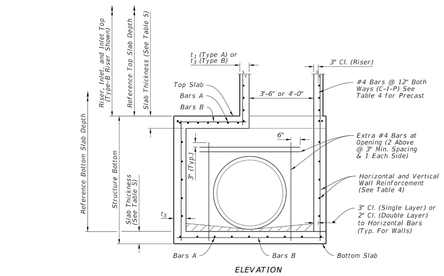


SPECIAL TOP SLAB

ALTERNATE A NOTES:

1. Rotate #4 Bars as required to maintain cover.
2. Construct the top or riser of the structure according the top slab to the "Special Top Slab" details, when the inside diameter of a round structure is not more than 1'-6" larger than the opening in the riser or top slab.
3. Alternate A slab reinforcing not applicable for Type A, B, C, D & E Ditch Bottom Inlets or Type S & V Gutter Inlets. See Indexes 425-040, 425-041, 425-050, 425-051, and 425-052.





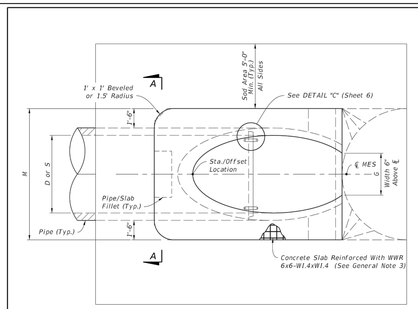
TYPE J BOTTOM - ALTERNATE A

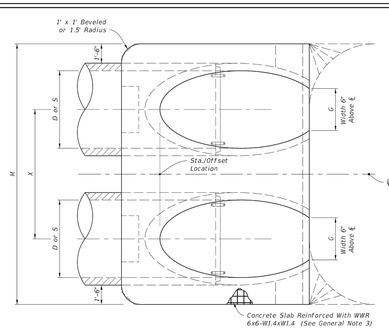
TYPE J BOTTOM - ALTERNATE B

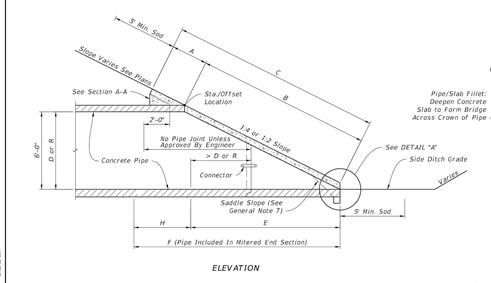
DIMENSIONAL AND REINFORCING DETAILS

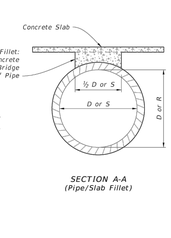
10/30/2022 8:48:50 AM

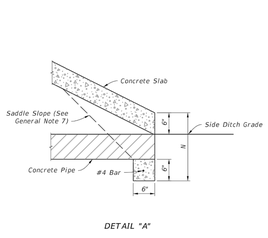
LAST REVISION	DESCRIPTION:	FDOT	FY 2023-24 STANDARD PLANS	STRUCTURE BOTTOMS TYPE J AND P	INDEX	SHEET
11/01/20					425-010	2 of 4











ROUND CONCRETE PIPE
(Elliptical Pipe Similar)

NOTE: See Table 1 on Sheet 3 for Dimensions and Quantities.

SINGLE AND MULTIPLE CONCRETE PIPE

10/30/2022 8:48:48 AM

LAST REVISION	DESCRIPTION:	FDOT	FY 2023-24 STANDARD PLANS	CROSS DRAIN MITERED END SECTION	INDEX	SHEET
11/01/19					430-021	2 of 6

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CIVIL ENGINEERING
LANDSCAPE ARCHITECTURE
ENVIRONMENTAL
PLANNING
TRANSPORTATION
(LC 42)
(EB 6516)

NO	DATE	BY	SUBMITTALS / REVISIONS
1	10-09-24	MH	CITY COMMENTS
2	10-21-24	MH	SJRWMD COMMENTS
3	02-25-25	MH	SJRWMD COMMENTS

DELAND DUPONT WAREHOUSE
FINAL ENGINEERING PLANS
CONSTRUCTION DETAILS

VOLUSIA COUNTY, FLORIDA
CITY OF DELAND

PROJECT NO: ZC 23310
DESIGNED BY: MW
DRAFTED BY: MH
CHECKED BY: SK
DRAWING FILE: 10-12_23310 DET

KRISTOPHER T. ROWLEY, P.E. NO. 84263
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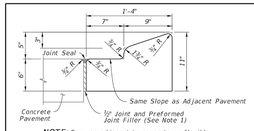
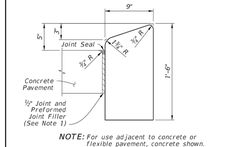
NOT VALID WITHOUT SEAL

SHEET: C10 OF 12



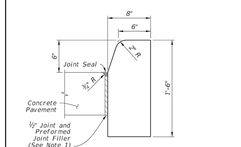
NOTE: For use adjacent to concrete or flexible pavement, concrete shown (See Note 4).

TYPE A



NOTE: For use adjacent to concrete or flexible pavement, concrete shown.

TYPE B

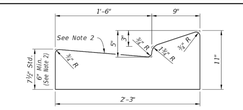


NOTE: For use adjacent to concrete or flexible pavement, concrete shown.

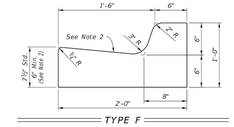
TYPE D

NOTES:

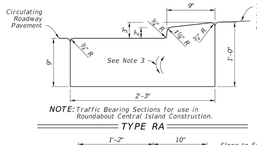
1. For Type A, Type B, and Type D Curb: Expansion joint, preformed joint filler and joint seal are required between curbs and concrete pavement only, see Sheet 3.
2. For Type E, Type F, Drop Curb, and Valley Gutter: When used on high side of roadways, match the cross slope of the gutter to the cross slope of the adjacent pavement. The thickness of the lip is 6", unless otherwise shown on Plans.
3. For Type RA, rotate entire section so that gutter cross slope matches slope of adjacent circulating roadway pavement.
4. For details depicting usage of Type A Curb adjacent to flexible pavement see Sheet 3.



TYPE E

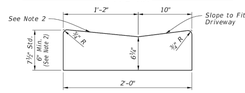


TYPE F

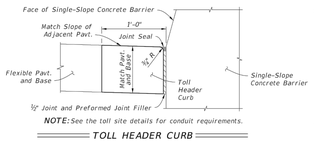


NOTE: Traffic Bearing Sections for use in Roundabout Central Island Construction.

TYPE RA

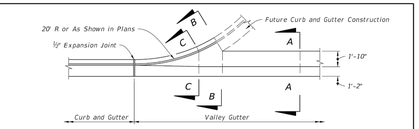


DROP CURB

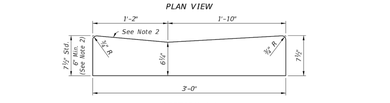


NOTE: See the toll site details for conduit requirements.

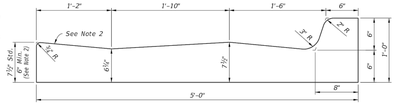
TOLL HEADER CURB



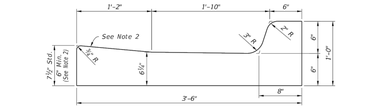
PLAN VIEW



SECTION A-A

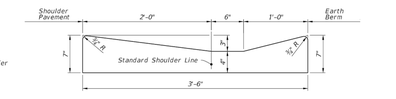


SECTION B-B



SECTION C-C

VALLEY GUTTER

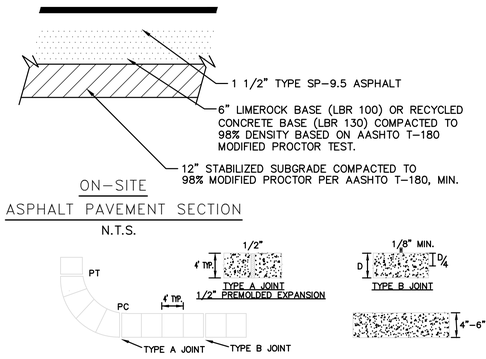


SHOULDER GUTTER

CONCRETE CURB AND GUTTER

LAST REVISION	DESCRIPTION:	FDOT FY 2023-24 STANDARD PLANS	CURB AND GUTTER	INDEX	SHEET
11/01/21	REVISION			520-001	2 of 3

10/26/2022 8:30:37 AM

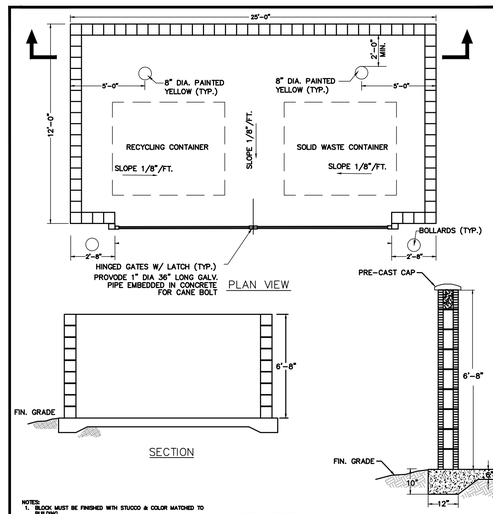


ON-SITE
ASPHALT PAVEMENT SECTION
N.T.S.

SIDEWALK CONSTRUCTION REQUIREMENTS

1. SIDEWALKS, BIKEPATHS, RAMPS, AND DRIVEWAY APRONS SHALL BE CONSTRUCTED OF PLAIN PORTLAND CEMENT CONCRETE HAVING A MAXIMUM SLUMP OF 3 INCHES, A MINIMUM DEVELOPED COMPRESSIVE STRENGTH OF 3000 P.S.I. IN 28 DAYS, AND A MINIMUM UNIFORM THICKNESS OF 4 INCHES WHERE INTENDED SOLELY FOR PEDESTRIAN TRAFFIC, AND 6 INCHES THICK WHERE MOTOR VEHICLES ARE LIKELY TO CROSS.
2. SIDEWALKS AND BIKEPATHS SHALL BE PLACED PARALLEL TO, AND ONE FOOT WITHIN THE RIGHT-OF-WAY LINE EXCEPT THAT THE CITY MAY APPROVE DEVIATIONS TO SAVE SPECIMEN TREES PROVIDED THAT THE SIDEWALK REMAINS WITHIN THE RIGHT-OF-WAY OR AN APPROVED SIDEWALK EASEMENT ABUTTING THE RIGHT OF WAY. SIDEWALKS AND BIKE PATHS SHOULD BE LOCATED AT LEAST 4 FEET FROM THE EDGE OF THE STREET PAVEMENT OR CURB UNLESS OTHERWISE APPROVED BY THE CITY.
3. THE TOP OF THE CONCRETE SHALL BE AT AN ELEVATION NO LOWER THAN THE CROWN OF THE ADJACENT ROADWAY, AND NO HIGHER THAN 6 INCHES ABOVE THE CROWN UNLESS APPROVED BY THE CITY TO MAKE A MORE NATURAL TRANSITION WITH THE ADJACENT LAND.
4. ISOLATION JOINTS (TYPE A JOINTS) SHALL BE PROVIDED BETWEEN EXISTING SLABS OR STRUCTURES AND FRESH CONCRETE, TO SEPARATE PEDESTRIAN SECTIONS FROM SECTIONS WHICH WILL ENCOUNTER VEHICLE TRAFFIC, TO SEPARATE FRESH PLACEMENT FROM CONCRETE WHICH HAS SET FOR MORE THAN 60 MINUTES, AND NO FARTHER APART THAN 100 FEET IN SIDEWALKS AND BIKEPATHS. JOINT MATERIAL SHALL BE AS SPECIFIED IN F.D.O.T. STANDARDS AND SPECIFICATIONS AND SHALL BE RUBBER, PLASTIC OR OTHER APPROVED NON-BIODEGRADABLE ELASTOMERIC MATERIAL. WOOD AND DECCA-DRAIN STYLE POOL DRAINS ARE STRICTLY PROHIBITED.
5. CONTROL JOINTS (TYPE B JOINTS) SHALL BE TOOLED INTO THE FRESH CONCRETE TO A DEPTH EQUAL TO 1/4 THE SLAB THICKNESS AND SPACED APART A DISTANCE EQUAL TO THE WIDTH OF THE SLAB OR 5 FEET WHICHEVER IS GREATEST.
6. THE SLAB SURFACE SHALL BE BROOM FINISHED TO BE SLIP RESISTANT, AND SHALL MATCH AS CLOSELY AS POSSIBLE THE FINISH OF EXISTING ADJACENT SLABS AND ALL EDGES SHALL BE TOOLED TO ELIMINATE SHARP CORNERS.
7. THE BEARING SUBSURFACE SHALL HAVE ALL ORGANIC, LOOSE, AND DELETERIOUS MATTER REMOVED, AND THE REMAINING CLEAN SOIL SHALL BE SMOOTH, SOUND, AND SOLID. ANY FILL MATERIAL SHALL BE COMPACTED WITH A VIBRATORY OR IMPACT COMPACTION MACHINE IN MAXIMUM 12 INCH LIFTS OR COMPACTED WITH A HAND TAMPER IN MAXIMUM 4 INCH LIFTS THE CITY SHALL REQUIRE A COMPACTION TEST FOR EACH LIFT IF THE TOTAL FILLED SECTION IS MORE THAN 12 INCHES DEEP OR IF THE SUBSURFACE HAS BEEN DISTURBED MORE THAN 12 INCHES DEEP. WHERE SUCH TEST IS REQUIRED, THE RESULTS SHALL SHOW A MINIMUM PROCTOR FIELD DENSITY OF 95 PERCENT.
8. ALL CONCRETE WORK IN THE RIGHT-OF-WAY SHALL BE INSPECTED BY THE CITY AFTER THE SUBSOIL IS PREPARED AND THE FORMS ARE SET, BUT BEFORE THE CONCRETE PLACEMENT BEGINS.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING THE FINISHED SLAB FROM ALL DAMAGE AND VANDALISM UNTIL THE CITY ACCEPTS OR APPROVES THE SLAB, AFTER WHICH TIME THE OWNER OF THE ABUTTING LAND SHALL BE RESPONSIBLE FOR THE SLAB IN ACCORDANCE WITH THE CITY CODE. ANY SLAB SECTION DAMAGED OR VANDALIZED PRIOR TO ACCEPTANCE OR APPROVAL SHALL BE CUT OUT BETWEEN JOINTS AND REPLACED. REPAIRS ARE NOT ACCEPTABLE.
10. SIDEWALKS LOCATED WITHIN THE RIGHT-OF-WAY SHALL NOT BE TINTED, STAINED, COLORED, OR COATED.
11. ALL FORMS SHALL BE REMOVED PRIOR TO ACCEPTANCE OR APPROVAL AND THE DISTURBED GROUND SHALL BE BACKFILLED, REGRADED, AND SODDED SO THAT THE WEAR SURFACE OF THE CONCRETE IS REASONABLY FLUSH WITH THE ADJACENT GRADE.
12. SUBSEQUENT TO SIDEWALK INSTALLATION ALL CONCRETE DEBRIS IS TO BE REMOVED AND DISPOSED OF IN A LAWFUL MANNER.

CONCRETE SIDEWALK
N.T.S.

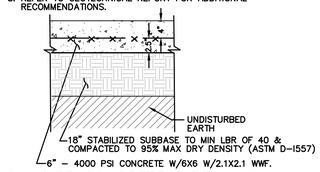


NOTES:
1. BLOCK MUST BE FINISHED WITH STUCCO & COLOR MATCHED TO BUILDING.
2. DUMPSTER STRUCTURE SHALL MEET THE REQUIREMENTS OF CHAPTER 2, ARTICLE 3, 2-50, 2 OF THE LAND DEVELOPMENT CODE (LDC).
3. SHRUB PLANTINGS REQUIRED (MIN. 3-FOOT WIDE PLANTING AREA) AROUND PERIMETER WALLS (EXCEPT OPENING).
4. GATES TO BE CONSTRUCTED OF PRESSURE-TREATED WOOD, OR APPROVED EQUAL.
5. THE CITY HAS A CONTRACTOR FOR ROLL OFF SERVICE. NO OTHER CONTRACTOR SHALL BE PERMITTED TO PROVIDE THIS SERVICE UNLESS UNDER CONTRACT WITH THE CITY.
6. DUMPSTER ENCLOSURE HEIGHT MAY BE INCREASED TO A MAXIMUM HEIGHT OF EIGHT (8) FEET.
7. IF BOLLARDS ARE INSTALLED CLEAR DEPTH MUST BE MEASURED FROM BOLLARDS TO GATES.

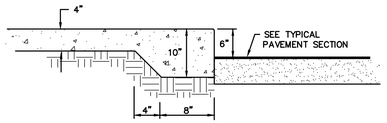
NOTE TO DESIGNER:
1. THIS DETAIL REFLECTS CITY DIMENSIONAL REQUIREMENTS FOR THE DUMPSTER ENCLOSURE ONLY.
2. PROVIDE PROPOSED WALL MATERIAL AND HORIZONTAL AND VERTICAL WALL REINFORCING REQUIREMENTS.
3. PROVIDE PROPOSED SLAB DESIGN REQUIREMENTS INCLUDING REINFORCING.
4. PROVIDE ANY OTHER CONSTRUCTION DETAILS THAT MAY BE REQUIRED.

DUAL-USE DUMPSTER ENCLOSURE DETAIL
NTS.

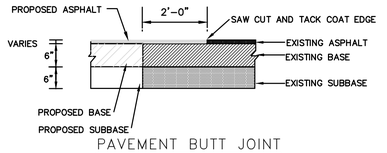
NOTES:
1. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI AT 28 DAYS, CONFORMANCE TO STRENGTH REQUIREMENTS SHALL BE DETERMINED BY ACI STANDARD 318, LATEST EDITION, SECTIONS 4.8.2.3 AND 4.8.3.
2. CONTRACTOR SHALL FURNISH A JOINTING PLAN TO ENGINEER FOR REVIEW BEFORE CONSTRUCTION COMMENCES.
3. REFER TO GEOTECHNICAL REPORT FOR ADDITIONAL RECOMMENDATIONS.



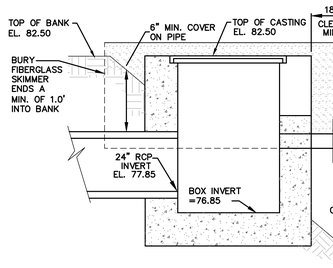
ON-SITE CONCRETE SIDEWALK
PAVEMENT SECTION
N.T.S.

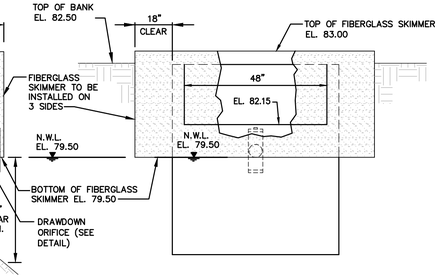


SIDEWALK THICKENED EDGE DETAIL
NTS

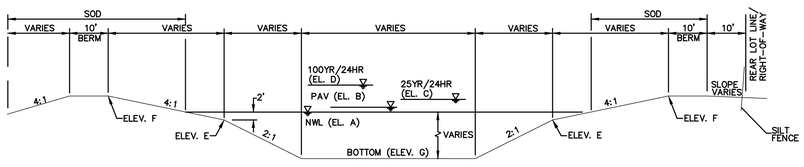


PAVEMENT BUTT JOINT
N.T.S.





DRAINAGE CONTROL STRUCTURES
DCS 1

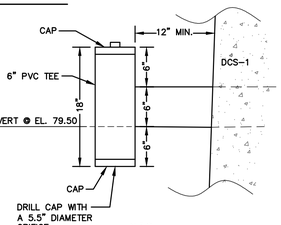


TYPICAL WET POND SECTION

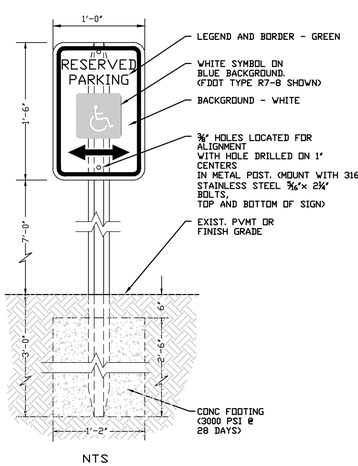
SCALE: NTS

STORMWATER MANAGEMENT POND ELEVATION DATA

STORMWATER MGMT. AREA	NWL ELEV. A	MEAN ANNUAL ELEV. B	25 YR-24 HR ELEV. C	100YR-24 HR ELEV. D	GRADE BRK ELEV. E	BERM ELEV. F	BOTTOM ELEV. G
DA-1	79.50	80.25	81.36	82.15	77.50	82.50	71.00



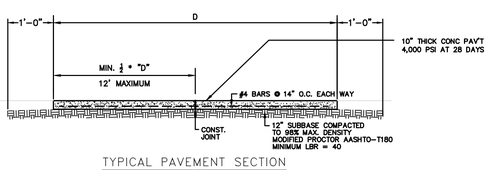
N.T.S.
ORIFICE TEE DETAIL



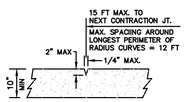
NTS

NOTES:
1. HANDICAP PARKING SIGN SHALL CONFORM WITH CURRENT FEDERAL, STATE LOCAL & ADA CODES & REGULATIONS, LATEST EDITION.
2. SIGNS WILL BE FABRICATED BY USING A REFLECTING COATING IN THE SYMBOL, MESSAGE AND BORDERS APPLIED TO A SHEET ALUMINUM BACKING (12"x18"x0.80").
3. LEGEND, SYMBOL AND BOARDER SIZES SHALL BE IN ACCORDANCE WITH THE MUTCD AND STANDARD HIGHWAY SIGNS MANUAL, LATEST EDITION.
4. THE SYMBOL IS COMPOSED OF TWO ELEMENTS, A WHITE WHEEL-CHAIR FIGURE (WHICH SHOULD ALWAYS FACE RIGHT) ON A SQUARE BACKGROUND, INTERNATIONAL BLUE IN COLOR (FED. STD. 595a, COLOR #15180).
5. METAL SIGN POSTS TO BE GALVANIZED U-IRON. ALL BOLTS, NUTS, WASHERS AND SCREWS MUST BE 316 STAINLESS STEEL.
6. CONCRETE FOOTING SHALL BE OF PORTLAND CEMENT AND HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 P.S.I.
7. SIGN POST SHALL BE MINIMUM 2'-0" CLEAR FROM BACK OF CURB OR WHEEL STOP.
8. SIGN POST SHALL BE DESIGNED TO WITHSTAND 120 M.P.H. WIND LOAD.

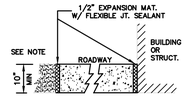
HANDICAP PARKING SIGN DETAIL
NTS



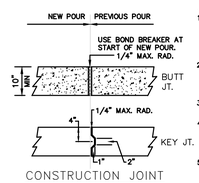
TYPICAL PAVEMENT SECTION
N.T.S.



CONTRACTION JOINT
N.T.S.



EXPANSION JOINT
N.T.S.



CONSTRUCTION JOINT
N.T.S.

NOTES:
1. CONTRACTION JTS. MAY BE HAND FORMED, SAWED OR CONSTRUCTED W/ A 1/4" PREMOLDED FILLER JT. JOINTS MUST BE SAWED BETWEEN 4 AND 18 HOURS AFTER CONCRETE HAS BEEN PLACED.
2. EXPANSION JOINTS TO BE PLACED BETWEEN ROADWAY AND CURB. ALSO AT ANY PERMANENT STRUCTURE ABUTTING OR WITHIN THE PAVED AREA INCLUDING SIDEWALKS.
3. USE OF WOOD IS NOT AN ACCEPTABLE ALTERNATIVE TO FLEXIBLE JOINT SEALANTS.
4. FINAL DETERMINATION OF CONSTRUCTION JOINT SELECTION AND APPLICATION SHALL BE PROVIDED BY THE CONTRACTOR IN A SHOP DRAWING TO THE ARCHITECT AND ENGINEER FOR REVIEW.
5. CONSTRUCTION JOINTS WITHIN THE SLAB AREA SHOULD NOT CONTAIN PREMOLDED EXPANSION JOINT FILLER.
6. CONCRETE PAVEMENT CONSTRUCTION SHALL BE IN ACCORDANCE WITH A.C.I. PUBLICATION ACI 330R-87.

HEAVY DUTY CONCRETE PAVEMENT DETAILS

ZEV COHEN & ASSOCIATES, INC.
300 INTERCHANGE BLVD., STE. C
ORMOND BEACH, FL 32174
WWW.ZEVCOHEN.COM

CIVIL ENGINEERING
LANDSCAPE ARCHITECTURE
ENVIRONMENTAL
PLANNING
TRANSPORTATION
(LC 42)
(EB 6516)

NO.	DATE	BY	SUBMITTALS / REVISIONS
1	10-09-24	MH	CITY COMMENTS
2	10-21-24	MH	SJRWMD COMMENTS
3	02-25-25	MH	SJRWMD COMMENTS
4	04-10-25	MH	CLIENT REVISION

DELAND DUPONT WAREHOUSE
FINAL ENGINEERING PLANS
CONSTRUCTION DETAILS

VOLUSIA COUNTY, FLORIDA
CITY OF DELAND

PROJECT NO: ZC 23310
DESIGNED BY: MW
DRAFTED BY: MH
CHECKED BY: SK
DRAWING FILE: 10-12_23310 DET

KRISTOPHER T. ROWLEY, P.E. NO. 84263
SPENCER H. KERSHAW, P.E. NO. 96683
NOT VALID WITHOUT SEAL

SHEET: C11 OF 12

R:\23310 DELAND AIRPORT PARCEL 17 & 18\FINAL ENGINEERING PLANS\ACAD\ENG\10-12_23310 DET.DWG - PRINTED 6/4/2025 4:19 PM

ZEV COHEN & ASSOCIATES, INC.
300 INTERCHANGE BLVD., STE. C
ORMOND BEACH, FL 32174
WWW.ZEVCOHEN.COM

CIVIL ENGINEERING
LANDSCAPE ARCHITECTURE
ENVIRONMENTAL
PLANNING
TRANSPORTATION
(LC #2)
(EB 6519)

NO	DATE	BY	SUBMITTALS / REVISIONS
1	10-09-24	MH	CITY COMMENTS
2	10-21-24	MH	SJRWMD COMMENTS
3	02-25-25	MH	SJRWMD COMMENTS

DELAND DUPONT WAREHOUSE
FINAL ENGINEERING PLANS
TRUCK AUTOTURN EXHIBIT

CITY OF DELAND — VOLUSIA COUNTY, FLORIDA

PROJECT NO: ZC 23310

DESIGNED BY: MH

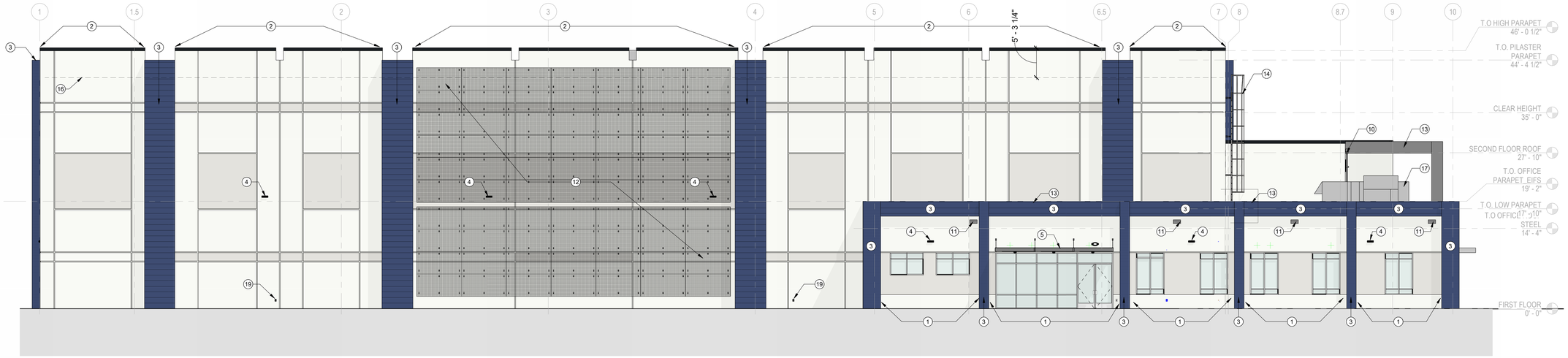
DRAFTED BY: OB

CHECKED BY: SK

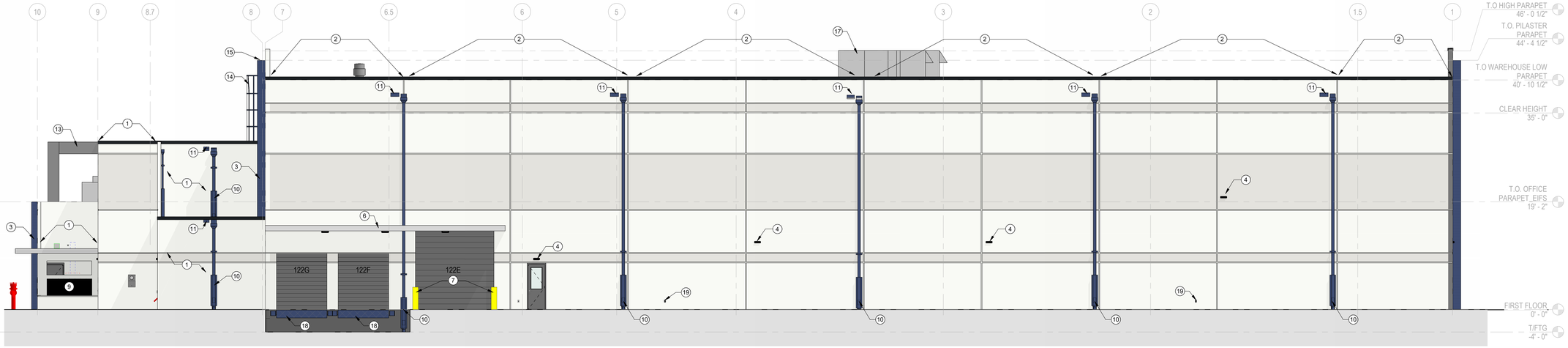
DRAWING FILE: 23310-AUTOTURN EXHIBIT
XREF'S: 23310_BAS.DWG
XREF'S: 23310_SURV.DWG

KRISTOPHER T. ROWLEY, P.E. NO. 84263
SPENCER H. KERSHAW, P.E. NO. 96663
NOT VALID WITHOUT SEAL

SHEET: C12 OF 12



2 PLAN SOUTH ELEVATION (TRUE EAST)
1/8" = 1'-0"



1 PLAN NORTH ELEVATION (TRUE WEST)
1/8" = 1'-0"

EXTERIOR ELEVATION LEGEND

A. REF: EXTERIOR ELEVATIONS FOR ADDITIONAL INFORMATION
B. BASIS OF DESIGN FOR PAINT: SHERWIN WILLIAMS OR APPROVED EQUIVALENT

- SOLID - DRAKE GRAY - ACCENT PAINT
- SOLID - DIGNIFIED - ACCENT PAINT
- SOLID - FIRST STAR - ACCENT PAINT
- SOLID - EXTRA WHITE - ACCENT PAINT
- GLAZING - VISION

EXTERIOR ELEVATION KEYED NOTES (X)

1. 7.25" NOMINAL SITE CAST TILT UP PANEL AT THE OFFICE.
2. 10.25" NOMINAL SITE CAST TILT UP PANEL AT THE WAREHOUSE.
3. DRYVIT 1" EIFS SYSTEM ATTACHED TO 12" STUD BACK-UP. STUCCO COLOR: SW6538 (SHERWIN WILLIAMS, DIGNIFIED).
4. EXTERIOR LIGHT FIXTURE. REF: ELECTRICAL.
5. MEDIUM GRAY CANTILEVERED METAL CLAD CANOPY; BASIS OF DESIGN: MAPES CANOPIES - LUMISHADE.
6. MEDIUM GRAY PRE-ENGINEERED ALUMINUM CANOPY.
7. 12" DIA. CONC. FILLED PIPE BOLLARD PAINT PT-6. REF: CIVIL.
8. ROOF TOP EQUIPMENT, REF: MECH DWGS.
9. LOUVER. REF: MECHANICAL M1.4, FINISH: SILVER - METALLIC.
10. 4" X 6" SCUPPER AND DOWNSPOUT. FINISH TO BE PAINTED SW6538 (SHERWIN WILLIAMS, DIGNIFIED). DOWNSPOUT TO BE CONNECTED TO CIVIL BOOT.
11. 6" X 10" OVERFLOW THRU-WALL SCUPPER.
12. INFRASTRUCTURE DEDICATED FOR EXTERIOR GREEN WALL SYSTEM.
13. ALUMINUM PERGOLA SYSTEM TO COVER ACCESSIBLE ROOF TERRACE AREA. REFER TO ROOF PLAN FOR EXTENTS.
14. EXTERIOR OSHA REQUIRED ROOF LADDER.
15. EXTENDED FASCIA AND METAL COPING TO COVER TOP OF EIFS SYSTEM.
16. DASHED LINE INDICATING ROOF LINE BEYOND.
17. RTU EQUIPMENT. REF: MECHANICAL DWGS
18. EDGE OF DOCK LEVELER. FINAL MANUFACTURER TO BE VERIFIED BY OWNER
19. HOSE BIB; REF: PLUMBING DWGS

LDG
Larson Design Group
1000 COMMERCE PARK DRIVE
SUITE 201
WILLIAMSPORT, PA 17701
(877) 323-6603

