Turkey Point Power Plant
Peak Construction Analysis

traffic study

prepared for:
Golder Associates, Inc.

Traf Tech
ENGINEERING, INC.

June 2009

Traf Tech
ENGINEERING, INC.

June 16, 2009

Ms. Kerri J. Kitchen
Senior Planner
Golder Associates, Inc.
5100 W. Lemon Street, Suite 114
Tampa, Florida 33609

Re: **Turkey Point Plant – Peak Construction Traffic Study**

Dear Kerri:

Traf Tech Engineering, Inc. is pleased to provide the results of the traffic study in connection with peak construction activities associated with Units 6 & 7 at the existing Turkey Point Plants located at the easternmost point of SW 344th Street (Palm Drive) in south Miami-Dade County, Florida. It has been a pleasure serving Golder Associates, Inc. on this project.

Sincerely,

TRAF TECH ENGINEERING, INC.

Joaquin E. Vargas, P.E.
Senior Transportation Engineer

8400 North University Drive, Suite 202, Tamarac, Florida 33321
Tel: (954) 582-0988 Fax: (954) 582-0989 E-mail: joaquin@traftech.biz

INTRODUCTION

Traf Tech Engineering, Inc. has been retained by Golder Associates, Inc. to perform a traffic study in connection with the construction of Units 6 & 7 at the existing Turkey Point Plant located at the easternmost point of SW 344th Street (Palm Drive) in south Miami-Dade County, Florida. Figure 1 shows the location of the Site and its relationship to the immediate transportation network. This traffic study addresses Miami-Dade County's Traffic Concurrency Management System and the future operating conditions of the transportation network located in the vicinity of the Site for peak work-force conditions. For this analysis, a new construction access roadway was assumed via the extensions of SW 117th Avenue and SW 137th Avenue, south of SW 344th Street to SW 359th Street, and SW 359th Street from the new extension of SW 137th Avenue to the construction site. The following is a summary of the report's findings.

PEAK CONSTRUCTION WORKFORCE

During the construction period, it is estimated that a maximum of approximately 3,650 workers will be assigned to the Turkey Point Plant, on a temporary basis. These 3,650 workers are in addition to the existing employees currently working at the existing plant.

EXISTING CONDITIONS

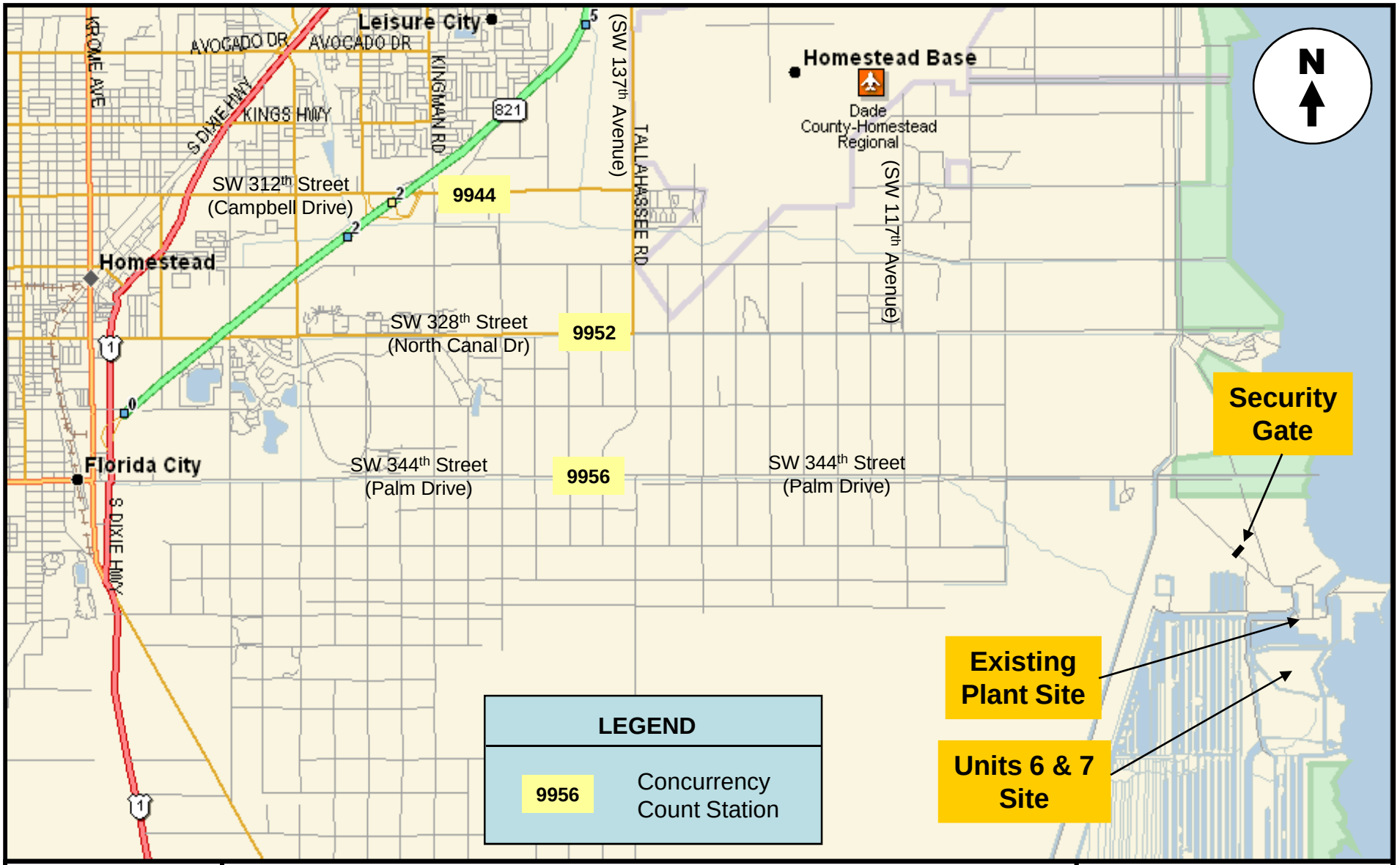
According to Miami-Dade County Concurrency Management System, there are three (3) traffic concurrency stations in the vicinity of the Site, as illustrated in Figure 1. The available capacities on the three concurrency stations are documented in Table 1. The information presented in Table 1 was obtained from Miami-Dade County's Concurrency Management System (refer to Appendix A).

TABLE 1
RESERVE CAPACITY (PM Peak Hour)
Turkey Point Plant

Station No.	Location	Peak Hour Capacity[1]	Peak Hour Trips[2]	Available Peak Hour Capacity[3]
9956	SW 344 St. W. of SW 137th Ave/Tallahassee Road	3,030	231	2,799
9952	SW 328th St. W. of SW 137th Ave/Tallahassee Road	2,600	254	2,346
9944	SW 312th St. E. of HEFT[4]	3,350	2,061	1,289

Source: Miami-Dade County (October 15, 2008)

[1] Maximum level of service capacity.
[2] Existing traffic volumes plus peak hour trips associated with approved, but not built, developments.
[3] Total peak hour trips minus peak hour capacity (reserved trips).
[4] Homestead Extension of Florida's Turnpike



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Project Location Map

FIGURE 1
Turkey Point Plant
Miami-Dade County, Florida

The available capacities shown in Table 1 reflect existing traffic as well as traffic associated with approved developments, but not yet built and/or fully occupied. As indicated in Table 1, all nearby traffic concurrency stations have sufficient peak hour capacity to accommodate additional traffic within south Miami-Dade County.

TRIP GENERATION (Construction Workforce and Truck Traffic)

The trip generation for the construction workforce and truck traffic is presented below:

Construction Workforce Trip Generation

The trip generation associated with the maximum work-force of 3,650 workers was based on discussions held with individuals experienced in the construction of similar FPL facilities. The trip generation associated with Units 6 & 7 was based on the following assumptions:

- A conservative vehicle occupancy of 1.0 worker per vehicle

- Two shifts for the construction workforce

  - Shift 1 will be scheduled from 6:00 AM to 4:30 PM and assumes 70% of the construction workforce. Therefore, the AM peak hour is projected to occur between 5:00 AM and 6:00 AM with one-half the construction traffic arriving in the first 30 minutes and the remaining half during the second 30 minutes. The afternoon peak hour is projected to occur between 4:30 PM and 5:30 PM with a similar distribution in outbound traffic between the two 30-minute periods.

  - Shift 2 will be scheduled from 5:00 PM to 3:00 AM and assumes 30% of the construction workforce. Hence, the inbound peak for the second shift is projected to occur between 4:00 PM and 5:00 PM and the outbound peak from 3:00 AM to 4:00 AM. Similar to Shift 1, the inbound and outbound construction-related traffic will evenly distribute between two 30-minute periods.

With the above assumptions, the AM peak hour is projected to occur between 5:00 AM and 6:00 AM with approximately 2,555 construction-related vehicles (2,555 inbound and zero outbound). The PM peak hour is projected to occur from 4:30 PM to 5:30 PM with approximately 3,103 construction-related vehicles (548 inbound and 2,555 outbound). Appendix B contains the trip generation calculations used to arrive at the AM and PM peak hour trips associated with the peak construction workforce.

Truck Traffic Trip Generation

It was assumed that a maximum of 36 trucks per hour will enter and exit the construction site. For purposes of this traffic study, 36 trucks were assumed to enter and exit (total of 72 trips) during the AM peak hour (5:00 AM to 6:00 AM) and 72 truck-trips during the afternoon peak hour (4:30 PM to 5:30 PM).

TRIP DISTRIBUTION AND TRAFFIC ASSIGNMENT

The trip distribution and traffic assignment for the construction traffic was based on existing traffic patterns associated with the current employees assigned to the subject plant. Based on the current travel patterns, the majority of the construction traffic is anticipated to arrive/depart via SW 137th Avenue from the north. The secondmost traveled route is projected to be SW 344th Street to/from US 1 and the least utilized roadway is anticipated to be SW 328th Street from the west. The percent construction traffic assignment, for both the workforce and truck traffic, is documented in Appendix C.

The trip distribution associated with the truck traffic was based on the following assumptions:

- Fifty percent of the trucks (18 trucks) will use a quarry site located north of the Site and therefore, will access the construction site via SW 117th Avenue and SW 359th Street

- The remaining 18 trucks will use a quarry site located west of the Site and therefore, will access the construction site via US 1, SW 344th Street, SW 137th Avenue/Tallahassee Road, and SW 359th Street

LINK ANALYSIS (Peak Construction Period)

The project traffic assignment shown in Appendix C was combined with the traffic concurrency information documented in Table 1 to develop future conditions analysis (with traffic generated during the peak construction period of Units 6 & 7). The resulting future conditions analysis is summarized in Table 2 on the following page. As indicated in Table 2, the transportation network located in the vicinity of the Site has sufficient capacity to absorb the traffic impacts generated during the peak construction period of Units 6 & 7.