SUBCONSULTANT

STATE OF FLORIDA
MICHAEL W. WILLIAMS
REGISTERED
AR102289
9-17-2024
REGISTERED ARCHITECT
SEAL

Roger Williams

COMMENTS

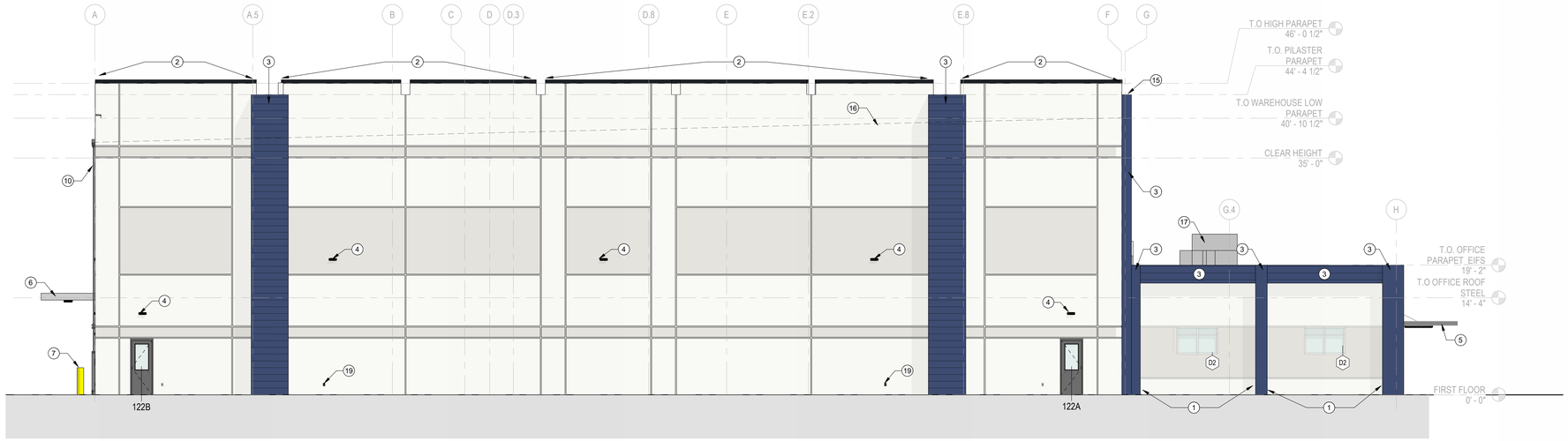
MARK	DATE

225 DUPONT LLC WAREHOUSE
DELAND AIRPORT PARCELS 17 &18; DELAND, VOLUSIA COUNTY, FL 32724

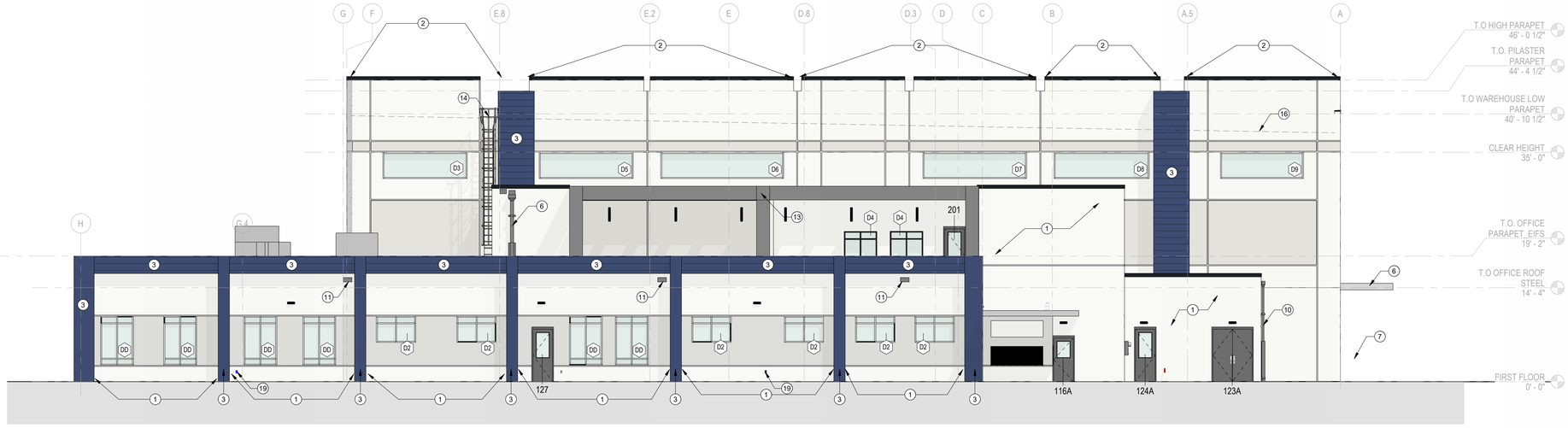
NORTH AND SOUTH ELEVATIONS
60% DESIGN DEVELOPMENT

Date: 2024-09-16
Project No.: 13650-002
Sheet No.: **A-201**

60% DD SUBMISSION



2 PLAN WEST ELEVATION (TRUE SOUTH)
1/8" = 1'-0"



1 PLAN EAST ELEVATION (TRUE NORTH)
1/8" = 1'-0"

EXTERIOR ELEVATION LEGEND

A. REF: EXTERIOR ELEVATIONS FOR ADDITIONAL INFORMATION
B. BASIS OF DESIGN FOR PAINT: SHERWIN WILLIAMS OR APPROVED EQUIVALENT

- SOLID - DRAKE GRAY - ACCENT PAINT
- SOLID - DIGNIFIED - ACCENT PAINT
- SOLID - FIRST STAR - ACCENT PAINT
- SOLID - EXTRA WHITE - ACCENT PAINT
- GLAZING - VISION

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6. MEDIUM GRAY PRE-ENGINEERED ALUMINUM CANOPY.
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9. LOUVER. REF: MECHANICAL M1.4, FINISH: SILVER - METALLIC.
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16. DASHED LINE INDICATING ROOF LINE BEYOND.
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18. EDGE OF DOCK LEVELER. FINAL MANUFACTURER TO BE VERIFIED BY OWNER
19. HOSE BIB; REF: PLUMBING DWGS

LDG
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1000 COMMERCE PARK DRIVE
SUITE 201
WILLIAMSPORT, PA 17701
(877) 323-6603

SUBCONSULTANT

SEAL
STATE OF FLORIDA
MICHAEL W. WILLIAMS
AR102289
9-17-2024
REGISTERED ARCHITECT

Roger Williams

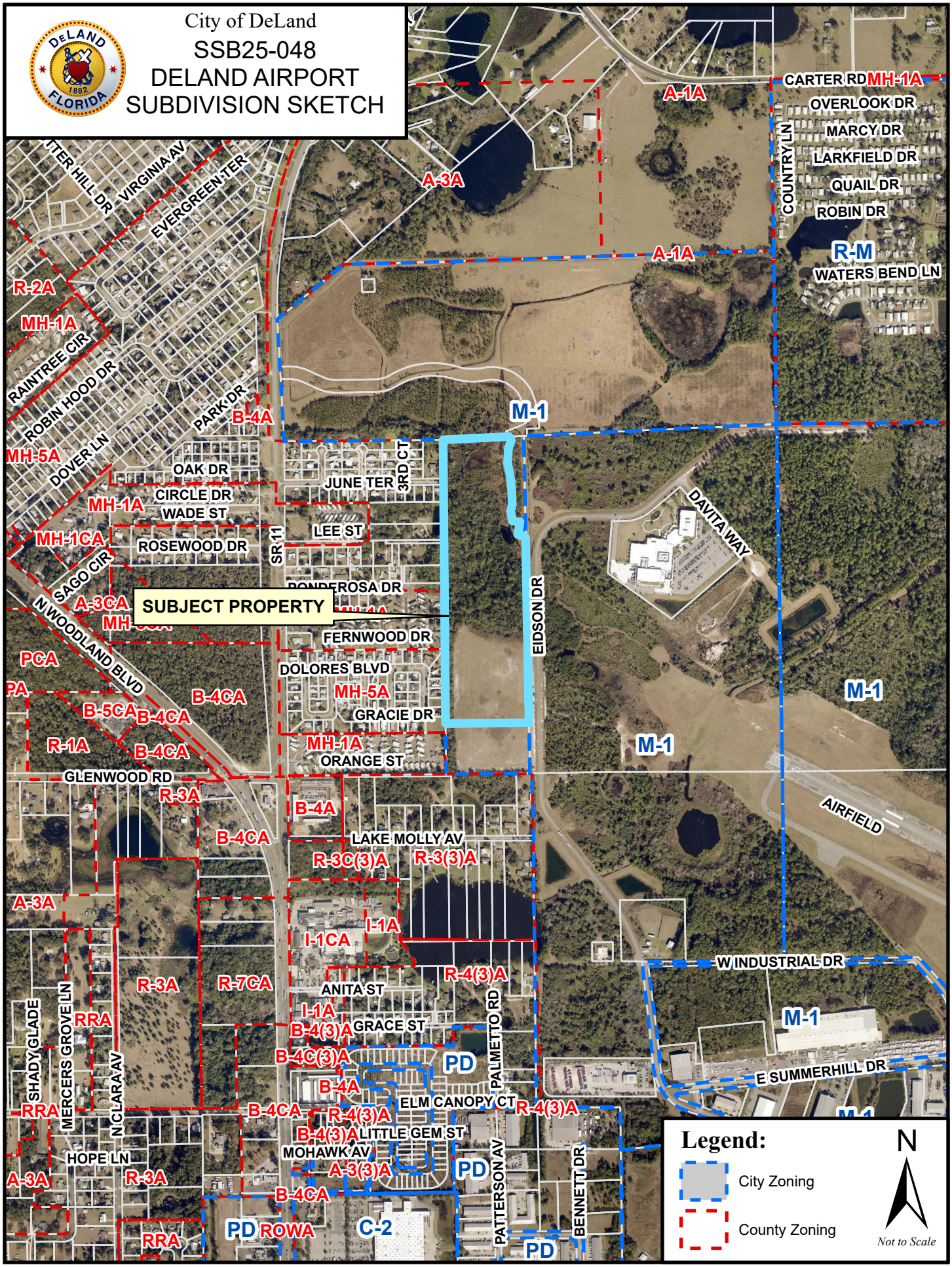
COMMENTS | DATE | MARK

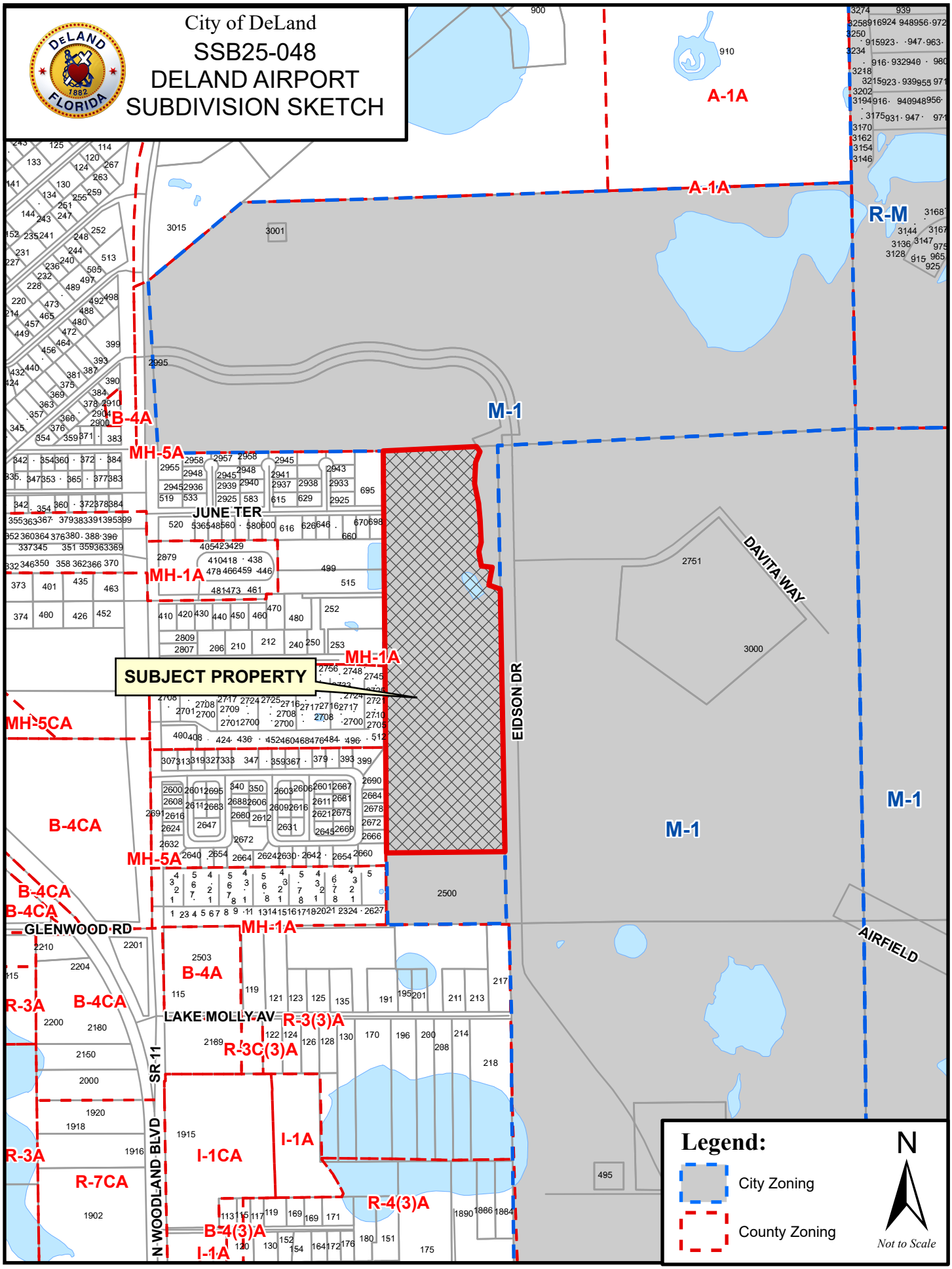
225 DUPONT LLC WAREHOUSE
DELAND AIRPORT PARCELS 17 &18; DELAND, VOLUSIA COUNTY, FL 32724

EAST AND WEST ELEVATION
60% DESIGN DEVELOPMENT

Date: 2024-09-16
Project No.: 13650-002
Sheet No.: **A-202**

60% DD SUBMISSION


City of DeLand
SSB25-048
DELAND AIRPORT
SUBDIVISION SKETCH
SUBJECT PROPERTY
CARTER RD
OVERLOOK DR
MARCY DR
LARKFIELD DR
QUAIL DR
ROBIN DR
COUNTRY LN
WATERS BEND LN
VIRGINIA AV
EVERGREEN TER
RAINTREE CIR
ROBIN HOOD DR
PARK DR
DOVER LN
OAK DR
CIRCLE DR
WADE ST
ROSEWOOD DR
SAGO CIR
JUNE TER
3RD CT
LEE ST
SR 11
PONDEROSA DR
FERNWOOD DR
DOLORES BLVD
GRACIE DR
ORANGE ST
N WOODLAND BLVD
GLENWOOD RD
LAKE MOLLY AV
ANITA ST
GRACE ST
ELM CANOPY CT
LITTLE GEM ST
MOHAWK AV
HOPE LN
SHADY GLADE
MERCERS GROVE LN
N CLARA AV
PALMETTO RD
PATTERSON AV
BENNETT DR
EIDSON DR
DAVITA WAY
AIRFIELD
W INDUSTRIAL DR
E SUMMERHILL DR
A-1A
A-3A
R-M
M-1
PD
C-2
PD ROWA
R-2A
MH-1A
MH-5A
MH-1CA
A-3CA
PCA
B-4A
B-4CA
B-5CA
R-1A
R-3A
R-7CA
R-3C(3)A
R-3(3)A
R-4(3)A
B-4C(3)A
B-4(3)A
A-3(3)A
I-1A
I-1CA
RRA
Legend:
City Zoning
County Zoning
N
Not to Scale


City of DeLand
SSB25-048
DELAND AIRPORT
SUBDIVISION SKETCH
SUBJECT PROPERTY
A-1A
R-M
M-1
B-4A
MH-5A
MH-1A
MH-5CA
B-4CA
R-3A
R-3(3)A
R-3C(3)A
I-1A
I-1CA
R-7CA
R-4(3)A
B-4(3)A
JUNE TER
DAVITA WAY
EIDSON DR
AIRFIELD
GLENWOOD RD
LAKE MOLLY AV
SR 11
N WOODLAND BLVD
Legend:
City Zoning
County Zoning
N
Not to Scale

PLANNING DIVISION STAFF REPORT
TO
THE CITY OF DELAND PLANNING BOARD

June 11, 2025

A. APPLICATION NO.: SSB25-048 *(Dupont Sketch Plan)*

Applicant: Zev Cohen & Associates

Request: Subdivision sketch plan review to include 2 lots and 2 tracts (Stormwater Tract and Tree Preservation Area (TPA) Tract)

Applicable Ordinance: Article 13, Sec. 33-146.02 Subdivision sketch plans

B. SITE FACTORS:

Location: Eidson Dr. (602800000050)

Parcel Size: ± 30.85 acres

Existing Land Use: Industrial & Airport Overlay

Existing Zoning: M-1 (Industrial District)

	SURROUNDING USE:	SURROUNDING ZONING:
North:	Industrial & Airport Overlay	M-1
South:	VC: COM & MXZ *(Commercial & Mixed-Use Zone)*	VC: R-3 *(Urban Single-Family Residential)*
East:	Industrial & Airport Overlay	M-1
West:	VC: UMI *(Urban Medium Intensity)*	VC: MH-1 & MH-5 *(Mobile Home Park & Urban Mobile Home)*

C. ANALYSIS:

City staff reviewed the application for consistency with the Land Development Regulations, and the Comprehensive Plan. The M-1 zoning district as outlined in the Land Development Regulations (LDR), establishes a minimum lot size of 9,000 sq. ft., a minimum width of 75 feet, and a maximum of 70% impervious surface area.

The proposed DeLand Dupont Sketch Plan shows a preliminary lot layout for future development on an existing vacant, undeveloped ±36.85 acres site. The area included in the sketch plan currently consists of two (2) separate parcels *(Parcel ID#'s 602800000052 & 602800000050)* totaling ±36.92 acres.

The sketch plan exhibit shows four (4) lots and two (2) tracts. However, the proposed 'lot 1' *(±6.07 acres) (Parcel ID# 602800000052)*, will no longer be included with the preliminary plat, as this parcel can stand alone and meet all of the development standards on its own. This parcel was included in a previous minor subdivision (MS24-139) which met the subdivision exemption criteria as outlined within LDR Section 33-145.03(b). Resulting in the preliminary and final plat to include only parcel 2 *(Parcel ID# 602800000050)* totaling ±30.85 acres.

The preliminary and final plat will exclude parcel 1 from the minor subdivision and further subdivide parcel 2, resulting in two (2) lots and two (2) tracts. The initial sketch plan submittal included four (4) lots and two (2) tracts to provide shared stormwater and Tree Preservation Area (TPA). However, due to project timing, the owner of parcel 1 redesigned their site to accommodate on-site stormwater and Tree Preservation Area (TPA). The preliminary plat will reflect the exclusion of parcel 1, and the desire for shared stormwater and Tree Preservation Area (TPA) for lots 1 and 2 in the subdivision.

At this time, the overall removal of parcel 1 as shown on the plans at 'lot 1' has not been addressed. The proposed layout of Tree Protection Area (tract A), Stormwater Area (tract B), lot 1 and lot 2 have been shown on the sketch plan, however at the time of preliminary plat, the boundary and size of each tract and lot will need to be updated and labeled correctly, as required in the Land Development Regulations. The primary access point for the two (2) proposed lots will be from the existing improved Eidson Drive.

The sketch plan is the first phase in the subdivision process. Following the sketch plan, the applicant will need to submit a Preliminary Plat, followed by a Final Plat. Separate site plan applications will be required for any future development on the lots. The purpose of the sketch plan is to allow the Planning Board to provide the applicant with comments prior to the submittal of preliminary and final plat application. As part of the preliminary and final plats, engineering construction plans are required. No official action is needed by the Planning Board for a sketch plan.

The Technical Review Committee reviewed the sketch plan on April 17, 2025. In response to the TRC review comments, although not required, the Applicant revised the plans and submitted the attached plan on May 15, 2025. While not required, some of the Technical Review Committee (TRC) comments have been addressed with the resubmittal, there are a few additional comments which are outlined below. The applicant will need to address these comments, along with comments from the Planning Board, as part of the preliminary plat application. The sketch plan will remain valid for one (1) year.

C. STAFF COMMENTS TO BE ADDRESSED WITH PRELIMINARY/FINAL PLAT

Planning Division

The applicant has been provided a red-lined version of the sketch plan to address the following comments with their preliminary plat submittal, in addition to any comments from the Planning Board:

1. Remove parcel 1, as shown on the plans as 'lot 1' *(±6.07 acres) (Parcel ID# 602800000052).*
2. Update the acres/square footage in the site data table to reflect the removal of parcel 1, as shown on the plans as 'lot 1' *(±6.07 acres) (Parcel ID# 602800000052).*
3. Show and label the Tree Preservation Area as 'Tract A' and include the total size (in acres and sq. ft).
4. Show and label the Stormwater Area as 'Tract B' and include the total size (in acres and sq. ft).
5. Update the project description to reflect the correct existing and proposed number of parcels.
6. Update the site data table to reflect the following:
    a. The correct acres/square footage after the removal of parcel 1, as shown on the plans as 'lot 1' (±6.07 acres) (Parcel ID# 602800000052).

b. Tree Preservation Area as ‘Tract A’ and include the total size (in acres and sq. ft).
c. Stormwater Area as ‘Tract B’ and include the total size (in acres and sq. ft).
d. New lot 1 & lot 2 and include the correct total size (in acres and sq. ft).
e. Update the name of the plat if Dupont is not longer included in the plan.

D. PLANNING BOARD ACTION:

No formal action is required by the City of DeLand Planning Board, the board shall review the sketch plan application and provide comments for the applicant to include within the Preliminary and Final Plat applications.

DELAND DUPONT WAREHOUSE

CITY OF DELAND - VOLUSIA COUNTY, FL

~~FINAL ENGINEERING PLANS~~

Preliminary Plat

OWNER:

JAMES SKINNER
1306 STONE STREET
DELAND, FL 32720
PHONE NUMBER
FAX NUMBER
CONTACT: JAMES SKINNER
e-mail: jamesskinner@greenwaym.com

OWNER:

UNIFIED INC.
225 DUPONT STREET
PLAINVIEW, NY 11803
PHONE NUMBER: (646) 327-4173
FAX NUMBER
CONTACT PERSON: ERIC CHEN
e-mail: echen@leatherracc.com

CIVIL ENGINEER:

ZEV COHEN & ASSOCIATES, INC.
300 INTERCHANGE BLVD, SUITE C
ORMOND BEACH, FL 32174
PHONE NUMBER: (386) 677-2482
FAX NUMBER: (386) 677-2505
e-mail: SPENCER KERSHAW, P.E.
e-mail: skershaw@zevcohen.com

SURVEYOR:

BLACKWELL & ASSOCIATES LAND SURVEYORS, INC
995 W VOLUSIA AVE
DELAND, FL 32720
PHONE NUMBER: (386) 734-8050
FAX NUMBER: (386) 734-7660
CONTACT PERSON: ROBERT R. EVERS
e-mail: info@blackwellsurveying.co

GEOTECHNICAL ENGINEER:

UNIVERSAL ENGINEERING SCIENCES
911 BEVILLE ROAD, SUITE 3
SOUTH DAYTONA, FL 32119
PHONE NUMBER: (386) 756-1105
FAX NUMBER: (386) 760-4067
CONTACT PERSON: MICHAEL MOHNEY
e-mail: mmohney@teamues.com

LANDSCAPE ARCHITECT:

ZEV COHEN & ASSOCIATES, INC.
300 INTERCHANGE BLVD, SUITE C
ORMOND BEACH, FL 32174
PHONE NUMBER: (386) 677-2482
FAX NUMBER: (386) 677-2505
CONTACT PERSON: JAKE STEHR, RLA
e-mail: jstehr@zevcohen.com

PROJECT DESCRIPTION:

THIS PRELIMINARY PLAT PROPOSES THE SUBDIVISION OF ~~TWO~~ ONE EXISTING COMMERCIAL PARCELS INTO ~~THREE~~ TWO BUILDABLE COMMERCIAL LOTS ALONG WITH A TREE PRESERVATION TRACT AND ~~A~~ STORMWATER AREA TRACT.

SITE INFORMATION:	
SITE ADDRESS:	2500 EIDSON DRIVE, DELAND, FL 32724
PROJECT AREA:	~~36.92 AC~~ Update to reflect the removal of the 6.03 "lot 1"
TAX PARCEL I.D. #:	602800000050, ~~602800000052~~
EXISTING ZONING:	M-1 INDUSTRIAL
PROPOSED ZONING:	M-1 INDUSTRIAL
EXISTING LAND USE:	INDUSTRIAL
PROPOSED LAND USE:	INDUSTRIAL
EXISTING FUTURE LAND USE:	INDUSTRIAL

VICINITY MAP
SCALE: 1" = 250'

Update maps to reflect correct project area

ZONING MAP
SCALE: 1" = 250'
CURRENT ZONING FOR THIS SITE IS: M-1

SHEET INDEX:

NOTE: THE SCALE OF THESE PLANS MAY HAVE CHANGED DUE TO REPRODUCTION.

ZEV COHEN & ASSOCIATES, INC.
300 INTERCHANGE BLVD., STE C
ORMOND BEACH, FL 32174
WWW.ZEVCOHEN.COM

CIVIL ENGINEERING | LANDSCAPE ARCHITECTURE | ENVIRONMENTAL | PLANNING | TRANSPORTATION
(LC 42)
(EB 6516)

NO.	DATE	BY	SUBMITTALS / REVISIONS

DELAND DUPONT WAREHOUSE
~~FINAL ENGINEERING PLANS~~
COVER SHEET
VOLUSIA COUNTY, FLORIDA
CITY OF DELAND

PROJECT NO: ZC 23310
DESIGNED BY: MW
DRAFTED BY: MH
CHECKED BY: SK
DRAWING FILE: 23310 PRELIM PLAT

KRISTOPHER T. ROWLEY, P.E. NO. 84263
NOT VALID WITHOUT SEAL

SHEET: 1 OF 2

Add a title

Seperate the legend from this table - have it stand on its own.

Include a column for the purpose of each lot and tract

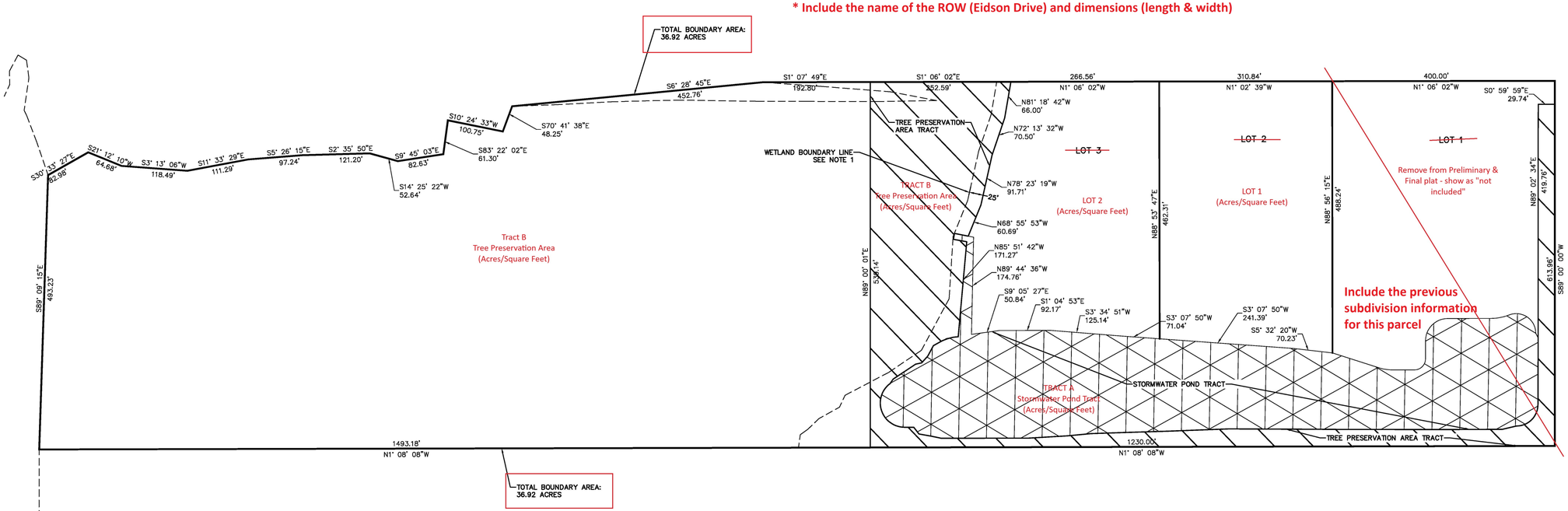
TRACT	LEGEND	AREA (SF/AC)	OWNERSHIP	MAINTENANCE	ZONING
STORMWATER POND		193,406 / 4.44	JAMES SKINNER	UNIFIED INC.	M-1 INDUSTRIAL
TREE PRESERVATION AREA		151,589 / 3.48	JAMES SKINNER	JAMES SKINNER	M-1 INDUSTRIAL
~~LOT 1~~		~~173,369 / 3.98~~	~~UNIFIED INC.~~	~~UNIFIED INC.~~	~~M-1 INDUSTRIAL~~
LOT 2		147,233 / 3.38	JAMES SKINNER	JAMES SKINNER	M-1 INDUSTRIAL
LOT 3		142,006 / 3.26	JAMES SKINNER	JAMES SKINNER	M-1 INDUSTRIAL
~~LOT 4~~		~~800,633 / 18.38~~	~~JAMES SKINNER~~	~~JAMES SKINNER~~	~~M-1 INDUSTRIAL~~
TOTAL BOUNDARY AREA=		1,608,235 / 36.92	Update to reflect the correct acres/square feet		

0 50 100 150 200

SCALE : 1" = 100'

NOTES:
1. ANY ACTIVITY WITHIN WETLAND AREAS WILL REQUIRE MITIGATION THROUGH THE SJRWMD OR A 25' BUFFER FROM WETLAND EDGE.
2. WETLAND SIGNS SHALL BE PLACED NO FURTHER THAN 50 FEET APART OR EVERY CHANGE IN DIRECTION, WHICHEVER IS LESS, LANDWARD OF THE UPLAND BUFFER BOUNDARIES WITH ROADS, COMMON AREA, OR LOTS.
3. NO BURNING OF LAND CLEARING DEBRIS IS ALLOWED WITHIN THE CITY OF DELAND.

* Include the name of the ROW (Eidson Drive) and dimensions (length & width)



* Include all the surrounding lots/subdivision names and information

* Tracts do not need to be hatched, they just need to be solid lines and labeled with the name and size (in acres/square feet)

ZEV COHEN & ASSOCIATES, INC.
300 INTERCHANGE BLVD., STE. C
OWENSBORO, KY. 42301
WWW.ZEVCOHEN.COM

CIVIL ENGINEERING | LANDSCAPE ARCHITECTURE | ENVIRONMENTAL | PLANNING | TRANSPORTATION

(LC 62)

(EB 4918)

NO.	DATE	BY	SUBMITTALS / REVISIONS

DUPONT SKETCH PLAT

VOLUSIA COUNTY, FLORIDA

CITY OF DELAND

PROJECT NO: ZC 23310

DESIGNED BY: MW

DRAFTED BY: MH

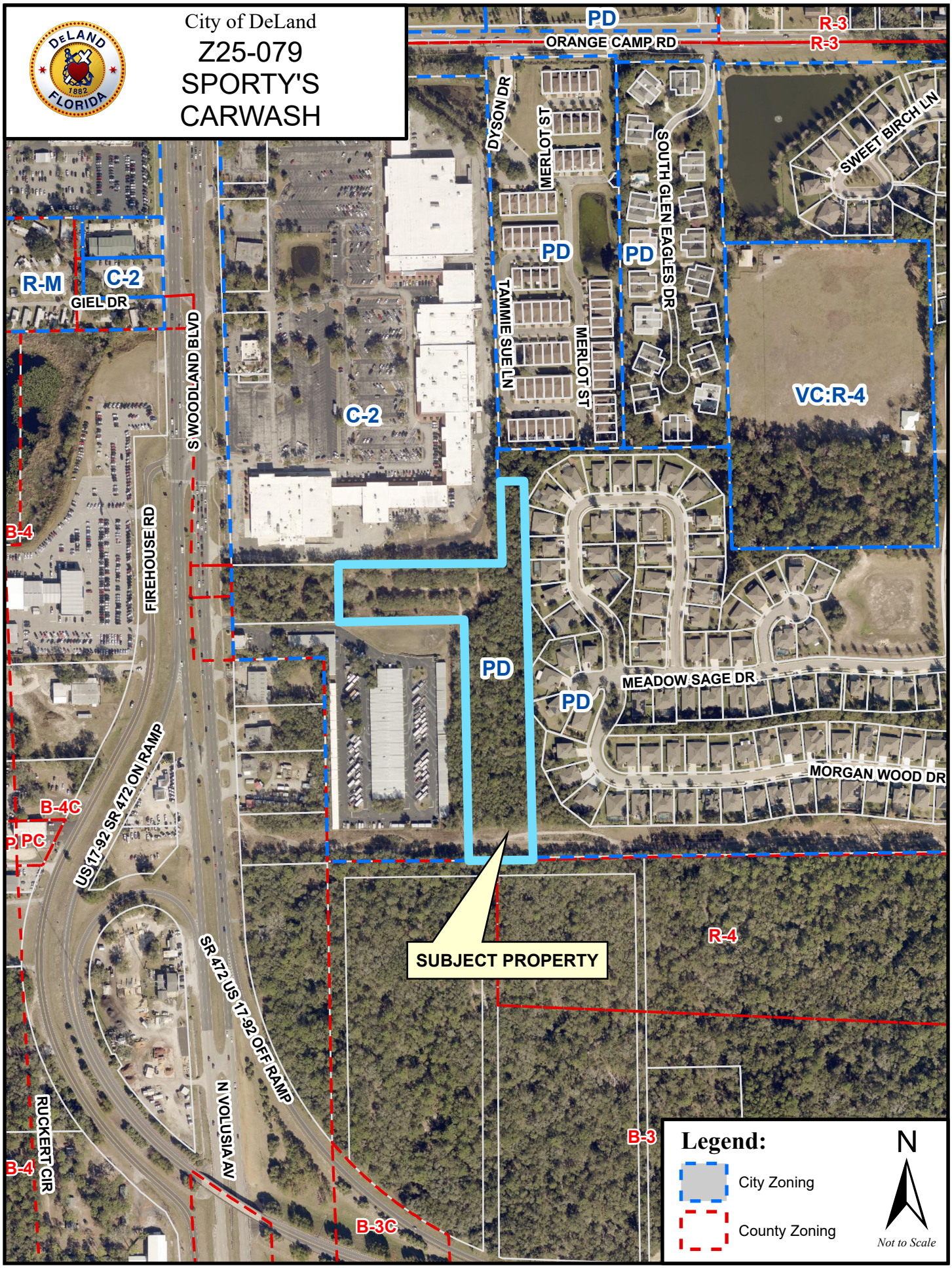
CHECKED BY: SK

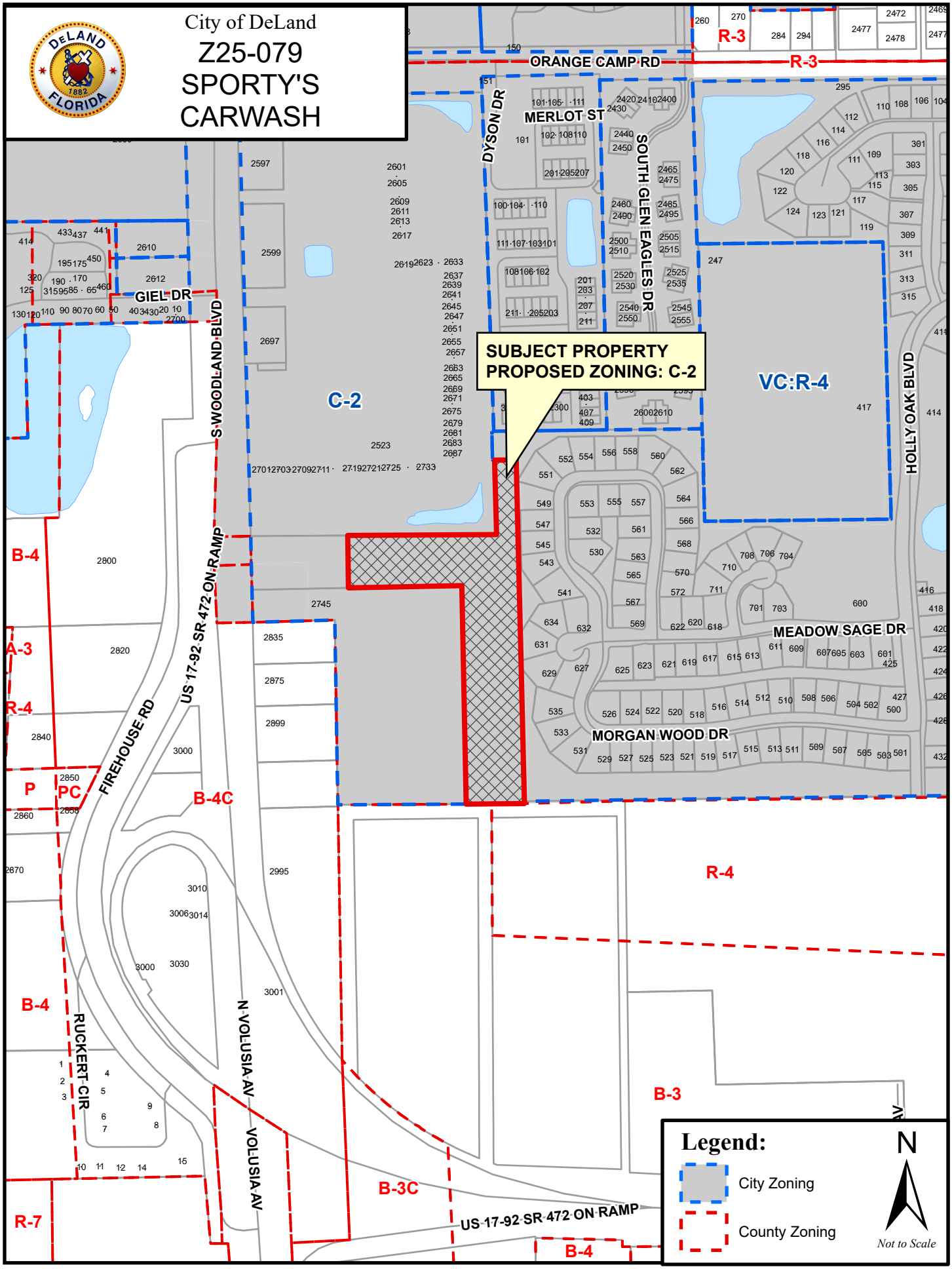
DRAWING FILE: 23310 PRELIM PLAT
XREF'S: 23310_SURV.DWG

KRISTOPHER T. ROWLEY, P.E. NO. 84263
SPENCER H. KERSHAW, P.E. NO. 96663
NOT VALID WITHOUT SEAL

SHEET: 2 OF 2

R:\23310 DELAND AIRPORT PARCEL 17 & 18\FINAL ENGINEERING PLANS\CADD\DWGS\23310 PRELIM PLAT.DWG — PRINTED 5/8/2023 2:32 PM


City of DeLand
Z25-079
SPORTY'S
CARWASH
PD
ORANGE CAMP RD
R-3
R-3
DYSON DR
MERLOT ST
SOUTH GLEN EAGLES DR
SWEET BIRCH LN
PD
PD
TAMMIE SUE LN
MERLOT ST
VC:R-4
R-M
C-2
GIEL DR
S WOODLAND BLVD
C-2
B-4
FIREHOUSE RD
PD
PD
MEADOW SAGE DR
MORGAN WOOD DR
B-4C
P PC
US 17-92 SR 472 ON RAMP
SUBJECT PROPERTY
R-4
SR 472 US 17-92 OFF RAMP
N VOLUSIA AV
RUCKERT CIR
B-4
B-3C
B-3
Legend:
City Zoning
County Zoning
N
Not to Scale


City of DeLand
Z25-079
SPORTY'S
CARWASH
SUBJECT PROPERTY
PROPOSED ZONING: C-2
ORANGE CAMP RD
DYSON DR
MERLOT ST
SOUTH GLEN EAGLES DR
GIEL DR
S WOODLAND BLVD
US 17-92 SR 472 ON RAMP
FIREHOUSE RD
RUCKERT CIR
N VOLUSIA AV
VOLUSIA AV
HOLLY OAK BLVD
MEADOW SAGE DR
MORGAN WOOD DR
C-2
VC:R-4
R-3
R-4
B-4
A-3
P
PC
B-4C
B-3
B-3C
R-7
Legend:
City Zoning
County Zoning
N
Not to Scale

PLANNING DEPARTMENT STAFF REPORT
TO
PLANNING BOARD

June 11, 2025

A. APPLICATION NO.: Z25-079

STAFF PLANNER: Kendall Story

APPLICANT: Jessica Gow, CobbCole

REQUEST: Rezone from Mainstreet Townhomes Planned Development, to City C-2 (General Commercial)

APPLICABLE REGULATIONS:

Article XII ADMINISTRATION AND ENFORCEMENT
Sec. 33-135 – Procedure for text amendments & rezoning.

B. SITE FACTORS:

Location:	S. Woodland Blvd., east of Firehouse Rd.
Size:	±7.35 acres
Land Use:	HC (Highway Commercial)
Existing Zoning:	Mainstreet Townhomes PD
Existing Use:	Vacant

	SURROUNDING LAND USE:	SURROUNDING ZONING:
North:	HC (Highway Commercial)	C-2 (General Commercial)
South:	VC: COM (Commercial)/HC (Highway Commercial)	VC: B-3 (Shopping Center)/C-2 (General Commercial)
East:	LDR (Low Density Residential)	Wellington Woods PD
West:	VC: COM (Commercial)	VC: B-4C (General Commercial)

C. ANALYSIS:

The subject property is located directly south of the West Volusia Shopping Center, across from Firehouse Rd. It was previously rezoned from C-2, General Commercial, to the Mainstreet Townhomes Planned Development (PD) on August 7, 2006. The Mainstreet Townhomes PD approved 66 multi-family townhome units, but the project was abandoned after the rezoning was approved. At this time, the applicant is proposing a carwash on both parcels 2A & 2B which will be replatted prior to a site plan submittal.

The first ±344 feet of property make up parcel 2A of the Mainstreet Townhomes subdivision. Parcel 2A fronts on Woodland Blvd. and is currently zoned C-2. Parcel 2B of the Mainstreet Townhome subdivision, which is east of parcel 2A, is zoned PD.

The C-2 zoning district allows for a range of commercial uses such as office/medical uses, personal service uses, hospitality uses as well as vehicular service uses and multi-family uses. The C-2 zoned district differs from the Mainstreet Townhomes PD which only allows multi-family townhomes as a permitted use. Below is a table comparing the development standards of the proposed C-2 district, with the current Mainstreet Townhomes PD.

DEVELOPMENT STANDARDS		
	C-2 REQUIRED	**MAINSTREET TOWNHOMES PD**
MIN. LOT AREA	9,000 sq. ft./Lot	900 sq. ft./Unit
FRONT YARD SETBACK (PERIMETER)	20'/30' Landscape buffer	30'/30' Landscape buffer
REAR YARD SETBACK (PERIMETER)	25'	20'
SIDE YAR SETBACK (PERIMETER)	10'	20'
LOT WIDTH	75'	20'
MAX. IMPERVIOUS (TOTAL SITE)	70%	46.82%

Section 33-135 of the Land Development Regulations provides the following criteria, which the Planning Board and City Commission shall utilize in reviewing a rezoning request:

1. **Is the proposed rezoning consistent with the Comprehensive Land Use Plan, the land use, zoning pattern and character of the surrounding area?**

   The proposed zoning of C-2 (General Commercial) is consistent with the Comprehensive Plan with an underlying land use designation of HC (Highway Commercial). The HC land use designation is considered compatible with the C-2 zoning district, per the Comprehensive Plan.

2. **Will the proposed rezoning have an impact upon the environment or natural resources?**

   The subject site is heavily wooded and any development will reduce the tree coverage significantly. However, when a site plan is submitted, the development standards will ensure that tree preservation areas and landscape buffering both meet the requirements of the Land Development Regulations. Additionally, because the property is greater than 5 acres, the code will require a survey of all endangered or threatened species and may require a habitat management plan.

3. **Will the proposed rezoning have an impact upon the economy of the affected area?**

   If developed, the rezoning of the property will have an impact on the local economy as it will no longer be restricted to residential uses only and will allow a range of commercial uses as well.

4. **Will the proposed rezoning have an impact upon governmental services?**

   The subject property will have access to existing services, such as police and fire, are already available. The effect upon governmental services will depend upon the use of the

property when it is developed, as multi-family townhomes will still be allowed, but the site may develop as a commercial use instead. The availability of services and traffic impacts will be evaluated at the time of site plan.

5. Are there changes in the circumstances or conditions affecting the area since the original assignment of zoning that will support the proposed zoning?

Since the original approval of the Mainstreet Townhomes PD in 2006, there have been changes in the market and demand of the area, as both residential and commercial developments have been established, such as the Huntington Downs residential development and the build-out of the Woodland Crossings shopping center. With this rezoning, multi-family uses will still be permitted, however, additional commercial uses will also be allowed.

6. Was there a mistake in the original classification?

There was no known mistake in the original zoning classification. Following 2006, when the property was originally rezoned from C-2 to the Mainstreet Townhomes PD, the economy and development demands shifted due to the recession. The applicant requests to restore the original zoning of C-2.

7. Will the proposed rezoning have any effect upon the use or value of the affected area?

The proposed rezoning would allow the operation of a commercial use which should have a positive impact upon the city's economy, as the property would no longer be undeveloped and vacant.

8. Will the proposed rezoning have an impact upon public health, safety and welfare?

There will not be any adverse impacts upon public health, safety, or welfare as a result of this zoning change. This rezoning would be consistent with the commercial uses of the surrounding area.

D. CONCLUSION:

The applicant is proposing to rezone the subject property from the Mainstreet Townhomes PD , back to its original C-2 zoning district, which is compatible with the HC (Highway Commercial) future land use designation and the Redevelopment Overlay.

E. STAFF RECOMMENDATION:

Staff recommends that the Planning Board forward the application to the City Commission with a recommendation of approval for the request to rezone from the Mainstreet PD to C-2 (General Commercial).

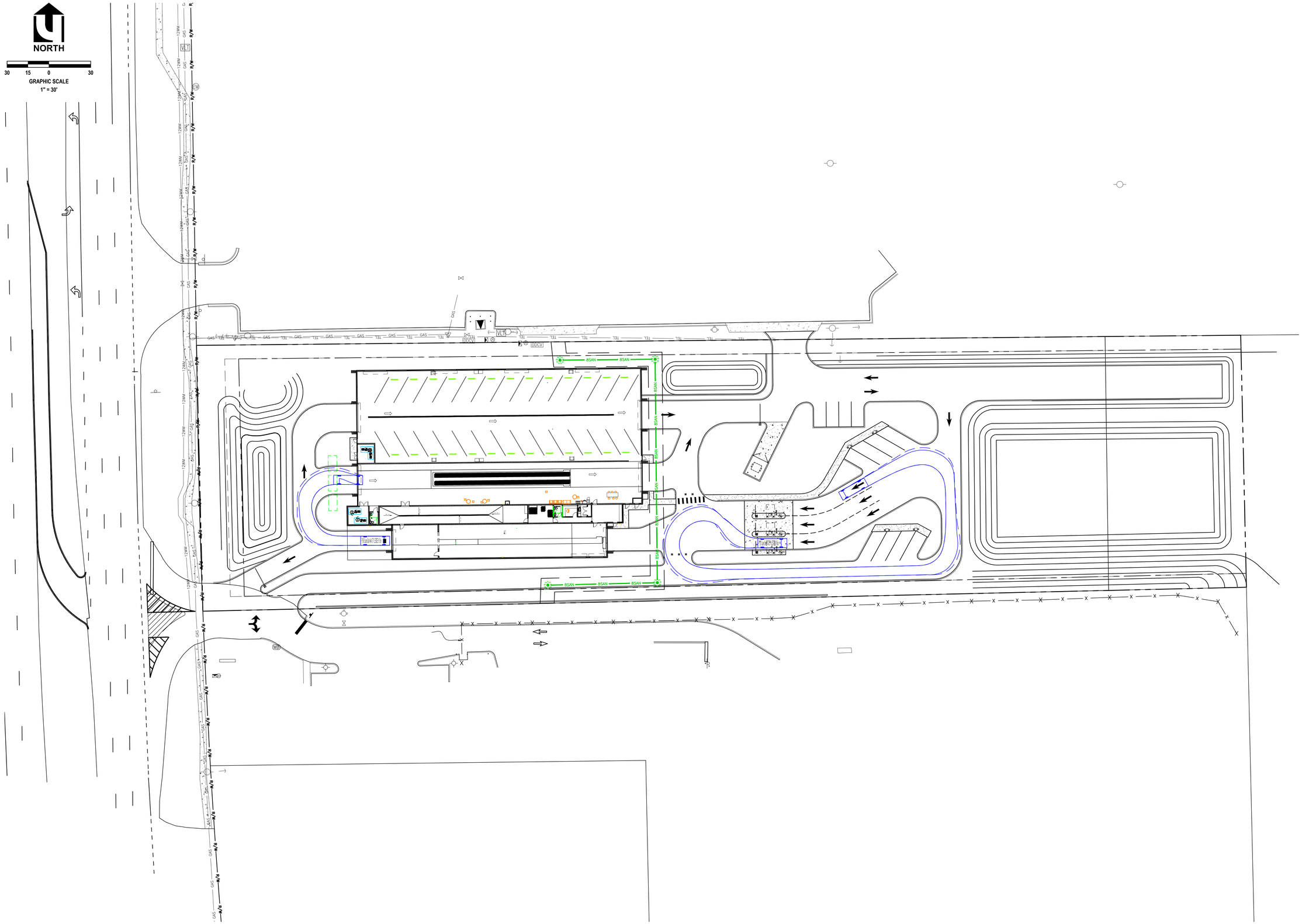
Project Narrative – Rezoning to C-2 Zoning District

The Applicant is requesting a rezoning back to the C-2 Zoning District as contemplated under the Mainstreet Townhomes Residential Planned District. The former Planned District, adopted in 2006, included a provision on reverter, noting that the City Commission may rezone any portion of the project which has not secured a final development order on or before 5 years from its effective date. This Property did not receive a final development order within the time frame set out above, and the Applicant is requesting the rezoning of the site to permit its orderly development through two commercial parcels.

NORTH

30 15 0 30

GRAPHIC SCALE
1" = 30'



REVISIONS

DATE	DESCRIPTION
-	

ROGER W. STRCULA
LICENSED
NO. 52784
STATE OF FLORIDA
PROFESSIONAL ENGINEER
NOT VALID UNLESS SIGNED AND DATED

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY ROGER W. STRCULA, PE
ON THE DATE ADJACENT TO THE SEAL.
PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

UPHAM
CIVIL ENGINEERING•SURVEYING•LANDSCAPE ARCHITECTURE
265 Kenilworth Avenue • Ormond Beach • Florida 32174
Voice: 386.672.9515 • Fax: 386.673.6554 • upham-inc.com
LB# 0003612 LC# 0000357

SITE LAYOUT PLAN

SPORTY'S CARWASH

DELAND, FLORIDA

PROJECT No:	-
DATE:	APRIL 22, 2025
DESIGN BY:	RWS
DRAWN BY:	JMB
CHECKED BY:	RWS
SCALE:	1" = 20'

SHEET NUMBER:

C400

MEMORANDUM

To: Ms. Carol Kuhn, AICP – Planning Director, City of DeLand

From: Mr. Chris J. Walsh, P.E.

Date: April 28, 2025

Subject: Sportys Car Wash Traffic Impact Analysis - DeLand, Florida

Walsh Traffic Engineering, LLC (Walsh Traffic) has been retained to conduct a Traffic Impact Analysis (TIA) for a proposed Sportys Car Wash and a future self-storage facility to be located on the east side of US 17/92, approximately 300 feet south of Firehouse Road in DeLand, Florida (see **Site Location Map** below). The property is currently vacant. The development will consist of a 1-tunnel automated car wash and an 80,000 square-foot self-storage facility. The development is proposed to be built out by the year 2027. The development is projected to generate less than 100 new external peak-hour trips, and thus not required to prepare a Traffic Impact Analysis per the River to Sea TPO TIA Guidelines. However, this memorandum was prepared to evaluate the development's access points as well as the development's impact on the immediately adjacent roadway network.

Walsh Traffic Engineering
285 Palmetto Springs Street, DeBary, Florida 32713
www.walshtraffic.com
Phone: 386.668.0062

Project Access

As can be seen by the preliminary site plan attached herein, access to the development is proposed via an existing driveway on US 17/92 located approximately 500 feet south of Firehouse Road. As part of this development, a directional southbound left is also proposed on US 17/92 at this same driveway location (Driveway #1). The development will have a cross-action connection to the shopping plaza immediately to the north. Therefore, vehicles from the north will be able to access the site via the traffic signal at US 17/92 at Firehouse Road. Lastly, with cross access to the adjacent shopping plaza, vehicles to/from the proposed development will also be able to access US 17/92 via the shopping plaza's southern right-in/right-out driveway located approximately 250 feet south of Firehouse Road.

Trip Generation

The total daily, AM peak-hour, and PM peak-hour trip generation potential for the proposed development is provided below based on trip generation equations/rates provided in the Institute of Transportation Engineer's (ITE) *Trip Generation Manual, 11th Edition*. As summarized below in ***Table 1***, the proposed development is projected to generate 56 total AM peak-hour trips (35 in, 21 out), and 90 total PM peak-hour trips (45 in, 45 out). Because ITE does not provide daily trip generation rates for automated car washes and that the roadway segment and intersection analyses are focused on the AM and PM peak hours, daily trip estimates for the development are not provided.

Table 1 – Total Trip Generation Summary

Land Use	ITE Land Use Code	Intensity	AM Peak Hour Total Trips		
			In	Out	Total
Mini-Warehouse	151	80 KSF	4	3	7
Automated Car Wash	948	1 Tunnel	31	18	49
Total			35	21	56

* ITE does not have an AM rate for LUC 948. Therefore, AM trips estimated based on AM-to-PM ratio for LUC 949. AM trip rate is 8.6 and PM trip rate is 13.6. Thus, AM trips calculated as 78 PM trips x (8.6/13.6) = 49 AM trips. AM in/out distribution for

Land Use	ITE Land Use Code	Intensity	PM Peak Hour Total Trips		
			In	Out	Total
Mini-Warehouse	151	80 KSF	6	6	12
Automated Car Wash	948	1 Tunnel	39	39	78
Total			45	45	90

Trip Distribution

The trip distribution for the new external trips was estimated based on engineering judgment recognizing that this location is likely to attract motorists both from DeLand to the north and Orange City to the south. Thus, a distribution of 50% to the north and 50% to the south is estimated.

Study Roadways

Per the River to Sea TPO TIA Guidelines, the study area is to include those roadways where the project impact exceeds 3% significance impact. As summarized in ***Table 2***, the project impact on US 17/92 is less than one percent significant. However, for informational purposes a level of service analysis is provided for US 17/92 adjacent to the development.

Table 2 – Project Significance Summary

Roadway Segment	# of Lanes	Adopted LOS	Existing Conditions		Project Trips (2-Way)			
			Service Volume (vph)	Source	% Assign	Project Trips (vph)	% Significant	Significant?
US 17/92								
SR 472 to Project Driveway	6	D	5,390	VC	50.0%	45	0.83%	no
Project Driveway to Orange Camp Rd	6	D	5,390	VC	50.0%	45	0.83%	no

Existing Conditions Analyses

For purposes of this study, AM and PM peak-period turning movement counts, from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM, were conducted at the existing project driveway intersections on US 17/92 as well as the US 17/92 at Firehouse Road intersection. Additionally, existing roadway segment capacities were obtained from Volusia County. Printouts of the turning movement counts and the applicable portion of the Volusia County traffic data spreadsheet are attached.

The operating conditions of the roadway segments were then analyzed by comparing the PM peak-hour directional volumes against the generalized service volume. As summarized in ***Table 3***, the existing roadway segment volumes are below the generalized service volumes therefore indicating acceptable operating conditions.

Table 3 – Existing Conditions Roadway Segment Analyses (2-Way PM Peak)

Roadway Segment	# of Lanes	Adopt. LOS	Service Volume (vph)	Source	Existing Volume (vph)	Source	Volume Exceeds Svc Vol?
US 17/92							
SR 472 to Project Driveway	6	D	5,390	VC	4,201	TMC	no
Project Driveway to Orange Camp Rd	6	D	5,390	VC	4,201	TMC	no

* VC - Volusia County; TMC - Turning Movement Counts

The US 17/92 at Firehouse Road and the US 17/92 at the project driveway intersections were analyzed based on *Highway Capacity Manual* methodologies using Synchro 12 software. Based on the Synchro printouts, and as summarized in ***Table 4*** on the following page, all STOP-controlled movements at the two project driveway intersections currently operate acceptably at level of service (LOS) D with volume-to-capacity (v/c) ratios below 1.0. Relative to the US 17/92 at Firehouse Road intersection, the intersection operates well overall with an overall LOS of C or better in the AM and PM peak hours. However, the eastbound and westbound approaches currently operate at LOS F, which is the result of the high cycle length programmed for the intersection . It should be noted that the v/c ratios are below 1.0, thus all eastbound and westbound movements are operating under capacity. With optimized signal timings, all movements can be brought to acceptable conditions.

Table 4 – Intersection Analysis Summary - Existing Conditions

Intersection	Control	MOE	AM Peak Hour					PM Peak Hour				
			Approach				Overall	Approach				Overall
			EB	WB	NB	SB	Intxn	EB	WB	NB	SB	Intxn
US 17/92 at Driveway #1	STOP	Delay (sec/veh)	-	34.7	-	-	-	-	27.3	-	-	-
		LOS	-	D	-	-	-	-	D	-	-	-
		Highest V/C	-	0.009	-	-	-	-	0.013	-	-	-
US 17/92 at Driveway #2	STOP	Delay (sec/veh)	-	34.5	-	-	-	-	29.3	-	-	-
		LOS	-	D	-	-	-	-	D	-	-	-
		Highest V/C	-	0.009	-	-	-	-	0.042	-	-	-
US 17/92 at Firehouse Road (Existing Timings)		Delay (sec/veh)	84.5	87.7	8.1	6.2	8.7	82.6	97.8	16.5	17.2	21.0
		LOS	F	F	A	A	A	F	F	B	B	C
		Highest V/C	0.19	0.47	0.67	0.46	-	0.4	0.81	0.63	0.79	-
US 17/92 at Firehouse Road (Optimized Timings)		Delay (sec/veh)	35.0	36.0	16.3	11.4	14.6	37.9	40.6	19.6	22.1	21.9
		LOS	D	D	B	B	B	D	D	B	C	C
		Highest V/C	0.1	0.25	0.81	0.59	-	0.31	0.59	0.78	0.86	-

Future Conditions Analyses

Existing roadway segment and intersection volumes were factored to year 2026 by applying a 2.2% annual growth rate based on historical trends (it should be noted that per the Volusia County growth rate policy, 1 1% annual growth would typically be applied, but the 2.2% annual growth rate was used to provide highly conservatively estimates of future background traffic volumes. ***Table 5*** summarizes the future background volume calculations and operating conditions for the study roadway segments.

Table 5 – Future Background Conditions Roadway Segment Analyses (2-Way PM Peak)

Roadway Segment	Applicable Annual Growth Rate	Applied Annual Growth Rate	Existing Volume (vph)	Existing Year	Buildout Year	Applied Volume Growth (vph)	Total Background Volume (vph)	Service Volume (vph)	Volume Exceeds Svc Vol?
US 17/92									
SR 472 to Project Driveway	2.2%	2.2%	4,201	2025	2027	185	4,386	5,390	no
Project Driveway to Orange Camp Rd	2.2%	2.2%	4,201	2025	2027	185	4,386	5,390	no

Project trips were then added to obtain the future total volumes on the study roadway segments at buildout of the proposed development in 2027. The total volumes were then compared against each roadway's service volume. As summarized in ***Table 6***, the future buildout volume projections on US 17/92 are below the generalized service volume, thus indicating all study roadways are projected to operate acceptably at buildout of the development.

Table 6 – Future Buildout Conditions Roadway Segment Analyses (2-Way PM Peak)

Roadway Segment	# of Lanes	Adopt. LOS	Total Background Volume (vph)	Project Trips		Total Buildout Volume (vph)	Service Volume (vph)	Volume Exceeds Svc Vol?
				% Assign	Volume (vph)			
US 17/92								
SR 472 to Project Driveway	6	D	4,386	50.0%	45	4,431	5,390	no
Project Driveway to Orange Camp Rd	6	D	4386	50.0%	45	4,431	5,390	no

The US 17/92 at Firehouse Road and the US 17/92 at the project driveway intersections were analyzed under future buildout conditions in year 2027. Based on the Synchro printouts, and as summarized in ***Table 7*** below, all STOP-controlled movements at the two project driveway intersections are projected to operate acceptably at buildout. Relative to the US 17/92 at Firehouse Road intersection, the intersection is projected to operate well overall with an overall LOS of C or better in the AM and PM peak hours. However, consistent with the existing conditions analyses, the eastbound and westbound approaches are projected to operate at LOS F, which is the result of the high cycle length programmed for the intersection. It should be noted that the v/c ratios are below 1.0, thus all eastbound and westbound movements are operating under capacity. Consistent with the existing conditions analyses, with optimized signal timings, all movements can be brought to acceptable conditions.

Table 7 – Intersection Analysis Summary – Future Buildout Conditions (Year 2027)

Intersection	Control	MOE	AM Peak Hour					PM Peak Hour				
			Approach				Overall	Approach				Overall
			EB	WB	NB	SB	Intxn	EB	WB	NB	SB	Intxn
US 17/92 at Driveway #1	STOP	Delay (sec/veh)	-	39.4	-	-	-	-	31.3	-	-	-
		LOS	-	E	-	-	-	-	D	-	-	-
		Highest V/C	-	0.049	-	-	-	-	0.078	-	-	-
US 17/92 at Driveway #2	STOP	Delay (sec/veh)	-	41.4	-	-	-	-	37.7	-	-	-
		LOS	-	E	-	-	-	-	E	-	-	-
		Highest V/C	-	0.117	-	-	-	-	0.224	-	-	-
US 17/92 at Firehouse Road (Existing Timings)		Delay (sec/veh)	83.1	87.2	9.5	7.1	9.9	83.2	117.4	18.2	18.8	23.6
		LOS	F	F	A	A	A	F	F	B	B	C
		Highest V/C	0.17	0.51	0.74	0.49	-	0.42	0.94	0.77	0.8	-
US 17/92 at Firehouse Road (Optimized Timings)		Delay (sec/veh)	34.8	36.1	18.9	12.4	16.6	37.0	41.3	23.4	29.4	27.4
		LOS	C	D	B	B	B	D	D	C	C	C
		Highest V/C	0.1	0.29	0.86	0.63	-	0.29	0.64	0.85	0.93	-

It is important to note that the improvement (optimizing the signal timings) is the same improvement as that needed to address the existing and future background deficiency. Per Florida Statutes 163.3180(5)(h)4:

> *A "transportation deficiency" means a facility or facilities on which the adopted level of service standard is exceeded by the existing, committed, and vested trips, plus additional projected background trips from any source other than the development project under review…*

Further, it is conveyed under F.S. 163.3180(5)(h)2b:

> *If any road is determined to be transportation deficient without the project traffic under review, the costs of correcting that deficiency shall be removed from the project's proportionate-share calculation and the necessary transportation improvements to correct that deficiency shall be considered to be in place for purposes of the proportionate-share calculation. The improvement necessary to correct the transportation deficiency is the funding responsibility of the entity that has maintenance responsibility for the facility. The development's proportionate share shall be calculated only for the needed transportation improvements that are greater than the identified deficiency.*

Therefore, because the needed improvement (signal timing optimization) for buildout is the same as that needed to mitigate deficiencies that are projected without the project, the development is not responsible to mitigate impacts to these roadway segments.

Project Driveway Turn-Lane Analysis

US 17/92 is a six-lane divided roadway with a posted speed limit of 50 miles per hour (mph). For two-lane and four-lane roadways, FDOT's Access Management Guidebook provides reference to right-turn lane evaluation procedures documented in the NCHRP Report 457: Evaluating Intersection Improvements. However, this procedure is not applicable to six-lane facilities. It should be noted that a 100-foot right-turn taper is currently provided and will be maintained at Driveway #1 (the south driveway) on US 17/92. There is an existing driveway immediately to the south of this taper, therefore, the provision of a right-turn lane would likely cause the adjacent driveway(s) to be situated within the turn lane. Thus, no modifications to the existing right-turn taper are proposed.

A southbound left-turn lane is proposed at Driveway #1 and will be designed in accordance with FDOT and the turn-lane length requirements of Exhibit 212-1 in the FDM for a posted speed roadway of 50 miles per hour plus a queue length of 50 feet as the 95th percentile queue projected for the movement is less than two vehicles.

The proposed development is projected to contribute only two AM trips and three PM trips to the northbound right-turn movement at Driveway #2 (the north driveway). Therefore, a right-turn lane is not proposed at this driveway.

Alternative Access Analysis

An alternative access analysis was conducted without a southbound left-turn lane at the proposed project driveway. In this scenario, all project-related trips coming from the north on US 17/92 were assigned to make a southbound left turn at the Firehouse Road traffic signal. Turning movement worksheets for this alternative access scenario are attached. Additionally, the US 17/92 at Firehouse Road was evaluated under this access scenario. Based on these alternative analyses, as summarized in ***Table 8***, the findings are effectively unchanged in that that the overall intersection LOS is projected to be acceptable with high delays for the eastbound and westbound approaches. The same signal timing optimization recommendation as previously provided is also recommended for this alternative. Because the needed improvement (signal timing optimization) for buildout is the same as that needed to mitigate deficiencies that are projected without the project, the development is not responsible to mitigate impacts to these roadway segments.