Based on the foregoing analysis, the new trips generated during the peak construction period of Units 6 & 7 of the existing Turkey Point Plant located east of Florida City meets Miami-Dade County's Traffic Concurrency Standards (no roadway improvements required at the location of the concurrency count stations).

TABLE 2 PM PEAK LINK ANALYSIS (PM Peak Construction Period of Units 6 & 7) Turkey Point Plant				
Station No.	**Location**	**Previous Peak Hour Capacity**	**Construction New Trips**	**Available Peak Hour Capacity**
9956	SW 344 St. W. of SW 137th Ave/Tallahassee Road	2,799	1,124	1,675
9952	SW 328th St. W. of SW 137th Ave/Tallahassee Road	2,346	447	1,899
9944	SW 312th St. E. of HEFT	1,289	784	505

Source: Miami-Dade County and Traf Tech Engineering, Inc.

INTERSECTION ANALYSIS (Peak Construction Period)

The six most affected intersections (within 5 miles of the construction site) were evaluated for the peak construction period of Units 6 & 7. The intersection analyses were undertaken following the capacity/level of service procedures outlined in the Highway Capacity Manual (HCS+ Version 5.2). Level of Service (LOS) is a quality measure describing operational conditions within a traffic stream. Six LOS are defined, from "A" to "F", with "A" representing the best operating conditions and LOS "F" the worst. Miami-Dade County has adopted LOS "D" as their standard for planning and operational analyses.

For these analyses, roadway improvements were identified in order to provide acceptable level of service at the six study intersections. The roadway improvements include additional turn lanes, signalization (or police control), and roadway widening. The results of the capacity analyses are summarized in Table 3.

TABLE 3 INTERSECTION ANALYSIS (Peak Construction Period of Units 6 & 7) Turkey Point Plant		
Intersection	**AM Peak Hour**	**PM Peak Hour**
SW 328th St & SW 137th Ave	C	D
SW 328th St & SW 117th Ave	C	D
SW 344th St & SW 137th Ave (W)	C	B
SW 344th St & SW 137th Ave (E)	B	B
SW 344th St & SW 117th Ave	C	C
SW 359th St & SW 117th Ave	C	D

Source: Highway Capacity Software

As indicated in Table 3, the six most impacted intersections are projected to operate adequately with the additional traffic generated during the peak construction period of Units 6 & 7, with the following improvements:

SW 328th Street (North Canal Drive) and SW 137th Avenue (Tallahassee Road)

- Signalization or Police Control
- Construct one additional southbound left-turn lane
- Construct one additional westbound through lane
- Construct two westbound right-turn lanes

SW 328th Street (North Canal Drive) and SW 117th Avenue

- Signalization or Police Control
- Construct two northbound left-turn lanes
- Construct one eastbound right-turn lane
- Restripe the eastbound through lane to a shared through/right-turn lane

SW 344th Street (Palm Drive) and SW 137th Avenue/Tallahassee Rd (West)

- Signalization or Police Control (PM Peak Hour Only)
- Construct one separate eastbound through lane
- Construct one additional westbound left-turn lane

SW 344th Street (Palm Drive) and SW 137th Avenue/Tallahassee Rd (East) – New Intersection

- Signalization or Police Control (PM Peak Hour Only)
- Construct two eastbound right-turn lanes
- Construct two northbound approach lanes (one striped as an exclusive left-turn lane and the other as a shared left-turn/right-turn lane)

SW 344th Street (Palm Drive) and SW 117th Avenue

- Signalization or Police Control
- Construct one eastbound left-turn lane
- Construct one eastbound right-turn lane
- Construct one westbound right-turn lane
- Construct one northbound left-turn lane
- Construct two northbound through lanes (outside lane will function as a shared through/right-turn lane)
- Construct one southbound left-turn lane
- Construct one southbound through lane (outside lane will function as a shared through/right-turn lane)

SW 359th Street and SW 117th Avenue – New Intersection

- Signalization or Police Control
- Construct two eastbound approach lanes (prohibit eastbound left-turns)
- Construct one westbound through lane
- Construct one westbound right-turn lane
- Construct two southbound approach lanes (one striped as an exclusive left-turn lane and the other as a shared left-turn/right-turn lane)

SW 137th Avenue/Tallahassee Road at SW 359th Street – New Curve

- Construct a curve linking SW 137th Avenue/Tallahassee Road with SW 359th Street. This curve should be designed so that it integrates appropriately with the existing FPL transmission lines

In addition to the intersection improvements described above, the following roadway segments need to be implemented in order to provide acceptable operating conditions[5] within the study area:

SW 328th Street/North Canal Drive (SW 137th Avenue/Tallahassee Road to SW 117th Avenue)

- Widen from two to four lanes

SW 344th Street/Palm Drive (SW 137th Avenue/Tallahassee Road West to SW 137th Avenue/Tallahassee Road East)

- Widen from two to four lanes

SW 117th Avenue (SW 328th Street/North Canal Drive to SW 344th Street/Palm Drive)

- Widen from two to four lanes

Improved SW 359th Street (SW 137th Avenue/Tallahassee Road to SW 117th Avenue)

- Three lanes (two eastbound and one westbound)

Improved SW 359th Street (SW 117th Avenue to Construction Site)

- Four lanes (two eastbound and two westbound)

Improved SW 137th Avenue/Tallahassee Road (SW 344th Street/Palm Drive to SW 359th Street)

- Three lanes (two southbound and one northbound)

Improved SW 117th Avenue (SW 344th Street/Palm Drive to SW 359th Street)

- Four lanes (two northbound and two southbound)

Figure 2 illustrates the required roadway improvements at the six study intersections and the affected roadway segments located within the study area. Figures 3 and 4 illustrate the typical sections for the required 3-lane and 4-lane roadway improvements, respectively.

The future turning movement volumes are contained in Appendix C, including existing intersection counts and peak season adjustment factors, while the computer printouts of the intersection capacity analyses are presented in Appendix D.

[5] Using a link capacity of 1,100 vehicles per hour per lane based on FDOT's Generalized Capacity Tables

N

SW 268th Street

SW 280th Street

SW 280th Street

US 1

Krome Avenue

SW 288th Street

Homestead Air Reserve Base

SW 137th Avenue

Tallahassee Road

Biscayne Bay

SW 312th Street

Campbell Drive

SW 152 Ave

821

Florida's Turnpike

SW 328th Street

N. Canal Drive

4L

4L

SW 117th Avenue

4L

SW 344th Street

Palm Drive

SW 167th Ave

3L

SW 137th Ave

4L

SW 359t

3L

4L

Existing Facility

Proposed Expansion

Card Sound Road

LEGEND

Widened Existing Paved Roadways

Improved Existing Unpaved Roadways

Intersection Improvement

4L Required # of Lanes

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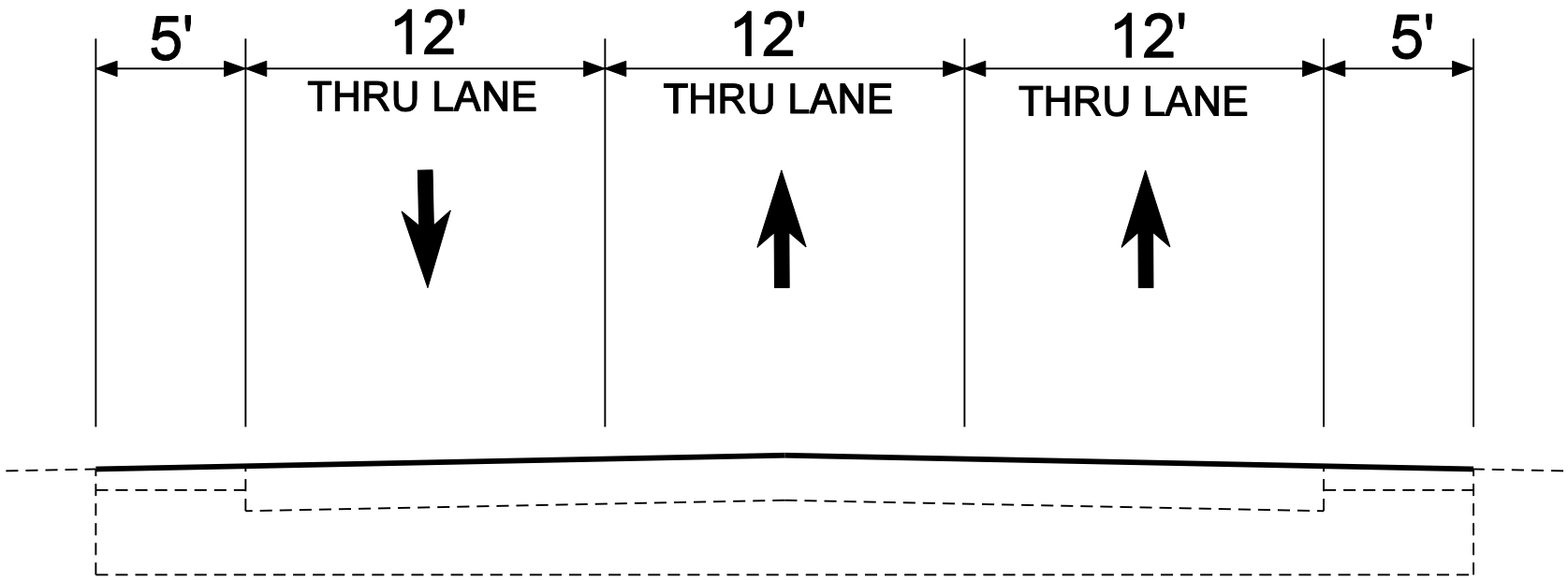
REQUIRED ROADWAY IMPROVEMENTS