Table 8 – Intersection Analysis Summary – Future Buildout Conditions (Year 2027)
"No Southbound Left-Turn Access at Driveway #1"

Intersection	Control	MOE	AM Peak Hour					PM Peak Hour				
			Approach				Overall	Approach				Overall
			EB	WB	NB	SB	Intxn	EB	WB	NB	SB	Intxn
Buildout Conditions												
US 17/92 at Firehouse Road (Existing Timings)		Delay (sec/veh)	83.1	87.2	10.4	7.9	10.7	83.2	117.4	19.8	19.5	24.6
		LOS	F	F	B	A	B	F	F	B	B	C
		Highest V/C	0.17	0.51	0.74	0.71	-	0.42	0.94	0.77	0.83	-
US 17/92 at Firehouse Road (Optimized Timings)		Delay (sec/veh)	34.8	36.1	21.3	12.6	18.0	37.0	41.3	25.9	29.1	28.3
		LOS	C	D	C	B	B	D	D	C	C	C
		Highest V/C	0.1	0.29	0.88	0.63	-	0.29	0.64	0.87	0.92	-

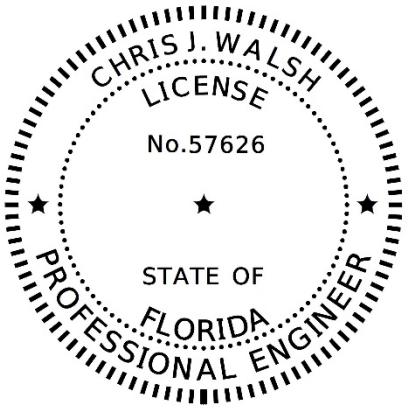
Conclusions

A Traffic Impact Analysis was conducted for a proposed Sportys Car Wash and a future self-storage facility to be located on the east side of US 17/92, approximately 300 feet south of Firehouse Road in DeLand, Florida. Based on the analysis, all study roadway segments currently operate acceptably and projected to operate acceptably at buildout in year 2027. Additionally, all movements at the two STOP-controlled driveway intersections are projected to operate acceptably at buildout in year 2027.

The US 17/92 at Firehouse Road intersection is projected to operate well overall with an overall LOS of C or better in the AM and PM peak hours under existing and future buildout conditions. However, signal timing optimization is needed under existing and future buildout conditions to improve the LOS for the eastbound and westbound approaches. Because the needed improvement (signal timing optimization) for buildout is the same as that needed to mitigate deficiencies that are projected without the project, the development is not responsible to mitigate impacts to these roadway segments.

Lastly, a southbound left-turn lane is proposed on US 17/92 at Driveway #1.

You may contact us at (386) 801-5682 should you have any questions.



THIS DOCUMENT HAS BEEN DIGITALLY SIGNED AND SEALED BY:

Chris J Walsh Date: 2025.04.29 10:19:40 -04'00'

ON THE DATE ADJACENT TO THE SEAL
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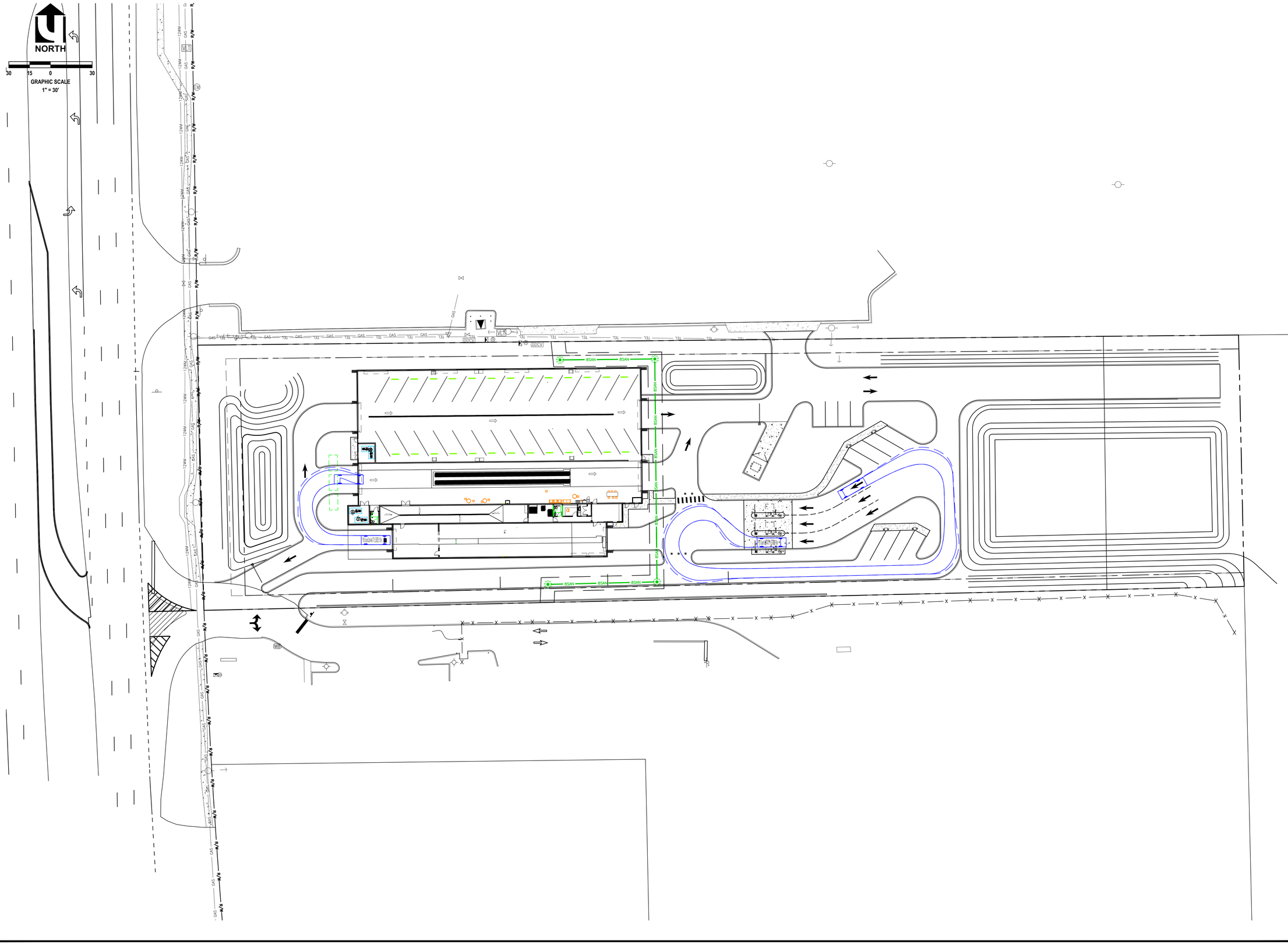
Attachments

Preliminary Site Plan



REVISIONS

DATE	DESCRIPTION
-	

ROGER W. STRCULA LICENSE NO. 52784 STATE OF FLORIDA PROFESSIONAL ENGINEER
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UPHAM
CIVIL ENGINEERING•SURVEYING•LANDSCAPE ARCHITECTURE
265 Kenilworth Avenue • Ormond Beach • Florida 32174
Voice: 386.672.9515 • Fax: 386.673.6554 • upham-inc.com
LB# 0003612 LC# 0000357

SITE LAYOUT PLAN

SPORTY'S CARWASH

DELAND, FLORIDA

PROJECT No:	-
DATE:	NOVEMBER 17, 2023
DESIGN BY:	RWS
DRAWN BY:	JMB
CHECKED BY:	RWS
SCALE:	1" = 20'

SHEET NUMBER:

C400

Traffic Count Data

TRIUNE INFRASTRUCTURE GROUP

File Name : US 17-92 at Firehouse Rd
Site Code : 00000000
Start Date : 3/25/2025
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Trucks

	US 17/92 Northbound					US 17/92 Southbound					FIREHOUSE ROAD Eastbound					SHOPPING PLAZA Westbound					
Start Time	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Int. Total
07:00 AM	1	366	6	0	373	0	407	4	1	412	3	0	1	0	4	7	0	2	0	9	798
07:15 AM	1	572	7	2	582	0	410	7	0	417	1	0	0	0	1	10	0	2	0	12	1012
07:30 AM	5	608	9	4	626	1	436	7	1	445	3	0	0	0	3	9	1	0	0	10	1084
07:45 AM	3	674	10	1	688	1	441	9	1	452	1	0	1	0	2	15	1	3	0	19	1161
Total	10	2220	32	7	2269	2	1694	27	3	1726	8	0	2	0	10	41	2	7	0	50	4055
08:00 AM	3	536	3	1	543	1	417	12	0	430	6	1	4	0	11	11	0	3	0	14	998
08:15 AM	2	443	7	0	452	2	403	5	0	410	2	0	2	0	4	14	1	4	0	19	885
08:30 AM	4	502	6	2	514	4	380	5	1	390	0	0	1	0	1	14	2	5	0	21	926
08:45 AM	5	468	12	0	485	2	369	4	0	375	5	0	4	0	9	15	0	3	0	18	887
Total	14	1949	28	3	1994	9	1569	26	1	1605	13	1	11	0	25	54	3	15	0	72	3696
*** BREAK ***																					
04:00 PM	1	476	20	8	505	14	565	6	1	586	12	0	9	0	21	37	0	11	0	48	1160
04:15 PM	3	456	14	3	476	7	511	5	4	527	11	0	3	0	14	36	0	17	0	53	1070
04:30 PM	1	476	16	3	496	12	533	3	3	551	12	3	6	0	21	30	0	12	0	42	1110
04:45 PM	0	540	20	2	562	15	613	2	2	632	8	1	3	0	12	24	0	18	0	42	1248
Total	5	1948	70	16	2039	48	2222	16	10	2296	43	4	21	0	68	127	0	58	0	185	4588
05:00 PM	4	496	20	3	523	12	629	1	0	642	6	0	8	0	14	44	1	14	0	59	1238
05:15 PM	2	506	18	3	529	9	601	2	2	614	12	3	5	0	20	31	0	19	0	50	1213
05:30 PM	1	522	14	2	539	12	610	2	0	624	7	0	6	0	13	38	0	13	0	51	1227
05:45 PM	0	492	27	3	522	9	534	2	5	550	4	0	4	0	8	22	0	17	0	39	1119
Total	7	2016	79	11	2113	42	2374	7	7	2430	29	3	23	0	55	135	1	63	0	199	4797
Grand Total	36	8133	209	37	8415	101	7859	76	21	8057	93	8	57	0	158	357	6	143	0	506	17136
Apprch %	0.4	96.6	2.5	0.4		1.3	97.5	0.9	0.3		58.9	5.1	36.1	0		70.6	1.2	28.3	0		
Total %	0.2	47.5	1.2	0.2	49.1	0.6	45.9	0.4	0.1	47	0.5	0	0.3	0	0.9	2.1	0	0.8	0	3	
Passenger Vehicles	35	8008	209	37	8289	100	7747	72	21	7940	89	7	55	0	151	355	6	142	0	503	16883
% Passenger Vehicles	97.2	98.5	100	100	98.5	99	98.6	94.7	100	98.5	95.7	87.5	96.5	0	95.6	99.4	100	99.3	0	99.4	98.5
Heavy Trucks	1	125	0	0	126	1	112	4	0	117	4	1	2	0	7	2	0	1	0	3	253
% Heavy Trucks	2.8	1.5	0	0	1.5	1	1.4	5.3	0	1.5	4.3	12.5	3.5	0	4.4	0.6	0	0.7	0	0.6	1.5

	US 17/92 Northbound					US 17/92 Southbound					FIREHOUSE ROAD Eastbound					SHOPPING PLAZA Westbound					
Start Time	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	1	572	7	2	582	0	410	7	0	417	1	0	0	0	1	10	0	2	0	12	1012
07:30 AM	**5**	608	9	**4**	626	**1**	436	7	**1**	445	3	0	0	0	3	9	**1**	0	0	10	1084
07:45 AM	3	**674**	**10**	1	**688**	1	**441**	9	1	**452**	1	0	1	0	2	**15**	1	**3**	0	**19**	**1161**
08:00 AM	3	536	3	1	543	1	417	**12**	0	430	**6**	**1**	**4**	0	**11**	11	0	3	0	14	998
Total Volume	12	2390	29	8	2439	3	1704	35	2	1744	11	1	5	0	17	45	2	8	0	55	4255
% App. Total	0.5	98	1.2	0.3		0.2	97.7	2	0.1		64.7	5.9	29.4	0		81.8	3.6	14.5	0		
PHF	.600	.886	.725	.500	.886	.750	.966	.729	.500	.965	.458	.250	.313	.000	.386	.750	.500	.667	.000	.724	.916
Passenger Vehicles	12	2354	29	8	2403	3	1677	33	2	1715	11	1	5	0	17	45	2	8	0	55	4190
% Passenger Vehicles	100	98.5	100	100	98.5	100	98.4	94.3	100	98.3	100	100	100	0	100	100	100	100	0	100	98.5
Heavy Trucks	0	36	0	0	36	0	27	2	0	29	0	0	0	0	0	0	0	0	0	0	65
% Heavy Trucks	0	1.5	0	0	1.5	0	1.6	5.7	0	1.7	0	0	0	0	0	0	0	0	0	0	1.5

TRIUNE INFRASTRUCTURE GROUP

File Name : US 17-92 at Firehouse Rd
Site Code : 00000000
Start Date : 3/25/2025
Page No : 2

	US 17/92 Northbound					US 17/92 Southbound					FIREHOUSE ROAD Eastbound					SHOPPING PLAZA Westbound					
Start Time	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	07:15 AM					07:15 AM					08:00 AM					07:45 AM					
+0 mins.	1	572	7	2	582	0	410	7	0	417	**6**	**1**	**4**	0	**11**	**15**	1	3	0	19	
+15 mins.	**5**	608	9	**4**	626	**1**	436	7	**1**	445	2	0	2	0	4	11	0	3	0	14	
+30 mins.	3	**674**	**10**	1	**688**	1	**441**	9	1	**452**	0	0	1	0	1	14	1	4	0	19	
+45 mins.	3	536	3	1	543	1	417	**12**	0	430	5	0	4	0	9	14	**2**	**5**	0	**21**	
Total Volume	12	2390	29	8	2439	3	1704	35	2	1744	13	1	11	0	25	54	4	15	0	73	
% App. Total	0.5	98	1.2	0.3		0.2	97.7	2	0.1		52	4	44	0		74	5.5	20.5	0		
PHF	.600	.886	.725	.500	.886	.750	.966	.729	.500	.965	.542	.250	.688	.000	.568	.900	.500	.750	.000	.869	
Passenger Vehicles	12	2354	29	8	2403	3	1677	33	2	1715	12	1	10	0	23	54	4	15	0	73	
% Passenger Vehicles	100	98.5	100	100	98.5	100	98.4	94.3	100	98.3	92.3	100	90.9	0	92	100	100	100	0	100	
Heavy Trucks	0	36	0	0	36	0	27	2	0	29	1	0	1	0	2	0	0	0	0	0	
% Heavy Trucks	0	1.5	0	0	1.5	0	1.6	5.7	0	1.7	7.7	0	9.1	0	8	0	0	0	0	0	
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	**540**	**20**	2	**562**	**15**	613	**2**	**2**	632	8	1	3	0	12	24	0	18	0	42	**1248**
05:00 PM	**4**	496	20	**3**	523	12	**629**	1	0	**642**	6	0	**8**	0	14	**44**	**1**	14	0	**59**	1238
05:15 PM	2	506	18	3	529	9	601	2	2	614	**12**	**3**	5	0	**20**	31	0	**19**	0	50	1213
05:30 PM	1	522	14	2	539	12	610	2	0	624	7	0	6	0	13	38	0	13	0	51	1227
Total Volume	7	2064	72	10	2153	48	2453	7	4	2512	33	4	22	0	59	137	1	64	0	202	4926
% App. Total	0.3	95.9	3.3	0.5		1.9	97.7	0.3	0.2		55.9	6.8	37.3	0		67.8	0.5	31.7	0		
PHF	.438	.956	.900	.833	.958	.800	.975	.875	.500	.978	.688	.333	.688	.000	.738	.778	.250	.842	.000	.856	.987
Passenger Vehicles	7	2040	72	10	2129	47	2429	7	4	2487	33	4	22	0	59	136	1	64	0	201	4876
% Passenger Vehicles	100	98.8	100	100	98.9	97.9	99.0	100	100	99.0	100	100	100	0	100	99.3	100	100	0	99.5	99.0
Heavy Trucks	0	24	0	0	24	1	24	0	0	25	0	0	0	0	0	1	0	0	0	1	50
% Heavy Trucks	0	1.2	0	0	1.1	2.1	1.0	0	0	1.0	0	0	0	0	0	0.7	0	0	0	0.5	1.0
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	04:45 PM					04:45 PM					04:00 PM					04:45 PM					
+0 mins.	0	**540**	**20**	2	**562**	**15**	613	**2**	**2**	632	**12**	0	**9**	0	**21**	24	0	18	0	42	
+15 mins.	**4**	496	20	**3**	523	12	**629**	1	0	**642**	11	0	3	0	14	**44**	**1**	14	0	**59**	
+30 mins.	2	506	18	3	529	9	601	2	2	614	12	**3**	6	0	21	31	0	**19**	0	50	
+45 mins.	1	522	14	2	539	12	610	2	0	624	8	1	3	0	12	38	0	13	0	51	
Total Volume	7	2064	72	10	2153	48	2453	7	4	2512	43	4	21	0	68	137	1	64	0	202	
% App. Total	0.3	95.9	3.3	0.5		1.9	97.7	0.3	0.2		63.2	5.9	30.9	0		67.8	0.5	31.7	0		
PHF	.438	.956	.900	.833	.958	.800	.975	.875	.500	.978	.896	.333	.583	.000	.810	.778	.250	.842	.000	.856	
Passenger Vehicles	7	2040	72	10	2129	47	2429	7	4	2487	40	3	21	0	64	136	1	64	0	201	
% Passenger Vehicles	100	98.8	100	100	98.9	97.9	99	100	100	99	93	75	100	0	94.1	99.3	100	100	0	99.5	
Heavy Trucks	0	24	0	0	24	1	24	0	0	25	3	1	0	0	4	1	0	0	0	1	
% Heavy Trucks	0	1.2	0	0	1.1	2.1	1	0	0	1	7	25	0	0	5.9	0.7	0	0	0	0.5	

TRIUNE INFRASTRUCTURE GROUP

File Name : US 17-92 at Firehouse Rd
Site Code : 00000000
Start Date : 3/25/2025
Page No : 1

Groups Printed- Passenger Vehicles

	US 17/92 Northbound					US 17/92 Southbound					FIREHOUSE ROAD Eastbound					SHOPPING PLAZA Westbound					
Start Time	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Int. Total
07:00 AM	1	358	6	0	365	0	399	4	1	404	3	0	0	0	3	7	0	1	0	8	780
07:15 AM	1	566	7	2	576	0	407	7	0	414	1	0	0	0	1	10	0	2	0	12	1003
07:30 AM	5	596	9	4	614	1	429	7	1	438	3	0	0	0	3	9	1	0	0	10	1065
07:45 AM	3	662	10	1	676	1	431	8	1	441	1	0	1	0	2	15	1	3	0	19	1138
Total	10	2182	32	7	2231	2	1666	26	3	1697	8	0	1	0	9	41	2	6	0	49	3986
08:00 AM	3	530	3	1	537	1	410	11	0	422	6	1	4	0	11	11	0	3	0	14	984
08:15 AM	2	435	7	0	444	2	399	5	0	406	2	0	2	0	4	14	1	4	0	19	873
08:30 AM	3	487	6	2	498	4	370	5	1	380	0	0	1	0	1	14	2	5	0	21	900
08:45 AM	5	456	12	0	473	2	362	4	0	368	4	0	3	0	7	15	0	3	0	18	866
Total	13	1908	28	3	1952	9	1541	25	1	1576	12	1	10	0	23	54	3	15	0	72	3623
*** BREAK ***																					
04:00 PM	1	470	20	8	499	14	558	6	1	579	11	0	9	0	20	36	0	11	0	47	1145
04:15 PM	3	449	14	3	469	7	501	4	4	516	10	0	3	0	13	36	0	17	0	53	1051
04:30 PM	1	470	16	3	490	12	527	2	3	544	11	2	6	0	19	30	0	12	0	42	1095
04:45 PM	0	534	20	2	556	15	605	2	2	624	8	1	3	0	12	24	0	18	0	42	1234
Total	5	1923	70	16	2014	48	2191	14	10	2263	40	3	21	0	64	126	0	58	0	184	4525
05:00 PM	4	490	20	3	517	11	627	1	0	639	6	0	8	0	14	44	1	14	0	59	1229
05:15 PM	2	499	18	3	522	9	596	2	2	609	12	3	5	0	20	30	0	19	0	49	1200
05:30 PM	1	517	14	2	534	12	601	2	0	615	7	0	6	0	13	38	0	13	0	51	1213
05:45 PM	0	489	27	3	519	9	525	2	5	541	4	0	4	0	8	22	0	17	0	39	1107
Total	7	1995	79	11	2092	41	2349	7	7	2404	29	3	23	0	55	134	1	63	0	198	4749
Grand Total	35	8008	209	37	8289	100	7747	72	21	7940	89	7	55	0	151	355	6	142	0	503	16883
Apprch %	0.4	96.6	2.5	0.4		1.3	97.6	0.9	0.3		58.9	4.6	36.4	0		70.6	1.2	28.2	0		
Total %	0.2	47.4	1.2	0.2	49.1	0.6	45.9	0.4	0.1	47	0.5	0	0.3	0	0.9	2.1	0	0.8	0	3	

	US 17/92 Northbound					US 17/92 Southbound					FIREHOUSE ROAD Eastbound					SHOPPING PLAZA Westbound					
Start Time	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	1	566	7	2	576	0	407	7	0	414	1	0	0	0	1	10	0	2	0	12	1003
07:30 AM	**5**	596	9	**4**	614	**1**	429	7	**1**	438	3	0	0	0	3	9	**1**	0	0	10	1065
07:45 AM	3	**662**	**10**	1	**676**	1	**431**	8	1	**441**	1	0	1	0	2	**15**	1	**3**	0	**19**	**1138**
08:00 AM	3	530	3	1	537	1	410	**11**	0	422	**6**	**1**	**4**	0	**11**	11	0	3	0	14	984
Total Volume	12	2354	29	8	2403	3	1677	33	2	1715	11	1	5	0	17	45	2	8	0	55	4190
% App. Total	0.5	98	1.2	0.3		0.2	97.8	1.9	0.1		64.7	5.9	29.4	0		81.8	3.6	14.5	0		
PHF	.600	.889	.725	.500	.889	.750	.973	.750	.500	.972	.458	.250	.313	.000	.386	.750	.500	.667	.000	.724	.920

Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM					07:15 AM					08:00 AM					07:45 AM					
+0 mins.	1	566	7	2	576	0	407	7	0	414	**6**	**1**	**4**	0	**11**	**15**	1	3	0	19	
+15 mins.	**5**	596	9	**4**	614	**1**	429	7	**1**	438	2	0	2	0	4	11	0	3	0	14	
+30 mins.	3	**662**	**10**	1	**676**	1	**431**	8	1	**441**	0	0	1	0	1	14	1	4	0	19	
+45 mins.	3	530	3	1	537	1	410	**11**	0	422	4	0	3	0	7	14	**2**	**5**	0	**21**	
Total Volume	12	2354	29	8	2403	3	1677	33	2	1715	12	1	10	0	23	54	4	15	0	73	
% App. Total	0.5	98	1.2	0.3		0.2	97.8	1.9	0.1		52.2	4.3	43.5	0		74	5.5	20.5	0		
PHF	.600	.889	.725	.500	.889	.750	.973	.750	.500	.972	.500	.250	.625	.000	.523	.900	.500	.750	.000	.869	

TRIUNE INFRASTRUCTURE GROUP

File Name : US 17-92 at Firehouse Rd
Site Code : 00000000
Start Date : 3/25/2025
Page No : 2

	US 17/92 Northbound					US 17/92 Southbound					FIREHOUSE ROAD Eastbound					SHOPPING PLAZA Westbound					
Start Time	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	**534**	**20**	2	**556**	**15**	605	**2**	**2**	624	8	1	3	0	12	24	0	18	0	42	**1234**
05:00 PM	**4**	490	20	**3**	517	11	**627**	1	0	**639**	6	0	**8**	0	14	**44**	**1**	14	0	**59**	1229
05:15 PM	2	499	18	3	522	9	596	2	2	609	**12**	**3**	5	0	**20**	30	0	**19**	0	49	1200
05:30 PM	1	517	14	2	534	12	601	2	0	615	7	0	6	0	13	38	0	13	0	51	1213
Total Volume	7	2040	72	10	2129	47	2429	7	4	2487	33	4	22	0	59	136	1	64	0	201	4876
% App. Total	0.3	95.8	3.4	0.5		1.9	97.7	0.3	0.2		55.9	6.8	37.3	0		67.7	0.5	31.8	0		
PHF	.438	.955	.900	.833	.957	.783	.969	.875	.500	.973	.688	.333	.688	.000	.738	.773	.250	.842	.000	.852	.988

Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM					04:45 PM					04:30 PM					04:45 PM				
+0 mins.	0	**534**	**20**	2	**556**	**15**	605	**2**	**2**	624	11	2	6	0	19	24	0	18	0	42
+15 mins.	**4**	490	20	**3**	517	11	**627**	1	0	**639**	8	1	3	0	12	**44**	**1**	14	0	**59**
+30 mins.	2	499	18	3	522	9	596	2	2	609	6	0	**8**	0	14	30	0	**19**	0	49
+45 mins.	1	517	14	2	534	12	601	2	0	615	**12**	**3**	5	0	**20**	38	0	13	0	51
Total Volume	7	2040	72	10	2129	47	2429	7	4	2487	37	6	22	0	65	136	1	64	0	201
% App. Total	0.3	95.8	3.4	0.5		1.9	97.7	0.3	0.2		56.9	9.2	33.8	0		67.7	0.5	31.8	0	
PHF	.438	.955	.900	.833	.957	.783	.969	.875	.500	.973	.771	.500	.688	.000	.813	.773	.250	.842	.000	.852

TRIUNE INFRASTRUCTURE GROUP

File Name : US 17-92 at Firehouse Rd
Site Code : 00000000
Start Date : 3/25/2025
Page No : 1

Groups Printed- Heavy Trucks

	US 17/92 Northbound					US 17/92 Southbound					FIREHOUSE ROAD Eastbound					SHOPPING PLAZA Westbound					
Start Time	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Int. Total
07:00 AM	0	8	0	0	8	0	8	0	0	8	0	0	1	0	1	0	0	1	0	1	18
07:15 AM	0	6	0	0	6	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	9
07:30 AM	0	12	0	0	12	0	7	0	0	7	0	0	0	0	0	0	0	0	0	0	19
07:45 AM	0	12	0	0	12	0	10	1	0	11	0	0	0	0	0	0	0	0	0	0	23
Total	0	38	0	0	38	0	28	1	0	29	0	0	1	0	1	0	0	1	0	1	69
08:00 AM	0	6	0	0	6	0	7	1	0	8	0	0	0	0	0	0	0	0	0	0	14
08:15 AM	0	8	0	0	8	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	12
08:30 AM	1	15	0	0	16	0	10	0	0	10	0	0	0	0	0	0	0	0	0	0	26
08:45 AM	0	12	0	0	12	0	7	0	0	7	1	0	1	0	2	0	0	0	0	0	21
Total	1	41	0	0	42	0	28	1	0	29	1	0	1	0	2	0	0	0	0	0	73
*** BREAK ***																					
04:00 PM	0	6	0	0	6	0	7	0	0	7	1	0	0	0	1	1	0	0	0	1	15
04:15 PM	0	7	0	0	7	0	10	1	0	11	1	0	0	0	1	0	0	0	0	0	19
04:30 PM	0	6	0	0	6	0	6	1	0	7	1	1	0	0	2	0	0	0	0	0	15
04:45 PM	0	6	0	0	6	0	8	0	0	8	0	0	0	0	0	0	0	0	0	0	14
Total	0	25	0	0	25	0	31	2	0	33	3	1	0	0	4	1	0	0	0	1	63
05:00 PM	0	6	0	0	6	1	2	0	0	3	0	0	0	0	0	0	0	0	0	0	9
05:15 PM	0	7	0	0	7	0	5	0	0	5	0	0	0	0	0	1	0	0	0	1	13
05:30 PM	0	5	0	0	5	0	9	0	0	9	0	0	0	0	0	0	0	0	0	0	14
05:45 PM	0	3	0	0	3	0	9	0	0	9	0	0	0	0	0	0	0	0	0	0	12
Total	0	21	0	0	21	1	25	0	0	26	0	0	0	0	0	1	0	0	0	1	48
Grand Total	1	125	0	0	126	1	112	4	0	117	4	1	2	0	7	2	0	1	0	3	253
Apprch %	0.8	99.2	0	0		0.9	95.7	3.4	0		57.1	14.3	28.6	0		66.7	0	33.3	0		
Total %	0.4	49.4	0	0	49.8	0.4	44.3	1.6	0	46.2	1.6	0.4	0.8	0	2.8	0.8	0	0.4	0	1.2	

	US 17/92 Northbound					US 17/92 Southbound					FIREHOUSE ROAD Eastbound					SHOPPING PLAZA Westbound					
Start Time	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	12	0	0	12	0	**10**	**1**	0	**11**	0	0	0	0	0	0	0	0	0	0	23
08:00 AM	0	6	0	0	6	0	7	1	0	8	0	0	0	0	0	0	0	0	0	0	14
08:15 AM	0	8	0	0	8	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	12
08:30 AM	**1**	**15**	0	0	**16**	0	10	0	0	10	0	0	0	0	0	0	0	0	0	0	**26**
Total Volume	1	41	0	0	42	0	31	2	0	33	0	0	0	0	0	0	0	0	0	0	75
% App. Total	2.4	97.6	0	0		0	93.9	6.1	0		0	0	0	0		0	0	0	0		
PHF	.250	.683	.000	.000	.656	.000	.775	.500	.000	.750	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.721

Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM					07:45 AM					08:00 AM					07:00 AM				
+0 mins.	0	12	0	0	12	0	**10**	**1**	0	**11**	0	0	0	0	0	0	0	**1**	0	**1**
+15 mins.	0	6	0	0	6	0	7	1	0	8	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	8	0	0	8	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0
+45 mins.	**1**	**15**	0	0	**16**	0	10	0	0	10	**1**	0	**1**	0	**2**	0	0	0	0	0
Total Volume	1	41	0	0	42	0	31	2	0	33	1	0	1	0	2	0	0	1	0	1
% App. Total	2.4	97.6	0	0		0	93.9	6.1	0		50	0	50	0		0	0	100	0	
PHF	.250	.683	.000	.000	.656	.000	.775	.500	.000	.750	.250	.000	.250	.000	.250	.000	.000	.250	.000	.250

TRIUNE INFRASTRUCTURE GROUP

File Name : US 17-92 at Firehouse Rd
Site Code : 00000000
Start Date : 3/25/2025
Page No : 2

	US 17/92 Northbound					US 17/92 Southbound					FIREHOUSE ROAD Eastbound					SHOPPING PLAZA Westbound					
Start Time	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Left	Thru	Right	U-Turns	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	6	0	0	6	0	7	0	0	7	**1**	0	0	0	1	**1**	0	0	0	**1**	15
04:15 PM	0	**7**	0	0	**7**	0	**10**	**1**	0	**11**	1	0	0	0	1	0	0	0	0	0	**19**
04:30 PM	0	6	0	0	6	0	6	1	0	7	1	**1**	0	0	**2**	0	0	0	0	0	15
04:45 PM	0	6	0	0	6	0	8	0	0	8	0	0	0	0	0	0	0	0	0	0	14
Total Volume	0	25	0	0	25	0	31	2	0	33	3	1	0	0	4	1	0	0	0	1	63
% App. Total	0	100	0	0		0	93.9	6.1	0		75	25	0	0		100	0	0	0		
PHF	.000	.893	.000	.000	.893	.000	.775	.500	.000	.750	.750	.250	.000	.000	.500	.250	.000	.000	.000	.250	.829

Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

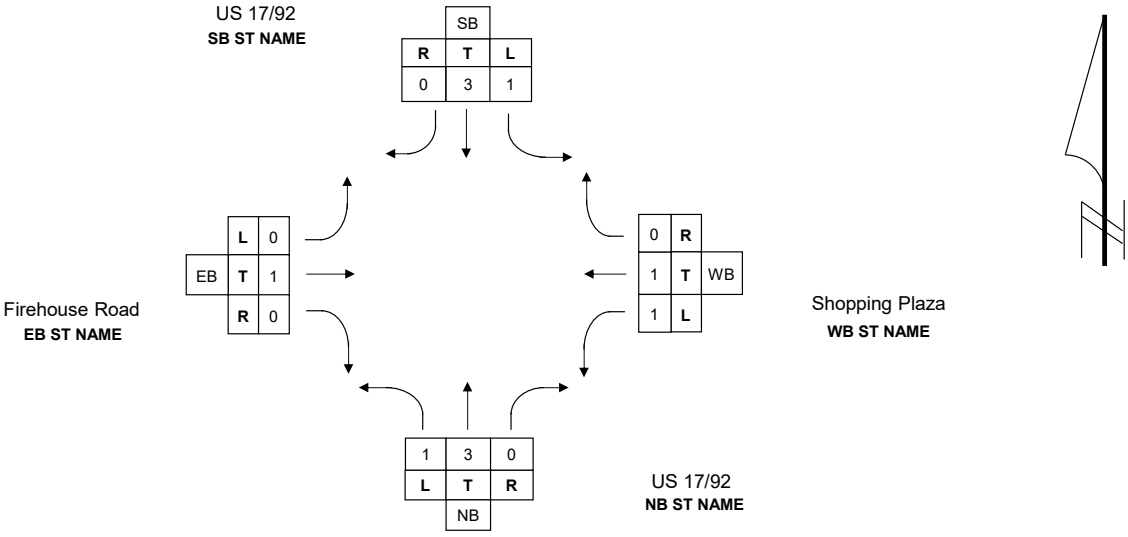
	04:00 PM					04:00 PM					03:45 PM					03:15 PM				
+0 mins.	0	6	0	0	6	0	7	0	0	7	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	**7**	0	0	**7**	0	**10**	**1**	0	**11**	**1**	0	0	0	1	0	0	0	0	0
+30 mins.	0	6	0	0	6	0	6	1	0	7	1	0	0	0	1	0	0	0	0	0
+45 mins.	0	6	0	0	6	0	8	0	0	8	1	**1**	0	0	**2**	**1**	0	0	0	**1**
Total Volume	0	25	0	0	25	0	31	2	0	33	3	1	0	0	4	1	0	0	0	1
% App. Total	0	100	0	0		0	93.9	6.1	0		75	25	0	0		100	0	0	0	
PHF	.000	.893	.000	.000	.893	.000	.775	.500	.000	.750	.750	.250	.000	.000	.500	.250	.000	.000	.000	.250