FIGURE 2
Turkey Point Plant
Miami-Dade County, Florida



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TYPICAL SECTION

3-Lane Roadway

FIGURE 3

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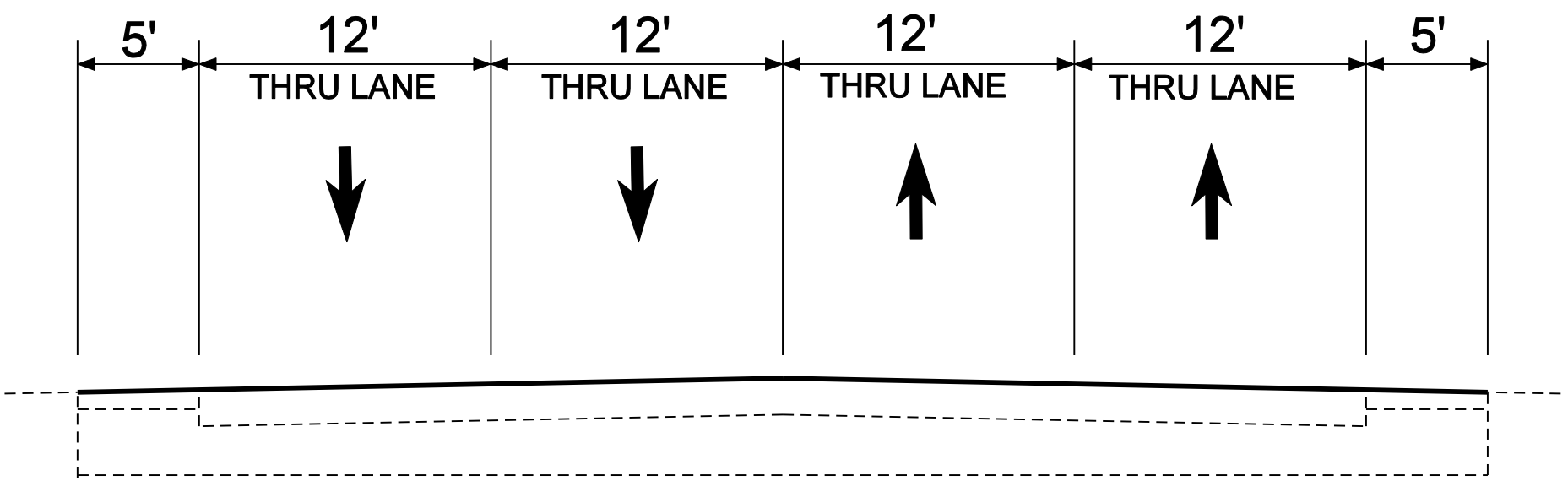

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TYPICAL SECTION

4-Lane Roadway

FIGURE 4

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Based on the results of 7-day machine traffic counts conducted near the security gate of the Turkey Point Plant (refer to Appendix E), the peak morning arrival period at the subject utility plant occurs between 6:00 AM and 7:00 AM. For this reason, construction workers should arrive no later than 6:00 AM in order to avoid the AM peak arrival period of the plant's normal operation.

CONCLUSION AND RECOMMENDATIONS

During the peak construction period of Units 6 & 7, approximately 2,627 (including 72 trucks) new AM peak hour trips and approximately 3,175 (including 72 trucks) new PM peak hour trips are anticipated at the Turkey Point Plant. With the construction of a new access roadway along SW 117th Avenue, SW 137th Avenue, and SW 359th Street, the following intersection and roadway segment improvements should be incorporated for the peak construction period:

Intersection Improvements

SW 328th Street (North Canal Drive) and SW 137th Avenue (Tallahassee Road)

- Signalization or Police Control
- Construct one additional southbound left-turn lane
- Construct one additional westbound through lane
- Construct two westbound right-turn lanes

SW 328th Street (North Canal Drive) and SW 117th Avenue

- Signalization or Police Control
- Construct two northbound left-turn lanes
- Construct one eastbound right-turn lane
- Restripe the eastbound through lane to a shared through/right-turn lane

SW 344th Street (Palm Drive) and SW 137th Avenue/Tallahassee Road (West)

- Signalization or Police Control (PM Peak Hour Only)
- Construct one separate eastbound through lane
- Construct one additional westbound left-turn lane

SW 344th Street (Palm Drive) and SW 137th Avenue/Tallahassee Road (East) – New Intersection

- Signalization or Police Control (PM Peak Hour Only)
- Construct two eastbound right-turn lanes
- Construct two northbound approach lanes (one striped as an exclusive left-turn lane and the other as a shared left-turn/right-turn lane)

SW 344th Street (Palm Drive) and SW 117th Avenue

- Signalization or Police Control
- Construct one eastbound left-turn lane
- Construct one eastbound right-turn lane
- Construct one westbound right-turn lane

- Construct one northbound left-turn lane
- Construct two northbound through lanes (outside lane will function as a shared through/right-turn lane)
- Construct one southbound left-turn lane
- Construct one southbound through lane (outside lane will function as a shared through/right-turn lane)

SW 359th Street and SW 117th Avenue – New Intersection

- Signalization or Police Control
- Construct two eastbound approach lanes (prohibit eastbound left-turns)
- Construct one westbound through lane
- Construct one westbound right-turn lane
- Construct two southbound approach lanes (one striped as an exclusive left-turn lane and the other as a shared left-turn/right-turn lane)

Conceptual drawings of the above intersection improvements are presented in Figures 5 through 10.

Roadway Improvements

SW 328th Street/North Canal Drive (SW 137th Avenue/Tallahassee Road to SW 117th Avenue)

- Widen from two to four lanes

SW 344th Street/Palm Drive (SW 137th Avenue/Tallahassee Road West to SW 137th Avenue/Tallahassee Road East)

- Widen from two to four lanes

SW 117th Avenue (SW 328th Street/North Canal Drive to SW 344th Street/Palm Drive)

- Widen from two to four lanes

New SW 359th Street (SW 137th Avenue/Tallahassee Road to SW 117th Avenue)

- Three lanes (two eastbound and one westbound)

New SW 359th Street (SW 117th Avenue to Construction Site)

- Four lanes (two eastbound and two westbound)

New SW 137th Avenue/Tallahassee Road (SW 344th Street/Palm Drive to SW 359th Street)

- Three lanes (two southbound and one northbound)

New SW 117th Avenue (SW 344th Street/Palm Drive to SW 359th Street)

- Four lanes (two northbound and two southbound)

SW 137th Avenue

SW 328th Street

SW 328th Street (N. Canal Drive)

ONLY

ONLY

SW 137th Avenue

Tallahassee Road

N

FIGURE 5
INTERSECTION CONCEPT PLAN
(SW 328th Street and SW 137th Avenue/Tallahassee Road)

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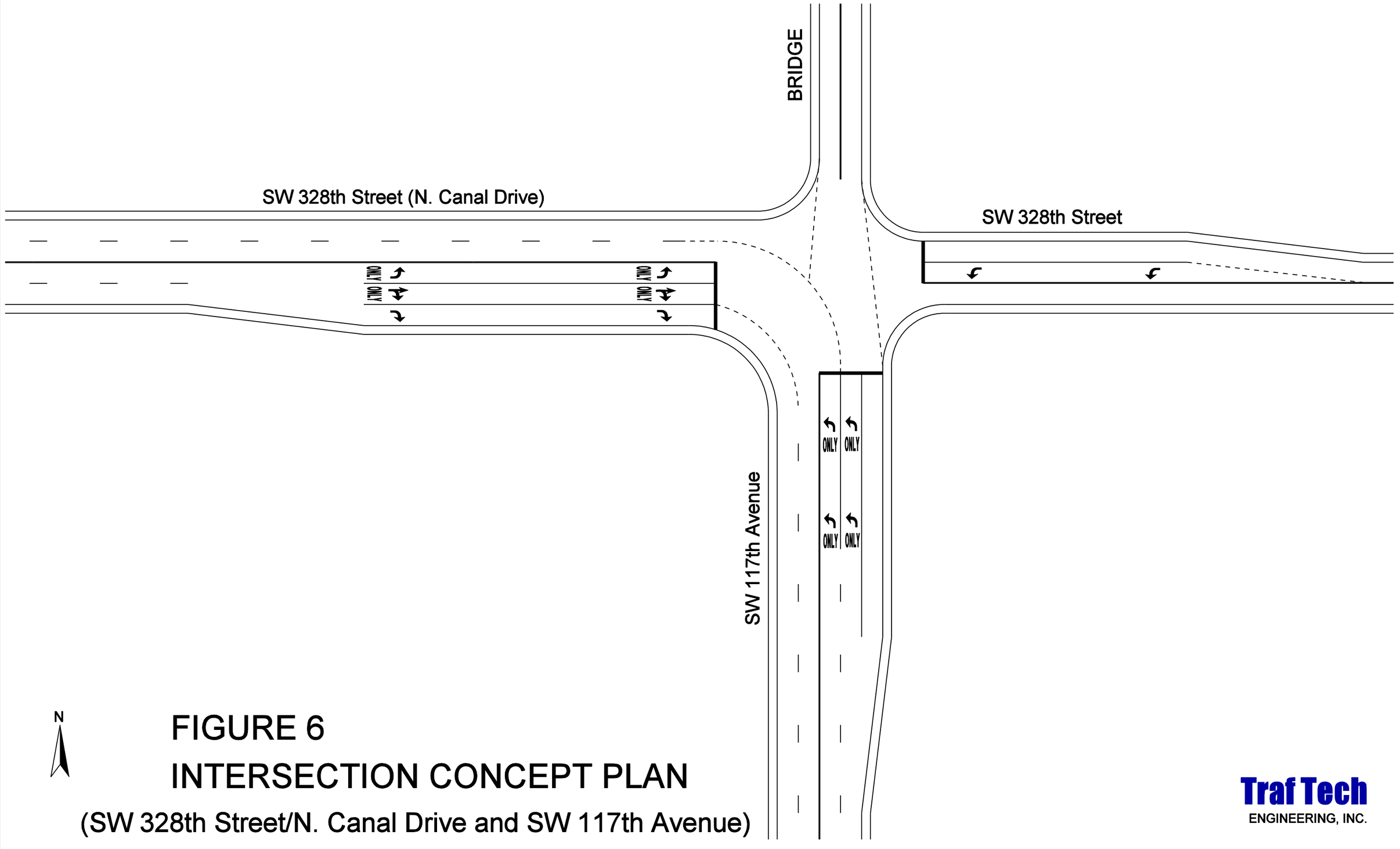

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FIGURE 6
INTERSECTION CONCEPT PLAN
(SW 328th Street/N. Canal Drive and SW 117th Avenue)