TRIUNE INFRASTRUCTURE GROUP

SUMMARY OF VEHICLE MOVEMENTS

SECTION	79040000	**CITY**	Deland	**COUNTY**	Volusia
STATE ROUTE	US 17/92	**INTERSECTING ROUTE**	Firehouse Road		
OBSERVER	HF	**DATE**	03.25.25	**MILEPOST**	10.037
WEATHER	Sunny	**ROAD CONDITION**	Good		
REMARKS					

FORM COMPLETED BY HF **DATE** 04.01.25



TIME	NORTHBOUND					SOUTHBOUND					TOTAL	EASTBOUND					WESTBOUND					TOTAL
BEGIN/END	**L**	**T**	**R**	**U**	**TOT**	**L**	**T**	**R**	**U**	**TOT**	**N/S**	**L**	**T**	**R**	**U**	**TOT**	**L**	**T**	**R**	**U**	**TOT**	**E/W**
7:00 - 8:00 AM	10	2,220	32	7	**2,269**	2	1,694	27	3	**1,726**	**3,995**	8	0	2	0	**10**	41	2	7	0	**50**	**60**
8:00 - 9:00 AM	14	1,949	28	3	**1,994**	9	1,569	26	1	**1,605**	**3,599**	13	1	11	0	**25**	54	3	15	0	**72**	**97**
4:00 - 5:00 PM	5	1,948	70	16	**2,039**	48	2,222	16	10	**2,296**	**4,335**	43	4	21	0	**68**	127	0	58	0	**185**	**253**
5:00 - 6:00 PM	7	2,016	79	11	**2,113**	42	2,374	7	7	**2,430**	**4,543**	29	3	23	0	**55**	135	1	63	0	**199**	**254**
TOTAL	**36**	**8,133**	**209**	**37**	**8,415**	**101**	**7,859**	**76**	**21**	**8,057**	**16,472**	**93**	**8**	**57**	**0**	**158**	**357**	**6**	**143**	**0**	**506**	**664**

Percentage	0%	97%	2%	0%		1%	98%	1%	0%			59%	5%	36%	0%		71%	1%	28%	0%		
Average	9	2,033	52	9	2,104	25	1,965	19	5	2,014		23	2	14	0	40	89	2	36	0	127	
Maximum	14	2,220	79	16	2,269	48	2,374	27	10	2,430		43	4	23	0	68	135	3	63	0	199	
Minimum	5	1,948	28	3	1,994	2	1,569	7	1	1,605		8	0	2	0	10	41	0	7	0	50	

TRIUNE INFRASTRUCTURE GROUP

PEDESTRIAN MOVEMENT SUMMARY

SECTION 79040000 **CITY** Deland **COUNTY** Volusia
STATE ROUTE US 17/92 **INTERSECTING ROUTE** Firehouse Road
OBSERVER HF **DATE** 03.25.25

REMARKS

FORM COMPLETED BY HF **DATE** 04.01.25

HOURS	West side of US 17/92			East side of US 17/92			North side of Firehouse Road			South side of Firehouse Road			GRAND TOTAL
	NB	SB	TOTAL	NB	SB	TOTAL	EB	WB	TOTAL	EB	WB	TOTAL	
7:00 - 8:00 AM	0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	**0**
8:00 - 9:00 AM	0	0	**0**	1	0	**1**	0	0	**0**	1	0	**1**	**2**
4:00 - 5:00 PM	0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	**0**
5:00 - 6:00 PM	1	0	**1**	0	0	**0**	0	0	**0**	0	0	**0**	**1**
TOTAL	**1**	**0**	**1**	**1**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**1**	**3**

TRIUNE INFRASTRUCTURE GROUP

BICYCLE MOVEMENT SUMMARY

SECTION 79040000 **CITY** Deland **COUNTY** Volusia
STATE ROUTE US 17/92 **INTERSECTING ROUTE** Firehouse Road
OBSERVER HF **DATE** 03.25.25

REMARKS

FORM COMPLETED BY HF **DATE** 04.01.25

HOURS	West side of US 17/92			East side of US 17/92			North side of Firehouse Road			South side of Firehouse Road			GRAND TOTAL
	NB	SB	TOTAL	NB	SB	TOTAL	EB	WB	TOTAL	EB	WB	TOTAL	
7:00 - 8:00 AM	0	0	**0**	1	0	**1**	0	0	**0**	0	0	**0**	1
8:00 - 9:00 AM	0	1	**1**	1	1	**2**	0	0	**0**	1	0	**1**	4
4:00 - 5:00 PM	0	2	**2**	1	1	**2**	1	0	**1**	0	0	**0**	5
5:00 - 6:00 PM	0	1	**1**	0	1	**1**	0	1	**1**	0	0	**0**	3
TOTAL	**0**	**4**	**4**	**3**	**3**	**6**	**1**	**1**	**2**	**1**	**0**	**1**	13

US 17/92 at Driveway #1 - Extra Space Storage (Turns Only)

3/25/2025

(#) = Heavy

US 17-92 NB at Driveway #1

]	NB Right	WB Right
7-7:15		1
7:15-7:30	3	
7:30-7:45		
7:45-8	5	
8-8:15	1	
8:15-8:30		
8:30-8:45	1(1)	1
8:45-9	1	

(#) = Heavy

US 17-92 NB at Driveway #1

PM Peak	NB Right	WB Right
4-4:15		5
4:15-4:30	1	
4:30-4:45		2
4:45-5	0(1)	
5-5:15		
5:15-5:30		1
5:30-5:45	2	1
5:45-6		

US 17/92 at Driveway #2 - ALDI Driveway (Turns Only)

3/25/2025

(#) = Heavy

US 17-92 NB at Driveway #2

PM Peak	NB Right	WB Right
7-7:15	2	
7:15-7:30	3	
7:30-7:45	6	
7:45-8	7	
8-8:15	4	1
8:15-8:30	1	
8:30-8:45	3(1)	1
8:45-9	9	

(#) = Heavy

US 17-92 NB at Driveway #2

PM Peak	NB Right	WB Right
4-4:15	9(1)	
4:15-4:30	12	
4:30-4:45	9	1
4:45-5	11	1
5-5:15	9	
5:15-5:30	16	1
5:30-5:45	7(1)	4
5:45-6	4	2

FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
2023 HISTORICAL AADT REPORT

COUNTY: 79 - VOLUSIA

SITE: 0445 - ON US-17/92, 0.092 MI. S OF NEW YORK AV. (UVL)

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2023	31500 C	N 16000	S 15500	9.00	59.10	4.90
2022	33500 F	N 17000	S 16500	9.00	58.80	6.00
2021	33500 C	N 17000	S 16500	9.00	58.20	6.20
2020	29000 S	N 14500	S 14500	9.00	58.70	5.00
2019	30000 F	N 15000	S 15000	9.00	59.00	4.40
2018	30000 C	N 15000	S 15000	9.00	60.00	4.50
2017	30000 F	N 15000	S 15000	9.00	60.90	6.50
2016	29000 C	N 14500	S 14500	9.00	61.40	5.30
2015	28000 C	N 14000	S 14000	9.00	60.20	5.20
2014	25000 C	N 13000	S 12000	9.00	59.20	5.70
2013	27000 C	N 13500	S 13500	9.00	61.00	4.60
2012	26000 C	N 13000	S 13000	9.00	61.90	4.90
2011	27000 C	N 13500	S 13500	9.00	62.20	4.20
2010	28000 C	N 14000	S 14000	10.39	62.46	4.50
2009	27500 C	N 14000	S 13500	10.54	62.19	4.20
2008	28000 C	N 14000	S 14000	10.88	64.83	4.70

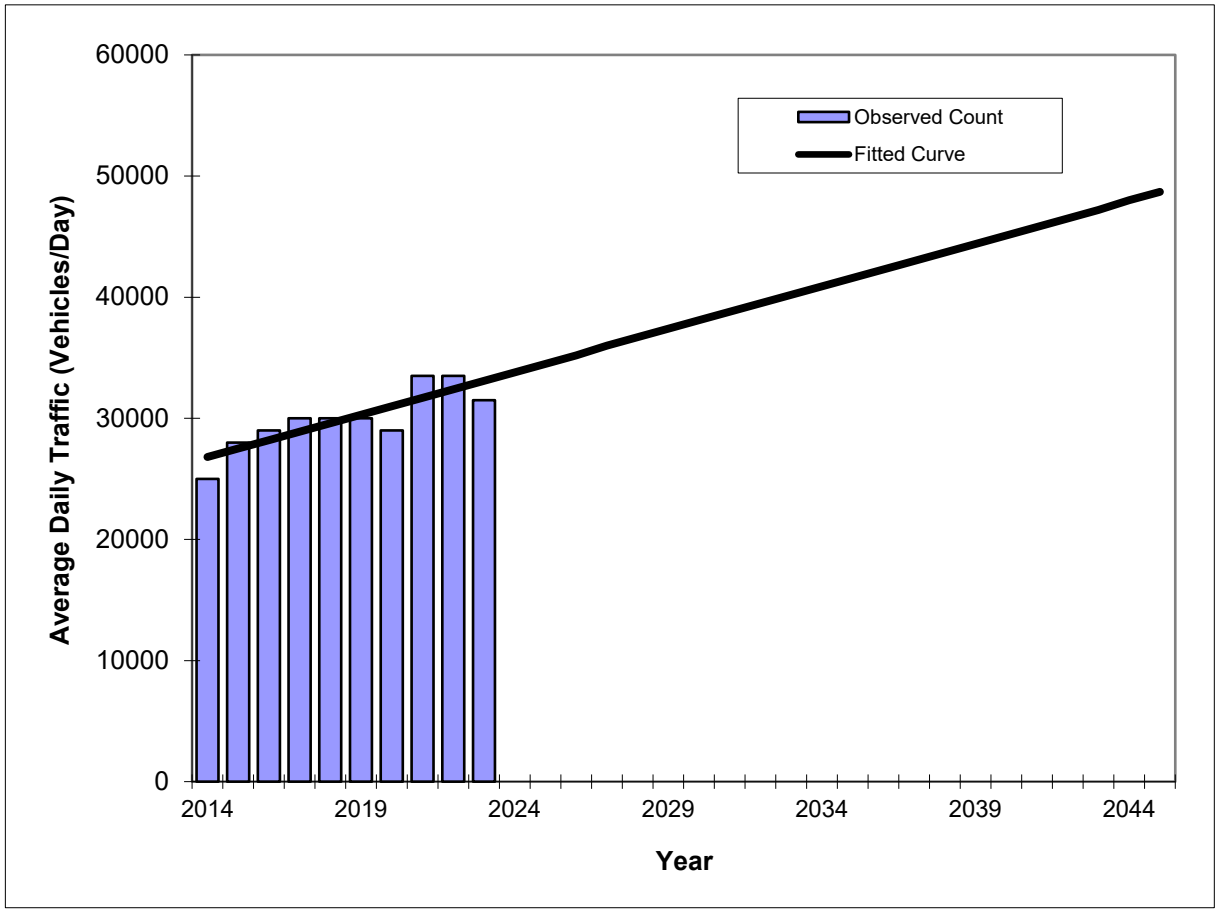
AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE
S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = FOURTH YEAR ESTIMATE
V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN
*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

Traffic Trends - V03.a

US 17/92 south of New York --

FIN#	
Location	

County:	Volusia
Station #:	79-0445
Highway:	US 17/92 south of New York



Year	Traffic (ADT/AADT) Count*	Trend**
2014	25000	26800
2015	28000	27500
2016	29000	28200
2017	30000	28900
2018	30000	29600
2019	30000	30300
2020	29000	31000
2021	33500	31700
2022	33500	32400
2023	31500	33100
2025 Opening Year Trend		
2025	N/A	34500
2026 Mid-Year Trend		
2026	N/A	35200
2027 Design Year Trend		
2027	N/A	36000
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

** Annual Trend Increase:	706
Trend R-squared:	71.25%
Trend Annual Historic Growth Rate:	2.61%
Trend Growth Rate (2023 to Design Year):	2.19%
Printed:	4-Apr-25

Straight Line Growth Option

2024 PEAK SEASON FACTOR CATEGORY REPORT - REPORT TYPE: ALL
CATEGORY: 7900 VOLUSIA COUNTYWIDE

MOCF: 0.97

WEEK	DATES	SF	PSCF
1	01/01/2024 - 01/06/2024	1.00	1.03
2	01/07/2024 - 01/13/2024	1.02	1.05
3	01/14/2024 - 01/20/2024	1.04	1.07
4	01/21/2024 - 01/27/2024	1.03	1.06
5	01/28/2024 - 02/03/2024	1.01	1.04
6	02/04/2024 - 02/10/2024	0.99	1.02
* 7	02/11/2024 - 02/17/2024	0.97	1.00
* 8	02/18/2024 - 02/24/2024	0.97	1.00
* 9	02/25/2024 - 03/02/2024	0.97	1.00
*10	03/03/2024 - 03/09/2024	0.96	0.99
*11	03/10/2024 - 03/16/2024	0.96	0.99
*12	03/17/2024 - 03/23/2024	0.96	0.99
*13	03/24/2024 - 03/30/2024	0.96	0.99
*14	03/31/2024 - 04/06/2024	0.96	0.99
*15	04/07/2024 - 04/13/2024	0.97	1.00
*16	04/14/2024 - 04/20/2024	0.97	1.00
*17	04/21/2024 - 04/27/2024	0.97	1.00
*18	04/28/2024 - 05/04/2024	0.98	1.01
*19	05/05/2024 - 05/11/2024	0.98	1.01
20	05/12/2024 - 05/18/2024	0.99	1.02
21	05/19/2024 - 05/25/2024	0.99	1.02
22	05/26/2024 - 06/01/2024	1.00	1.03
23	06/02/2024 - 06/08/2024	1.01	1.04
24	06/09/2024 - 06/15/2024	1.01	1.04
25	06/16/2024 - 06/22/2024	1.02	1.05
26	06/23/2024 - 06/29/2024	1.02	1.05
27	06/30/2024 - 07/06/2024	1.03	1.06
28	07/07/2024 - 07/13/2024	1.03	1.06
29	07/14/2024 - 07/20/2024	1.04	1.07
30	07/21/2024 - 07/27/2024	1.03	1.06
31	07/28/2024 - 08/03/2024	1.02	1.05
32	08/04/2024 - 08/10/2024	1.01	1.04
33	08/11/2024 - 08/17/2024	1.00	1.03
34	08/18/2024 - 08/24/2024	1.01	1.04
35	08/25/2024 - 08/31/2024	1.01	1.04
36	09/01/2024 - 09/07/2024	1.02	1.05
37	09/08/2024 - 09/14/2024	1.02	1.05
38	09/15/2024 - 09/21/2024	1.02	1.05
39	09/22/2024 - 09/28/2024	1.02	1.05
40	09/29/2024 - 10/05/2024	1.01	1.04
41	10/06/2024 - 10/12/2024	1.00	1.03
42	10/13/2024 - 10/19/2024	1.00	1.03
43	10/20/2024 - 10/26/2024	1.01	1.04
44	10/27/2024 - 11/02/2024	1.03	1.06
45	11/03/2024 - 11/09/2024	1.04	1.07
46	11/10/2024 - 11/16/2024	1.05	1.08
47	11/17/2024 - 11/23/2024	1.04	1.07
48	11/24/2024 - 11/30/2024	1.03	1.06
49	12/01/2024 - 12/07/2024	1.02	1.05
50	12/08/2024 - 12/14/2024	1.01	1.04
51	12/15/2024 - 12/21/2024	1.00	1.03
52	12/22/2024 - 12/28/2024	1.02	1.05
53	12/29/2024 - 12/31/2024	1.04	1.07

* PEAK SEASON

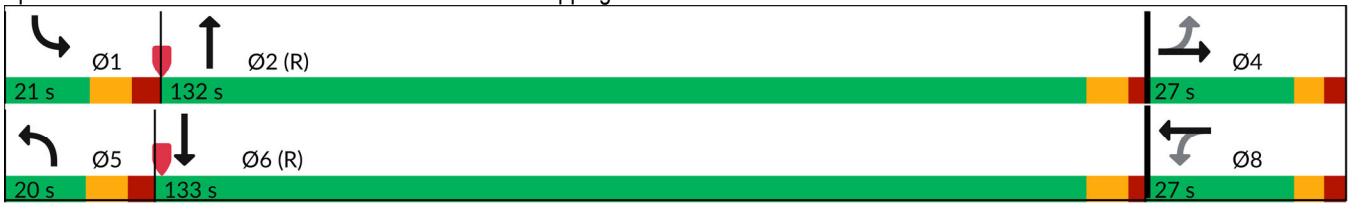
04-MAR-2025 16:32:53 830UPD 5_7900_PKSEASON.TXT

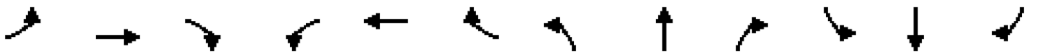
Existing Conditions Synchro Printouts

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	11	1	53	2	25	2506	7	1794
Future Volume (vph)	11	1	53	2	25	2506	7	1794
Turn Type	Perm	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	5.0	11.0	5.0	11.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	18.8	14.4	18.8
Total Split (s)	27.0	27.0	27.0	27.0	20.0	132.0	21.0	133.0
Total Split (%)	15.0%	15.0%	15.0%	15.0%	11.1%	73.3%	11.7%	73.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	5.5	5.5	5.5	5.5
All-Red Time (s)	3.0	3.0	3.0	3.0	3.5	2.3	3.9	2.3
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.0	7.0	7.0	9.0	7.8	9.4	7.8
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)		12.8	12.9	12.9	8.3	150.0	6.5	142.4
Actuated g/C Ratio		0.07	0.07	0.07	0.05	0.83	0.04	0.79
v/c Ratio		0.17	0.59	0.09	0.33	0.65	0.13	0.50
Control Delay (s/veh)		63.6	103.2	40.4	93.3	9.3	87.7	9.2
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)		63.6	103.2	40.4	93.3	9.3	87.7	9.2
LOS		E	F	D	F	A	F	A
Approach Delay (s/veh)		63.6		93.1		10.1		9.6
Approach LOS		E		F		B		A

Intersection Summary	
Cycle Length: 180	
Actuated Cycle Length: 180	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay (s/veh): 11.2	Intersection LOS: B
Intersection Capacity Utilization 69.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: US 17/92 & Firehouse Road/Shopping Plaza





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	1	5	53	2	8	25	2506	30	7	1794	37
Future Volume (veh/h)	11	1	5	53	2	8	25	2506	30	7	1794	37
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	12	1	5	58	2	9	27	2724	33	8	1950	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	75	11	20	113	14	65	37	4200	51	16	4112	84
Arrive On Green	0.05	0.05	0.05	0.05	0.05	0.05	0.02	0.81	0.81	0.01	0.80	0.80
Sat Flow, veh/h	850	216	410	1410	296	1334	1781	5200	63	1781	5150	106
Grp Volume(v), veh/h	18	0	0	58	0	11	27	1780	977	8	1288	702
Grp Sat Flow(s),veh/h/ln	1477	0	0	1410	0	1630	1781	1702	1859	1781	1702	1851
Q Serve(g_s), s	0.9	0.0	0.0	4.7	0.0	1.2	2.7	37.9	38.3	0.8	22.1	22.1
Cycle Q Clear(g_c), s	2.1	0.0	0.0	6.8	0.0	1.2	2.7	37.9	38.3	0.8	22.1	22.1
Prop In Lane	0.67		0.28	1.00		0.82	1.00		0.03	1.00		0.06
Lane Grp Cap(c), veh/h	105	0	0	113	0	79	37	2750	1502	16	2718	1478
V/C Ratio(X)	0.17	0.00	0.00	0.51	0.00	0.14	0.74	0.65	0.65	0.49	0.47	0.47
Avail Cap(c_a), veh/h	197	0	0	201	0	181	109	2750	1502	115	2718	1478
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	82.4	0.0	0.0	84.5	0.0	82.0	87.7	7.0	7.0	88.8	5.9	5.9
Incr Delay (d2), s/veh	0.8	0.0	0.0	3.6	0.0	0.8	24.6	1.2	2.2	21.0	0.6	1.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.5	0.0	0.0	5.1	0.0	0.9	2.7	16.9	18.8	0.8	11.0	12.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	83.1	0.0	0.0	88.1	0.0	82.8	112.2	8.2	9.2	109.8	6.5	7.0
LnGrp LOS	F			F		F	F	A	A	F	A	A
Approach Vol, veh/h		18			69			2784			1998	
Approach Delay, s/veh		83.1			87.2			9.5			7.1	
Approach LOS		F			F			A			A	

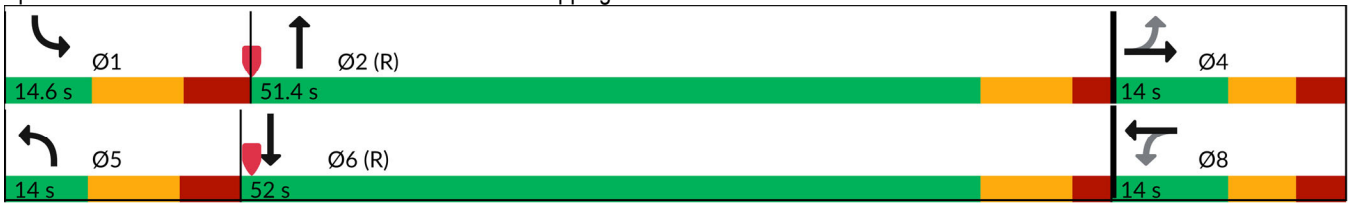
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.0	153.2		15.8	12.7	151.5		15.8				
Change Period (Y+Rc), s	9.4	7.8		7.0	9.0	7.8		7.0				
Max Green Setting (Gmax), s	11.6	124.2		20.0	11.0	125.2		20.0				
Max Q Clear Time (g_c+I1), s	2.8	40.3		4.1	4.7	24.1		8.8				
Green Ext Time (p_c), s	0.0	49.2		0.0	0.0	24.3		0.1				

Intersection Summary												
HCM 7th Control Delay, s/veh			9.9									
HCM 7th LOS			A									

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	11	1	45	2	20	2390	5	1704
Future Volume (vph)	11	1	45	2	20	2390	5	1704
Turn Type	Perm	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	5.0	11.0	5.0	11.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	18.8	14.4	18.8
Total Split (s)	14.0	14.0	14.0	14.0	14.0	51.4	14.6	52.0
Total Split (%)	17.5%	17.5%	17.5%	17.5%	17.5%	64.3%	18.3%	65.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	5.5	5.5	5.5	5.5
All-Red Time (s)	3.0	3.0	3.0	3.0	3.5	2.3	3.9	2.3
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.0	7.0	7.0	9.0	7.8	9.4	7.8
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)		7.0	7.0	7.0	5.2	64.0	5.3	61.3
Actuated g/C Ratio		0.09	0.09	0.09	0.07	0.80	0.07	0.77
v/c Ratio		0.14	0.32	0.07	0.19	0.65	0.04	0.49
Control Delay (s/veh)		30.8	40.1	22.4	39.7	8.7	36.0	7.7
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)		30.8	40.1	22.4	39.7	8.7	36.0	7.7
LOS		C	D	C	D	A	D	A
Approach Delay (s/veh)		30.8		36.9		8.9		7.8
Approach LOS		C		D		A		A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay (s/veh): 8.9	Intersection LOS: A
Intersection Capacity Utilization 66.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: US 17/92 & Firehouse Road/Shopping Plaza



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	1	5	45	2	8	20	2390	29	5	1704	35
Future Volume (veh/h)	11	1	5	45	2	8	20	2390	29	5	1704	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	12	1	5	49	2	9	22	2598	32	5	1852	38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	134	20	30	195	21	96	43	3218	40	12	3122	64
Arrive On Green	0.07	0.07	0.07	0.07	0.07	0.07	0.02	0.62	0.62	0.01	0.61	0.61
Sat Flow, veh/h	818	282	423	1410	296	1334	1781	5199	64	1781	5150	106
Grp Volume(v), veh/h	18	0	0	49	0	11	22	1699	931	5	1224	666
Grp Sat Flow(s),veh/h/ln	1522	0	0	1410	0	1630	1781	1702	1859	1781	1702	1851
Q Serve(g_s), s	0.0	0.0	0.0	1.7	0.0	0.5	1.0	30.4	30.6	0.2	17.7	17.7
Cycle Q Clear(g_c), s	0.8	0.0	0.0	2.5	0.0	0.5	1.0	30.4	30.6	0.2	17.7	17.7
Prop In Lane	0.67		0.28	1.00		0.82	1.00		0.03	1.00		0.06
Lane Grp Cap(c), veh/h	185	0	0	195	0	117	43	2107	1150	12	2064	1122
V/C Ratio(X)	0.10	0.00	0.00	0.25	0.00	0.09	0.51	0.81	0.81	0.43	0.59	0.59
Avail Cap(c_a), veh/h	207	0	0	217	0	143	111	2107	1150	116	2064	1122
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.8	0.0	0.0	35.5	0.0	34.7	38.6	11.6	11.6	39.6	9.7	9.7
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.7	0.0	0.3	9.1	3.4	6.2	22.8	1.3	2.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.6	0.0	0.0	1.7	0.0	0.4	0.9	13.9	16.1	0.3	8.8	9.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	35.0	0.0	0.0	36.2	0.0	35.0	47.6	15.0	17.8	62.3	10.9	12.0
LnGrp LOS	D			D		D	D	B	B	E	B	B
Approach Vol, veh/h		18			60			2652			1895	
Approach Delay, s/veh		35.0			36.0			16.3			11.4	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.9	57.3		12.8	10.9	56.3		12.8				
Change Period (Y+Rc), s	9.4	7.8		7.0	9.0	7.8		7.0				
Max Green Setting (Gmax), s	5.2	43.6		7.0	5.0	44.2		7.0				
Max Q Clear Time (g_c+I1), s	2.2	32.6		2.8	3.0	19.7		4.5				
Green Ext Time (p_c), s	0.0	9.7		0.0	0.0	13.8		0.0				

Intersection Summary			
HCM 7th Control Delay, s/veh		14.6	
HCM 7th LOS		B	

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	12	2549	23	0	1866
Future Vol, veh/h	0	12	2549	23	0	1866
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	13	2771	25	0	2028

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1398	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	112	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	112	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	41.42	0	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	112	-
HCM Lane V/C Ratio	-	-	0.117	-
HCM Ctrl Dly (s/v)	-	-	41.4	-
HCM Lane LOS	-	-	E	-
HCM 95th %tile Q(veh)	-	-	0.4	-

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	5	2567	24	15	1851
Future Vol, veh/h	0	5	2567	24	15	1851
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	5	2790	26	16	2012

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1408	0	0	2816	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	5.34	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	0	110	-	-	47	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	110	-	-	47	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

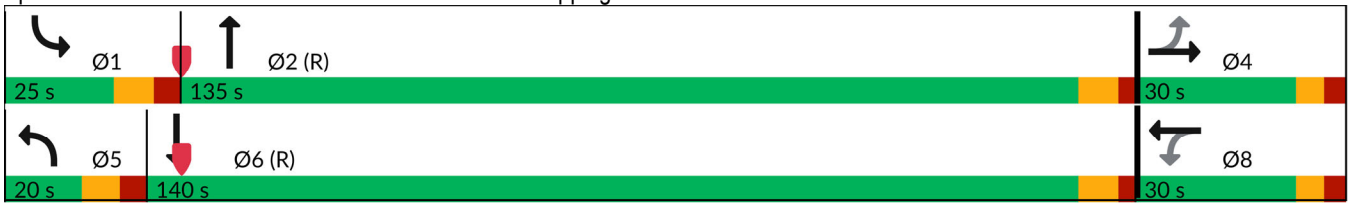
Approach	WB	NB	SB
HCM Ctrl Dly, s/v	39.43	0	0.94
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	110	47	-
HCM Lane V/C Ratio	-	-	0.049	0.345	-
HCM Ctrl Dly (s/v)	-	-	39.4	116.8	-
HCM Lane LOS	-	-	E	F	-
HCM 95th %tile Q(veh)	-	-	0.2	1.2	-

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	33	4	137	1	17	2064	52	2453
Future Volume (vph)	33	4	137	1	17	2064	52	2453
Turn Type	Perm	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	5.0	11.0	5.0	11.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	18.8	14.4	18.8
Total Split (s)	30.0	30.0	30.0	30.0	20.0	135.0	25.0	140.0
Total Split (%)	15.8%	15.8%	15.8%	15.8%	10.5%	71.1%	13.2%	73.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	5.5	5.5	5.5	5.5
All-Red Time (s)	3.0	3.0	3.0	3.0	3.5	2.3	3.9	2.3
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.0	7.0	7.0	9.0	7.8	9.4	7.8
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)		22.7	22.7	22.7	7.5	131.7	11.4	142.0
Actuated g/C Ratio		0.12	0.12	0.12	0.04	0.69	0.06	0.75
v/c Ratio		0.36	0.94	0.28	0.26	0.66	0.54	0.70
Control Delay (s/veh)		67.3	138.3	17.5	96.9	18.0	104.2	15.2
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)		67.3	138.3	17.5	96.9	18.0	104.2	15.2
LOS		E	F	B	F	B	F	B
Approach Delay (s/veh)		67.3		99.3		18.6		17.0
Approach LOS		E		F		B		B

Intersection Summary	
Cycle Length: 190	
Actuated Cycle Length: 190	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay (s/veh): 21.7	Intersection LOS: C
Intersection Capacity Utilization 72.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: US 17/92 & Firehouse Road/Shopping Plaza



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	4	22	137	1	64	17	2064	72	52	2453	7
Future Volume (veh/h)	33	4	22	137	1	64	17	2064	72	52	2453	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	36	4	24	149	1	70	18	2243	78	57	2666	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	94	16	49	184	3	190	29	3604	125	72	3876	12
Arrive On Green	0.12	0.12	0.12	0.12	0.12	0.12	0.02	0.71	0.71	0.04	0.74	0.74
Sat Flow, veh/h	536	134	402	1382	22	1566	1781	5067	176	1781	5256	16
Grp Volume(v), veh/h	64	0	0	149	0	71	18	1504	817	57	1726	948
Grp Sat Flow(s),veh/h/ln	1071	0	0	1382	0	1588	1781	1702	1839	1781	1702	1868
Q Serve(g_s), s	6.1	0.0	0.0	9.0	0.0	7.8	1.9	43.4	43.9	6.0	51.3	51.4
Cycle Q Clear(g_c), s	14.0	0.0	0.0	23.0	0.0	7.8	1.9	43.4	43.9	6.0	51.3	51.4
Prop In Lane	0.56		0.37	1.00		0.99	1.00		0.10	1.00		0.01
Lane Grp Cap(c), veh/h	159	0	0	184	0	192	29	2421	1308	72	2511	1377
V/C Ratio(X)	0.40	0.00	0.00	0.81	0.00	0.37	0.63	0.62	0.62	0.79	0.69	0.69
Avail Cap(c_a), veh/h	159	0	0	184	0	192	103	2421	1308	146	2511	1377
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	81.0	0.0	0.0	84.3	0.0	76.8	92.9	14.2	14.3	90.4	13.3	13.3
Incr Delay (d2), s/veh	1.6	0.0	0.0	22.9	0.0	1.2	20.2	1.2	2.3	17.4	1.6	2.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.6	0.0	0.0	13.4	0.0	5.9	1.9	22.3	24.6	5.6	25.2	27.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	82.6	0.0	0.0	107.2	0.0	78.0	113.1	15.4	16.5	107.7	14.8	16.1
LnGrp LOS	F			F		E	F	B	B	F	B	B
Approach Vol, veh/h		64			220			2339			2731	
Approach Delay, s/veh		82.6			97.8			16.5			17.2	
Approach LOS		F			F			B			B	

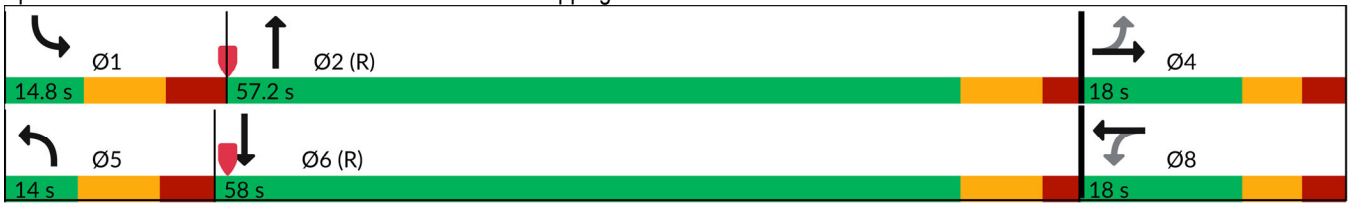
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	17.1	142.9		30.0	12.1	147.9		30.0				
Change Period (Y+Rc), s	9.4	7.8		7.0	9.0	7.8		7.0				
Max Green Setting (Gmax), s	15.6	127.2		23.0	11.0	132.2		23.0				
Max Q Clear Time (g_c+I1), s	8.0	45.9		16.0	3.9	53.4		25.0				
Green Ext Time (p_c), s	0.0	33.5		0.1	0.0	44.7		0.0				

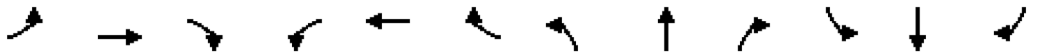
Intersection Summary		
HCM 7th Control Delay, s/veh		21.0
HCM 7th LOS		C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	33	4	137	1	17	2064	52	2453
Future Volume (vph)	33	4	137	1	17	2064	52	2453
Turn Type	Perm	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	5.0	11.0	5.0	11.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	18.8	14.4	18.8
Total Split (s)	18.0	18.0	18.0	18.0	14.0	57.2	14.8	58.0
Total Split (%)	20.0%	20.0%	20.0%	20.0%	15.6%	63.6%	16.4%	64.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	5.5	5.5	5.5	5.5
All-Red Time (s)	3.0	3.0	3.0	3.0	3.5	2.3	3.9	2.3
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.0	7.0	7.0	9.0	7.8	9.4	7.8
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)		11.0	11.0	11.0	5.0	52.4	5.4	58.6
Actuated g/C Ratio		0.12	0.12	0.12	0.06	0.58	0.06	0.65
v/c Ratio		0.34	0.92	0.28	0.18	0.79	0.54	0.81
Control Delay (s/veh)		30.5	94.1	12.7	45.1	17.9	60.6	15.9
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)		30.5	94.1	12.7	45.1	17.9	60.6	15.9
LOS		C	F	B	D	B	E	B
Approach Delay (s/veh)		30.5		67.9		18.1		16.8
Approach LOS		C		E		B		B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay (s/veh): 19.7	Intersection LOS: B
Intersection Capacity Utilization 72.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: US 17/92 & Firehouse Road/Shopping Plaza





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	4	22	137	1	64	17	2064	72	52	2453	7
Future Volume (veh/h)	33	4	22	137	1	64	17	2064	72	52	2453	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	36	4	24	149	1	70	18	2243	78	57	2666	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	128	26	55	254	3	191	36	2872	99	75	3118	9
Arrive On Green	0.12	0.12	0.12	0.12	0.12	0.12	0.02	0.57	0.57	0.04	0.59	0.59
Sat Flow, veh/h	539	213	451	1382	22	1566	1781	5067	176	1781	5256	16
Grp Volume(v), veh/h	64	0	0	149	0	71	18	1504	817	57	1726	948
Grp Sat Flow(s),veh/h/ln	1203	0	0	1382	0	1588	1781	1702	1839	1781	1702	1868
Q Serve(g_s), s	1.9	0.0	0.0	3.6	0.0	3.7	0.9	30.9	31.2	2.8	37.7	37.7
Cycle Q Clear(g_c), s	5.6	0.0	0.0	9.2	0.0	3.7	0.9	30.9	31.2	2.8	37.7	37.7
Prop In Lane	0.56		0.37	1.00		0.99	1.00		0.10	1.00		0.01
Lane Grp Cap(c), veh/h	210	0	0	254	0	194	36	1929	1042	75	2019	1108
V/C Ratio(X)	0.31	0.00	0.00	0.59	0.00	0.37	0.50	0.78	0.78	0.76	0.85	0.86
Avail Cap(c_a), veh/h	210	0	0	254	0	194	99	1929	1042	107	2019	1108
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.0	0.0	0.0	38.7	0.0	36.3	43.6	15.1	15.2	42.6	15.1	15.1
Incr Delay (d2), s/veh	0.8	0.0	0.0	3.5	0.0	1.2	10.4	3.2	5.9	17.4	4.9	8.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.4	0.0	0.0	6.1	0.0	2.7	0.9	15.6	17.8	2.8	18.4	21.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	37.9	0.0	0.0	42.2	0.0	37.4	54.1	18.3	21.1	60.0	20.0	23.6
LnGrp LOS	D			D		D	D	B	C	E	B	C
Approach Vol, veh/h		64			220			2339			2731	
Approach Delay, s/veh		37.9			40.6			19.6			22.1	
Approach LOS		D			D			B			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.2	58.8		18.0	10.8	61.2		18.0				
Change Period (Y+Rc), s	9.4	7.8		7.0	9.0	7.8		7.0				
Max Green Setting (Gmax), s	5.4	49.4		11.0	5.0	50.2		11.0				
Max Q Clear Time (g_c+I1), s	4.8	33.2		7.6	2.9	39.7		11.2				
Green Ext Time (p_c), s	0.0	12.7		0.1	0.0	9.4		0.0				

Intersection Summary												
HCM 7th Control Delay, s/veh			21.9									
HCM 7th LOS			C									

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	6	2147	44	0	2622
Future Vol, veh/h	0	6	2147	44	0	2622
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	7	2334	48	0	2850

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1191	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	154	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	154	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	29.33	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	154	-
HCM Lane V/C Ratio	-	-	0.042	-
HCM Ctrl Dly (s/v)	-	-	29.3	-
HCM Lane LOS	-	-	D	-
HCM 95th %tile Q(veh)	-	-	0.1	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	2	2189	3	0	2622
Future Vol, veh/h	0	2	2189	3	0	2622
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2	2304	3	0	2760

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1154	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	164	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	164	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	27.29	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	164	-
HCM Lane V/C Ratio	-	-	0.013	-
HCM Ctrl Dly (s/v)	-	-	27.3	-
HCM Lane LOS	-	-	D	-
HCM 95th %tile Q(veh)	-	-	0	-

Volusia County, FL

ECONOLITE

MOVING TRAFFIC FORWARD

169 - US-17-92 @ Firehouse Road - ASC/3 [redacted] - Econolite Type - ASC/3

Controller Timing Plan (MM) 2-1

Plan 1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	SBLT	NB		EB	NBLT	SB		WB								
Min Green	5	11	5	7	5	11	5	7	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	7	0	16	0	8	0	0	0	0	0	0	0	0	0	0
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	26	0	37	0	19	0	0	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	3.0	4.0	5.0	3.0	3.0	4.0	5.0	3.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	20	50	35	25	20	50	35	25	35	35	35	35	35	35	35	35
Max2	0	0	0	0	0	0	0	0	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	5.5	5.5	3.0	4.0	5.5	5.5	3.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	3.9	2.3	1.0	4.3	3.5	2.3	1.0	4.3	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Volusia County, FL

ECONOLITE

MOVING TRAFFIC FORWARD

169 - US-17-92 @ Firehouse Road - ASC/3 [redacted] - Econolite Type - ASC/3

Coordination Options

Options (MM) 3-1

Manual Pattern	Auto	ECPI Coord	Yes
System Source	SYS	System Format	STD
Splits In	Seconds	Offsets In	Seconds
Transition	Smooth	Max Select	MAXINH
Dwell / Add Time	0		
Delay Coord Wk-LZ	No	Force Off	Fixed
Offset Reference	Yellow	Use Ped Time	Yes
Ped Recall	No	Ped Reservice	No
Local Zero Override	No	FO Added Ini Green	No
Re-sync Count	0	Multisync	No

Auto Perm Minimum Green (Seconds) (MM) 3-4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Split Demand (MM) 3-5

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Demand 1																
Demand 2																

Demand	1	2
Detector	0	0
Call Time (Sec)	0	0
Cycle Count	0	0

Volusia County, FL

ECONOLITE

MOVING TRAFFIC FORWARD

169 - US-17-92 @ Firehouse Road - ASC/3 [redacted] - Econolite Type - ASC/3

Coordination Pattern Data
Coordinator Pattern Data (MM) 3-2

Coordinator Pattern # 1

Split Pattern	1	TS2 (Pat-Off)	0-1	Splits In	Seconds
Cycle	180	Std (COS)	236	Offsets In	Seconds
Offset Value	179s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	0		
Actuated Walk Rest	No	Sequence	2		
Phase Reservice	No	Action Plan	0		
Max Select	MAXINH	Force Off	Fixed		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB		EB	NBLT	SB		WB								
Splits (Split Pat 1)	21	132	0	27	20	133	0	27	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	180s	180s	0s	0s

Misc. Data

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time		X				X										
Omit Phase									X	X	X	X	X	X	X	X
Special Funciton Outputs																

Coordinator Pattern # 2

Split Pattern	2	TS2 (Pat-Off)	0-2	Splits In	Seconds
Cycle	180	Std (COS)	13	Offsets In	Seconds
Offset Value	134s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	0		
Actuated Walk Rest	No	Sequence	5		
Phase Reservice	No	Action Plan	0		
Max Select	MAXINH	Force Off	Fixed		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB		EB	NBLT	SB		WB								
Splits (Split Pat 2)	23	118	0	39	18	123	0	39	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	180s	180s	0s	0s

Misc. Data

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time		X				X										
Omit Phase									X	X	X	X	X	X	X	X
Special Funciton Outputs																

Coordinator Pattern # 3

Split Pattern	3	TS2 (Pat-Off)	0-3	Splits In	Seconds
Cycle	190	Std (COS)	21	Offsets In	Seconds
Offset Value	17s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	0		
Actuated Walk Rest	No	Sequence	1		
Phase Reservice	No	Action Plan	0		
Max Select	MAXINH	Force Off	Fixed		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB		EB	NBLT	SB		WB								
Splits (Split Pat 3)	25	135	0	30	20	140	0	30	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	190s	190s	0s	0s

Misc. Data

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time		X				X										
Omit Phase									X	X	X	X	X	X	X	X
Special Funciton Outputs																

Coordinator Pattern # 4

Split Pattern	4	TS2 (Pat-Off)	1-1	Splits In	Seconds
Cycle	140	Std (COS)	29	Offsets In	Seconds
Offset Value	55s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	0		
Actuated Walk Rest	No	Sequence	2		
Phase Reservice	No	Action Plan	0		
Max Select	MAXINH	Force Off	Fixed		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB		EB	NBLT	SB		WB								
Splits (Split Pat 4)	20	100	0	20	20	100	0	20	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	140s	140s	0s	0s

Misc. Data

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time		X				X										
Omit Phase									X	X	X	X	X	X	X	X
Special Funciton Outputs																

Coordinator Pattern # 5

Split Pattern	5	TS2 (Pat-Off)	1-2	Splits In	Seconds
Cycle	180	Std (COS)	13	Offsets In	Seconds
Offset Value	134s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	0		
Actuated Walk Rest	No	Sequence	5		
Phase Reservice	No	Action Plan	0		
Max Select	MAXINH	Force Off	Fixed		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB		EB	NBLT	SB		WB								
Splits (Split Pat 5)	23	118	0	39	18	123	0	39	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	180s	180s	0s	0s

Misc. Data

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time		X				X										
Omit Phase									X	X	X	X	X	X	X	X
Special Funciton Outputs																

Coordinator Pattern # 90

Split Pattern	90	TS2 (Pat-Off)	0-0	Splits In	Seconds
Cycle	200	Std (COS)	109	Offsets In	Seconds
Offset Value	161s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	1		
Phase Reservice	No	Action Plan	0		
Max Select	MAXINH	Force Off	Fixed		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB		EB	NBLT	SB		WB								
Splits (Split Pat 90)	26	134	0	40	22	138	0	40	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	200s	200s	0s	0s

Misc. Data

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time		X				X										
Omit Phase									X	X	X	X	X	X	X	X
Special Funciton Outputs																

Coordinator Pattern # 91

Split Pattern	91	TS2 (Pat-Off)	0-0	Splits In	Seconds
Cycle	200	Std (COS)	141	Offsets In	Seconds
Offset Value	108s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	1		
Phase Reservice	No	Action Plan	0		

Max Select MAXINH Force Off Fixed

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB		EB	NBLT	SB		WB								
Splits (Split Pat 91)	26	134	0	40	22	138	0	40	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	200s	200s	0s	0s

Misc. Data

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time		X				X										
Omit Phase									X	X	X	X	X	X	X	X
Special Funciton Outputs																

Coordinator Pattern # 92

Split Pattern	92	TS2 (Pat-Off)	0-0	Splits In	Seconds
Cycle	200	Std (COS)	149	Offsets In	Seconds
Offset Value	133s	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	1		
Phase Reservice	No	Action Plan	0		
Max Select	MAXINH	Force Off	Fixed		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB		EB	NBLT	SB		WB								
Splits (Split Pat 92)	26	134	0	40	22	138	0	40	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	200s	200s	0s	0s

Misc. Data

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time		X				X										
Omit Phase									X	X	X	X	X	X	X	X
Special Funciton Outputs																

Volusia County, FL

ECONOLITE

MOVING TRAFFIC FORWARD

169 - US-17-92 @ Firehouse Road - ASC/3 [redacted] - Econolite Type - ASC/3

Coordination Split Pattern
Split Pattern Data (MM) 3-3

Split Pattern # 1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB		EB	NBLT	SB		WB								
Split (seconds)	21	132	0	27	20	133	0	27	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time		X				X										
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	180s	180s	0s	0s

Split Pattern # 2

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB		EB	NBLT	SB		WB								
Split (seconds)	23	118	0	39	18	123	0	39	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time		X				X										
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	180s	180s	0s	0s

Split Pattern # 3

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB		EB	NBLT	SB		WB								
Split (seconds)	25	135	0	30	20	140	0	30	0	0	0	0	0	0	0	0
Coord Phase		X				X										

Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time		X				X										
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	190s	190s	0s	0s

Split Pattern # 4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB		EB	NBLT	SB		WB								
Split (seconds)	20	100	0	20	20	100	0	20	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time		X				X										
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	140s	140s	0s	0s

Split Pattern # 5

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB		EB	NBLT	SB		WB								
Split (seconds)	23	118	0	39	18	123	0	39	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time		X				X										
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	180s	180s	0s	0s

Split Pattern # 90

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB		EB	NBLT	SB		WB								
Split (seconds)	26	134	0	40	22	138	0	40	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																

Pedestrian Recall																
Recall to Max. Time		X				X										
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	200s	200s	0s	0s

Split Pattern # 91

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB		EB	NBLT	SB		WB								
Split (seconds)	26	134	0	40	22	138	0	40	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time		X				X										
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	200s	200s	0s	0s

Split Pattern # 92

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB		EB	NBLT	SB		WB								
Split (seconds)	26	134	0	40	22	138	0	40	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time		X				X										
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	200s	200s	0s	0s

Volusia County, FL

ECONOLITE

MOVING TRAFFIC FORWARD

169 - US-17-92 @ Firehouse Road - ASC/3 [redacted] - Econolite Type - ASC/3

Time Base Day Plan/Schedule

Day Plan (MM) 5-3

Day Plan #1

Event	Action Plan	Start Time
1	1	06:30
2	2	09:30
3	3	15:30
4	4	19:00
5	11	20:30

Day Plan #2

Event	Action Plan	Start Time
1	5	09:00
2	11	20:00

Day Plan #3

Event	Action Plan	Start Time
1	5	10:00
2	11	19:00

Schedule (MM) 5-4

Schedule Number - 1

Day Plan No.: 1

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
		X	X	X	X	X	

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

Schedule Number - 2

Day Plan No.: 2

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
							X

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

Schedule Number - 3

Day Plan No.: 3

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
	X						

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**
	X	X	X	X	X	X	X	X	X	X	X
	23	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**		
	X	X	X	X	X	X	X	X	X		

Turning Movement Worksheets

US 17/92 at Driveway #1
AM Peak Hour

Existing TMCs

	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Existing Count	0	0	0	0	0	0	0	1	0	0	2,457	9	0	0	1,762	0
Date of Count	3/25/2025				SF				1.00							
Adjusted Count	0	0	0	0	0	0	0	1	0	0	2,457	9	0	0	1,762	0

	West Leg	East Leg	South Leg	North Leg
Existing Approach & Departure Volumes	EB: 0	EB: 9	NB: 2,466	NB: 2,458
	WB: 0	WB: 1	SB: 1,762	SB: 1,762
Directional Factors Based on Existing Counts	EB: #DIV/0!	EB: 0.90	NB: 0.58	NB: 0.58
	WB: #DIV/0!	WB: 0.10	SB: 0.42	SB: 0.42

Future Background **Year** 2027

Annual Growth Rate	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%
Simple Volume Growth	0	0	0	0	0	0	0	0	0	0	108	0	0	0	78	0
Applied Bckgrnd Growth	0	0	0	0	0	0	0	0	0	0	108	0	0	0	78	0
Total Bckgrnd Pk-Hr Vols	0	0	0	0	0	0	0	1	0	0	2,565	9	0	0	1,840	0

Project Trips

	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
New Ext Inbound	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	43.0%	0.0%	43.0%	0.0%	0.0%
Volume	0	0	0	0	0	0	0	0	0	0	2	15	0	15	0	0
New Ext Outbound	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	20.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	0.0%
Volume	0	0	0	0	0	0	0	4	0	0	0	0	0	0	11	0
Total Project Trips	0	0	0	0	0	0	0	4	0	0	2	15	0	15	11	0

	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Total Pk-Hr Volumes	0	0	0	0	0	0	0	5	0	0	2,567	24	0	15	1,851	0

US 17/92 at Driveway #1
PM Peak Hour

Existing TMCs

	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Existing Count	0	0	0	0	0	0	0	2	0	0	2,189	3	0	0	2,622	0
Date of Count	3/25/2025				SF				1.00							
Adjusted Count	0	0	0	0	0	0	0	2	0	0	2,189	3	0	0	2,622	0

	West Leg	East Leg	South Leg	North Leg
Existing Approach & Departure Volumes	EB: 0	EB: 3	NB: 2,192	NB: 2,191
	WB: 0	WB: 2	SB: 2,622	SB: 2,622
Directional Factors Based on Existing Counts	EB: #DIV/0!	EB: 0.60	NB: 0.46	NB: 0.46
	WB: #DIV/0!	WB: 0.40	SB: 0.54	SB: 0.54

Future Background **Year** 2027

Annual Growth Rate	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%
Simple Volume Growth	0	0	0	0	0	0	0	0	0	0	96	0	0	0	115	0
Applied Bckgrnd Growth	0	0	0	0	0	0	0	0	0	0	96	0	0	0	115	0
Total Bckgrnd Pk-Hr Vols	0	0	0	0	0	0	0	2	0	0	2,285	3	0	0	2,737	0

Project Trips

	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
New Ext Inbound	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	43.0%	0.0%	43.0%	0.0%	0.0%
Volume	0	0	0	0	0	0	0	0	0	0	3	19	0	19	0	0
New Ext Outbound	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	20.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	0.0%
Volume	0	0	0	0	0	0	0	9	0	0	0	0	0	0	23	0
Total Project Trips	0	0	0	0	0	0	0	9	0	0	3	19	0	19	23	0

	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Total Pk-Hr Volumes	0	0	0	0	0	0	0	11	0	0	2,288	22	0	19	2,760	0

US 17/92 at Driveway #2
AM Peak Hour

Existing TMCs

	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Existing Count	0	0	0	0	0	0	0	1	0	0	2,438	20	0	0	1,762	0
Date of Count	3/25/2025				SF				1.00							
Adjusted Count	0	0	0	0	0	0	0	1	0	0	2,438	20	0	0	1,762	0

	West Leg	East Leg	South Leg	North Leg
Existing Approach & Departure Volumes	EB: 0	EB: 20	NB: 2,458	NB: 2,439
	WB: 0	WB: 1	SB: 1,762	SB: 1,762
Directional Factors Based on Existing Counts	EB: #DIV/0!	EB: 0.95	NB: 0.58	NB: 0.58
	WB: #DIV/0!	WB: 0.05	SB: 0.42	SB: 0.42

Future Background **Year** 2027

Annual Growth Rate	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%
Simple Volume Growth	0	0	0	0	0	0	0	0	0	0	107	1	0	0	78	0
Applied Bckgrnd Growth	0	0	0	0	0	0	0	0	0	0	107	1	0	0	78	0
Total Bckgrnd Pk-Hr Vols	0	0	0	0	0	0	0	1	0	0	2,545	21	0	0	1,840	0

Project Trips

	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
New Ext Inbound	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	0.0%	0.0%	43.0%	0.0%
Volume	0	0	0	0	0	0	0	0	0	0	0	2	0	0	15	0
New Ext Outbound	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%	20.0%	0.0%	0.0%	0.0%	50.0%	0.0%
Volume	0	0	0	0	0	0	0	11	0	0	4	0	0	0	11	0
Total Project Trips	0	0	0	0	0	0	0	11	0	0	4	2	0	0	26	0

	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Total Pk-Hr Volumes	0	0	0	0	0	0	0	12	0	0	2,549	23	0	0	1,866	0

US 17/92 at Driveway #2
PM Peak Hour

Existing TMCs

	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Existing Count	0	0	0	0	0	0	0	6	0	0	2,147	44	0	0	2,622	0
Date of Count	3/25/2025				SF				1.00							
Adjusted Count	0	0	0	0	0	0	0	6	0	0	2,147	44	0	0	2,622	0

	West Leg	East Leg	South Leg	North Leg
Existing Approach & Departure Volumes	EB: 0	EB: 44	NB: 2,191	NB: 2,153
	WB: 0	WB: 6	SB: 2,622	SB: 2,622
Directional Factors Based on Existing Counts	EB: #DIV/0!	EB: 0.88	NB: 0.46	NB: 0.45
	WB: #DIV/0!	WB: 0.12	SB: 0.54	SB: 0.55

Future Background **Year** 2027

Annual Growth Rate	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%
Simple Volume Growth	0	0	0	0	0	0	0	0	0	0	94	2	0	0	115	0
Applied Bckgrnd Growth	0	0	0	0	0	0	0	0	0	0	94	2	0	0	115	0
Total Bckgrnd Pk-Hr Vols	0	0	0	0	0	0	0	6	0	0	2,241	46	0	0	2,737	0

Project Trips

	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
New Ext Inbound	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	0.0%	0.0%	43.0%	0.0%
Volume	0	0	0	0	0	0	0	0	0	0	0	3	0	0	19	0
New Ext Outbound	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%	20.0%	0.0%	0.0%	0.0%	50.0%	0.0%
Volume	0	0	0	0	0	0	0	23	0	0	9	0	0	0	23	0
Total Project Trips	0	0	0	0	0	0	0	23	0	0	9	3	0	0	42	0

	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Total Pk-Hr Volumes	0	0	0	0	0	0	0	29	0	0	2,250	49	0	0	2,779	0

US 17/92 at Firehouse Road
AM Peak Hour

Existing TMCs

	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Existing Count	0	11	1	5	0	45	2	8	8	12	2,390	29	2	3	1,704	35
Date of Count	3/25/2025				SF				1.00							
Adjusted Count	0	11	1	5	0	45	2	8	8	12	2,390	29	2	3	1,704	35

	West Leg	East Leg	South Leg	North Leg
Existing Approach & Departure Volumes	EB: 17	EB: 33	NB: 2,439	NB: 2,411
	WB: 49	WB: 55	SB: 1,762	SB: 1,744
Directional Factors Based on Existing Counts	EB: 0.26	EB: 0.38	NB: 0.58	NB: 0.58
	WB: 0.74	WB: 0.62	SB: 0.42	SB: 0.42

Future Background **Year** 2027

Annual Growth Rate	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%
Simple Volume Growth	0	0	0	0	0	2	0	0	0	1	105	1	0	0	75	2
Applied Bckgrnd Growth	0	0	0	0	0	2	0	0	0	1	105	1	0	0	75	2
Total Bckgrnd Pk-Hr Vols	0	11	1	5	0	47	2	8	8	13	2,495	30	2	3	1,779	37

Project Trips

	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
New Ext Inbound	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	43.0%	0.0%
Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	2	15	0
New Ext Outbound	0.0%	0.0%	0.0%	0.0%	0.0%	30.0%	0.0%	0.0%	20.0%	0.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Volume	0	0	0	0	0	6	0	0	4	0	11	0	0	0	0	0
Total Project Trips	0	0	0	0	0	6	0	0	4	0	11	0	0	2	15	0

	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Total Pk-Hr Volumes	0	11	1	5	0	53	2	8	12	13	2,506	30	2	5	1,794	37

US 17/92 at Firehouse Road
PM Peak Hour

Existing TMCs

	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Existing Count	0	33	4	22	0	137	1	64	10	7	2,064	72	4	48	2,453	7
Date of Count	3/25/2025				SF				1.00							
Adjusted Count	0	33	4	22	0	137	1	64	10	7	2,064	72	4	48	2,453	7

	West Leg	East Leg	South Leg	North Leg
Existing Approach & Departure Volumes	EB: 59	EB: 124	NB: 2,153	NB: 2,165
	WB: 15	WB: 202	SB: 2,622	SB: 2,512
Directional Factors Based on Existing Counts	EB: 0.80	EB: 0.38	NB: 0.45	NB: 0.46
	WB: 0.20	WB: 0.62	SB: 0.55	SB: 0.54

Future Background **Year** 2027

Annual Growth Rate	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%
Simple Volume Growth	0	1	0	1	0	6	0	3	0	0	91	3	0	2	108	0
Applied Bckgrnd Growth	0	1	0	1	0	6	0	3	0	0	91	3	0	2	108	0
Total Bckgrnd Pk-Hr Vols	0	34	4	23	0	143	1	67	10	7	2,155	75	4	50	2,561	7

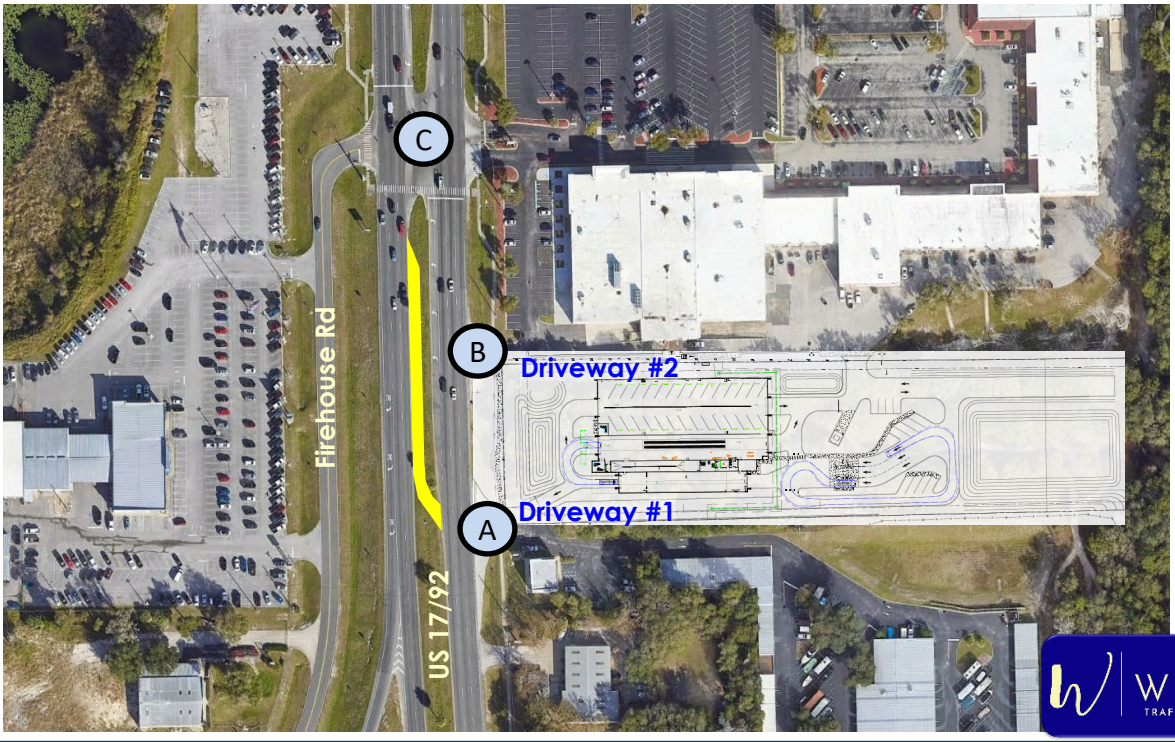
Project Trips

	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
New Ext Inbound	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.0%	43.0%	0.0%
Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	3	19	0
New Ext Outbound	0.0%	0.0%	0.0%	0.0%	0.0%	30.0%	0.0%	0.0%	20.0%	0.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Volume	0	0	0	0	0	14	0	0	9	0	23	0	0	0	0	0
Total Project Trips	0	0	0	0	0	14	0	0	9	0	23	0	0	3	19	0

	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Total Pk-Hr Volumes	0	34	4	23	0	157	1	67	19	7	2,178	75	4	53	2,580	7

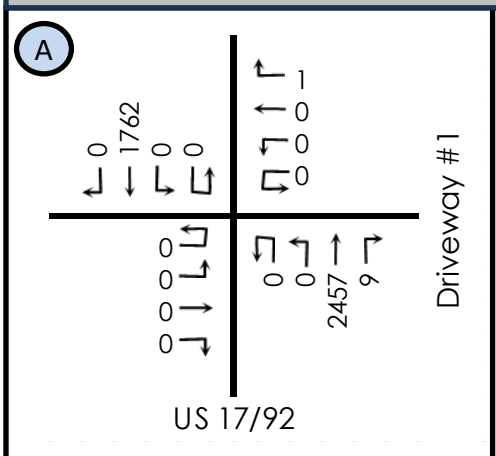
Intersection Traffic Volume Figures

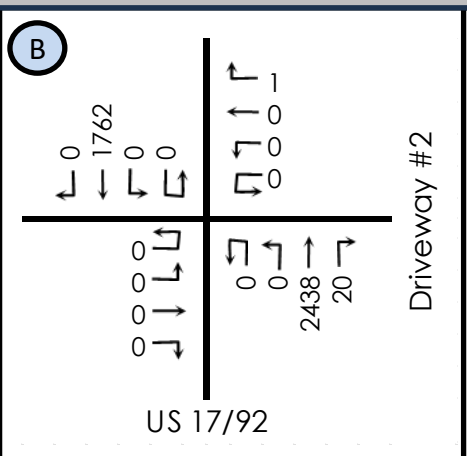
Figure A: Existing Peak-Hour Intersection Volumes

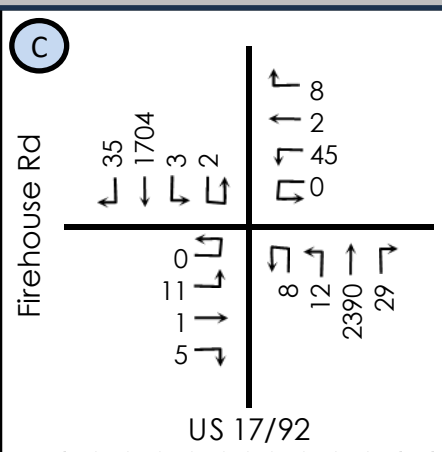


WALSH TRAFFIC ENGINEERING

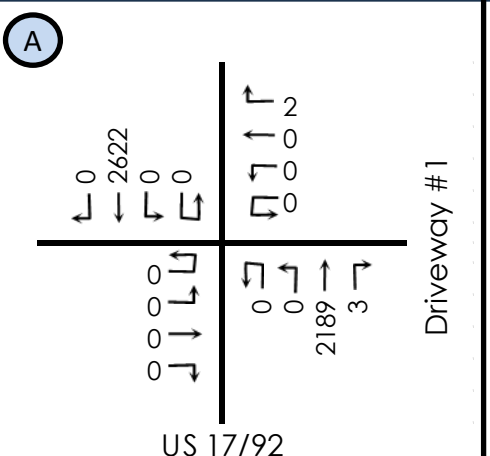
AM Peak Hour

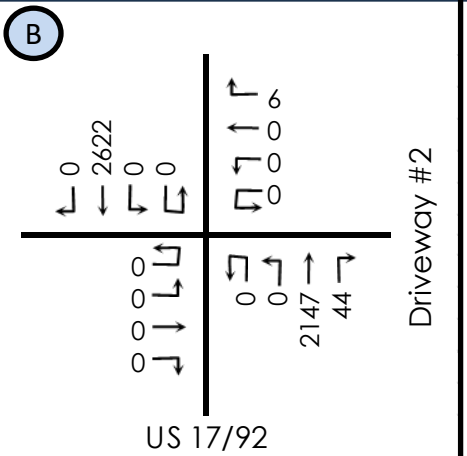






PM Peak Hour





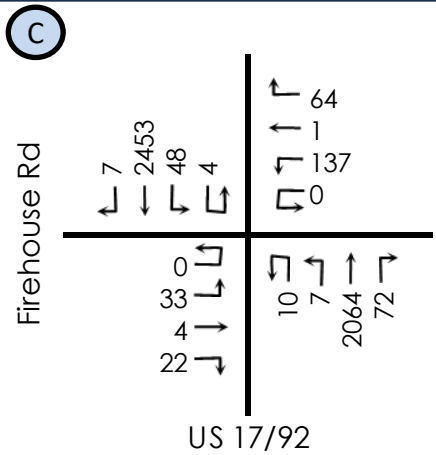
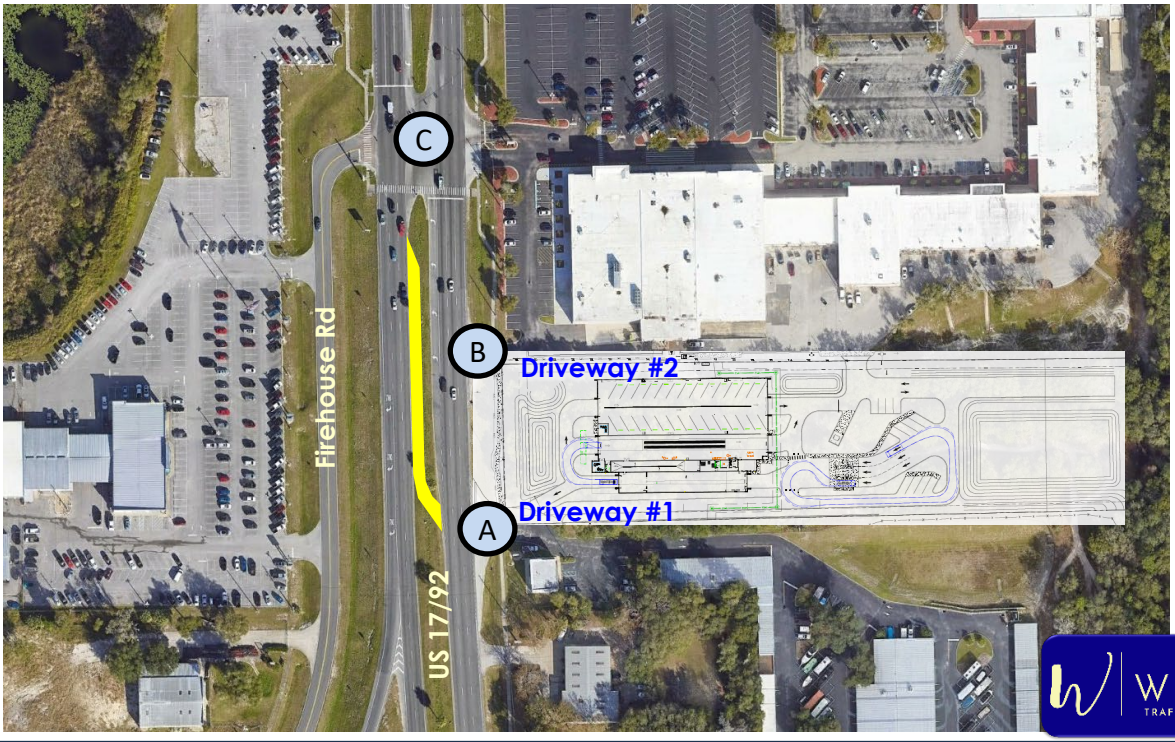
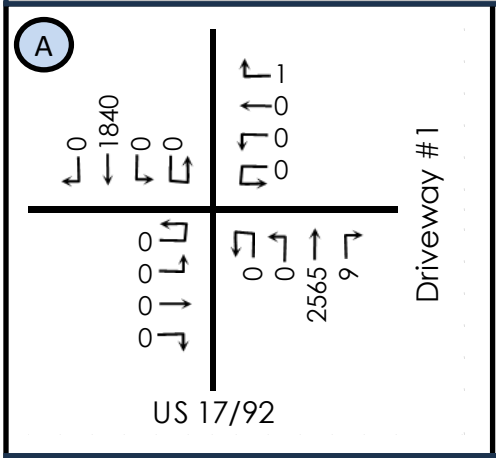
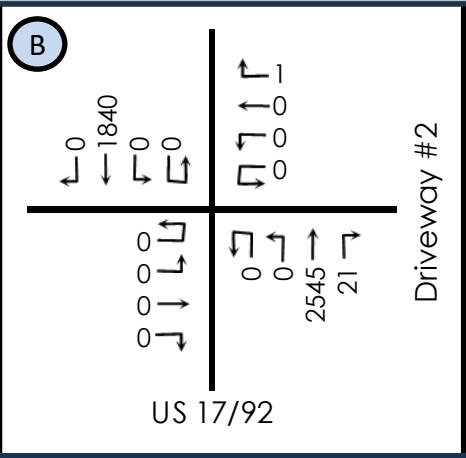