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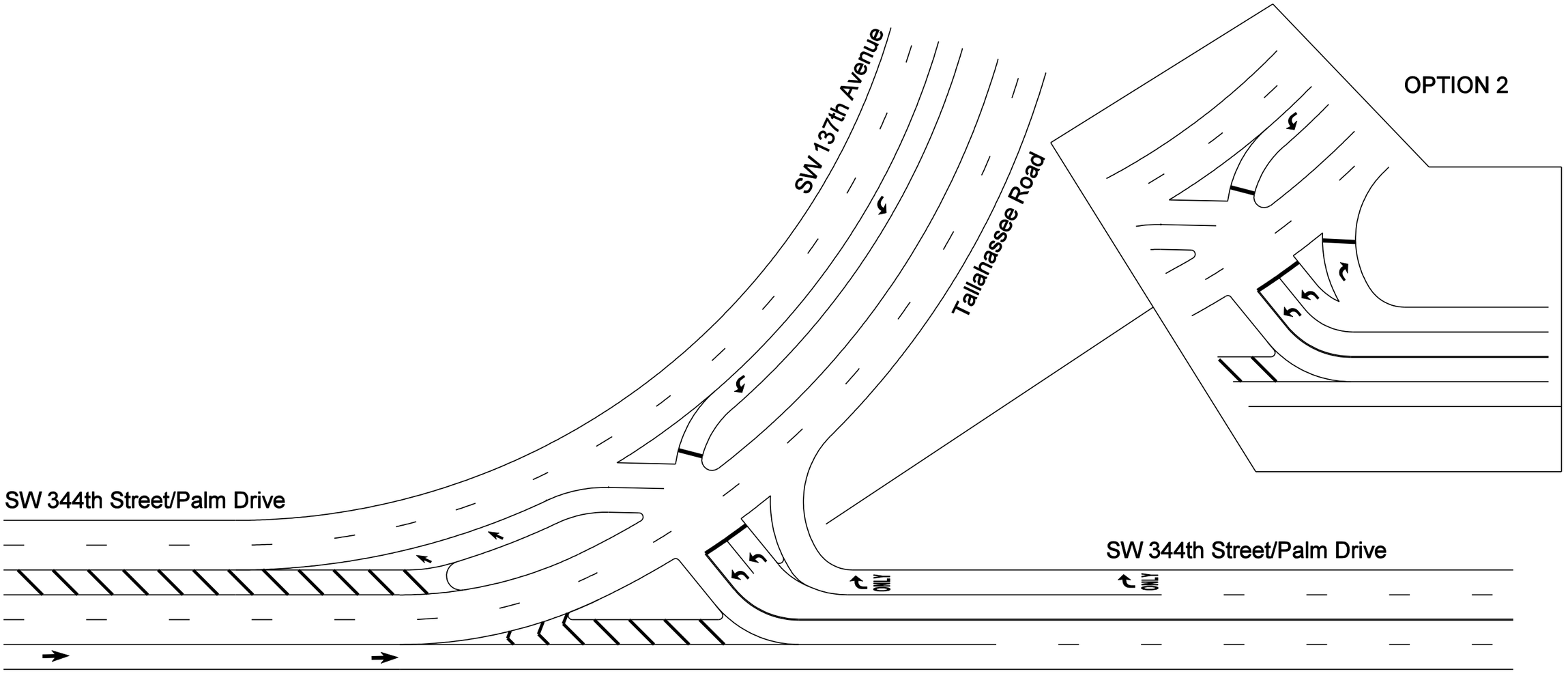

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FIGURE 7
INTERSECTION CONCEPT PLAN
(SW 344th Street/Palm Drive and SW 137th Avenue/Tallahassee Road West)