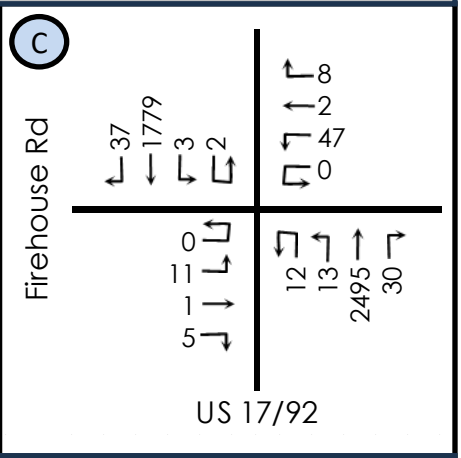
Figure B: Future Background (Year 2027) Peak-Hour Intersection Volumes



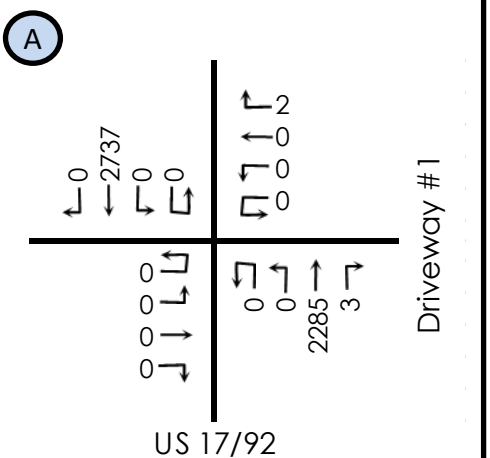
AM Peak Hour

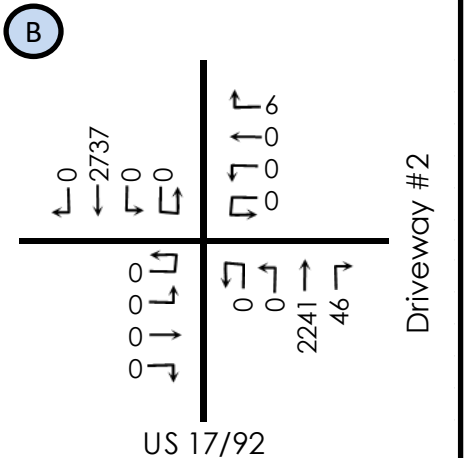






PM Peak Hour





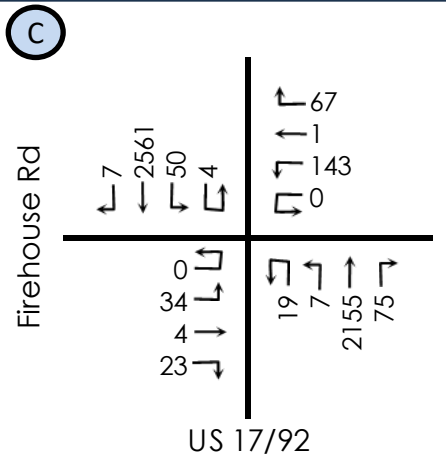
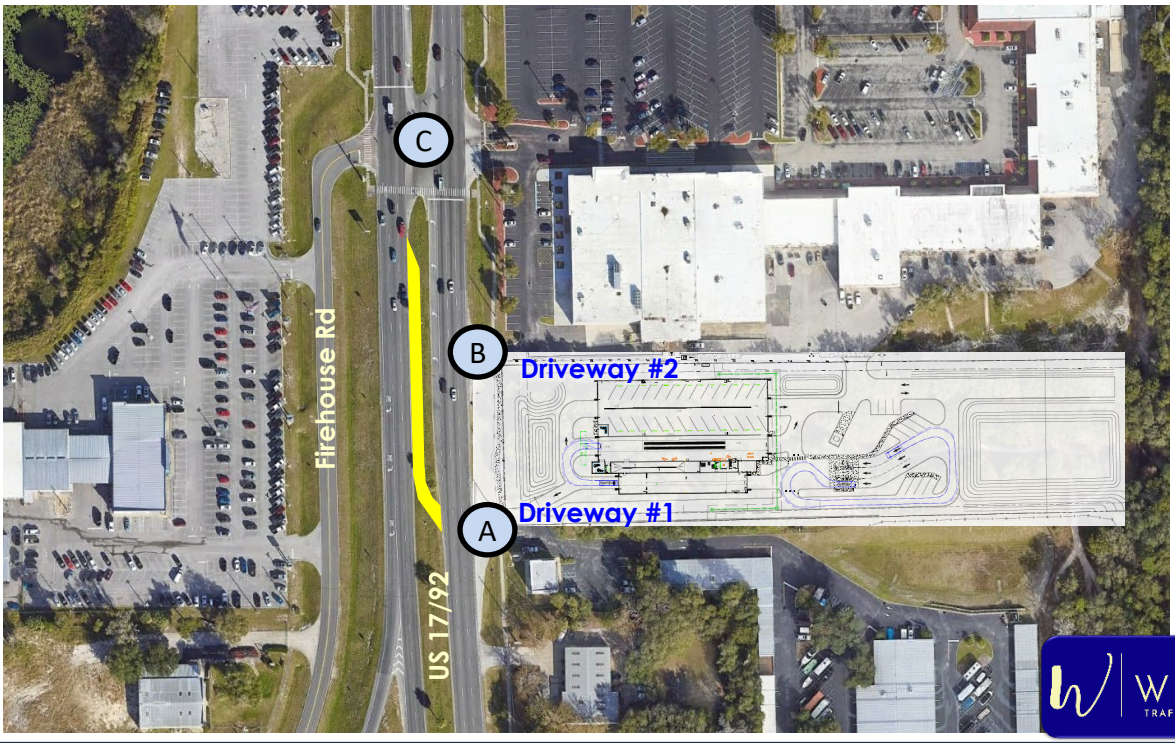
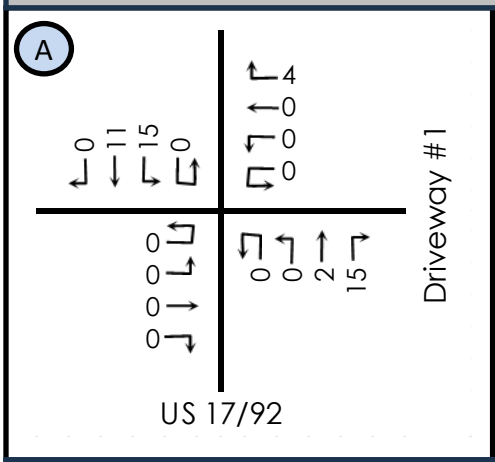
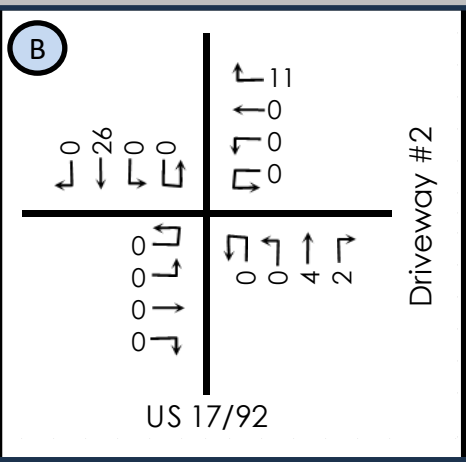


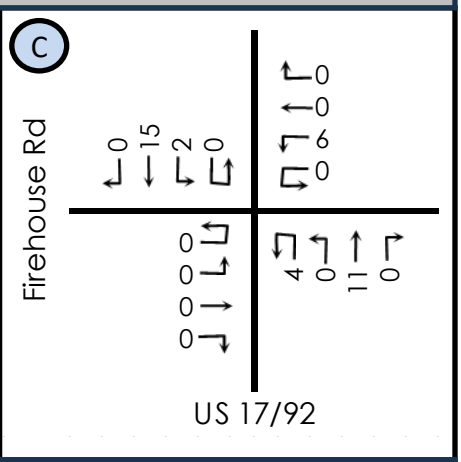
Figure C: New External Project Trips



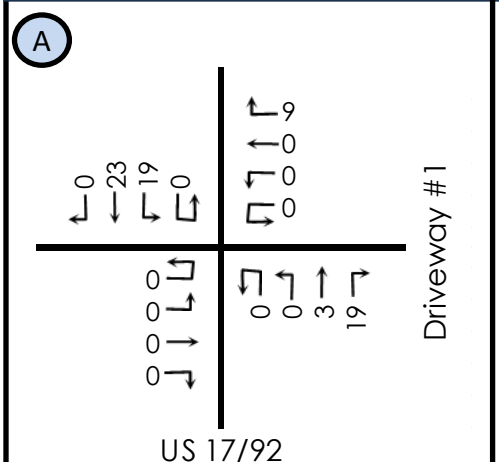
AM Peak Hour

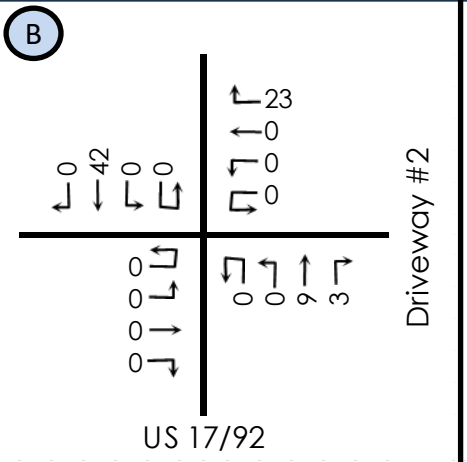






PM Peak Hour





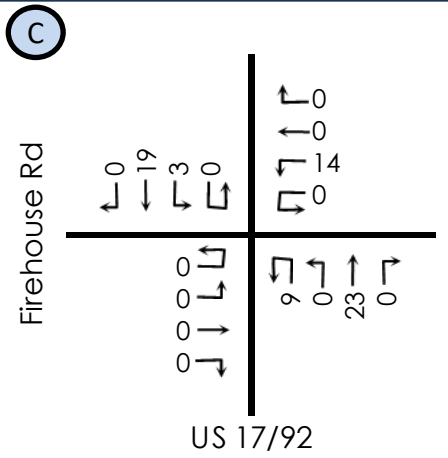
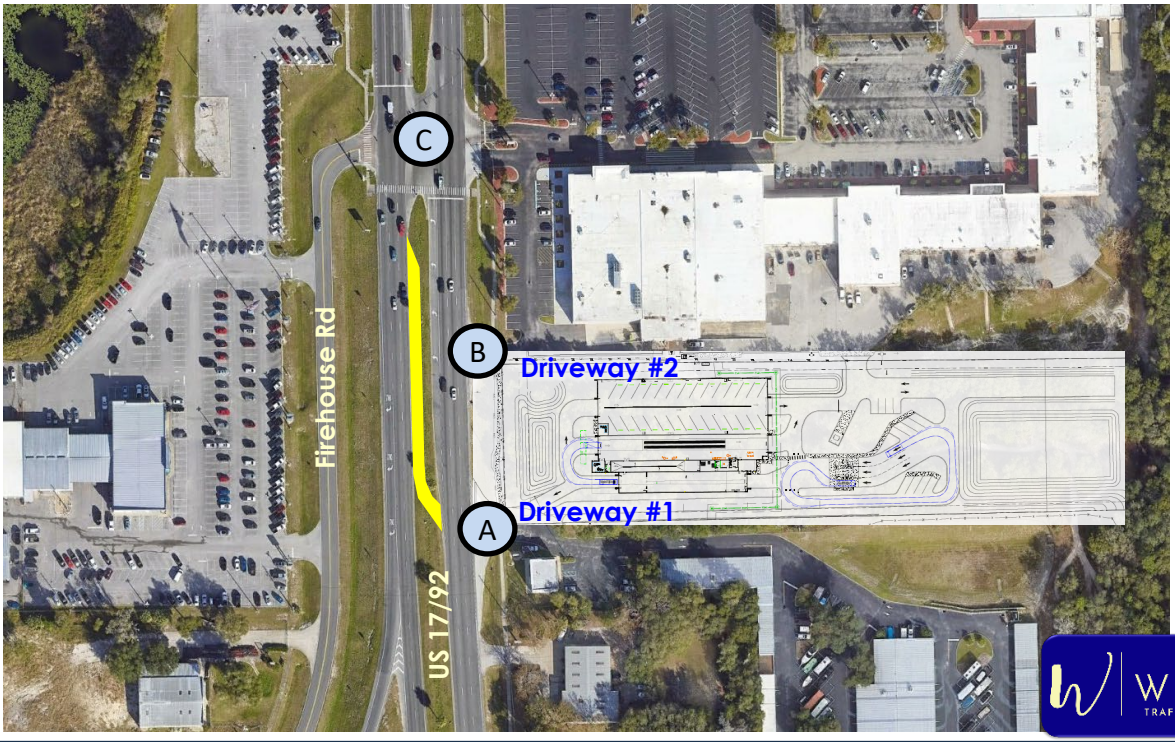
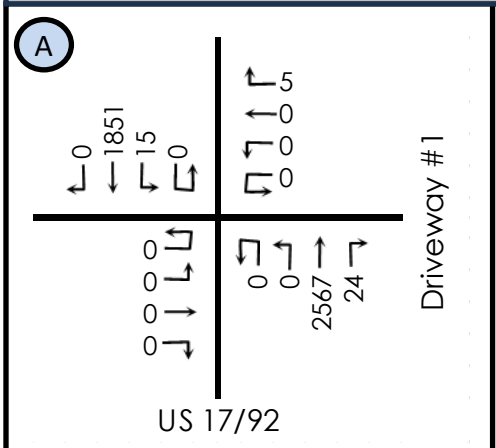
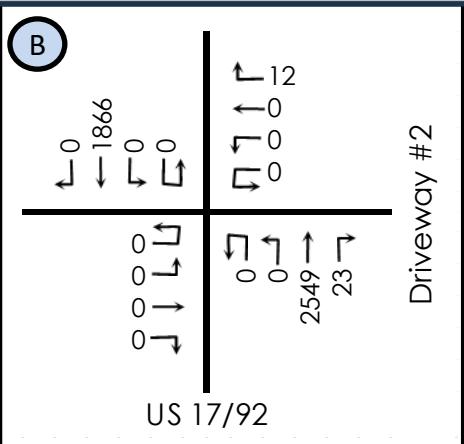


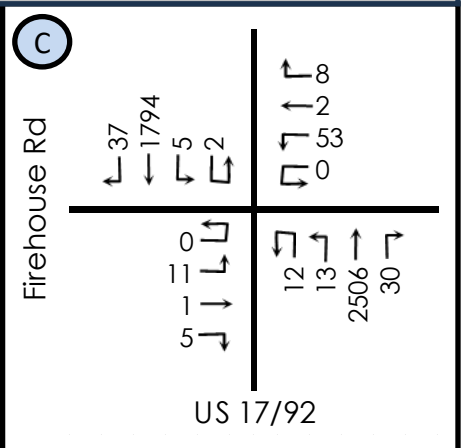
Figure D: Future Buildout (Year 2027) Peak-Hour Intersection Volumes



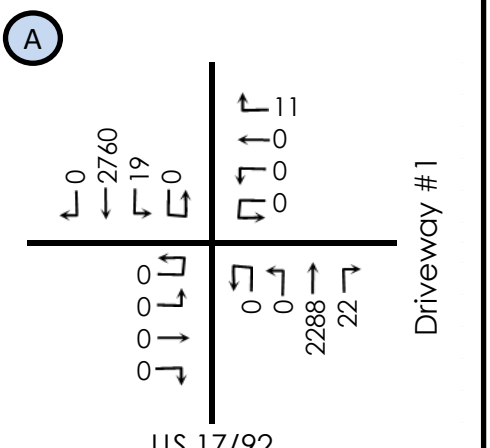
AM Peak Hour

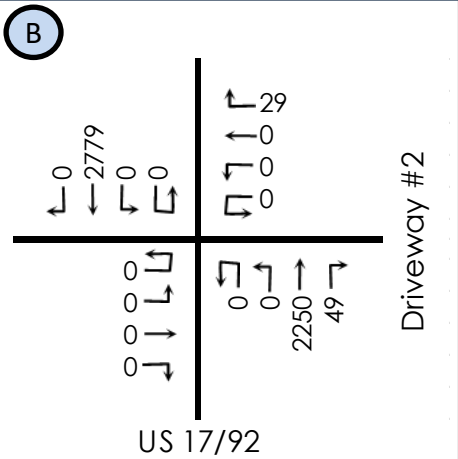


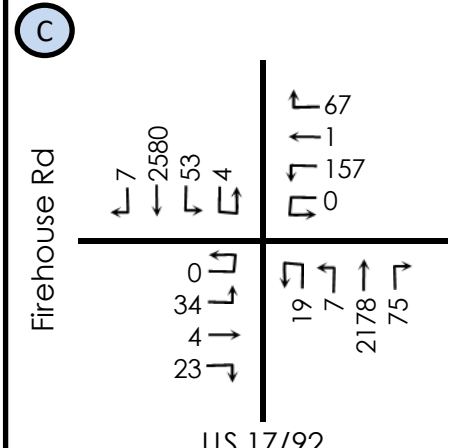




PM Peak Hour





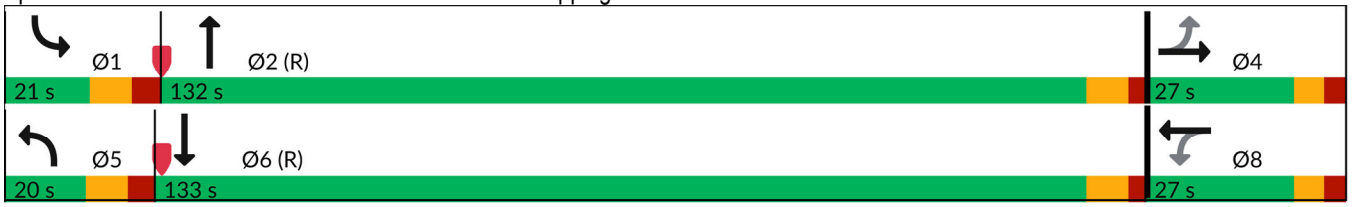


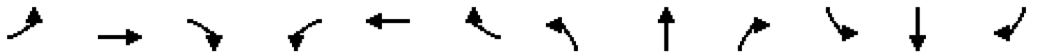
Buildout Conditions Synchro Printouts

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	11	1	53	2	25	2506	7	1794
Future Volume (vph)	11	1	53	2	25	2506	7	1794
Turn Type	Perm	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	5.0	11.0	5.0	11.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	18.8	14.4	18.8
Total Split (s)	27.0	27.0	27.0	27.0	20.0	132.0	21.0	133.0
Total Split (%)	15.0%	15.0%	15.0%	15.0%	11.1%	73.3%	11.7%	73.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	5.5	5.5	5.5	5.5
All-Red Time (s)	3.0	3.0	3.0	3.0	3.5	2.3	3.9	2.3
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.0	7.0	7.0	9.0	7.8	9.4	7.8
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)		12.8	12.9	12.9	8.3	150.0	6.5	142.4
Actuated g/C Ratio		0.07	0.07	0.07	0.05	0.83	0.04	0.79
v/c Ratio		0.17	0.59	0.09	0.33	0.65	0.13	0.50
Control Delay (s/veh)		63.6	103.2	40.4	93.3	9.3	87.7	9.2
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)		63.6	103.2	40.4	93.3	9.3	87.7	9.2
LOS		E	F	D	F	A	F	A
Approach Delay (s/veh)		63.6		93.1		10.1		9.6
Approach LOS		E		F		B		A

Intersection Summary	
Cycle Length: 180	
Actuated Cycle Length: 180	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay (s/veh): 11.2	Intersection LOS: B
Intersection Capacity Utilization 69.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: US 17/92 & Firehouse Road/Shopping Plaza





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	1	5	53	2	8	25	2506	30	7	1794	37
Future Volume (veh/h)	11	1	5	53	2	8	25	2506	30	7	1794	37
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	12	1	5	58	2	9	27	2724	33	8	1950	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	75	11	20	113	14	65	37	4200	51	16	4112	84
Arrive On Green	0.05	0.05	0.05	0.05	0.05	0.05	0.02	0.81	0.81	0.01	0.80	0.80
Sat Flow, veh/h	850	216	410	1410	296	1334	1781	5200	63	1781	5150	106
Grp Volume(v), veh/h	18	0	0	58	0	11	27	1780	977	8	1288	702
Grp Sat Flow(s),veh/h/ln	1477	0	0	1410	0	1630	1781	1702	1859	1781	1702	1851
Q Serve(g_s), s	0.9	0.0	0.0	4.7	0.0	1.2	2.7	37.9	38.3	0.8	22.1	22.1
Cycle Q Clear(g_c), s	2.1	0.0	0.0	6.8	0.0	1.2	2.7	37.9	38.3	0.8	22.1	22.1
Prop In Lane	0.67		0.28	1.00		0.82	1.00		0.03	1.00		0.06
Lane Grp Cap(c), veh/h	105	0	0	113	0	79	37	2750	1502	16	2718	1478
V/C Ratio(X)	0.17	0.00	0.00	0.51	0.00	0.14	0.74	0.65	0.65	0.49	0.47	0.47
Avail Cap(c_a), veh/h	197	0	0	201	0	181	109	2750	1502	115	2718	1478
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	82.4	0.0	0.0	84.5	0.0	82.0	87.7	7.0	7.0	88.8	5.9	5.9
Incr Delay (d2), s/veh	0.8	0.0	0.0	3.6	0.0	0.8	24.6	1.2	2.2	21.0	0.6	1.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.5	0.0	0.0	5.1	0.0	0.9	2.7	16.9	18.8	0.8	11.0	12.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	83.1	0.0	0.0	88.1	0.0	82.8	112.2	8.2	9.2	109.8	6.5	7.0
LnGrp LOS	F			F		F	F	A	A	F	A	A
Approach Vol, veh/h		18			69			2784			1998	
Approach Delay, s/veh		83.1			87.2			9.5			7.1	
Approach LOS		F			F			A			A	

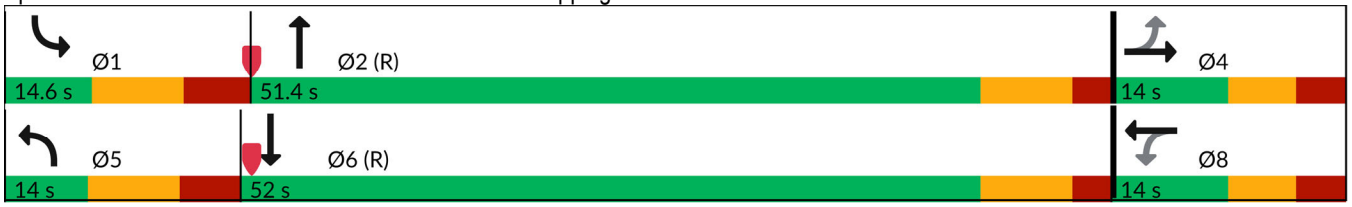
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.0	153.2		15.8	12.7	151.5		15.8				
Change Period (Y+Rc), s	9.4	7.8		7.0	9.0	7.8		7.0				
Max Green Setting (Gmax), s	11.6	124.2		20.0	11.0	125.2		20.0				
Max Q Clear Time (g_c+I1), s	2.8	40.3		4.1	4.7	24.1		8.8				
Green Ext Time (p_c), s	0.0	49.2		0.0	0.0	24.3		0.1				

Intersection Summary												
HCM 7th Control Delay, s/veh			9.9									
HCM 7th LOS			A									

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	11	1	53	2	25	2506	7	1794
Future Volume (vph)	11	1	53	2	25	2506	7	1794
Turn Type	Perm	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	5.0	11.0	5.0	11.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	18.8	14.4	18.8
Total Split (s)	14.0	14.0	14.0	14.0	14.0	51.4	14.6	52.0
Total Split (%)	17.5%	17.5%	17.5%	17.5%	17.5%	64.3%	18.3%	65.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	5.5	5.5	5.5	5.5
All-Red Time (s)	3.0	3.0	3.0	3.0	3.5	2.3	3.9	2.3
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.0	7.0	7.0	9.0	7.8	9.4	7.8
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)		7.0	7.0	7.0	5.3	64.0	5.3	61.3
Actuated g/C Ratio		0.09	0.09	0.09	0.07	0.80	0.07	0.77
v/c Ratio		0.14	0.37	0.07	0.23	0.68	0.07	0.51
Control Delay (s/veh)		30.8	41.8	22.4	40.8	9.3	36.6	8.0
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)		30.8	41.8	22.4	40.8	9.3	36.6	8.0
LOS		C	D	C	D	A	D	A
Approach Delay (s/veh)		30.8		38.7		9.6		8.1
Approach LOS		C		D		A		A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay (s/veh): 9.5	Intersection LOS: A
Intersection Capacity Utilization 69.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: US 17/92 & Firehouse Road/Shopping Plaza



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	1	5	53	2	8	25	2506	30	7	1794	37
Future Volume (veh/h)	11	1	5	53	2	8	25	2506	30	7	1794	37
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	12	1	5	58	2	9	27	2724	33	8	1950	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	137	21	32	199	22	100	50	3185	38	18	3087	63
Arrive On Green	0.07	0.07	0.07	0.07	0.07	0.07	0.03	0.61	0.61	0.01	0.60	0.60
Sat Flow, veh/h	823	275	422	1410	296	1334	1781	5200	63	1781	5150	106
Grp Volume(v), veh/h	18	0	0	58	0	11	27	1780	977	8	1288	702
Grp Sat Flow(s),veh/h/ln	1521	0	0	1410	0	1630	1781	1702	1859	1781	1702	1851
Q Serve(g_s), s	0.0	0.0	0.0	2.2	0.0	0.5	1.2	34.0	34.3	0.4	19.5	19.6
Cycle Q Clear(g_c), s	0.8	0.0	0.0	3.0	0.0	0.5	1.2	34.0	34.3	0.4	19.5	19.6
Prop In Lane	0.67		0.28	1.00		0.82	1.00		0.03	1.00		0.06
Lane Grp Cap(c), veh/h	189	0	0	199	0	122	50	2085	1139	18	2041	1110
V/C Ratio(X)	0.10	0.00	0.00	0.29	0.00	0.09	0.54	0.85	0.86	0.44	0.63	0.63
Avail Cap(c_a), veh/h	207	0	0	217	0	143	111	2085	1139	116	2041	1110
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.6	0.0	0.0	35.5	0.0	34.5	38.4	12.6	12.7	39.4	10.3	10.3
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.8	0.0	0.3	8.6	4.7	8.4	15.9	1.5	2.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.6	0.0	0.0	2.0	0.0	0.4	1.1	15.7	18.5	0.4	9.6	10.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	34.8	0.0	0.0	36.3	0.0	34.8	47.0	17.3	21.1	55.3	11.8	13.1
LnGrp LOS	C			D		C	D	B	C	E	B	B
Approach Vol, veh/h		18			69			2784			1998	
Approach Delay, s/veh		34.8			36.1			18.9			12.4	
Approach LOS		C			D			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.2	56.8		13.0	11.3	55.8		13.0				
Change Period (Y+Rc), s	9.4	7.8		7.0	9.0	7.8		7.0				
Max Green Setting (Gmax), s	5.2	43.6		7.0	5.0	44.2		7.0				
Max Q Clear Time (g_c+I1), s	2.4	36.3		2.8	3.2	21.6		5.0				
Green Ext Time (p_c), s	0.0	6.8		0.0	0.0	14.0		0.0				

Intersection Summary			
HCM 7th Control Delay, s/veh		16.6	
HCM 7th LOS		B	

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	12	2549	23	0	1866
Future Vol, veh/h	0	12	2549	23	0	1866
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	13	2771	25	0	2028

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1398	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	112	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	112	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	41.42	0	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	112	-
HCM Lane V/C Ratio	-	-	0.117	-
HCM Ctrl Dly (s/v)	-	-	41.4	-
HCM Lane LOS	-	-	E	-
HCM 95th %tile Q(veh)	-	-	0.4	-

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	5	2567	24	15	1851
Future Vol, veh/h	0	5	2567	24	15	1851
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	5	2790	26	16	2012

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1408	0	0	2816	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	5.34	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	0	110	-	-	47	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	110	-	-	47	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

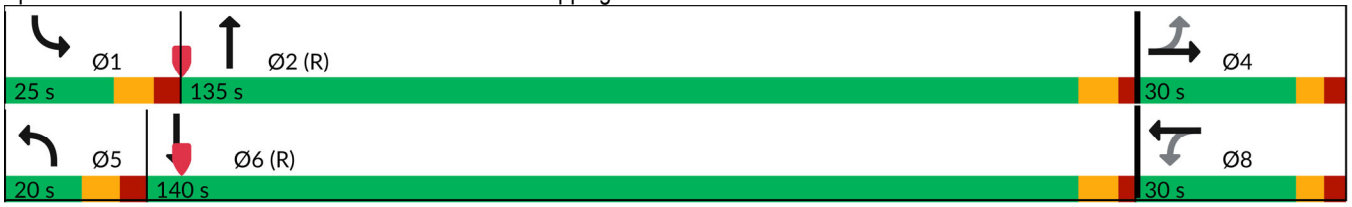
Approach	WB	NB	SB
HCM Ctrl Dly, s/v	39.43	0	0.94
HCM LOS	E		

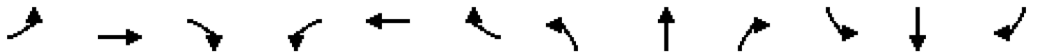
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	110	47	-
HCM Lane V/C Ratio	-	-	0.049	0.345	-
HCM Ctrl Dly (s/v)	-	-	39.4	116.8	-
HCM Lane LOS	-	-	E	F	-
HCM 95th %tile Q(veh)	-	-	0.2	1.2	-

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	34	4	157	1	26	2178	57	2580
Future Volume (vph)	34	4	157	1	26	2178	57	2580
Turn Type	Perm	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	5.0	11.0	5.0	11.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	18.8	14.4	18.8
Total Split (s)	30.0	30.0	30.0	30.0	20.0	135.0	25.0	140.0
Total Split (%)	15.8%	15.8%	15.8%	15.8%	10.5%	71.1%	13.2%	73.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	5.5	5.5	5.5	5.5
All-Red Time (s)	3.0	3.0	3.0	3.0	3.5	2.3	3.9	2.3
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.0	7.0	7.0	9.0	7.8	9.4	7.8
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)		23.0	23.0	23.0	8.3	131.0	11.8	137.8
Actuated g/C Ratio		0.12	0.12	0.12	0.04	0.69	0.06	0.73
v/c Ratio		0.37	1.08	0.29	0.36	0.70	0.57	0.76
Control Delay (s/veh)		68.0	166.3	17.3	100.3	19.4	105.5	18.7
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)		68.0	166.3	17.3	100.3	19.4	105.5	18.7
LOS		E	F	B	F	B	F	B
Approach Delay (s/veh)		68.0		121.3		20.3		20.6
Approach LOS		E		F		C		C

Intersection Summary	
Cycle Length: 190	
Actuated Cycle Length: 190	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.08	
Intersection Signal Delay (s/veh): 25.4	Intersection LOS: C
Intersection Capacity Utilization 76.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 3: US 17/92 & Firehouse Road/Shopping Plaza





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	4	23	157	1	67	26	2178	75	57	2580	7
Future Volume (veh/h)	34	4	23	157	1	67	26	2178	75	57	2580	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	37	4	25	171	1	73	28	2367	82	62	2804	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	93	16	48	183	3	190	36	3588	124	78	3855	11
Arrive On Green	0.12	0.12	0.12	0.12	0.12	0.12	0.02	0.71	0.71	0.04	0.73	0.73
Sat Flow, veh/h	521	130	397	1381	21	1567	1781	5068	175	1781	5257	15
Grp Volume(v), veh/h	66	0	0	171	0	74	28	1586	863	62	1815	997
Grp Sat Flow(s),veh/h/ln	1049	0	0	1381	0	1588	1781	1702	1839	1781	1702	1868
Q Serve(g_s), s	6.4	0.0	0.0	8.4	0.0	8.2	3.0	48.4	49.1	6.6	57.9	58.0
Cycle Q Clear(g_c), s	14.6	0.0	0.0	23.0	0.0	8.2	3.0	48.4	49.1	6.6	57.9	58.0
Prop In Lane	0.56		0.38	1.00		0.99	1.00		0.09	1.00		0.01
Lane Grp Cap(c), veh/h	157	0	0	183	0	192	36	2410	1302	78	2496	1370
V/C Ratio(X)	0.42	0.00	0.00	0.94	0.00	0.38	0.77	0.66	0.66	0.80	0.73	0.73
Avail Cap(c_a), veh/h	157	0	0	183	0	192	103	2410	1302	146	2496	1370
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	81.4	0.0	0.0	85.8	0.0	77.0	92.6	15.2	15.3	90.0	14.5	14.5
Incr Delay (d2), s/veh	1.8	0.0	0.0	48.6	0.0	1.3	28.7	1.4	2.7	16.8	1.9	3.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.8	0.0	0.0	16.4	0.0	6.2	3.0	24.6	27.2	6.1	28.1	31.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	83.2	0.0	0.0	134.4	0.0	78.2	121.3	16.6	17.9	106.8	16.4	17.9
LnGrp LOS	F			F		E	F	B	B	F	B	B
Approach Vol, veh/h		66			245			2477			2874	
Approach Delay, s/veh		83.2			117.4			18.2			18.8	
Approach LOS		F			F			B			B	

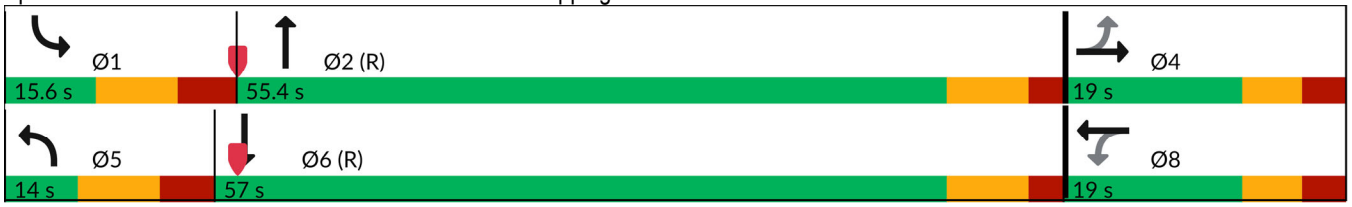
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	17.7	142.3		30.0	12.9	147.1		30.0				
Change Period (Y+Rc), s	9.4	7.8		7.0	9.0	7.8		7.0				
Max Green Setting (Gmax), s	15.6	127.2		23.0	11.0	132.2		23.0				
Max Q Clear Time (g_c+I1), s	8.6	51.1		16.6	5.0	60.0		25.0				
Green Ext Time (p_c), s	0.0	36.8		0.1	0.0	46.8		0.0				

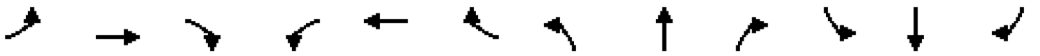
Intersection Summary			
HCM 7th Control Delay, s/veh		23.6	
HCM 7th LOS		C	

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	34	4	157	1	26	2178	57	2580
Future Volume (vph)	34	4	157	1	26	2178	57	2580
Turn Type	Perm	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	5.0	11.0	5.0	11.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	18.8	14.4	18.8
Total Split (s)	19.0	19.0	19.0	19.0	14.0	55.4	15.6	57.0
Total Split (%)	21.1%	21.1%	21.1%	21.1%	15.6%	61.6%	17.3%	63.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	5.5	5.5	5.5	5.5
All-Red Time (s)	3.0	3.0	3.0	3.0	3.5	2.3	3.9	2.3
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.0	7.0	7.0	9.0	7.8	9.4	7.8
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)		12.0	12.0	12.0	5.0	50.7	6.1	57.6
Actuated g/C Ratio		0.13	0.13	0.13	0.06	0.56	0.07	0.64
v/c Ratio		0.32	0.97	0.27	0.29	0.86	0.53	0.86
Control Delay (s/veh)		29.0	101.1	12.1	48.5	21.8	57.0	18.9
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)		29.0	101.1	12.1	48.5	21.8	57.0	18.9
LOS		C	F	B	D	C	E	B
Approach Delay (s/veh)		29.0		74.2		22.1		19.7
Approach LOS		C		E		C		B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay (s/veh): 23.2	Intersection LOS: C
Intersection Capacity Utilization 76.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 3: US 17/92 & Firehouse Road/Shopping Plaza





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	4	23	157	1	67	26	2178	75	57	2580	7
Future Volume (veh/h)	34	4	23	157	1	67	26	2178	75	57	2580	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	37	4	25	171	1	73	28	2367	82	62	2804	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	136	27	61	267	3	209	50	2803	97	80	3019	9
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.03	0.55	0.55	0.04	0.57	0.57
Sat Flow, veh/h	551	201	458	1381	21	1567	1781	5068	175	1781	5257	15
Grp Volume(v), veh/h	66	0	0	171	0	74	28	1586	863	62	1815	997
Grp Sat Flow(s),veh/h/ln	1210	0	0	1381	0	1588	1781	1702	1839	1781	1702	1868
Q Serve(g_s), s	1.9	0.0	0.0	5.0	0.0	3.8	1.4	35.1	35.6	3.1	43.8	43.9
Cycle Q Clear(g_c), s	5.8	0.0	0.0	10.8	0.0	3.8	1.4	35.1	35.6	3.1	43.8	43.9
Prop In Lane	0.56		0.38	1.00		0.99	1.00		0.09	1.00		0.01
Lane Grp Cap(c), veh/h	224	0	0	267	0	212	50	1883	1017	80	1955	1073
V/C Ratio(X)	0.29	0.00	0.00	0.64	0.00	0.35	0.56	0.84	0.85	0.78	0.93	0.93
Avail Cap(c_a), veh/h	224	0	0	267	0	212	99	1883	1017	123	1955	1073
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.2	0.0	0.0	38.4	0.0	35.5	43.2	16.8	16.9	42.5	17.5	17.5
Incr Delay (d2), s/veh	0.7	0.0	0.0	5.0	0.0	1.0	9.6	4.8	8.8	15.4	9.3	15.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.5	0.0	0.0	7.2	0.0	2.7	1.3	18.0	20.8	2.9	22.4	26.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	37.0	0.0	0.0	43.4	0.0	36.4	52.8	21.6	25.7	58.0	26.8	32.5
LnGrp LOS	D			D		D	D	C	C	E	C	C
Approach Vol, veh/h		66			245			2477			2874	
Approach Delay, s/veh		37.0			41.3			23.4			29.4	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.4	57.6		19.0	11.5	59.5		19.0				
Change Period (Y+Rc), s	9.4	7.8		7.0	9.0	7.8		7.0				
Max Green Setting (Gmax), s	6.2	47.6		12.0	5.0	49.2		12.0				
Max Q Clear Time (g_c+I1), s	5.1	37.6		7.8	3.4	45.9		12.8				
Green Ext Time (p_c), s	0.0	8.6		0.1	0.0	3.2		0.0				

Intersection Summary												
HCM 7th Control Delay, s/veh			27.4									
HCM 7th LOS			C									

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	29	2250	49	0	2779
Future Vol, veh/h	0	29	2250	49	0	2779
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	32	2446	53	0	3021

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1249	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	141	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	141	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	37.73	0	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	141	-
HCM Lane V/C Ratio	-	-	0.224	-
HCM Ctrl Dly (s/v)	-	-	37.7	-
HCM Lane LOS	-	-	E	-
HCM 95th %tile Q(veh)	-	-	0.8	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	11	2288	22	19	2760
Future Vol, veh/h	0	11	2288	22	19	2760
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	12	2408	23	20	2905

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1216	0	0	2432	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	5.34	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	0	149	-	-	75	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	149	-	-	75	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	31.26	0	0.48
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	149	75	-
HCM Lane V/C Ratio	-	-	0.078	0.266	-
HCM Ctrl Dly (s/v)	-	-	31.3	69.5	-
HCM Lane LOS	-	-	D	F	-
HCM 95th %tile Q(veh)	-	-	0.2	1	-

“No SB Left-Turn Access” Access Alternative

US 17/92 at Firehouse Road (No SB Directional Left at Driveway)
AM Peak Hour

Existing TMCs

	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Existing Count	0	11	1	5	0	45	2	8	8	12	2,390	29	2	3	1,704	35
Date of Count	3/25/2025				SF				1.00							
Adjusted Count	0	11	1	5	0	45	2	8	8	12	2,390	29	2	3	1,704	35

	West Leg	East Leg	South Leg	North Leg
Existing Approach & Departure Volumes	EB: 17	EB: 33	NB: 2,439	NB: 2,411
	WB: 49	WB: 55	SB: 1,762	SB: 1,744
Directional Factors Based on Existing Counts	EB: 0.26	EB: 0.38	NB: 0.58	NB: 0.58
	WB: 0.74	WB: 0.62	SB: 0.42	SB: 0.42

Future Background **Year** 2027

Annual Growth Rate	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%
Simple Volume Growth	0	0	0	0	0	2	0	0	0	1	105	1	0	0	75	2
Applied Bckgrnd Growth	0	0	0	0	0	2	0	0	0	1	105	1	0	0	75	2
Total Bckgrnd Pk-Hr Vols	0	11	1	5	0	47	2	8	8	13	2,495	30	2	3	1,779	37

Project Trips

	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
New Ext Inbound	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%
Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	18	0	0
New Ext Outbound	0.0%	0.0%	0.0%	0.0%	0.0%	30.0%	0.0%	0.0%	20.0%	0.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Volume	0	0	0	0	0	6	0	0	4	0	11	0	0	0	0	0
Total Project Trips	0	0	0	0	0	6	0	0	4	0	11	0	0	18	0	0

	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Total Pk-Hr Volumes	0	11	1	5	0	53	2	8	12	13	2,506	30	2	21	1,779	37

US 17/92 at Firehouse Road (No SB Directional Left at Driveway)
PM Peak Hour

Existing TMCs

	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Existing Count	0	33	4	22	0	137	1	64	10	7	2,064	72	4	48	2,453	7
Date of Count	3/25/2025				SF				1.00							
Adjusted Count	0	33	4	22	0	137	1	64	10	7	2,064	72	4	48	2,453	7

	West Leg	East Leg	South Leg	North Leg
Existing Approach & Departure Volumes	EB: 59	EB: 124	NB: 2,153	NB: 2,165
	WB: 15	WB: 202	SB: 2,622	SB: 2,512
Directional Factors Based on Existing Counts	EB: 0.80	EB: 0.38	NB: 0.45	NB: 0.46
	WB: 0.20	WB: 0.62	SB: 0.55	SB: 0.54

Future Background **Year** 2027

Annual Growth Rate	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%
Simple Volume Growth	0	1	0	1	0	6	0	3	0	0	91	3	0	2	108	0
Applied Bckgrnd Growth	0	1	0	1	0	6	0	3	0	0	91	3	0	2	108	0
Total Bckgrnd Pk-Hr Vols	0	34	4	23	0	143	1	67	10	7	2,155	75	4	50	2,561	7

Project Trips

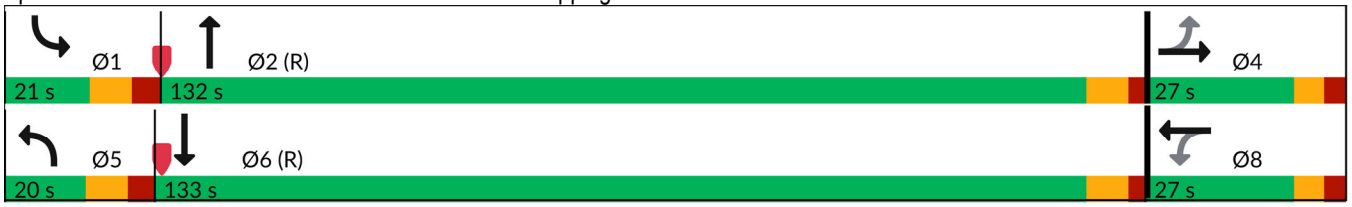
	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
New Ext Inbound	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%
Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	23	0	0
New Ext Outbound	0.0%	0.0%	0.0%	0.0%	0.0%	30.0%	0.0%	0.0%	20.0%	0.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Volume	0	0	0	0	0	14	0	0	9	0	23	0	0	0	0	0
Total Project Trips	0	0	0	0	0	14	0	0	9	0	23	0	0	23	0	0

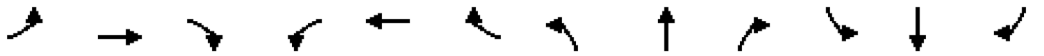
	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Total Pk-Hr Volumes	0	34	4	23	0	157	1	67	19	7	2,178	75	4	73	2,561	7

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	11	1	53	2	25	2506	23	1779
Future Volume (vph)	11	1	53	2	25	2506	23	1779
Turn Type	Perm	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	5.0	11.0	5.0	11.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	18.8	14.4	18.8
Total Split (s)	27.0	27.0	27.0	27.0	20.0	132.0	21.0	133.0
Total Split (%)	15.0%	15.0%	15.0%	15.0%	11.1%	73.3%	11.7%	73.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	5.5	5.5	5.5	5.5
All-Red Time (s)	3.0	3.0	3.0	3.0	3.5	2.3	3.9	2.3
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.0	7.0	7.0	9.0	7.8	9.4	7.8
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)		12.8	12.9	12.9	8.3	145.5	8.1	142.4
Actuated g/C Ratio		0.07	0.07	0.07	0.05	0.81	0.05	0.79
v/c Ratio		0.17	0.59	0.09	0.33	0.67	0.32	0.49
Control Delay (s/veh)		63.6	103.2	40.4	93.3	11.7	92.8	9.2
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)		63.6	103.2	40.4	93.3	11.7	92.8	9.2
LOS		E	F	D	F	B	F	A
Approach Delay (s/veh)		63.6		93.1		12.5		10.2
Approach LOS		E		F		B		B

Intersection Summary	
Cycle Length: 180	
Actuated Cycle Length: 180	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay (s/veh): 12.9	Intersection LOS: B
Intersection Capacity Utilization 69.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: US 17/92 & Firehouse Road/Shopping Plaza





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	1	5	53	2	8	25	2506	30	23	1779	37
Future Volume (veh/h)	11	1	5	53	2	8	25	2506	30	23	1779	37
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	12	1	5	58	2	9	27	2724	33	25	1934	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	75	11	20	113	14	65	37	4145	50	35	4111	85
Arrive On Green	0.05	0.05	0.05	0.05	0.05	0.05	0.02	0.80	0.80	0.02	0.80	0.80
Sat Flow, veh/h	850	216	410	1410	296	1334	1781	5200	63	1781	5149	106
Grp Volume(v), veh/h	18	0	0	58	0	11	27	1780	977	25	1278	696
Grp Sat Flow(s),veh/h/ln	1477	0	0	1410	0	1630	1781	1702	1859	1781	1702	1851
Q Serve(g_s), s	0.9	0.0	0.0	4.7	0.0	1.2	2.7	40.0	40.4	2.5	21.8	21.8
Cycle Q Clear(g_c), s	2.1	0.0	0.0	6.8	0.0	1.2	2.7	40.0	40.4	2.5	21.8	21.8
Prop In Lane	0.67		0.28	1.00		0.82	1.00		0.03	1.00		0.06
Lane Grp Cap(c), veh/h	105	0	0	113	0	79	37	2713	1482	35	2718	1478
V/C Ratio(X)	0.17	0.00	0.00	0.51	0.00	0.14	0.74	0.66	0.66	0.71	0.47	0.47
Avail Cap(c_a), veh/h	197	0	0	201	0	181	109	2713	1482	115	2718	1478
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	82.4	0.0	0.0	84.5	0.0	82.0	87.7	7.8	7.8	87.7	5.8	5.9
Incr Delay (d2), s/veh	0.8	0.0	0.0	3.6	0.0	0.8	24.6	1.3	2.3	22.8	0.6	1.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.5	0.0	0.0	5.1	0.0	0.9	2.7	18.1	20.2	2.5	10.9	11.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	83.1	0.0	0.0	88.1	0.0	82.8	112.2	9.0	10.1	110.5	6.4	6.9
LnGrp LOS	F			F		F	F	A	B	F	A	A
Approach Vol, veh/h		18			69			2784			1999	
Approach Delay, s/veh		83.1			87.2			10.4			7.9	
Approach LOS		F			F			B			A	

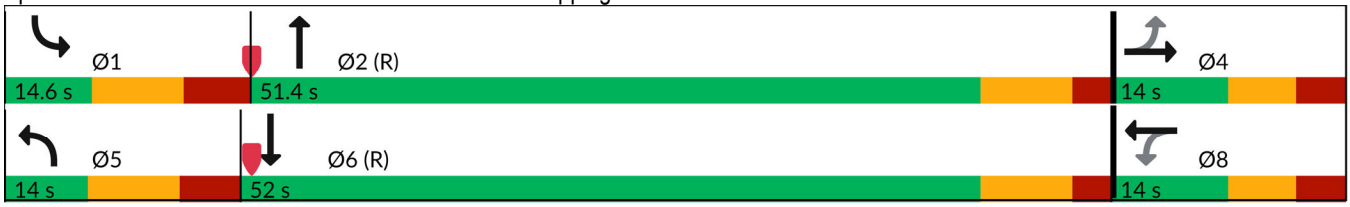
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.0	151.3		15.8	12.7	151.5		15.8				
Change Period (Y+Rc), s	9.4	7.8		7.0	9.0	7.8		7.0				
Max Green Setting (Gmax), s	11.6	124.2		20.0	11.0	125.2		20.0				
Max Q Clear Time (g_c+I1), s	4.5	42.4		4.1	4.7	23.8		8.8				
Green Ext Time (p_c), s	0.0	48.6		0.0	0.0	23.8		0.1				

Intersection Summary												
HCM 7th Control Delay, s/veh			10.7									
HCM 7th LOS			B									

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	11	1	53	2	25	2506	23	1779
Future Volume (vph)	11	1	53	2	25	2506	23	1779
Turn Type	Perm	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	5.0	11.0	5.0	11.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	18.8	14.4	18.8
Total Split (s)	14.0	14.0	14.0	14.0	14.0	51.4	14.6	52.0
Total Split (%)	17.5%	17.5%	17.5%	17.5%	17.5%	64.3%	18.3%	65.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	5.5	5.5	5.5	5.5
All-Red Time (s)	3.0	3.0	3.0	3.0	3.5	2.3	3.9	2.3
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.0	7.0	7.0	9.0	7.8	9.4	7.8
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)		7.0	7.0	7.0	5.3	61.1	5.4	61.3
Actuated g/C Ratio		0.09	0.09	0.09	0.07	0.76	0.07	0.77
v/c Ratio		0.14	0.37	0.07	0.23	0.71	0.21	0.51
Control Delay (s/veh)		30.8	41.8	22.4	40.8	12.4	39.9	8.0
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)		30.8	41.8	22.4	40.8	12.4	39.9	8.0
LOS		C	D	C	D	B	D	A
Approach Delay (s/veh)		30.8		38.7		12.7		8.4
Approach LOS		C		D		B		A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay (s/veh): 11.3	Intersection LOS: B
Intersection Capacity Utilization 69.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: US 17/92 & Firehouse Road/Shopping Plaza



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	1	5	53	2	8	25	2506	30	23	1779	37
Future Volume (veh/h)	11	1	5	53	2	8	25	2506	30	23	1779	37
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	12	1	5	58	2	9	27	2724	33	25	1934	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	137	21	32	199	22	100	50	3099	37	47	3087	64
Arrive On Green	0.07	0.07	0.07	0.07	0.07	0.07	0.03	0.60	0.60	0.03	0.60	0.60
Sat Flow, veh/h	823	275	422	1410	296	1334	1781	5200	63	1781	5149	106
Grp Volume(v), veh/h	18	0	0	58	0	11	27	1780	977	25	1278	696
Grp Sat Flow(s),veh/h/ln	1521	0	0	1410	0	1630	1781	1702	1859	1781	1702	1851
Q Serve(g_s), s	0.0	0.0	0.0	2.2	0.0	0.5	1.2	35.4	35.8	1.1	19.3	19.3
Cycle Q Clear(g_c), s	0.8	0.0	0.0	3.0	0.0	0.5	1.2	35.4	35.8	1.1	19.3	19.3
Prop In Lane	0.67		0.28	1.00		0.82	1.00		0.03	1.00		0.06
Lane Grp Cap(c), veh/h	189	0	0	199	0	122	50	2029	1108	47	2041	1110
V/C Ratio(X)	0.10	0.00	0.00	0.29	0.00	0.09	0.54	0.88	0.88	0.53	0.63	0.63
Avail Cap(c_a), veh/h	207	0	0	217	0	143	111	2029	1108	116	2041	1110
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.6	0.0	0.0	35.5	0.0	34.5	38.4	13.7	13.8	38.4	10.3	10.3
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.8	0.0	0.3	8.6	5.8	10.2	8.8	1.5	2.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.6	0.0	0.0	2.0	0.0	0.4	1.1	16.9	19.9	1.0	9.6	10.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	34.8	0.0	0.0	36.3	0.0	34.8	47.0	19.4	23.9	47.2	11.7	13.0
LnGrp LOS	C			D		C	D	B	C	D	B	B
Approach Vol, veh/h		18			69			2784			1999	
Approach Delay, s/veh		34.8			36.1			21.3			12.6	
Approach LOS		C			D			C			B	

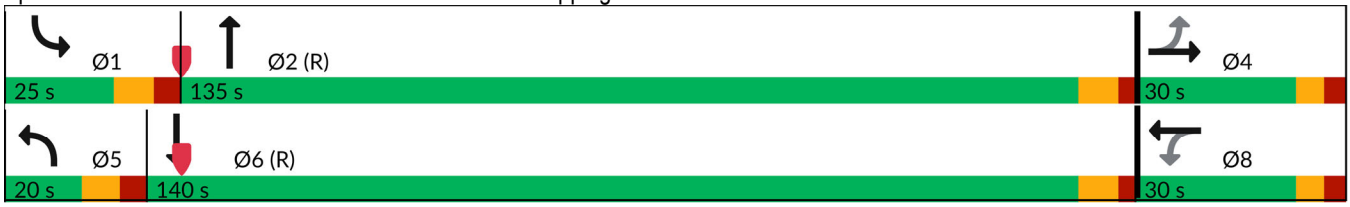
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.5	55.5		13.0	11.3	55.8		13.0				
Change Period (Y+Rc), s	9.4	7.8		7.0	9.0	7.8		7.0				
Max Green Setting (Gmax), s	5.2	43.6		7.0	5.0	44.2		7.0				
Max Q Clear Time (g_c+I1), s	3.1	37.8		2.8	3.2	21.3		5.0				
Green Ext Time (p_c), s	0.0	5.5		0.0	0.0	13.9		0.0				

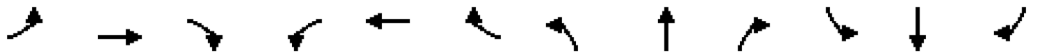
Intersection Summary			
HCM 7th Control Delay, s/veh		18.0	
HCM 7th LOS		B	

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	34	4	157	1	26	2178	77	2561
Future Volume (vph)	34	4	157	1	26	2178	77	2561
Turn Type	Perm	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	5.0	11.0	5.0	11.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	18.8	14.4	18.8
Total Split (s)	30.0	30.0	30.0	30.0	20.0	135.0	25.0	140.0
Total Split (%)	15.8%	15.8%	15.8%	15.8%	10.5%	71.1%	13.2%	73.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	5.5	5.5	5.5	5.5
All-Red Time (s)	3.0	3.0	3.0	3.0	3.5	2.3	3.9	2.3
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.0	7.0	7.0	9.0	7.8	9.4	7.8
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)		23.0	23.0	23.0	8.3	129.5	13.3	137.8
Actuated g/C Ratio		0.12	0.12	0.12	0.04	0.68	0.07	0.73
v/c Ratio		0.37	1.08	0.29	0.36	0.71	0.68	0.76
Control Delay (s/veh)		68.0	166.3	17.3	100.3	20.3	112.3	18.5
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)		68.0	166.3	17.3	100.3	20.3	112.3	18.5
LOS		E	F	B	F	C	F	B
Approach Delay (s/veh)		68.0		121.3		21.2		21.2
Approach LOS		E		F		C		C

Intersection Summary	
Cycle Length: 190	
Actuated Cycle Length: 190	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.08	
Intersection Signal Delay (s/veh): 26.1	Intersection LOS: C
Intersection Capacity Utilization 87.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 3: US 17/92 & Firehouse Road/Shopping Plaza





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	4	23	157	1	67	26	2178	75	77	2561	7
Future Volume (veh/h)	34	4	23	157	1	67	26	2178	75	77	2561	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	37	4	25	171	1	73	28	2367	82	84	2784	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	93	16	48	183	3	190	36	3521	121	101	3855	11
Arrive On Green	0.12	0.12	0.12	0.12	0.12	0.12	0.02	0.69	0.69	0.06	0.73	0.73
Sat Flow, veh/h	521	130	397	1381	21	1567	1781	5068	175	1781	5257	15
Grp Volume(v), veh/h	66	0	0	171	0	74	28	1586	863	84	1802	990
Grp Sat Flow(s),veh/h/ln	1049	0	0	1381	0	1588	1781	1702	1839	1781	1702	1868
Q Serve(g_s), s	6.4	0.0	0.0	8.4	0.0	8.2	3.0	50.6	51.3	8.9	57.0	57.1
Cycle Q Clear(g_c), s	14.6	0.0	0.0	23.0	0.0	8.2	3.0	50.6	51.3	8.9	57.0	57.1
Prop In Lane	0.56		0.38	1.00		0.99	1.00		0.09	1.00		0.01
Lane Grp Cap(c), veh/h	157	0	0	183	0	192	36	2365	1278	101	2496	1370
V/C Ratio(X)	0.42	0.00	0.00	0.94	0.00	0.38	0.77	0.67	0.68	0.83	0.72	0.72
Avail Cap(c_a), veh/h	157	0	0	183	0	192	103	2365	1278	146	2496	1370
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	81.4	0.0	0.0	85.8	0.0	77.0	92.6	16.6	16.7	88.7	14.4	14.4
Incr Delay (d2), s/veh	1.8	0.0	0.0	48.6	0.0	1.3	28.7	1.5	2.9	22.3	1.8	3.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.8	0.0	0.0	16.4	0.0	6.2	3.0	25.9	28.6	8.2	27.7	30.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	83.2	0.0	0.0	134.4	0.0	78.2	121.3	18.1	19.6	111.0	16.2	17.7
LnGrp LOS	F			F		E	F	B	B	F	B	B
Approach Vol, veh/h		66			245			2477			2876	
Approach Delay, s/veh		83.2			117.4			19.8			19.5	
Approach LOS		F			F			B			B	

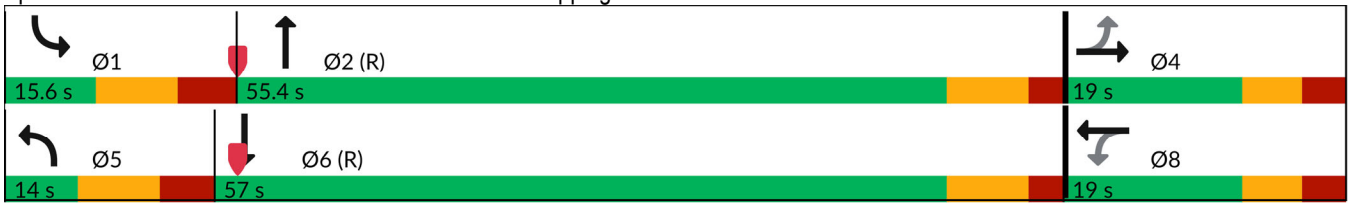
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	20.2	139.8		30.0	12.9	147.1		30.0				
Change Period (Y+Rc), s	9.4	7.8		7.0	9.0	7.8		7.0				
Max Green Setting (Gmax), s	15.6	127.2		23.0	11.0	132.2		23.0				
Max Q Clear Time (g_c+I1), s	10.9	53.3		16.6	5.0	59.1		25.0				
Green Ext Time (p_c), s	0.1	36.4		0.1	0.0	46.5		0.0				

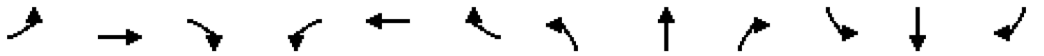
Intersection Summary			
HCM 7th Control Delay, s/veh		24.6	
HCM 7th LOS		C	

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	34	4	157	1	26	2178	77	2561
Future Volume (vph)	34	4	157	1	26	2178	77	2561
Turn Type	Perm	NA	Perm	NA	Prot	NA	Prot	NA
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	5.0	11.0	5.0	11.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	18.8	14.4	18.8
Total Split (s)	19.0	19.0	19.0	19.0	14.0	55.4	15.6	57.0
Total Split (%)	21.1%	21.1%	21.1%	21.1%	15.6%	61.6%	17.3%	63.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	5.5	5.5	5.5	5.5
All-Red Time (s)	3.0	3.0	3.0	3.0	3.5	2.3	3.9	2.3
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.0	7.0	7.0	9.0	7.8	9.4	7.8
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)		12.0	12.0	12.0	5.0	50.7	6.2	57.6
Actuated g/C Ratio		0.13	0.13	0.13	0.06	0.56	0.07	0.64
v/c Ratio		0.32	0.97	0.27	0.29	0.86	0.69	0.86
Control Delay (s/veh)		29.0	101.1	12.1	48.5	21.8	71.0	18.6
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)		29.0	101.1	12.1	48.5	21.8	71.0	18.6
LOS		C	F	B	D	C	E	B
Approach Delay (s/veh)		29.0		74.2		22.1		20.1
Approach LOS		C		E		C		C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay (s/veh): 23.4	Intersection LOS: C
Intersection Capacity Utilization 87.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 3: US 17/92 & Firehouse Road/Shopping Plaza





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	4	23	157	1	67	26	2178	75	77	2561	7
Future Volume (veh/h)	34	4	23	157	1	67	26	2178	75	77	2561	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	37	4	25	171	1	73	28	2367	82	84	2784	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	136	27	61	267	3	209	50	2724	94	107	3019	9
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.03	0.54	0.54	0.06	0.57	0.57
Sat Flow, veh/h	551	201	458	1381	21	1567	1781	5068	175	1781	5257	15
Grp Volume(v), veh/h	66	0	0	171	0	74	28	1586	863	84	1802	990
Grp Sat Flow(s),veh/h/ln	1210	0	0	1381	0	1588	1781	1702	1839	1781	1702	1868
Q Serve(g_s), s	1.9	0.0	0.0	5.0	0.0	3.8	1.4	36.3	36.8	4.2	43.1	43.2
Cycle Q Clear(g_c), s	5.8	0.0	0.0	10.8	0.0	3.8	1.4	36.3	36.8	4.2	43.1	43.2
Prop In Lane	0.56		0.38	1.00		0.99	1.00		0.09	1.00		0.01
Lane Grp Cap(c), veh/h	224	0	0	267	0	212	50	1830	988	107	1955	1073
V/C Ratio(X)	0.29	0.00	0.00	0.64	0.00	0.35	0.56	0.87	0.87	0.78	0.92	0.92
Avail Cap(c_a), veh/h	224	0	0	267	0	212	99	1830	988	123	1955	1073
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.2	0.0	0.0	38.4	0.0	35.5	43.2	18.0	18.1	41.7	17.3	17.4
Incr Delay (d2), s/veh	0.7	0.0	0.0	5.0	0.0	1.0	9.6	5.8	10.6	24.3	8.7	14.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.5	0.0	0.0	7.2	0.0	2.7	1.3	19.0	22.1	4.4	22.0	25.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	37.0	0.0	0.0	43.4	0.0	36.4	52.8	23.9	28.7	66.0	26.0	31.6
LnGrp LOS	D			D		D	D	C	C	E	C	C
Approach Vol, veh/h		66			245			2477			2876	
Approach Delay, s/veh		37.0			41.3			25.9			29.1	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.8	56.2		19.0	11.5	59.5		19.0				
Change Period (Y+Rc), s	9.4	7.8		7.0	9.0	7.8		7.0				
Max Green Setting (Gmax), s	6.2	47.6		12.0	5.0	49.2		12.0				
Max Q Clear Time (g_c+I1), s	6.2	38.8		7.8	3.4	45.2		12.8				
Green Ext Time (p_c), s	0.0	7.7		0.1	0.0	3.8		0.0				

Intersection Summary		
HCM 7th Control Delay, s/veh		28.3
HCM 7th LOS		C

Legal Description

PARCEL 2B, MAIN STREET TOWNHOMES, ACCORDING TO THE PLAT THEREOF AS RECORDED IN PLAT BOOK 52, PAGES 35 AND 36, PUBLIC RECORDS OF VOLUSIA COUNTY, FLORIDA.

Total Acres: 7.35