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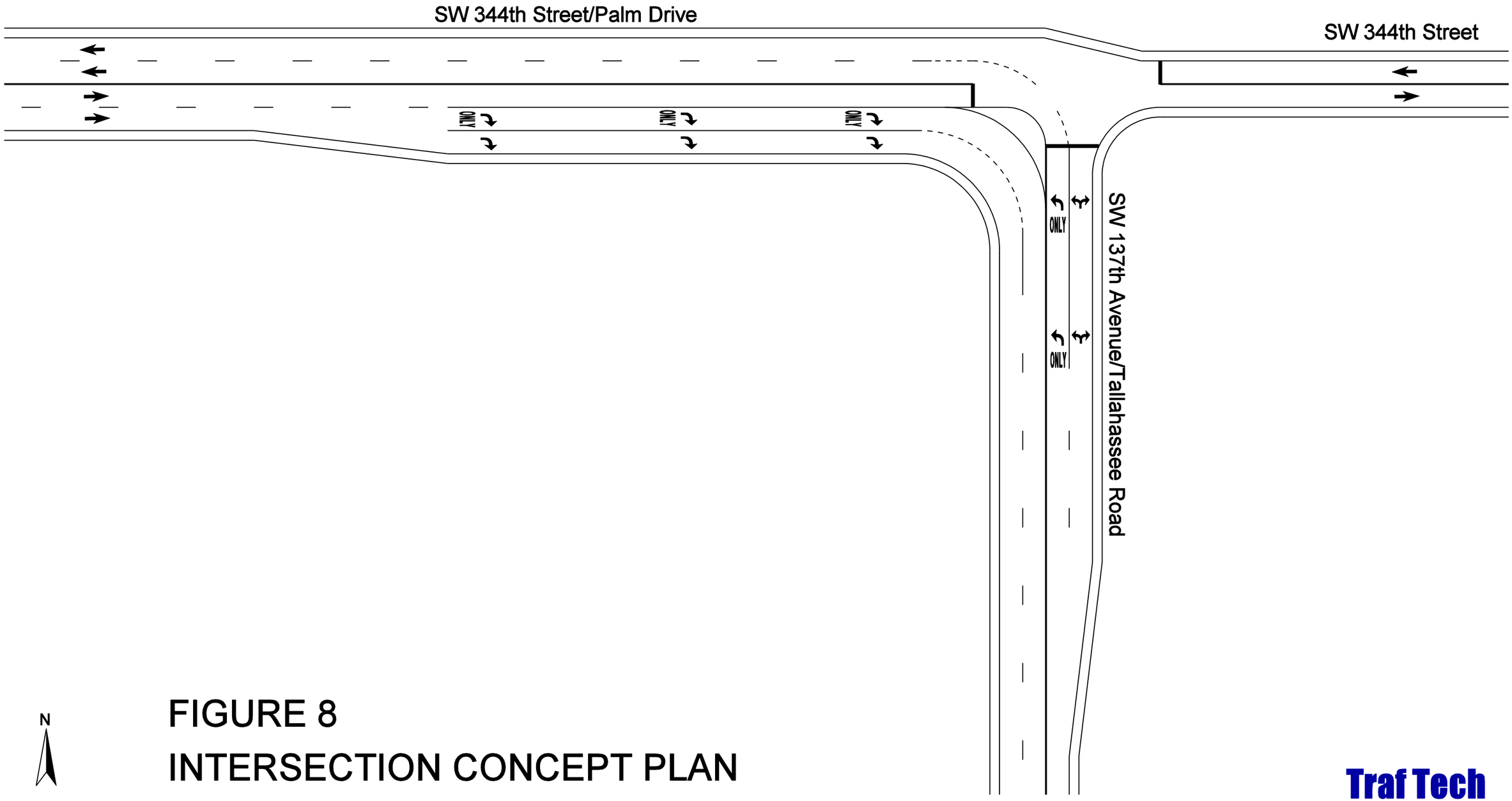

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FIGURE 8
INTERSECTION CONCEPT PLAN
(SW 344th Street/Palm Drive and SW 137th Avenue/Tallahassee Road East)

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SW 117th Avenue

ONLY

ONLY

SW 344th Street

SW 344th Street/Palm Drive

SW 117th Avenue

ONLY

ONLY

N

FIGURE 9
INTERSECTION CONCEPT PLAN
(SW 344th Street/Palm Drive and SW 117th Avenue)

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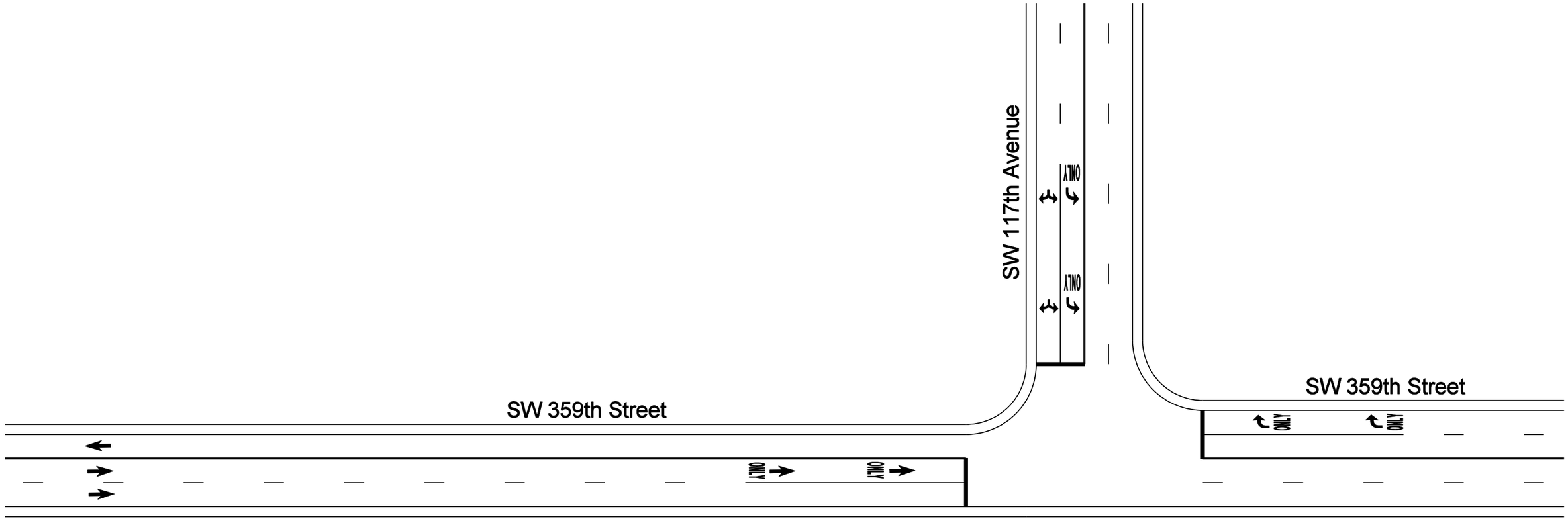

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FIGURE 10
INTERSECTION CONCEPT PLAN
(SW 359th Street and SW 117th Avenue)

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